Personal Research Database

Part C

By

Prof. Yuh-Shan Ho

Last data updates: 10/01/12

#: in processing of inter-library loan

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[Title: Canadian Agricultural Engineering 25](#_Toc317158657)

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[Title: Canadian Journal of Administrative Sciences-Revue Canadienne des Sciences de l Administration 34](#_Toc317158663)

[Title: Canadian Journal of Agricultural Economics-Revue Canadienne d’Economie Rurale 35](#_Toc317158664)

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[Title: Canadian Journal of Civil Engineering 70](#_Toc317158670)

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[Title: Canadian Journal of Fisheries and Aquatic Sciences 81](#_Toc317158673)

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[Title: Cancer Letters 171](#_Toc317158701)

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[Title: Celestial Mechanics 334](#_Toc317158724)

[Title: Cell 335](#_Toc317158725)

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[Title: Cell Death and Differentiation 339](#_Toc317158728)

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[Title: Clinical Pharmacy 1396](#_Toc317158922)

[Title: Clinical Physiology 1398](#_Toc317158923)

[Title: Clinical Psychology Review 1400](#_Toc317158924)

[Title: Clinical Radiology 1402](#_Toc317158925)

[Title: Clinical Rehabilitation 1404](#_Toc317158926)

[Title: Clinical Rheumatology 1415](#_Toc317158927)

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[Title: Counseling Psychology 2103](#_Toc317159034)

[Title: Creativity Research Journal 2104](#_Toc317159035)

[Title: Crime and Justice: A Review of Research 2105](#_Toc317159036)

[Title: CRC Critical Reviews in Solid State and Materials Sciences 2106](#_Toc317159037)

[Title: Critical Care 2107](#_Toc317159038)

[Title: Critical Care Medicine 2109](#_Toc317159039)

[Title: Critical Perspectives on International Business 2118](#_Toc317159040)

[Title: Critical Reviews in Analytical Chemistry 2119](#_Toc317159041)

[Title: Critical Reviews in Biotechnology 2121](#_Toc317159042)

[Title: Critical Reviews in Microbiology 2123](#_Toc317159043)

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[Title: Critical Reviews in Microbiology 2134](#_Toc317159046)

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[Title: Croatica Chemica Acta 2151](#_Toc317159051)

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[Title: Crustacean Issues, History of Carcinology 2155](#_Toc317159053)

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[Title: Crystengcomm 2157](#_Toc317159055)

[Title: Cuadernos de Economia y Direccion de la Empresa 2159](#_Toc317159056)

[Title: Cultura y Educacion 2160](#_Toc317159057)

[Title: Cultural Diversity & Ethnic Minority Psychology 2161](#_Toc317159058)

[Title: Culture and Organization 2163](#_Toc317159059)

[Title: Current Biology 2164](#_Toc317159060)

[Title: Current Comments 2165](#_Toc317159061)

[Title: Current Contents 2166](#_Toc317159062)

[Title: Current Contents/Agriculture Biology & Environmental Sciences 2183](#_Toc317159063)

[Title: Current Contents/Life Sciences 2184](#_Toc317159064)

[Title: Current Drug Metabolism 2186](#_Toc317159065)

[Title: Current Genetics 2188](#_Toc317159066)

[Title: Current Medical Research and Opinion 2189](#_Toc317159067)

[Title: Current Microbiology 2195](#_Toc317159068)

[Title: Current Nanoscience 2198](#_Toc317159069)

[Title: Current Neuropharmacology 2200](#_Toc317159070)

[Title: Current Opinion in Anesthesiology 2202](#_Toc317159071)

[Title: Current Opinion in Pediatrics 2203](#_Toc317159072)

[Title: Current Opinion in Rheumatology 2204](#_Toc317159073)

[Title: Current Pharmaceutical Analysis 2205](#_Toc317159074)

[Title: Current Pharmaceutical Analysis 2207](#_Toc317159075)

[Title: Current Science 2210](#_Toc317159076)

[Title: Current Surgery 2230](#_Toc317159077)

[Title: Current Therapeutic Research-Clinical and Experimental 2232](#_Toc317159078)

[Title: Current Topics in Biochemical Research 2236](#_Toc317159079)

[Title: Current Topics in Medicinal Chemistry 2237](#_Toc317159080)

[Title: Cutaneous and Ocular Toxicology 2239](#_Toc317159081)

[Title: Cybermetrics 2241](#_Toc317159082)

[Title: CyberPsychology & Behavior 2243](#_Toc317159083)

[Title: Czechoslovak Journal of Physics 2244](#_Toc317159084)

[Title: Czechoslovak Journal of Physics Section B 2246](#_Toc317159085)

# Title: CA-A Cancer Journal for Clinicians

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Full Text: [1992\CA-A Can J Cli42, 19.pdf](1992/CA-A%20Can%20J%20Cli42,%2019.pdf)

Notes: highly cited

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Full Text: [1993\CA-A Can J Cli43, 7.pdf](1993/CA-A%20Can%20J%20Cli43,%207.pdf)

Notes: highly cited

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Full Text: [1994\CA-A Can J Cli44, 7.pdf](1994/CA-A%20Can%20J%20Cli44,%207.pdf)

Abstract: The American Cancer Society’s Department of Epidemiology and Statistics reports its 28th annual compilation of cancer incidence, survival, and mortality data for the United States and around the world.

Keywords: Cancer, Data, Incidence, Mortality, Survival, United States, World

Notes: highly cited

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Full Text: [1995\CA-A Can J Cli45, 8.pdf](1995/CA-A%20Can%20J%20Cli45,%208.pdf)

Abstract: The American Cancer Society’s Department oi Epidemiology and Statistics reports its 29th annual compilation of cancer incidence, survival, and mortality data for the United States and around the world.

Keywords: Cancer, Data, Incidence, Mortality, Survival, United States, World

Notes: highly cited

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Full Text: [1996\CA-A Can J Cli46, 5.pdf](1996/CA-A%20Can%20J%20Cli46,%205.pdf)

Keywords: Statistics

Notes: highly cited

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Full Text: [1997\CA-A Can J Cli47, 5.pdf](1997/CA-A%20Can%20J%20Cli47,%205.pdf)

Keywords: Statistics

Notes: highly cited

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Full Text: [1998\CA-A Can J Cli48, 6.pdf](1998/CA-A%20Can%20J%20Cli48,%206.pdf)

Abstract: The Surveillance Research Program of the American Cancer Society’s Department of Epidemiology and Surveillance reports its 32nd annual compilation of cancer incidence, mortality, and survival data for the United States and around the world.

Keywords: Cancer, Data, Incidence, Mortality, Research, Statistics, Survival, United States, World

Notes: highly cited

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Full Text: [1999\CA-A Can J Cli49, 8.pdf](1999/CA-A%20Can%20J%20Cli49,%208.pdf)

Keywords: Statistics

Notes: highly cited

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Full Text: [2000\CA-A Can J Cli50, 7.pdf](2000/CA-A%20Can%20J%20Cli50,%207.pdf)

Abstract: The Surveillance Research Program, of the American Cancer Society’s, Department of Epidemiology and Surveillance Research reports its annual compilation of estimated cancer incidence, mortality, and survival data for the United Stares in the year 2000. After 70 years of increases, the recorded number of total cancer deaths among men in the LIS declined for the first time from 1996 to 1997, This decrease in overall male,mortality is the result of recent downturns in lung and bronchus cancer deaths, prostate cancer deaths, mid color and rectum cancer deaths, Despite decreasing numbers of deaths from female breast cancer and colon and rectum cancer, mortality associated with lung and bronchus cancer among women continues to increase. Lung cancer is expected to account for 25% of all female cancer deaths in 2000. This report also includes a summary of global cancer mortality rates using data from the World Health Organization.

Keywords: Breast Cancer, Cancer, Data, Female, First, Incidence, Lis, Lung, Men, Mortality, Prostate Cancer, Rates, Rectum, Research, Statistics, Survival, Women, World Health Organization

Notes: highly cited

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Full Text: [2001\CA-A Can J Cli51, 15.pdf](2001/CA-A%20Can%20J%20Cli51,%2015.pdf)

Abstract: Each year the American Cancer Society compiles estimates of the number of new cancer cases and deaths expected in the US in the current year and the most recent data on cancer incidence, mortality. and survival. An estimated 1,268,000 new cases of cancer will be diagnosed in the year 2001 and an estimated 553,400 Americans will die from cancer. Overall cancer incidence and death rates have continued to decrease in men and women since the early 1990s, and the decline in overall cancer mortality has been greater in recent years. Despite reductions in age-adjusted rates of cancer death, the total number of recorded cancer deaths in the US continues to increase, due to an aging and expanding population. Large disparities in cancer incidence and mortality across racial/ethnic groups continue. Black men and women experience higher incidence of cancer and poorer survival than white men and women, The disparity in survival reflects both diagnosis of cancer at later disease stages, and poorer survival within each stage of diagnosis.

Keywords: Aging, Cancer, Data, Death, Diagnosis, Disease, Disparities, Disparity, Estimates, Experience, Incidence, Men, Mortality, Population, Rates, Statistics, Survival, US, Women

Notes: highly cited

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Full Text: [2002\CA-A Can J Cli52, 23.pdf](2002/CA-A%20Can%20J%20Cli52,%2023.pdf)

Abstract: Every year the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival, using National Cancer Institute (NCl) incidence and National Center for Health Statistics (NCHS) mortality data. Incidence and death rates are age adjusted to the 1970 US standard population. It is estimated that 1,284,900 new cases of cancer will be diagnosed and 555,500 people will die from cancer in the United States in the year 2002. From 1992 to 1998, cancer death rates declined in males and females, while cancer incidence rates decreased among males and increased slightly among females. Most notably, African-American men showed the largest decline for both incidence and mortality. Nevertheless, African Americans still carry the highest burden of cancer with later-stage cancer diagnosis and poorer survival compared with whites. Despite the continued decline in cancer death rates, the total number of recorded cancer deaths in the United States continues to increase slightly due to the aging and expanding population.

Keywords: African American, African American Men, African Americans, African-Americans, Age, Aging, Burden, Cancer, Data, Death, Diagnosis, Estimates, Incidence, Men, Mortality, Population, Rates, Standard, Statistics, Survival, United States, Us, Whites

Notes: highly cited

? Jemal, A., Murray, T., Samuels, A., Ghafoor, A., Ward, E. and Thun, M.J. (2003), Cancer statistics, 2003. *CA-A Cancer Journal for Clinicians*, **53** (1), 5-26.

Full Text: [2003\CA-A Can J Cli53, 5.pdf](2003/CA-A%20Can%20J%20Cli53,%205.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year, and compiles the most recent data on cancer incidence, mortality, and survival, by using incidence data from the National Cancer Institute (NCI) and mortality data from the National Center for Health Statistics (NCHS). Incidence and death rates are age adjusted to the 2000 US standard population. In the year 2003, we estimate that 1,334,100 new cases of cancer will be diagnosed, and 556,500 people will die from cancer in the United States. Age-adjusted cancer death rates declined in both males and females in the,1990s, though the magnitude of decline is substantially higher in males than in. females. In contrast, incidence rates continued to increase in females while stabilizing in males. African-American males showed the largest decline for mortality. However, African Americans still carry the highest burden of cancer with diagnosis of cancer at a later stage and poorer survival within each stage compared with Whites. In spite of the continued decline in cancer death rates in the most recent time period, the total number of recorded cancer deaths in the United States continues to increase slightly due to the aging and expanding population.

Keywords: African American, African Americans, African-Americans, Age, Aging, Burden, Cancer, Data, Death, Diagnosis, Estimates, Incidence, Mortality, NCI, Population, Rates, Standard, Statistics, Survival, United States, US

Notes: highly cited

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Full Text: [2004\CA-A Can J Cli54, 8.pdf](2004/CA-A%20Can%20J%20Cli54,%208.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival rates based on incidence data from the National Cancer Institute and mortality data from the National Center for Health Statistics. Incidence and mortality rates are age standardized to the 2000 US standard million population. A total of 1,368,030 new cancer cases and 563,700 deaths are expected in the United States in 2004. Incidence rates stabilized among men from 1995 through 2000 but continued to increase among females by 0.4% per year from 1987 through 2000. Mortality rates have decreased by 1.5% per year since 1992 among men, but have stabilized from 1998 through 2000 among women. Cancer death rates continued to decrease from the three major cancer sites in men (lung and bronchus, colon and rectum, and prostate) and from female breast and colorectal cancers in women. In analyses by race and ethnicity, African-American men and women have 40% and 20% higher death rates from all cancers combined compared with White men and women, respectively. Cancer incidence and mortality rates are lower in other racial and ethnic groups than in Whites and African Americans for all sites combined and for the four major cancer sites. However, these groups generally have higher rates for stomach, liver, and cervical cancers than do Whites. Furthermore, minority populations are more likely to be diagnosed with advanced stage disease than are Whites. Progress in reducing the burden from cancer can be accelerated by applying existing cancer control knowledge into practice among all segments of the population.

Keywords: African American, African American Men, African Americans, African-Americans, Age, Analyses, Burden, Cancer, Control, Data, Death, Disease, Estimates, Ethnic Groups, Ethnicity, Female, Incidence, Knowledge, Liver, Lung, Men, Mortality, Population, Populations, Practice, Race, Race And Ethnicity, Rates, Rectum, Standard, Statistics, Surveillance, Survival, Trends, United States, US, Whites, Women

Notes: highly cited

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Full Text: [2005\CA-A Can J Cli55, 10.pdf](2005/CA-A%20Can%20J%20Cli55,%2010.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute and mortality data from the National Center for Health Statistics. Incidence and death rates are age-standardized to the 2000 US standard million population. A total of 1,372,910 new cancer cases and 570,280 deaths are expected in the United States in 2005. When deaths are aggregated by age, cancer has surpassed heart disease as the leading cause of death for persons younger than 85 since 1999. When adjusted to delayed reporting, cancer incidence rates stabilized in men from 1995 through 2001 but continued to increase by 0.3% per year from 1987 through 2001 in women. The death rate from all cancers combined has decreased by 1.5% per year since 1993 among men and by 0.8% per year since 1992 among women. The mortality rate has also continued to decrease from the three most common cancer sites in men (lung and bronchus, colon and rectum, and prostate) and from breast and colorectal cancers in women. Lung cancer mortality among women has leveled off after increasing for many decades. In analyses by race and ethnicity, African American men and women have 40% and 20% higher death rates from all cancers combined than White men and women, respectively. Cancer incidence and death rates are lower in other racial and ethnic groups than in Whites and African Americans for all sites combined and for the four major cancer sites. However, these groups generally have higher rates for stomach, liver, and cervical cancers than Whites. Furthermore, minority populations are more likely to be diagnosed with advanced stage disease than are Whites. Progress in reducing the burden of suffering and death from cancer can be accelerated by applying existing cancer control knowledge across all segments of the population.

Keywords: African American, African American Men, African Americans, African-Americans, Age, Analyses, Burden, Cancer, Cause of Death, Control, Data, Death, Disease, Estimates, Ethnic Groups, Ethnicity, Heart, Incidence, Knowledge, Liver, Lung, Men, Mortality, Mortality Rate, Population, Populations, Race, Race And Ethnicity, Rates, Rectum, Reporting, Standard, Statistics, Suffering, Survival, Trends, United States, US, Whites, Women

Notes: highly cited

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Full Text: [2005\CA-A Can J Cli55, 74.pdf](2005/CA-A%20Can%20J%20Cli55,%2074.pdf)

Abstract: Estimates of the worldwide incidence, mortality and prevalence of 26 cancers in the year 2002 are now available in the GLOBOCAN series of the International Agency for Research on Cancer. The results are presented here in summary form, including the geographic variation between 20 large “areas” of the world. Overall, there were 10.9 million new cases, 6.7 million deaths, and 24.6 million persons alive with cancer (within three years of diagnosis). The most commonly diagnosed cancers are lung (1.35 million), breast (1.15 million), and colorectal (1 million); the most common causes of cancer death are lung cancer (1.18 million deaths), stomach cancer (700,000 deaths), and liver cancer (598,000 deaths). The most prevalent cancer in the world is breast cancer (4.4 million survivors up to 5 years following diagnosis). There are striking variations in the risk of different cancers by geographic area. Most of the international variation is due to exposure to known or suspected risk factors related to lifestyle or environment, and provides a clear challenge to prevention.

Keywords: Breast Cancer, Cancer, Challenge, Death, Diagnosis, Environment, Exposure, Helicobacter-Pylori, Hemoglobin Adduct Levels, Hepatocellular-Carcinoma, Incidence, International, International Trends, Kaposis-Sarcoma, Liver, Lung, Lung Cancer, Major Cancers, Mortality, Prevalence, Prevention, Prostate-Cancer, Research, Risk, Risk Factors, S-Transferase M1, Statistics, United-States, World, Worldwide Incidence

Notes: highly cited

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Full Text: [2006\CA-A Can J Cli56, 106.pdf](2006/CA-A%20Can%20J%20Cli56,%20106.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute and mortality data from the National Center for Health Statistics. Incidence and death rates are age-standardized to the 2000 US standard million population. A total of 1,399,790 new cancer cases and 564,830 deaths from cancer are expected in the United States in 2006. When deaths are aggregated by age, cancer has surpassed heart disease as the leading cause of death for those younger than age 85 since 1999. Delay-adjusted cancer incidence rates stabilized in men from 1995 through 2002, but continued to increase by 0.3% per year from 1987 through 2002 in women. Between 2002 and 2003, the actual number of recorded cancer deaths decreased by 778 in men, but increased by 409 in women, resulting in a net decrease of 369, the first decrease in the total number of cancer deaths since national mortality record keeping was instituted in 1930. The death rate from all cancers combined has decreased by 1.5% per year since 1993 among men and by 0.8% per year since 1992 among women. The mortality rate has also continued to decrease for the three most common cancer sites in men (lung and bronchus, colon and rectum, and prostate) and for breast and colon and rectum cancers in women. Lung cancer mortality among women continues to increase slightly. In analyses by race and ethnicity, African American men and women have 40% and 18% higher death rates from all cancers combined than White men and women, respectively. Cancer incidence and death rates are lower in other racial and ethnic groups than in Whites and African Americans for all sites combined and for the four major cancer sites. However, these groups generally have higher rates for stomach, liver, and cervical cancers than Whites. Furthermore, minority populations are more likely to be diagnosed with advanced stage disease than are Whites. Progress in reducing the burden of suffering and death from cancer can be accelerated by applying existing cancer control knowledge across all segments of the population.

Keywords: African American, African American Men, African Americans, African-Americans, Age, Analyses, Burden, Cancer, Cause of Death, Control, Data, Death, Disease, Estimates, Ethnic Groups, Ethnicity, First, Heart, Incidence, Knowledge, Liver, Lung, Men, Mortality, Mortality Rate, Population, Populations, Race, Race And Ethnicity, Rates, Record, Record Keeping, Rectum, Standard, Statistics, Suffering, Survival, Trends, United States, US, Whites, Women

Notes: highly cited

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Full Text: [2007\CA-A Can J Cli57, 43.pdf](2007/CA-A%20Can%20J%20Cli57,%2043.pdf)

Abstract: Each year, the American Cancer Society (ACS) estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute, Centers for Disease Control and Prevention, and the North American Association of Central Cancer Registries and mortality data from the National Center for Health Statistics. This report considers incidence data through 2003 and mortality data through 2004. Incidence and death rates are age-standardized to the 2000 US standard million population, A total of 1,444,920 new cancer cases and 559,650 deaths for cancers are projected to occur in the United States in 2007. Notable trends in cancer incidence and mortality rates include stabilization of the age-standardized, delay-adjusted incidence rates for all cancers combined in men from 1995 through 2003; a continuing increase in the incidence rate by 0.3% per year in women; and a 13.6% total decrease in age-standardized cancer death rates among men and women combined between 1991 and 2004. This report also examines cancer incidence, mortality, and survival by site, sex, race/ethnicity, geographic area, and calendar year, as well as the proportionate contribution of selected sites to the overall trends. While the absolute number of cancer deaths decreased for the second consecutive year in the United States (by more than 3,000 from 2003 to 2004) and much progress has been made in reducing mortality rates and improving survival, cancer still accounts for more deaths than heart disease in persons under age 85 years. Further progress can be accelerated by supporting new discoveries and by applying existing cancer control knowledge across all segments of the population.

Keywords: Age, Cancer, Control, Data, Death, Disease, Estimates, Heart, Incidence, Knowledge, Men, Mortality, North, Population, Progress, Rates, Sex, Site, Standard, Statistics, Survival, Trends, United States, US, Whites, Women

Notes: highly cited

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Full Text: [2008\CA-A Can J Cli58, 71.pdf](2008/CA-A%20Can%20J%20Cli58,%2071.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute, Centers for Disease Control and Prevention, and the North American Association of Central Cancer Registries and mortality data from the National Center for Health Statistics. Incidence and death rates are age-standardized to the 2000 US standard million population. A total of 1,437,180 new cancer cases and 565,650 deaths from cancer are projected to occur in the United States in 2008. Notable trends in cancer incidence and mortality include stabilization of incidence rates for all cancer sites combined in men from 1995 through 2004 and in women from 1999 through 2004 and a continued decrease in the cancer death rate since 1990 in men and since 1991 in women. Overall cancer death rates in 2004 compared with 1990 in men and 1991 in women decreased by 18.4% and 10.5%, respectively, resulting in the avoidance of over a half million deaths from cancer during this time interval. This report also examines cancer incidence, mortality, and survival by site, sex, race/ethnicity, education, geographic area, and calendar year, as well as the proportionate contribution of selected sites to the overall trends. Although much progress has been made in reducing mortality rates, stabilizing incidence rates, and improving survival, cancer still accounts for more deaths than heart disease in persons under age 85 years. Further progress can be accelerated by supporting new discoveries and by applying existing cancer control knowledge across all segments of the population.

Keywords: Age, Breast-Cancer, Cancer, Control, Current Calendar Year, Data, Death, Disease, Education, Estimates, Heart, Incidence, Incidence Rates, Interval, Knowledge, Level, Men, Mortality, Nation, North, Population, Progress, Rates, Sex, Site, Standard, Statistics, Survival, Trends, United States, United-States, US, Whites, Women

Notes: highly cited

? Jemal, A., Siegel, R., Ward, E., Hao, Y.P., Xu, J.Q. and Thun, M.J. (2009), Cancer Statistics, 2009. *CA-A Cancer Journal for Clinicians*, **59** (4), 225-249.

Full Text: [2009\CA-A Can J Cli59, 225.pdf](2009/CA-A%20Can%20J%20Cli59,%20225.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data on cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute, Centers for Disease Control and Prevention, and the North American Association of Central Cancer Registries and mortality data from the National Center for Health Statistics. Incidence and death rates are standardized by age to the 2000 United States standard million population. A total of 1,479,350 new cancer cases and 562,340 deaths from cancer are projected to occur in the United States in 2009. Overall cancer incidence rates decreased in the most recent time period in both men (1.8% per year from 2001 to 2005) and women (0.6% per year from 1998 to 2005), largely because of decreases in the three major cancer sites in men (lung, prostate, and colon and rectum [colorectum]) and in two major cancer sites in women (breast and colorectum). Overall cancer death rates decreased in men by 19.2% between 1990 and 2005, with decreases in lung (37%), prostate (24%), and colorectal (17%) cancer rates accounting for nearly 80% of the total decrease. Among women, overall cancer death rates between 1991 and 2005 decreased by 11.4%, with decreases in breast (37%) and colorectal (24%) cancer rates accounting for 60% of the total decrease. The reduction in the overall cancer death rates has resulted in the avoidance of about 650,000 deaths from cancer over the 15-year period. This report also examines cancer incidence, mortality, and survival by site, sex, race/ethnicity, education, geographic area, and calendar year. Although progress has been made in reducing incidence and mortality rates and improving survival, cancer still accounts for more deaths than heart disease in persons younger than 85 years of age. Further progress can be accelerated by applying existing cancer control knowledge across all segments of the population and by supporting new discoveries in cancer prevention, early detection, and treatment. CA Cancer J Clin 2009;59:225-249. (C) 2009 American Cancer Society, Inc.

Keywords: Age, Cancer, Control, Counts, Current Calendar Year, Data, Death, Disease, Education, Estimates, Heart, Incidence, Incidence Rates, Knowledge, Lung, Men, Mortality, Nation, North, Population, Prevention, Progress, Rates, Rectum, Reduction, Sex, Site, Standard, Survival, Treatment, Trends, United States, United-States, US, Women

Notes: highly cited

? Jemal, A., Siegel, R., Xu, J.Q. and Ward, E. (2010), Cancer Statistics, 2010. *CA-A Cancer Journal for Clinicians*, **60** (5), 277-300.

Full Text: [2010\CA-A Can J Cli60, 277.pdf](2010/CA-A%20Can%20J%20Cli60,%20277.pdf)

Abstract: Each year, the American Cancer Society estimates the number of new cancer cases and deaths expected in the United States in the current year and compiles the most recent data regarding cancer incidence, mortality, and survival based on incidence data from the National Cancer Institute, the Centers for Disease Control and Prevention, and the North American Association of Central Cancer Registries and mortality data from the National Center for Health Statistics. Incidence and death rates are age-standardized to the 2000 US standard million population. A total of 1,529,560 new cancer cases and 569,490 deaths from cancer are projected to occur in the United States in 2010. Overall cancer incidence rates decreased in the most recent time period in both men (1.3% per year from 2000 to 2006) and women (0.5% per year from 1998 to 2006), largely due to decreases in the 3 major cancer sites in men (lung, prostate, and colon and rectum [colorectum]) and 2 major cancer sites in women (breast and colorectum). This decrease occurred in all racial/ethnic groups in both men and women with the exception of American Indian/Alaska Native women, in whom rates were stable. Among men, death rates for all races combined decreased by 21.0% between 1990 and 2006, with decreases in lung, prostate, and colorectal cancer rates accounting for nearly 80% of the total decrease. Among women, overall cancer death rates between 1991 and 2006 decreased by 12.3%, with decreases in breast and colorectal cancer rates accounting for 60% of the total decrease. The reduction in the overall cancer death rates translates to the avoidance of approximately 767,000 deaths from cancer over the 16-year period. This report also examines cancer incidence, mortality, and survival by site, sex, race/ethnicity, geographic area, and calendar year. Although progress has been made in reducing incidence and mortality rates and improving survival, cancer still accounts for more deaths than heart disease in persons younger than 85 years. Further progress can be accelerated by applying existing cancer control knowledge across all segments of the population and by supporting new discoveries in cancer prevention, early detection, and treatment. CA Cancer J Clin 2010;60:277-300. (C) 2010 American Cancer Society, Inc.

Keywords: Current Calendar Year, Breast-Cancer, Incidence Rates, United-States, Trends, Nation, Survival, Counts, Impact

# Title: Cadernos de Saúde Pública

Full Journal Title: Cadernos de Saude Publica

ISO Abbreviated Title:

JCR Abbreviated Title: Cad Saude Publica

ISSN: 0102-311X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Coimbra, C.E.A. (2003), Challenges for scientific output and communications in health in Brazil. *Cadernos de Saúde Pública*, **19** (1), 4-5.

Full Text: 2003\Cad Sau Pub19, 4.pdf

Keywords: Brazil, Communications, Health, Scientific Output

? Novaes, H.M.D. (2004), Research in, about, and for health services: An international panorama and questions for health research in Brazil. *Cadernos de Saúde Pública*, **20** (S2), S147-S157.

Full Text: [2004\Cad Sau Pub20S, S147.pdf](2004/Cad%20Sau%20Pub20S,%20S147.pdf)

Abstract: Health systems and services are important determinants of health conditions and quality of life. Health services research is a multidisciplinary area aimed at deepening and widening knowledge on the area in specific contexts and focusing on system accessibility, impact, and performance and conditions and quality of health care in order to contribute to decisions by policy-makers, managers, and health professionals. This article analyzes the main characteristics and trends in recent output in the international literature and discusses several key questions for health services research in Brazil.

Keywords: Brazil, Care, Characteristics, Determinants Of Health, Health, Health Care, Health Professionals, Health Research, Health Services, Health Services Research, Impact, International, Knowledge, Life, Literature, Multidisciplinary, Performance, Quality, Quality of, Quality of Health Care, Quality of Life, Research, Services, Systems, Trends

? Oria, M.O., Glick, D.F. and Alves, M.D. (2005), Trends in breastfeeding research by Brazilian nurses. *Cadernos de Saúde Pública*, **21** (1), 20-28.

Full Text: [2005\Cad Sau Pub21, 20.pdf](2005/Cad%20Sau%20Pub21,%2020.pdf)

Abstract: Exclusive breastfeeding is acknowledged as important for survival, optimal growth, and development of infants. The current review presents a synthesis of research output by Brazilian nurses on breastfeeding over the last 20 years, analyzes the theoretical and methodological issues emerging from studies on breastfeeding in Brazil, and provides directions for future research and practice by nurses in the area breastfeeding. Studies included in this review were identified through LILACS searches of Portuguese-language sources. Articles were organized and analyzed chronologically by comparing the evolution of the Brazilian Breastfeeding Program. The incomplete research output of the Brazilian nursing profession in regard to breastfeeding research needs to be addressed. In addition, specific cultural, sociological, and anthropological characteristics of Brazilian regional settings remain to be explored. Emphasis on potential confounders and critical interrelations is warranted.

Keywords: Brazil, Breastfeeding, Characteristics, Cultural, Development, Evolution, Growth, Infants, Needs, Nurses, Nursing, Nursing Profession, Potential, Practice, Profession, Regional, Research, Review, Sources, Survival, Synthesis

? Palma-Solis, M.A., Franco Giraldo, A. and Álvarez-Dardet, C. (2006), Influences and hegemonies in health reform research. *Cadernos de Saúde Pública*, **22** (12), 2527-2537.

Full Text: [2006\Cad Sau Pub22, 2527.pdf](2006/Cad%20Sau%20Pub22,%202527.pdf)

Abstract: The authors analyze the evolution in publications indexed in MEDLINE, LILACS, and Sociological Abstracts concerning health reforms around the world and the determinants of their orientation and distribution from 1990 to 2004. A total of 8,729 publications were selected. The principles of “sustainability” and “quality and effectiveness” were dealt with most frequently, with different patterns of attention, depending on the regions and countries. Of 199 countries, 61% included references as to their health reform processes, with the largest numbers in the United States and the Great Britain. The British and U.S. standards for attention to health reform principles displayed strong influences on the study of health reforms elsewhere. This may limit the scientific visibility of issues like equity, participation, and efficiency.

Keywords: Britain, Distribution, Efficiency, Equity, Evolution, Health, MEDLINE, Participation, Principles, Publications, Reform, Standards, United States, Visibility, World

? Carvalho, L., Coimbra, C.E.A., Souza-Santos, R. and Santos, R.V. (2007), Output and citation in public health: A perspective based on the journals *Cadernos de Saúde Pública* and *Revista de Saúde Pública*. *Cadernos de Saúde Pública*, **23** (12), 3023-3030.

Full Text: [2007\Cad Sau Pub23, 3023.pdf](2007/Cad%20Sau%20Pub23,%203023.pdf)

Abstract: This is a comparative bibliometric study of the two main scientific journals in the Public Health field in Brazil: Cadernos de Saude Publica (CSP) and Revista de Saude Publica (RSP). Twenty-four issues of each periodical were analyzed, published from 1996 to 2003, comprising a sample of 819 articles (496 from CSP and 323 from RSP). The following elements in the articles were identified and analyzed: thematic area of the article and citation pattern of publications (articles in periodicals, books and/or book chapters, theses/dissertations, Internet documents, “gray” literature, and other types of publications). The resulting data showed that the majority of the articles represent the sub-area of “epidemiology”. The citation pattern in the journals showed articles in periodicals in first place, followed by citations of books and/or book chapters. Papers in the sub-area “social sciences in health” published in CSP are exceptions, since books and chapters are the most frequently cited. The authors discuss the implications of the findings for the characterization and evaluation of scientific output in Public Health in Brazil.

Keywords: Bibliometric Indicators, Literature, Patterns, Periodicals, Scientific Communication and Diffusion

? Barata, R.B. (2007), SciELO public health: The performance of *Cadernos de Saúde Pública* and *Revista de Saúde Pública*. *Cadernos de Saúde Pública*, **23** (12), 3031-3040.

Full Text: [2007\Cad Sau Pub23, 3031.pdf](2007/Cad%20Sau%20Pub23,%203031.pdf)

Abstract: The aim of this paper was to analyze two Brazilian scientific journals included in the SciELO Library of Public Health, using a group of bibliometric indicators and scrutinizing the articles most viewed. Cadernos de Saude Publica was accessed 3,743.59 times per month, with an average of 30.31 citations per article. The 50 articles most viewed (6.72 to 524.5 views) were mostly published in Portuguese (92%). 42% were theoretical essays, 20% surveys, and 16% descriptive studies. 42% used argumentative techniques, 34% quantitative techniques, 18% qualitative techniques, and 6% mathematical modeling. The most common themes were: health and work (50%), epidemiology (22916), and environmental health (8916). Revista de Saude Publica was accessed 1,590.97 times per month, with an average of 26.27 citations per article. The 50 articles most viewed (7.33 and 56.50 views) were all published in Portuguese: 46% were surveys, 14% databases analysis, and 12% systematic reviews. Quantitative techniques were adopted in 66% of such articles, while mathematical modeling was the same as observed in Cadernos de Saude Publica, as were qualitative techniques. The most common themes were health services organization (22%), nutrition (22%), health and work (18%), epidemiology (12%), and environmental health (12916).

Keywords: Bibliometric Indicators, Databases, Environmental Health, Indexes, Open Access, Periodicals, Virtual Libraries

? Castiel, L.D. and Sanz-Valero, J. (2007), Between fetishism and survival: Are scientific articles a form of academic merchandise? *Cadernos de Saúde Pública*, **23** (12), 3041-3050.

Full Text: [2007\Cad Sau Pub23, 3041.pdf](2007/Cad%20Sau%20Pub23,%203041.pdf)

Abstract: This article discusses the possible meanings of the intense prevailing concern in academic circles over the notion of research productivity, as reflected in an excess number of articles published in various scientific journals. The numerical accounting of articles published by researchers in scientific journals with renowned academic status serves to legitimize academics in their fields of work, in various ways. In this sense, we suggest that scientific articles take on aspects of merchandise-as-fetish, according to Marx’s theory of use-value and exchange-value and Benjamin’s exposure value. Meanwhile, the biological notions of selection and evolution are used as metaphorical elements in “bibliographic Darwinism”. There are references as to the possibility many of the prevailing bibliometric concerns serve as instruments for econometric analysis, especially to orient and enhance cost-effectiveness analysis in research investments of various orders and types, from the point of view of their economic return.

Keywords: Journal Article, Medicine, Periodicals, Research, Science, Scientific Communication and Diffusion

? da Cruz, M.M., dos Santos, E.M. and Monteiro, S. (2007), Evaluation of STD/AIDS prevention programs: A review of approaches and methodologies. *Cadernos de Saúde Pública*, **23** (5), 995-1003.

Full Text: [2007\Cad Sau Pub23, 995.pdf](2007/Cad%20Sau%20Pub23,%20995.pdf)

Abstract: The article presents a review of approaches and methodologies in the evaluation of STD/AIDS prevention programs, searching for theoretical and methodological support for the institutionalization of evaluation and decision-making. The review included the MEDLINE, SciELO, and ISI Web of Science databases and other sources like textbooks and congress abstracts from 1990 to 2005, with the key words: “evaluation”; “programs”, “prevention”, “STD/AIDS”; and similar terms. The papers showed a predominance of quantitative outcome or impact evaluative studies with an experimental or quasi-experimental design. The main use of evaluation is accountability, although knowledge output and program improvement were also identified in the studies. Only a few evaluative studies contemplate process evaluation and its relationship to the contexts. The review aimed to contribute to the debate on STD/AIDS, which requires more effective, consistent, and sustainable decisions in the field of prevention.

Keywords: Acquired Immunodeficiency Syndrome, AIDS, Databases, Decision Making, Decision-Making, Disease Prevention, Education-Program, Evaluation, Impact, Institutionalization, ISI, Knowledge, MEDLINE, Outcome, Papers, Prevention, Program Evaluation, Quantitative, Review, Risk, Scielo, Science, Sexually Transmitted Diseases, Textbooks, Web of Science, Young-Adults

? da Silva, G.A.P. and Vieira-Da-Silva, L.M. (2008), Health surveillance: Proposal for a tool to evaluate technological arrangements in local health systems. *Cadernos de Saúde Pública*, **24** (11), 2463-2475.

Full Text: [2008\Cad Sau Pub24, 2463.pdf](2008/Cad%20Sau%20Pub24,%202463.pdf)

Abstract: In order to identify the various meanings ascribed to health surveillance, the authors conducted a systematic review of articles published from January 1990 to August 2005 in the following databases: LILACS, SciELO, CAPES, MEDLINE, and Web of Science. A total of 144 abstracts were read and 18 full texts of Brazilian articles were selected for in-depth analysis, leading to the design of a typology for technological arrangements related to the various meanings: (i) traditional epidemiological surveillance, with communicable diseases as the main object; (ii) public health surveillance, as the municipal component of the national health surveillance system; and (iii) health surveillance, a technological mode of organizing health practices in a given territory. The proposed typology can contribute to research on surveillance practices in local health systems. It can also serve as a template for data collection and analysis. The meanings ascribed to the three types are discussed in light of public health’s historical development as a field.

Keywords: Analysis, Authors, Chemical Incidents, Communicable Diseases, Data Collection, Databases, Design, Development, Evaluation, Health, Health Surveillance, Local Health Systems, MEDLINE, Public Health, Public-Health, Research, Review, SCIELO, Science, Surveillance, Systematic, Systematic Review, Traditional, United-States, Web of Science

? Dumith, S.C. (2009), Physical activity in Brazil: A systematic review. *Cadernos de Saúde Pública*, **25** (S3) S415-S426.

Full Text: [2009\Cad Sau Pub25, S415.pdf](2009/Cad%20Sau%20Pub25,%20S415.pdf)

Abstract: The purpose of this study, based on a systematic literature review, was to describe the prevalence of physical activity (or inactivity) in the Brazilian population. The databases consulted were: LILACS, SciELO, MEDLINE, Web of Science, and the Google Scholar portal. The terms “physical activity”, “physical exercise”, “physical inactivity”, “sedentary” “Brazil”, and “Brazilian” were used in the search. Overall, 47 studies (all cross-sectional) with random samples were found, and in 26 studies physical activity was the main variable. Only two studies were published before the year 2000, as compared to 12 in 2008 alone. The studies were heavily concentrated in the South and Southeast of Brazil, and there were few studies on physical activity in children and adolescents. In all the studies, physical activity was measured subjectively, mainly with questionnaires, and the most widely studied domain was leisure time. The criteria for defining physical activity varied widely, as did prevalence. The study highlighted the need for standardization of instruments, criteria, and nomenclature in epidemiological studies on physical activity.

Keywords: Adolescents, Adults, Brazil, Children, Chronic Diseases, Databases, Exercise, Google Scholar, Health, Inactivity, Leisure, Leisure-Time, Literature, Literature Review, MEDLINE, Motor Activity, Physical Activity, Prevalence, Questionnaires, Review, Risk-Factors, Sao-Paulo, SCIELO, Science, Systematic, Systematic Literature Review, Systematic Review, Variables, Web of Science

? Gasperin, D., Netuveli, G., Dias-Da-Costa, J.S. and Pattussi, M.P. (2009), Effect of psychological stress on blood pressure increase: A meta-analysis of cohort studies. *Cadernos de Saúde Pública*, **25** (4), 715-726.

Full Text: [2009\Cad Sau Pub25, 715.pdf](2009/Cad%20Sau%20Pub25,%20715.pdf)

Abstract: Studies have suggested that chronic exposure to stress may have an influence on increased blood pressure. A systematic review followed by a meta-analysis was conducted aiming to assess the effect of psychological stress on blood pressure increase. Research was mainly conducted in Ingenta, Psycinfo, PUBMED, Scopus and Web of Science. Inclusion criteria were: published in any language; from January 1970 to December 2006; prospective cohort design; adults; main exposure psychological/emotional stress; outcome arterial hypertension or blood pressure increase >= 3.5mmHg. A total of 2,043 studies were found, of which 110 were cohort studies. of these, six were eligible and yielded 23 comparison groups and 34,556 subjects. Median follow-up time and loss to follow-up were 11.5 years and 21%. Results showed individuals who had stronger responses to stressor tasks were 21% more likely to develop blood pressure increase when compared to those with less strong responses (OR: 1.21; 95% CI: 1.14-1.28; p < 0.001). Although the magnitude of effect was relatively small, results suggest the relevance of the control of psychological stress to the non-therapeutic management of high blood pressure.

Keywords: Adults, Blood, Blood Pressure, Cardia, Cardiovascular Reactivity, Cohort Studies, Control, Coronary-Artery Disease, Follow-Up, Hypertension, Hypertension, Management, Mental Stress, Meta-Analysis, Outcome, Plasma, Pressure, Psychological Stress, Publication, PUBMED, Recovery, Research, Responses, Review, Risk-Factors, Science, Scopus, Stress, Systematic, Systematic Review, Web of Science

? de Farias, J.C., Lopes, A.D., Florindo, A.A. and Hallal, P.C. (2010), Validity and reliability of self-report instruments for measuring physical activity in adolescents: A systematic review. *Cadernos de Saúde Pública*, **26** (9), 1669-1691.

Full Text: [2010\Cad Sau Pub26, 1669.pdf](2010/Cad%20Sau%20Pub26,%201669.pdf)

Abstract: This was a systematic review of studies on the reliability and validity of self-report instruments for measuring physical activity, or subjective measurements, in adolescents (10-18 years). Searches were conducted in databases (MEDLINE, PsycInfo, SportsDiscus, Scopus, Web of Science, SciELO, Lilacs) and in the references of the retrieved articles. Sixty-six studies met the inclusion criteria. The majority were from North America, with only 5 from Brazil. Fifty-two different instruments were identified: 42 questionnaires, 6 diaries or logs, and 4 interviews. “Test-retest” reliability varied from 0.20 to 0.98; the majority (28150) of the coefficients showed values < 0.70. Validity coefficients showed wide variation (-0.13 to 0.88), with the majority (64184) <= 0.50, Only 3 instruments displayed correlations >= 0.70. Various instruments were tested in adolescents, especially questionnaires. These instruments generally showed better “test-retest” reliability than validity.

Keywords: Activity Diary, Activity Questionnaire, Activity Recall, Adolescent, Adolescents, Brazil, Convergent Validity, Daily Energy-Expenditure, Databases, Doubly Labeled Water, MEDLINE, Methods, Middle-School Youth, Motion Sensor, Motor Activity, Older Children, Physical Activity, Questionnaires, Reliability, Reproducibility of Results, Review, Risk Behavior Survey, Scielo, Science, Scopus, Systematic, Systematic Review, Validity, Validity of Tests, Web of Science

? Celeste, R.K., Bastos, J.L. and Faerstein, E. (2011), Trends in the investigation of social determinants of health: Selected themes and methods. *Cadernos de Saúde Pública*, **27** (1), 183-189.

Full Text: [2011\Cad Sau Pub27, 183.pdf](2011/Cad%20Sau%20Pub27,%20183.pdf)

Abstract: We analyze bibliometric trends of topics relevant to the epidemiologic research of social determinants of health. A search of the PUBMED database, covering the period 1985-2007, was performed for the topics: socioeconomic factors, sex, race/ethnicity, discrimination/prejudice, social capital/support, lifecourse, income inequality, stress, behavioral research, contextual effects, residential segregation, multilevel modeling, regression based indices to measure inequalities, and structural equation modeling/causal diagrams/path analysis. The absolute, but not the relative, frequency of publications increased for all themes. Total publications in PUBMED increased 2.3 times, while the subsets of epidemiology/public health and social epidemiologic themes/methods increased by factors of 5.3 and 5.2, respectively. Only multilevel and contextual analyses had a growth over and above that observed for epidemiology/public health. We conclude that there is clearly room for wider use of established techniques, and for new methods to emerge when they satisfy theoretical needs.

Keywords: Analyses, Analysis, Bibliometric, Database, Determinants of Health, Diet Surveys, Epidemiologic Methods, Food Consumption, Growth, Health, Indices, Inequalities, Inequality, Investigation, Measure, Methods, Modeling, Needs, Publications, PUBMED, Regression, Research, Residential, Sex, Social, Socioeconomic Factors, Stress, Techniques, Trends

# Title: Calcified Tissue International

Full Journal Title: [Calcified Tissue International](http://springerlink.metapress.com/app/home/journal.asp?wasp=32gnnjrhupdpd5tpulft&referrer=parent&backto=searchpublicationsresults,1,1;)

ISO Abbreviated Title: Calcif. Tissue Int.

JCR Abbreviated Title: Calcified Tissue Int

ISSN: 0171-967X

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Endocrinology & Metabolism: Impact Factor

? Li, J., Nakagaki, H., Kato, K., Tsuboi, S., Kato, S., Morita, I., Ohno, N., Kameyama, Y., Chen, R. and Robinson, C. (1995), Effect of stopping fluoride administration on the distribution profiles of fluoride in three different kinds of rat bones. *Calcified Tissue International*, **56** (4), 292-296.

Abstract: The aim of this work was to explore the reduction of fluoride concentrations in the skeleton after stopping experimental fluoride administration. Fluoride was administered to the rats at varying doses (0, 50, 100 ppm in drinking water) and for different lengths of time (4, 13, 25 weeks). A series of fluoride concentrations across the full thickness of humerus, parietal bone, and vertebra arch in rats were measured by means of an abrasive micro-sampling technique. The distribution profiles of fluoride from periosteal to endosteal surfaces, which were apparently related to the histological structure of these bones, were U shaped in the humerus, V shaped in the parietal bone, and W shaped in the vertebra arch. The average fluoride concentrations in the bones increased significantly with each increasing dose and length of fluoride administration. The relative increments were similar between the different regions or the different bones. After stopping fluoride administration, on the other hand, the relative reduction of the average fluoride concentrations in the bones were 30-100%. They were greatly related to the length after stopping fluoride administration and the dose and length of fluoride administration, but also dependent upon the type of bone and the region examined.

# Title: California Law Review

Full Journal Title: [California Law Review](http://www.jstor.org/action/showPublication?journalCode=colulawrevi)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Derenberg, W.J. (1952), Plagiarism and originality. *California Law Review*, **52** (6), 818-822.

Full Text: Cal Law Rev52, 818.pdf

? Harriman, D.B. (1954), Plagiarism and originality. *California Law Review*, **42** (1), 215.

Full Text: Cal Law Rev42, 215.pdf

? Shapiro, F.R. (1985), The most-cited law review articles. *California Law Review*, **73** (5), 1540-1554.

Full Text: [1985\Cal Law Rev73, 1540.pdf](1985/Cal%20Law%20Rev73,%201540.pdf)

Keywords: Articles, Law, Review

# Title: California Management Review

Full Journal Title: California Management Review

ISO Abbreviated Title: Calif. Manage. Rev.

JCR Abbreviated Title: Calif Manage Rev

ISSN: 0008-1256

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Univ Calif, Berkeley

Publisher Address:

Subject Categories:

: Impact Factor

Howard, J., Nash, J. and Ehrenfeld, J. (2000), Standard or smokescreen? Implementation of a voluntary environmental code. *California Management Review*, **42** (2), 63-82.

Full Text: [C\Cal Man Rev42, 63.pdf](C/Cal%20Man%20Rev42,%2063.pdf)

Abstract: In recent years, demands from external stakeholders have created pressures for companies to adopt new environmental management practices. Some industries have developed their own non-regulatory codes of environment, health, and safety (EHS) practice. Have these fades generated substantive change in members’ actions or do they simply reinforce existing perceptions and practices? This article examines the response of sixteen chemical companies to the first industry-generated EHS code, Responsible Care. In some cases, companies have adopted uniform practices, while in other cases significant variation persists. The adoption and implementation by companies of non-regulatory environmental codes is a poor indicator that any particular standard practices will be followed.

? Gaba, D.M. (2000), Structural and organizational issues in patient safety: A comparison of health care to other high-hazard industries. *California Management Review*, **43** (1), 83-??.

Full Text: [2000\Cal Man Rev43, 83.pdf](2000/Cal%20Man%20Rev43,%2083.pdf)

Abstract: A recent report from the Institute of Medicine has focused attention anew on the incidence of medical errors in the health care industry. While there is a relatively large body of research on how organizations can operate in a highly reliable manner, and thus avoid such errors, little of that work has been done in the health care field. This article discusses the ways in which the health care industry has failed to meet systematically the standards for achieving high reliability, based in part on two existing theories about the management of high-hazard environments- High Reliability Organization Theory (HROT) and Normal Accidents Theory (NAT).

Keywords: Crisis Resource-Management, High-Reliability, Adverse Events, Hospitalized-Patients, Production Pressure, Errors, System, Anesthesiologists, Environment, Litigation

# Title: California Medicine

Full Journal Title: California Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Veith, I. (1973), Acupuncture in traditional Chinese medicine – An historical review. *California Medicine*, **118** (2), 70-79.

Full Text: [1960-80\Cal Med118, 70.pdf](1960-80/Cal%20Med118,%2070.pdf)

# Title: Cambridge Journal of Economics

Full Journal Title: Cambridge Journal of Economics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0309-166X

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Univ Calif, Berkeley

Publisher Address:

Subject Categories:

: Impact Factor

? Laursen, K. and Salter, A. (2005), The fruits of intellectual production: Economic and scientific specialisation among OECD countries. *Cambridge Journal of Economics*, **29** (2), 289-308.

Full Text: [2005\Cam J Eco29, 289.pdf](2005/Cam%20J%20Eco29,%20289.pdf)

Abstract: This paper brings together data from 17 OECD countries on scientific publications, patents and production, to explore the relationship between scientific and economic specialisation for 17 manufacturing industries. Since Marx, there has been a fundamental debate in economics about the link between science and the economic system. Marx argued that the needs of production shape scientific developments and that science has become a factor of production, whereas Polanyi argued that developments in science are largely independent of the economic sphere. Using a panel data model and econometric estimations at the industry level, the paper derives some hypotheses from the two positions and finds that, while the overall evidence on the link between national production and scientific specialisation is mixed, it is important to have high levels of relevant to-the-industry scientific strength per capita in order to be specialised in science-based industries.

Keywords: Bibliometric Data, Dynamics, Economics, Innovation, International Economic Specialisation, Patents, Publications, Science, Scientific Publications, Scientific Specialisation, Technology, Us

# Title: Canadian Agricultural Engineering

Full Journal Title: Canadian Agricultural Engineering

ISO Abbreviated Title: Can. Agric. Eng.

JCR Abbreviated Title: Can Agr Eng

ISSN: 0045-432X

Issues/Year: 4

Journal Country/Territory: Canada

Language: English

Publisher: Canadian Soc Agricultural Engineering

Publisher Address: Box 381, Rpo Univ, Saskatoon, SK S7N 4J8, Canada

Subject Categories:

Agriculture Engineering: Impact Factor

Viraraghavan, T. and Kikkeri, S.R. (1991), Dairy wastewater treatment using anaerobic filters. *Canadian Agricultural Engineering*, **33**, 143-149.

? Wasay, S.A., Barrington, S.F. and Tokunaga, S. (1998), Organic acids to remediate a clay loam polluted by heavy metals. *Canadian Agricultural Engineering*, **40** (1), 9-15.

Abstract: Weak organic acids have the capabilities of washing heavy metals without seriously deteriorating the soil properties. A clay loam naturally contaminated by heavy metals was characterized physically and analyzed for its content in Cr, Hg, Mn, and Pb. At various pH, concentration, and reaction time, several weak organic acids and their salts were used to leach out heavy metals. The optimum pH ranged from 5 to 7 for citrate and 2 to 3 for tartarate in the case of Cr, Hg, and Mn and 2 to 7 in the case of Pb. More than 85% of Pb was removed with both citrate and tartarate at a concentration of 0.12 and 0.2 M, respectively, within 24 h. From 86 to 99% of Hg was removed by tartarate and citrate, whereas up to 60% of Cr was removed. EDTA and DTPA were found to be quite effective in removing Pb but not the other metals. Four citrate or tartarate extractions were required to remediate the experimental soil to a category A except for Hg. For Hg, remediation criteria are so strict that only the C criteria were met after two extractions, with citrate and tartarate, that left levels of 32 and 62 mg/kg, respectively, when a category A soil requires no more than 0.5 mg/kg.

Keywords: Extraction, Soil

# Title: Canadian Association of Radiologists Journal-Journal de l Association Canadienne des Radiologistes

Full Journal Title: Canadian Association of Radiologists Journal-Journal de l Association Canadienne des Radiologistes

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0846-5371

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Browne, R.F.J., Logan, P.M., Lee, M.J. and Torreggiani, W.C. (2004), The accuracy of references in manuscripts submitted for publication. *Canadian Association of Radiologists Journal-Journal de l Association Canadienne des Radiologistes*, **55** (3), 170-173.

Abstract: Objective: To analyze the errors present in references cited in papers submitted for peer review for possible publication. Methods: Nineteen consecutive manuscripts submitted for peer review were assessed. They contained a total of 261 Logan, references. Manuscripts were submitted to 1 of 5 major radiology journals. Journal references were compared with either the original articles or abstracts obtained through MEDLINE. Book references were checked against the original book. In total, 259 of 261 references were obtained. The remaining 2 references were both out-of-print books that were not available. Each reference was checked and errors were identified as either major or minor, depending on the gravity of the error. Errors were analyzed to see whether they could be attributed to not adhering to journal guidelines or to other reasons. Results: Of a total of 259 references, 56% (n = 145) contained at least 1 error, 53% (n = 137) contained minor errors and 15% (n = 39) contained major errors. Five per cent (n = 13) of references had more than 3 errors, and 79% (n = 274) of all errors were the direct result of authors not following journal instructions. Conclusion: Over half of all references included in manuscripts submitted to radiology journals contain at least 1 error. The majority are avoidable, resulting from failure to follow the journal’s instructions to authors.

Keywords: Reference Citations, Authors Check, Journals

# Title: Canadian Ceramics

Full Journal Title: Canadian Ceramics (Canadian Ceramics Quarterly-Journal of the Canadian Ceramic Society)

ISO Abbreviated Title: Can. Ceram.

JCR Abbreviated Title: Can Ceram

ISSN: 0831-2974

Issues/Year: 3

Journal Country/Territory: Canada

Language: English

Publisher: Canadian Ceramic Soc

Publisher Address: 2175 Sheppard Ave E, Ste 310, N York, Ontario M2J 1W8, Canada

Subject Categories:

Materials Science, Ceramics: Impact Factor 0.00, / (2000)

? Brosnan, D.A. (1994), Examination of medical waste incinerator slags and implicationson refractory performance. *Canadian Ceramic*, **63** (2), 123-127.

Abstract: Slag and ash from a medical waste incinerator at a teaching hospital facility were examined to determine their chemistry and mineralogy so that the potential for refractory wear could be evaluated. They were found to be compositions including metals and an oxide residual comprised primarily of Na2O, AlO3, CaO, and SiO2. Some incompletely oxidized organic materials were observed in bulk samples indicating uneven temperature distribution during incineration. Major phases identified in the slag include magnetite or iron spinel, mullite, anorthite, and soda rich glass. The slag solidus or melting point is on the order of 1245-degrees-C (2273-degrees-F) which is just above the operating temperature of about 1200-degrees-C. Typical batch type medical incinerators in North America are lined with 1500-degrees (2800-degrees-F) duty rated castable refractories, and the linings exhibit mechanical wear due to slag sticking and subsequent slag removal, alkali attack, and thermal shock. The proximity of operating temperatures to the expected reaction temperature between ash and fireclay aggregates or cement in castable refractories suggests that other types of refractory including silicon carbide monolithics or shapes could provide improved refractory service.

? Knowles, S.D. and Brosnan, D.A. (1995), Composition and properties of glass ceramics produced from incinerator residuals. *Canadian Ceramics*, **64** (4), 231-234.

Abstract: Vitrification of waste materials is a method that is well established as a means to immobilize inorganic constituents in the waste. Vitrification has been extensively applied in remediation of nuclear wastes by engineering the glass composition to serve as a host to the radionuclides, and to achieve maximum resistance to solution by leaching media. Vitrification of non-nuclear, hazardous wastes has been extensively researched and applied in a few remediation projects/processes. These efforts with hazardous wastes have involved forming a glass followed by casting billets or by slag granulation processes. Prior to this research, formation of glass ceramics, i.e. substantially crystalline products, in waste remediation efforts had not been reported. This research utilized hazardous waste incinerator residuals in the form of slag, baghouse dust, and water treatment sludge in a two-step process of vitrification and recrystallization to produce a repository for “regulated” metals within the resulting glass ceramic. The residuals contained magnesia. alumina, iron oxide, and silica as major constituents, and their chemical composition was adjusted to yield the desired crystalline phases after melting between 1400-1465°C. The glass was cast into graphite crucibles and annealed. The samples were then recrystallized by reheating to 975-l000°C forming phases of enstatite, forsterite, hercynite, magnesioferrite, pseudobrookite and spinel. Micrographs of the recrystallized samples indicate that phase separation occurs at 850°C with crystals growing from a droplet-type phase. At the optimum recrystallization temperature of 975-1000°C, a finely crystalline microstructure develops with low porosity. This type of microstructure provides both high compressive strength and low leachability in the remediated product.

# Title: Canadian Family Physician

Full Journal Title: Canadian Family Physician

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Beever, R. (2009), Far-infrared saunas for treatment of cardiovascular risk factors: Summary of published evidence. *Canadian Family Physician*, **55** (7), 691-696.

Full Text: 2009\Can Fam Phy55, 691.pdf

Abstract: OBJECTIVE To review the literature about the health benefits of far-infrared sauna (FIRS) use. QUALITY of EVIDENCE A search of Web of Science, EBSCO, Ovid MEDLINE, Ovid HealthSTAR, and EMBASE using the terms far-infrared and sauna, refined by limiting the search to studies of humans published in English, yielded 9 relevant papers (level I or level II evidence). MAIN MESSAGE Far-infrared saunas are approved by the Canadian Standards Association and are sold to the public. The manufacturers claim numerous health benefits; however, the published evidence to substantiate these claims is limited. Four papers support the use of FIRS therapy for those with congestive heart failure and 5 papers support its use for those with coronary risk factors. CONCLUSION There is limited moderate evidence supporting FIRS efficacy in normalizing blood pressure and treating congestive heart failure; fair evidence, from a single study, supporting FIRS therapy in chronic pain; weak evidence, from a single study, supporting FIRS therapy in chronic fatigue syndrome; weak evidence, from a single study, supporting FIRS therapy for obesity; and consistent fair evidence to refute claims regarding the role of FIRSs in cholesterol reduction.

Keywords: Blood, Blood Pressure, Cardiovascular, Cardiovascular Risk, Chronic Heart-Failure, Efficacy, Embase, Fatigue, Health Benefits, Humans, Literature, MEDLINE, Obesity, Pain, Papers, Pressure, Quality, Repeated Thermal Therapy, Review, Risk, Risk Factors, Safety, Science, Therapy, Treatment, Web of Science

? Pimlott, N. and Ladouceur, R. (2010), Notice of retraction: Plagiarism in “Common colds. Causes, potential cures, and treatment” (Can Fam Physician 1993;39:2215-20). *Canadian Family Physician*, **56** (5), 413.

Full Text: [2010\Can Fam Phy56, 413.pdf](2010/Can%20Fam%20Phy56,%20413.pdf)

Keywords: Plagiarism

# Title: Canadian Family Physician Médecin de Famille Canadien

Full Journal Title: Canadian Family Physician Médecin de Famille Canadien

ISO Abbreviated Title:

JCR Abbreviated Title: Can Fam Physician

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fortin, M., Lapointe, L., Hudon, C. and Vanasse, A. (2005), Multimorbidity is common to family practice: is it commonly researched? *Canadian Family Physician Médecin de Famille Canadien*, **51**, 244-245.

Abstract: OBJECTIVE: Family physicians often have to care for patients with several concurrent chronic conditions (multimorbidity or comorbidity). Consequently, they need to inform themselves by reading indexed publications on multimorbidity. This study aimed to assess how well the concept of multimorbidity was covered in the medical literature. Objectives were first, to quantify the literature on multimorbidity (or comorbidity) and to compare the number of publications on it with the number of publications on three common chronic conditions (asthma, hypertension, and diabetes), and second, to describe the articles on multimorbidity. DESIGN: Bibliometric study. METHOD: We consulted MEDLINE for the reference period 1990 to the end of 2002. The term “multimorbidity” and its various spellings was used as the search term. Comorbidity, asthma, hypertension, and diabetes were searched for using their respective MeSH terms. For comparison purposes, prevalence data were taken from published sources. Abstracts of articles relating to multimorbidity were reviewed and their content analyzed. MAIN OUTCOME MEASURES: Number and type of articles. RESULTS: Multimorbidity has a prevalence of 60% among people aged 55 to 74. This prevalence is much higher than that of asthma (6.5%), hypertension (29.6%), and diabetes (8.7%). Few articles in the medical literature deal specifically with multimorbidity (or comorbidity), however. For each article on multimorbidity, there are 74 on asthma, 94 on hypertension, and 38 on diabetes. Content analysis of abstracts of articles on multimorbidity revealed a high proportion of epidemiologic studies (50.0%) followed by validation studies (22.4%) and opinion pieces (11.8%). The few experimental studies on multimorbidity were not done in primary care settings. CONCLUSION: This study shows that the prevalence of multimorbidity is not matched by the number of indexed publications on it in the medical literature. To date, the number and diversity of articles on multimorbidity are both insufficient to provide scientific background for strong evidence-based care of patients affected by multiple concurrent chronic conditions. Research is needed to increase knowledge and understanding of this important clinical topic.

Keywords: Aged, Analysis, Asthma, Care, Chronic, Clinical, Comorbidity, Comparison, Data, Design, Diabetes, Diversity, Evidence Based, Evidence-Based, Experimental, Family, Family Practice, First, Hypertension, Knowledge, Literature, Medical, Medical Literature, MEDLINE, Outcome, Outcome Measures, Patients, Physicians, Practice, Prevalence, Primary, Primary Care, Publications, Reading, Sources, Term, Understanding, Validation

# Title: Canadian Geotechnical Journal

Full Journal Title: Canadian Geotechnical Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Santamarina, J.C., Klein, K.A., Wang, Y.H. and Prencke, E. (2002), Specific surface: Determination and relevance. *Canadian Geotechnical Journal*, **39** (1), 233-241.

Abstract: Specific surface captures the combined effects of particle size and slenderness in a measurement that is independent and complementary to grain-size distribution. There are various methods to measure specific surface, including gas adsorption in dry conditions and selective molecular absorption in aqueous suspensions. The measurement procedure can have an important effect on measured values, yet such sensitivity is informative in itself. The amount of surface in a soil mass determines the balance between surface-related forces and gravimetric-skeletal forces acting on a soil particle, affects fabric formation, supports rich energy coupling mechanisms, governs conduction, and controls sorption and retardation during chemical diffusion.

Keywords: Specific Surface, Surface Area, Methylene Blue, Gas Adsorption, Fabric, Atterberg Limits, Grain-Size Distribution, Methylene-Blue, Absorption

# Title: Canadian Journal of Administrative Sciences-Revue Canadienne des Sciences de l Administration

Full Journal Title: Canadian Journal of Administrative Sciences-Revue Canadienne des Sciences de l Administration

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Serenko, A., Cocosila, M. and Turel, O. (2008), The state and evolution of information systems research in Canada: A scientometric analysis. *Canadian Journal of Administrative Sciences-Revue Canadienne des Sciences de l Administration*, **25** (4), 279-294.

Full Text: [2008\Can J Adm Sci25, 279.pdf](2008/Can%20J%20Adm%20Sci25,%20279.pdf)

Abstract: This paper investigates the state and evolution of information systems (IS) research in Canada as reflected in publications of the proceedings of the annual conference of the Administrative Sciences Association of Canada from 1974 to 2007. We present a scientometric analysis of (a) individual and institutional research outputs; (b) differences in three productivity, score calculation methods: straight count, equal credit, and author position; (c) study topics; (d) research methods; and (e) use of student samples. Copyright (C) 2008 ASA C. Published by John Wiley & Sons, Ltd.

Keywords: Discipline, Discipline Evolution, Identity Crisis, Impact, Information Systems, Journals, MIS, Productivity, Psychology, Publications, Research, Research Methods, Research Output, Research Productivity, Sciences, Scientometrics, Students, Update

# Title: Canadian Journal of Agricultural Economics-Revue Canadienne d’Economie Rurale

Full Journal Title: [Canadian Journal of Agricultural Economics-Revue Canadienne d Economie Rurale](http://www3.interscience.wiley.com/journal/118501588/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Harper, J.A. (1991), A bibliometric profile of the *Canadian Journal of Agricultural Economics*. *Canadian Journal of Agricultural Economics-Revue Canadienne d’Economie Rurale*, **39** (3), 503-513.

Full Text: [1991\Can J Agr Eco39, 503.pdf](1991/Can%20J%20Agr%20Eco39,%20503.pdf)

Abstract: The Canadian Journal of Agricultural Economics was studied to determine the number and language of the articles, the number of citations per article, author collaboration, and the geographical location and institutional affiliation of the authors. A citation analysis study was done to identify the main bibliographical formats and languages of the cited material as well as the geographical distribution, subject dispersion, and titles of the journals most frequently cited. Other journals citing the Canadian Journal of Agricultural Economics were identified

Keywords: Citation, Citation Analysis, Citations, Collaboration, English, Journals, Management

# Title: Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie

Full Journal Title: [Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie](http://www.springerlink.com/content/121278/?p=af4d028cfdd94a9b8b0ecd5e03967107&pi=0)

ISO Abbreviated Title: Can. J. Anaesth.-J. Can. Anesth.

JCR Abbreviated Title: Can J Anaesth

ISSN: 0832-610X

Issues/Year: 6

Journal Country/Territory: Canada

Language: Multi-Language

Publisher: Canadian Anesthesiologists Soc

Publisher Address: 1 Eglinton Ave East, Suite 208, Toronto, Ontario M4P 3A1, Canada

Subject Categories:

Anesthesiology: Impact Factor 1.808, 9/22 (2007)

? Bevan, D.R. and Purkis, J.M. (1995), Citation errors can be reduced. *Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie*, **42** (5), 367-369.

Full Text: [1995\Can J Ana42, 367.pdf](1995/Can%20J%20Ana42,%20367.pdf)

Keywords: Accuracy, Citation

? Asano, M., Mikawa, K., Nishina, K., Maekawa, N. and Obara, H. (1995), Improvement of the accuracy of references in the *Canadian Journal of Anaesthesia*. *Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie*, **42** (5), 370-372.

Full Text: [1995\Can J Ana42, 307.pdf](1995/Can%20J%20Ana42,%20307.pdf)

Abstract: A previous study indicated that there were many citation errors in the Canadian Journal of Anaesthesia. After this report, editors of the Journal requested any contributors, whose papers were accepted for publication, to verify the accuracy of reference citation by including a photocopy of the first page of each reference. The present study examined if the accuracy of the reference list had improved. We compared citation errors between volumes of 1990 and 1994. One hundred references from each year’s publication were randomly selected. After citations of nonjournal articles were excluded, the remaining 190 citations were carefully scrutinized. Authors’ names, article title, journal title volume number, page numbers, and year were examined in each selected reference. A reference war; deemed correct if each element of the citation was identical to its source. Of the examined references, 48% and 22% contained one or more errors in 1990 and 1994, respectively. Errors in the title and author field of citation were most common in the either of the two years, occurring in about 70% of the references which contained some errors. Citation errors in Canadian Journal of Anaesthesia were considerably improved after the request to verify citation accuracy Although this check-system probably contributes to the improvement of accuracy of reference citation, the rate of citation errors remains high. We believe that contributors’ efforts will enhance the value of the journal.

Keywords: Accuracy, Anesthesia,Journals, Citation, Citation Accuracy, Citation Errors, Citations, Errors, Field, First, Improvement, Journal, Papers, Publication, Publication,Documentation,Canadian Journal of Anesthesia, Reference, References, Source, Value, Volume, War

? Asai, T. and Vickers, M.D. (1995), Citation errors: There is still much to be done. *Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie*, **42** (11), 1063.

Full Text: [1995\Can J Ana42, 1063.pdf](1995/Can%20J%20Ana42,%201063.pdf)

Keywords: Citation, NOV

? Yu, C.H. and Beattie, W.S. (2006), The effects of volatile anesthetics on cardiac ischemic complications and mortality in CABG: A meta-analysis. *Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie*, **53** (9), 906-918.

Full Text: [2006\Can J Ana53, 906.pdf](2006/Can%20J%20Ana53,%20906.pdf)

Abstract: Purpose: Coronary artery bypass graft surgery (CABG) is associated with cardiac complications, including ischemia, acute myocardial infarction (AMI), and death. Volatile anesthetics have been shown to have a preconditioning-like effect. This systematic review assesses the effects of volatile anesthetics on cardiac ischemic complications and morbidity after CABG. Methods: Data were obtained, without language restriction, from searches of MEDLINE, Science Citation Index, PUBMED, and reference lists. We included only prospective randomized controlled trials evaluating volatile anesthetics during CABG. Two reviewers independently abstracted data on myocardial ischemia, acute myocardial infarction (AMI), and death. Treatment effects were calculated as odds ratio (OR) with 95% confidence intervals (CI) for binary data, and weighted mean difference (WMD) with 95% Cl for continuous data. Principal findings: Thirty-two studies (2,841 patients) were included. In comparison with iv anesthesia, volatile anesthetics were associated with reduced all-cause mortality (OR, 0.65; 95% Cl, 0.36-1.18; P = 0.16). Enflurane was associated with increased AMI (OR, 1.34; 95% CI, 0.68-2.64; P = 0.40) whereas sevoflurane and desflurane reduced cardiac troponin (cTnI) at six hours, 12 hr, 24 hr [WMD, -1.45; 95% CI (-1.73, -1.16); P < 0.00001], and 48 hr after operation. Conclusion: This meta-analysis demonstrates sevoflurane and desflurane reduce the postoperative rise in cTnI. Sevoflurane-mediated reduction in cardiac troponin was associated with improved long-term outcomes in one study. This meta-analysis was not able to show that these positive effects on troponin were translated into improved clinical outcomes. Well-designed large randomized control trials are needed to further elucidate the differential cardio-protective effects of volatile anesthetics.

Keywords: Anesthesia, Bypass Graft-Surgery, Cardiopulmonary Bypass, Citation, Comparison, Coronary-Artery Surgery, High-Dose Fentanyl, Language, Medline, Meta-Analysis, Nitrous-Oxide Anesthesia, Outcomes, Positive, Postoperative Myocardial-Ischemia, Randomized-Trials, Recovery Profile, Reduction, Review, Science, Science Citation Index, Sufentanil Anesthesia, Surgery, Systematic Review, Systemic Hemodynamics

? Kurrek, M.M. and Twersky, R.S. (2010), Office-based anesthesia. *Canadian Journal of Anaesthesia-Journal Canadien d’Anesthesie*, **57** (3), 256-272.

Full Text: [2010\Can J Ana57, 256.pdf](2010/Can%20J%20Ana57,%20256.pdf)

Abstract: Ambulatory office-based anesthesia (OBA) is a relatively new but rapidly growing field. OBA requires a different approach than that used in the hospital, because there are unique considerations that must be recognized when administering anesthesia in a free-standing office facility. This review provides a summary of the important issues and aspects of safe patient care. The Medline, Embase, Biological Abstract, Science Citation Index, and Healthstar databases were searched under the key words “office-based anesthesia” for relevant English language articles from 1966 to December 2008. Relevant publications were queried from governing institutions, such as the American Society of Anesthesiologists (ASA), as well as from colleges in various provinces across Canada. Office-based anesthesia remains poorly regulated in many parts of Canada (and the US). Despite continuing concerns regarding patient safety, the rates of death and reported major complications for OBA appear to be very low, especially in accredited facilities. Multiple considerations for facility design, administration, and patient care need to be taken into account. Appropriately so, an increasing number of provinces (Canada) and states (US) are beginning to regulate office-based facilities and require accreditation.

Keywords: Ambulatory Surgery, Articles, Care, Citation, Databases, Efficacy, Massachusetts, Maxillofacial Surgeons, Medline, Mortality, Outcomes, Outpatient Anesthesia, Patient Safety, Plastic-Surgery, Publications, Review, Science, Science Citation Index

# Title: Canadian Journal of Botany-Revue Canadienne de Botanique

Full Journal Title: Canadian Journal of Botany-Revue Canadienne de Botanique

ISO Abbreviated Title: Can. J. Bot.-Rev. Can. Bot.

JCR Abbreviated Title: Can J Bot

ISSN: 0008-4026

Issues/Year: 12

Journal Country/Territory: Canada

Language: Multi-Language

Publisher: Natl Research Council Canada

Publisher Address: Research Journals, Montreal Rd, Ottawa, Ontario K1A 0R6, Canada

Subject Categories:

Plant Sciences: Impact Factor 0.816, / (2000)

? Churchill, H., Tryon, R. and Barrington, D.S. (1998), Development of the sorus in tree ferns: Dicksoniaceae. *Canadian Journal of Botany-Revue Canadienne de Botanique*, **76** (7), 1245-1252.

Abstract: Studies of soral development in the tree-fern family Dicksoniaceae in comparison with the Cyatheaceae led to (1), recognition of two basic patterns in the Dicksoniaceae, (2), clarification of marginal versus superficial sori and their indusia in tree ferns, and (3), phylogenetic interpretations. In Cibotium the sorus originates directly from the marginal initial file. The outer and inner indusia arise simultaneously, early in development, on the adaxial and abaxial sides of the receptacle, respectively. The receptacle in Dicksonia originates from a shifted segment of the marginal initial file. The outer indusium is initiated first, approximately at the same time as the receptacle. The initial cells of the marginal meristem give rise to the soral receptacle in both groups of dicksoniaceous genera. Preliminary studies of soral morphogenesis in some cyatheaceous genera indicate that abaxial derivatives originate the sorus. The Cyatheaceae have a single, abaxial indusium proximal to the sorus at maturity, or none. Consideration of these morphogenetic data in light of recent molecular phylogenies suggests that fundamental changes in the meristematic origin of tree-fern sori have taken place since the origin of the lineage that includes both Dicksoniaceae and Cyatheaceae.

Keywords: Cibotium, Dicksonia, Dicksoniaceae, Sorus, Tree Ferns, Equences, RbCl

# Title: Canadian Journal of Cardiology

Full Journal Title: [Canadian Journal of Cardiology](http://www.pulsus.com/journals/past_issues.jsp?sCurrPg=journal&jnlKy=1&fold=Past%20Issues)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

ISBN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Mclean, D.L., Simpson, S.H., McAlister, F.A. and Tsuyuki, R.T. (2006), Treatment and blood pressure control in 47,964 people with diabetes and hypertension: A systematic review of observational studies. *Canadian Journal of Cardiology*, **22** (10), 855-860.

Full Text: 2006\Can J Car22, 855.pdf

Abstract: BACKGROUND: Many patients with diabetes also have hypertension, greatly increasing their risk for cardiovascular disease. It has been suggested that hypertension is poorly treated in those with diabetes. OBJECTIVE: To examine treatment and control of hypertension in people with diabetes. DATA SOURCES: Data sources included MEDLINE, EMBASE, HealthSTAR, CINAHL, Web of Science, clinical evidence and government health and statistical Web sites. METHOD: Databases were systematically reviewed and hand searches of the bibliographies of relevant Studies (1990 to 2004) were conducted. Two investigators selected studies and extracted the data independently. RESULTS: A total of 44 studies (77,649 subjects with diabetes, 47,964 [62%] of whom also had hypertension) were included. While 83% (range 32% to 100%) of patients with hypertension received drug therapy, only 12% (range 6% to 30%) had their blood pressure (BP) controlled to 130/85 mmHg or less. While BP control rates differed by definition of control (those studies with the least stringent definitions for BP control - 160/90 mmHg or less - reported mean control rates of 37%), treatment and control rates did not differ appreciably between countries or health care settings. CONCLUSIONS: Fewer than one in eight people with diabetes and hypertension have adequately controlled BP, with remarkable uniformity across studies conducted in a variety of settings. There is an urgent need for multidisciplinary, community-based approaches to manage these high-risk patients.

Keywords: 3rd National-Health, Blood, Blood Pressure, Cardiovascular, Cardiovascular Disease, Cardiovascular Risk, Control, Databases, Definitions, Diabetes, Diabetes Mellitus, Disease, Drug, EMBASE, Glucose-Tolerance, Health Care, High-Risk Patients, Hypertension, Management, MEDLINE, Mellitus, Microvascular Complications, Nutrition Examination Survey, Observational Studies, Population, Pressure, Randomized Trial, Review, Risk, Science, Statistical, Systematic, Systematic Review, Therapy, Treatment, US Adults, Web of Science

? Smith, E.R. (2007), Plagiarism, self-plagiarism and duplicate publication. *Canadian Journal of Cardiology*, **23** (2), 146-147.

Full Text: [2007\Can J Car23, 146.pdf](2007/Can%20J%20Car23,%20146.pdf)

Keywords: Publication, Self-Plagiarism

# Title: Canadian Journal of Chemical Engineering

Full Journal Title: [Canadian Journal of Chemical Engineering](http://www3.interscience.wiley.com/journal/116330099/home)

ISO Abbreviated Title: Can. J. Chem. Eng.

JCR Abbreviated Title: Can J Chem Eng

ISSN: 0008-4034

Issues/Year: 6

Journal Country/Territory: Canada

Language: Multi-Language

Publisher: Canadian Soc Chemical Engineering

Publisher Address: 130 Slater St, Ste 550, Ottawa, Ontario K1P 6E2, Canada

Subject Categories:

Engineering, Chemical: Impact Factor 0.569, 48/110 (1999); Impact Factor 0.480, 58/117 (2000); Impact Factor 0.679, 46/123 (2001); Impact Factor 0.431, 74/126 (2001); Impact Factor 0.452 (2004); Impact Factor 0.497, 82/116 (2008); Impact Factor 0.630, 81/126 (2009)

? Ahmed, S.M. and Vancleav, A.B. (1965), Adsorption and flotation studies with quartz. Part I. Adsorption of calcium hydrogen and hydroxyl ions on quartz. *Canadian Journal of Chemical Engineering*, **43** (1), 23-26.

Full Text: 1960-80\Can J Che Eng43, 23.pdf

? Ahmed, S.M. and Vancleav, A.B. (1965), Adsorption and flotation studies with quartz. Part II. Adsorption of laurate and myristate on quartz. *Canadian Journal of Chemical Engineering*, **43** (1), 27-29.

Full Text: 1960-80\Can J Che Eng43, 27.pdf

Lee, R.G. and Weber, T.W. (1969), Isothermal adsorption in fixed beds. *Canadian Journal of Chemical Engineering*, **47**, 54-59.

Full Text: 1960-80\Can J Che Eng47, 54.pdf

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Full Text: 1960-80\Can J Che Eng56, 187.pdf

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Full Text: 1960-80\Can J Che Eng56, 610.pdf

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Full Text: 1960-80\Can J Che Eng56, 1947.pdf

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Full Text: 1960-80\Can J Che Eng57, 65.pdf

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Full Text: 1960-80\Can J Che Eng57, 71.pdf

Gravelle, D.V. and Landreville, A. (1980), Caractérisation de la tourbe pour le traitement des eaux usées d’abattoirs. *Canadian Journal of Chemical Engineering*, **58**, 235-240.

Full Text: 1960-80\Can J Che Eng58, 235.pdf

McKay, G. and Allen, S.J. (1980), Surface mass transfer processes using peat as an adsorbent for dyestuffs. *Canadian Journal of Chemical Engineering*, **58** (4), 521-526.

Full Text: [1960-80\Can J Che Eng58, 521.pdf](1960-80/Can%20J%20Che%20Eng58,%20521.pdf)

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Full Text: 1982\Can J Che Eng60, 377.pdf

Novosad, J. and Myers, A.L. (1982), Thermodynamics of ion exchange as an adsorption process. *Canadian Journal of Chemical Engineering*, **60** (4), 500-503.

Full Text: 1982\Can J Che Eng60, 500.pdf

Birnholtz, H., Nir, A., Lotan, N. and Aharoni, C. (1984), Surface diffusion as rate determining step in activated chemisorption. *Canadian Journal of Chemical Engineering*, **62** (2), 233-240.

Full Text: 1984\Can J Che Eng62, 233.pdf

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Full Text: 1984\Can J Che Eng62, 340.pdf

Cloutier, J.N., Leduy, A. and Ramalho, R.S. (1985), Peat adsorption of herbicide 2,4-d from wastewaters. *Canadian Journal of Chemical Engineering*, **63** (2), 250-257.

Full Text: [C\Can J Che Eng63, 250.pdf](C/Can%20J%20Che%20Eng63,%20250.pdf)

Couillard, D. and Gariépy, S. (1990), Treatment and recycling of food-industry waste-water - feasibility of aerobic thermal procedures for slaughterhouse effluents. *Canadian Journal of Chemical Engineering*, **68** (6), 1018-1023.

Full Text: 1990\Can J Che Eng68, 1018.pdf

Abstract: This study fits into the scheme of research work being carried out to develop a wastewater treatment process for the food industry with the possibility of recycling nutrients as a proteinic biomass. A slaughterhouse effluent was submitted to a series of laboratory tests at temperatures of 45, 52 and 58-degrees-C. The treatment efficiency was demonstrated by a 90% reduction of chemical oxygen demand (COD) for studied retention times (6, 12, 18, 24 and 30 hours) at 45 and 52-degrees-C. The crude protein content collected reached an average of nearly 70% dry basis, and the amino-acids composition was proven adequate for use as protein concentrate for pig and poultry feedings.

Keywords: Food Industry, Slaughterhouse Effluent, Waste-Water Treatment, Thermophilic Bacteria, Biomass Recycling, Activated-Sludge Treatment, High-Strength Wastewaters, Protein Recovery, Digestion

? Fan, L.T., Boateng, A.A. and Walawender, W.P. (1992), Surface fractal dimension on rice hull-derived charcoal from a fluidized-bed reactor. *Canadian Journal of Chemical Engineering*, **70** (2), 387-390.

Full Text: 1992\Can J Che Eng70, 387.pdf

Abstract: Disposal of or energy recovery from rice hull can be accomplished by pyrolysis, a heterogeneous reaction whose rate tends to depend on the area of the solid reactant surface. In the present work, the surface fractal dimension, d(SF), an intrinsic quantitative measure for characterizing irregular particle surfaces, has been determined for rice hull as 2.42. The values of d(SF) of hull-derived charcoal particles at a retention time of 30 s in a fluidized bed have been determined to be 2.79 at 848 K and 3.00 at 973 and 1173 K, thereby indicating the development of a highly porous network with increasing temperature.

Keywords: Rice Hull, Hull Char, Fluidized Bed, Physisorption, Surface Fractal Dimension

? Silem, A., Boualia, A., Kada, R. and Mellah, A. (1992), Adsorption of organic-matter from a wet phosphoric-acid using activated carbon: Batch-contact time study and linear driving force models. *Canadian Journal of Chemical Engineering*, **70** (3), 491-498.

Full Text: 1992\Can J Che Eng70, 491.pdf

Abstract: The removal of organic matter from industrial phosphoric acid is an important step both for the production of decontaminated fertilizers and the successful recovery of uranium. This study deals with the determination of the organic matter adsorption equilibrium isotherms onto activated carbon. The effect of operating parameters on the adsorption rate is also investigated. A linear driving force model has been developed to quantitatively describe the mass transfer. The model assumes a combination of linear driving forces in the particle and in the Nernst film surrounding it. Based on the assumption of bilinear configuration of the isotherm, an analytical solution can be found. The model predicts the internal and external mass transfer coefficients.

Keywords: Adsorption, Driving Force, Mass Transfer, H3PO4 Organic Matter, Activated Carbon, Aqueous-Solutions, Dyestuffs, Rates

? Watts, D.G. (1994), Estimating parameters in nonlinear rate equations. *Canadian Journal of Chemical Engineering*, **72** (4), 701-710.

Full Text: 1994\Can J Che Eng72, 701.pdf

Abstract: Reaction rate equations with coefficients that have an Arrhenius dependence on temperature require nonlinear procedures to obtain parameter estimates. Estimates are important, but of equal importance are their measures of plausibility. The simplest measures, in the form (estimate ± limits), are based on linear approximations, which can be, and often are, highly misleading. But there is no need to use approximations because modern statistical profiling techniques can produce accurate intervals very efficiently. Profiling also provides valuable insight into the estimation situation by revealing how models can be simplified. Strategies are given for model reformulation and parameter transformation to produce models with well-behaved estimates.

Keywords: Arrhenius Relations, Model Formulation, Parameter Estimate Behavior, Profile Plots

Aldor, I., Fourest, E. and Volesky, B. (1995), Desorption of cadmium from algal biosorbent. *Canadian Journal of Chemical Engineering*, **73** (4), 516-522.

Full Text: 1995\Can J Che Eng73, 516.pdf

Abstract: Desorption of metal-laden new biosorbent material was studied using batch and column equilibrium elution processes. Equilibrium screening tests of cadmium desorption established a solution of HCl as the most appropriate eluant at approximately pH 1.0. The desorption of Cd by protons was indicated to be a reversible exchange with a stoichiometric coefficient of 1.24. The solid to liquid ratio (biosorbent mass to elutant volume) is described as a key parameter in determination of elution efficiency, affecting simultaneously the pH at desorption equilibrium, the concentration of cadmium released and the concentration ratio of the overall metal recovery process. When the pH is maintained constant, the solid to liquid ratio has little influence on metal recovery but still controls the concentration ratio. Recycling a small amount of eluant through a desorption column with metal-laden biosorbent material resulted in very high solid-to-liquid ratios (up to 130 g/L) leading to high value of 70 for the metal concentration ratio of the sorption/desorption process. No loss of cadmium biosorbent properties was observed in three consecutive metal uptake/desorption cycles.

Keywords: Sargassum, Biosorption, Cadmium, Desorption, Elution, Biosorbent Regeneration, *Rhizopus-arrhizus* Biomass, Marine-Algae, Biosorption, Metals, Uranium, Adsorption, Protons, Cobalt, Accumulation, Mechanism

Notes: highly cited

Ho, Y.S. and McKay, G. (1998), The kinetics of sorption of basic dyes from aqueous solution by sphagnum moss peat. *Canadian Journal of Chemical Engineering*, **76** (4), 822-827.

Full Text: [C\Can J Che Eng76, 822.pdf](C/Can%20J%20Che%20Eng76,%20822.pdf)

Abstract: The kinetics of sorption of three basic dyes, namely, Chrysoidine (BO2), Astrazon Blue (BB3) and Astrazone Blue (BB69) onto sphagnum moss peat have been investigated. The study focuses on the application of three sorption kinetic models for predicting the uptake of basic dyes. The sorption behaviour is found to be second order, based on the assumption of a pseudo-second order mechanism. The rate constant of sorption, the equilibrium capacity and initial sorption rate with the effect of various peat doses and initial dye concentrations have also been predicted.

Keywords: Adsorbent, Adsorption, Basic Dyes, Biosorption, Color Removal, Dye, Dyes, Dyestuffs, Equilibrium, Fly-Ash, Kaolinite, Kinetics, Kinetics and Sorption, Mass-Transfer Processes, Peat, Pseudo-Second Order, Silica, Sorption

? Bahrami, S., Bassi, A.S., Yanful, E. (1999), Polyethyleneimine-containing sol-gels as novel sorbents for the removal of cadmium from aqueous solutions. *Canadian Journal of Chemical Engineering*, **77** (5), 931-935.

Full Text: 1999\Can J Che Eng77, 931.pdf

Abstract: The removal of cadmium ions from aqueous solutions is described using polyethyleneimine (PEI) entrapped in sol-gel matrices. The process is optimized with respect to operating conditions and both sorption and desorption are considered. The sorption process followed the Langmuir isotherm, and the corresponding Langmuir constants qmax and Kd were found to be 80.64 mg Cd2+/g PEI and 236.36 mg/L, respectively, using the immobilized PEI polymer. More than 90% of the cadmium could be recovered in 2 h using 2 M NaCl solutions. This technique has potential applications in the recovery of cadmium in aqueous waste streams.

Keywords: Polyethyleneimine, Chelation, Sol-Gel, Cadmium Sorption, Metal-Ions, Waste-Water, Adsorption, Flocculation, Recovery, Carriers, Membrane, Polymer, Acid), Zinc

? Hemmi, M., Krull, R. and Hempel, D.C. (1999), Sequencing batch reactor technology for the purification of concentrated dyehouse liquors. *Canadian Journal of Chemical Engineering*, **77** (5), 948-954.

Full Text: 1999\Can J Che Eng77, 948.pdf

Abstract: A sequencing batch reactor (SBR) technology for the purification of concentrated reactive ate-dye containing residual dyehouse liquors from a padding process was developed and investigated. Within the treatment cycle, the anoxic dye cleavage, the aerobic mineralization of organic compounds, in combination with the biodegradability-achieving partial oxidation with ozone, are carried out sequentially. Anoxic decolourization of the residual liquor without addition of an auxiliary substrate was observed, and a 90% biological degradation of the dyehouse liquor’s recalcitrant organic compounds was achieved. COD decreased by 95% and AOX (adsorbable organohalogenic compounds) by 90%. Within the whole process, the colour of the concentrated wastewater decreased by 98%.

Keywords: Wastewater Treatment, Sequencing Batch Process, Residual Dyehouse Liquors, Ozone Pre-Oxidation, Biological Degradability, Biological Decolourization

Roberge, G., Blais, J.F. and Mercier, G. (1999), Phosphorus removal from wastewater treated with red mud-doped peat. *Canadian Journal of Chemical Engineering*, **77** (6), 1185-1194.

Full Text: 1999\Can J Che Eng77, 1185.pdf

Abstract: The addition of an aluminium and iron doping agent, bauxite red mud, has been tested with a commercial peat for the treatment of a secondary municipal wastewater. Based on a column study, phosphorus (P) removal was raised from about 17% to 21% on peat alone to over 95% with red mud treatment of peat. By this mean, the use of red muds allowed a reduction of Pt concentration effluent to below 0.15 mg/L. The boosting effect of red mud seemed to decrease with time and especially with the hydraulic loading. For a hydraulic loading of 30 cm/j, P removal met govermental guidelines (P, effluent < 1 mg/L) for a period of 50 days. Other classic efficiency parameters such as BOD5, COD and coliforms were not altered by the use of the doping agent.

Keywords: Phosphate Removal, Water, Adsorption, Mechanisms, Reduction, Nutrients, Capacity, Wetlands, Wastes, Soils

Jadhav, R.A., Agnihotri, R., Gupta, H. and Fan, L.S. (2000), Mechanism of selenium sorption by activated carbon. *Canadian Journal of Chemical Engineering*, **78** (1), 168-174.

Full Text: 2000\Can J Che Eng78, 168.pdf

Abstract: Selenium, along with mercury and halides, represents one of the most volatile trace metallic emissions from coal-fired combustors and utility boilers. This study investigates the potential of activated carbon in capturing gas phase selenium species in the low temperature range (125°C to 250°C) and elucidates the mechanism of interaction between selenium species and activated carbon, Selenium dioxide is chosen as the representative selenium species and experimental investigations are carried out in a differential bed reactor to illustrate the mechanism of SeO2 and carbon interaction. Activated carbons with different structural properties are studied as adsorbents for selenium dioxide capture at law temperature. The capture mechanism Is found to involve both physical and chemical adsorption in the low temperature range, At 125°C, about 1.5 wt% of selenium is captured at equilibrium. Carbon surface analyses and XPS studies confirm the presence of both elemental and oxide forms of selenium on the surface suggesting partial reduction of selenium dioxide to elemental selenium at carbon surface.

Keywords: Elemental Mercury, Metal Emissions, Coal Combustion, Trace-Elements, Adsorption, Filters, Vapor, Selenium, Activated Carbon, Low Temperature, Adsorption, Chemisorption

Ismadji, S. and Bhatia, S.K. (2000), Adsorption of flavour esters on granular activated carbon. *Canadian Journal of Chemical Engineering*, **78** (5), 892-901.

Full Text: 2000\Can J Che Eng78, 892.pdf

Abstract: This article reports on the liquid phase adsorption of flavour esters onto granular activated carbon. Ethyl propionate, ethyl butyrate, and ethyl isovalerate were used as adsorbates, and Filtrasorb 400 activated carbon was chosen as the adsorbent. Sips, Tóth, Unilan, and Dubinin-Radushkevich isotherm equations which are generally used for heterogeneous adsorbents were used to fit the data. Although satisfactory in fitting the data, inconsistency in parameter values indicated these models to be inadequate. On the other hand the Dubinin-Radushkevich model gave more consistent and meaningful parameter values and adsorption capacities. By employing the Dubinin-Radushkevich equation, the limiting volume of the adsorbed space, which equals the accessible micropore volume, was determined, and found to correlate with the value from carbon dioxide adsorption.

Keywords: Liquid Phase Adsorption, Flavour Esters, Activated Carbon, Isotherms, Liquid-Phase Adsorption, Isotherms, Equilibria, Fibers

? Rahman, M.H., Wasiuddin, N.M. and Islam, M.R. (2004), Experimental and numerical modeling studies of arsenic removal with wood ash from aqueous streams. *Canadian Journal of Chemical Engineering*, **82** (5), 968-977.

Full Text: [2004\Can J Che Eng82, 968.pdf](2004/Can%20J%20Che%20Eng82,%20968.pdf)

Abstract: Most of the arsenic removal processes are not cost-effective and/or not efficient in removing As(III). In this research, it was found that Maple wood ash has the potential to adsorb both As(III) and As(V) from contaminated aqueous streams at low concentration levels without any chemical treatment. Static tests showed up to 80% arsenic removal and in various dynamic column tests the arsenic concentration was reduced from 500 ppb to lower than Sppb. Finally, the ash column was modeled using the surface excess theory. The identified model significantly facilitates practical design of arsenic adsorption system.

Keywords: Activated Carbon, Adsorption, Adsorption, Aqueous Stream, Arsenic, Arsenic Removal, Behavior, Coated Sand, Contamination, Drinking-Water, Ground-Water, Iron, Model, Modeling, Numerical Modeling, Potential, Removal, Research, Sorption, Surface Excess Theory, Surfactants, Theory, Treatment, Wood Ash

? Loh, K.C. and Wang, Y. (2006), Enhanced cometabolic transformation of 4-chlorophenol in the presence of phenol by granular activated carbon adsorption. *Canadian Journal of Chemical Engineering*, **84** (2), 248-255.

Full Text: [2006\Can J Che Eng84, 248.pdf](2006/Can%20J%20Che%20Eng84,%20248.pdf)

Abstract: Substrate inhibitions that manifest within the cometabolism system of 4-chlorophenol (4-cp) and phenol were alleviated through the application of granular activated carbon (GAC) in batch biodegradation. It was found that 4-cp was preferentially adsorbed over phenol by the GAC and that 50% to 70% of the adsorption was achieved within the first two hours of contact. The kinetics of 4-cp adsorption was also much faster than that of phenol, even when the co-existing phenol was of a significantly higher initial concentration. As a result, competitive inhibition between the two compounds was minimized. Adsorption also caused a lowering of the phenol concentration in solution with a concomitant reduction in the substrate inhibition effect on cell growth. The addition of GAC benefited the biotransformation process through shortening the total degradation time for 600 mg L-1 phenol and 100 mg L-1 4-cp from 42 h to 12 h; and it also made it possible for cells to survive and transform 600 mg L-1 phenol and as high as 400 mg L-1 4-cp in free suspension cultures. Repeated operations in which GAC was reused showed that GAC could be regenerated by the cells, thus rendering the GAC incorporated process amenable to long term operations.

Keywords: 4-Chlorophenol, Activated Carbon, Activated Carbon Adsorption, Adsorption, Aqueous-Solutions, Aromatics, Biodegradation, Carbon, Cometabolism, Degradation, First, GAC, Granular Activated Carbon, Growth, Inhibition, Kinetics, Phenol, Pseudomonas Putida, Reduction, Solution, Transformation

? Ncibi, M.C., Mahjoub, B. and Seffen, M. (2006), Biosorption of phenol onto *Posidonia oceanica* (L.) seagrass in batch system: Equilibrium and kinetic modelling. *Canadian Journal of Chemical Engineering*, **84** (4), 495-500.

Full Text: [2006\Can J Che Eng84, 495.pdf](2006/Can%20J%20Che%20Eng84,%20495.pdf)

Abstract: In this research, the biosorption of phenol using the fibres of a Mediterranean seagrass Posidania oceanica (L.) was studied. Batch experimental procedures Were Made to investigate the ability of this novel marine biomass to remove phenol from aqueous phase. The influences of pH and contact time at different initial concentrations were evaluated. The results showed that biosorption capacity was enhanced using solution pH equal to 5.2. The modelling results showed that pseudo-second-order and Redlich-Peterson models were found to be the most suitable to satisfactory describe the kinetic and equilibrium adsorption data, respectively.

Keywords: Activated Carbons, Adsorption, Aqueous-Solutions, Bed, Biodegradation, Biomass, Biosorption, Capacity, Chlorophenols, Equilibrium, Experimental, Isotherms, Kinetic, Kinetic Modelling, Kinetics, Modelling, Models, pH, Phenol, Pollutants, Posidonia Fibres, Procedures, Removal, Research, Solution, Sorption, Waste-Water

? Cadotte, M., Tellier, M.E., Blanco, A., Fuente, E., van de Ven, T.G.M. and Paris, J. (2007), Flocculation, retention and drainage in papermaking: A comparative study of polymeric additives. *Canadian Journal of Chemical Engineering*, **85** (2), 240-248.

Full Text: [2007\Can J Che Eng85, 240.pdf](2007/Can%20J%20Che%20Eng85,%20240.pdf)

Abstract: Fibre and filler flocculation, filler retention and drainage, induced by several polymeric retention aids, were compared in laboratory experiments on mixtures of kraft fibres and two calcium carbonate fillers. Some experiments were also per-formed on thermomechanical pulp and de-inked pulp fibres. Flocculation was measured by a focused beam reflectance measurement probe. It was found that flocs induced by polyethyleneoxide (PEO) and cofactor broke up with time and shear and could not be reformed subsequently. Floc strength was the highest for PEO and the weakest for polyethylenimine and polyaluminium chloride. When comparing filler retention under optimal flocculation conditions, we found similar filler retention for all retention aids. Salt did not affect drainage for cationic retention aids, but reduced the drainage rate for PEO. Drainage with PEO was considerably slower than for other retention aids.

Keywords: Adsorption, Aids, Calcium, Calcium Carbonate, Carbonate, Cationic Polyacrilamide (CPAM), Charge, Chloride, Clay, Experiments, Fibre Flocculation, Filler Flocculation, Floc Properties, Flocs, Measurement, Mechanisms, Papermaking, Performance, Poly(Ethylene Oxide) (PEO), Polyaluminium Chloride (PAC), Polyethylenimine, Polyethylenimine (PEI), Polymeric, Pulp Fibers, Retention, Retention Aids, Systems

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Full Text: [2007\Can J Che Eng85, 863.pdf](2007/Can%20J%20Che%20Eng85,%20863.pdf)

Abstract: The electrical resistance of a fixed bed of Al2O3 and SnO2, measured during a step change in C3H6 flow through the bed, is reported. The mixed bed was used to simulate a device for simultaneous containment and monitoring of leaks from valves. Simultaneous measurements of the C3H6 concentration breakthrough and the bed resistance showed that Al2O3 was responsible for most of the C3H6 adsorption, whereas low levels of surface adsorption on SnO2 resulted in large changes in the bed electrical resistance. The bed resistance was modelled as a function of the C3H6 breakthrough using first-order kinetics for the reduction of the oxidized SnO2 by C3H6.

Keywords: Adsorption, Alumina, Breakthrough, Changes, Conductivity, Dioxide-Containing Catalysts, Equilibria, First-Order Kinetics, Fixed Bed, Fixed Bed Adsorber, Function, Kinetics, Propane, Reduction, Resistance, Sensor, Surface Dynamics, Tin Dioxide, Tin Dioxide, Water

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Full Text: [2007\Can J Che Eng85, 900.pdf](2007/Can%20J%20Che%20Eng85,%20900.pdf)

Abstract: The influence of the apatite on the efficiency of neutralization and on heavy metal removal of acid mine waste water has been studied. The analysis of the treated waste water samples with apatite has shown an advanced purification, the concentration of the heavy metals after the treatment of the waste water with apatite being 25 to 1000 times less than the Maximum Concentration Limits admitted by European Norms (NTPA 001/2005). In order to establish the macro-kinetic mechanism in the neutralization process, the activation energy, Ea, and the kinetic parameters, rate coefficient of reaction, k(r), and k(t) were determined from the experimental results obtained in “ceramic ball-mill” reactor. The obtained values of the activation energy Ea >> 42 kJ mol-1 (e.g. Ea = 115.50±7.50 kJ mol-1 for a conversion of sulphuric acid eta H2SO4 = 0.05, Ea = 60.90±9.50 kJ mol-1 for eta H2SO4 = 0.10 and Ea = 55.75±10.45 kJ mol-1 for eta H2SO4 = 0.15) suggest that up to a conversion of H2SO4 equal 0.15 the global process is controlled by the transformation process, adsorption followed by reaction, which means surface - controlled reactions. At a conversion of sulphuric acid eta H2SO4 > 0.15, the obtained values of activation energy Ea < 42 kJ mol-1 (e.g. Ea = 37.55±4.05 kJ mol-1 for eta H2SO4 = 0.2, Ea = 37.54±2.54 kJ mol-1 for eta H2SO4 = 0.3 and Ea = 37.44±2.90 kJ mol-1 for eta H2SO4 = 0.4) indicate diffusion - controlled processes. This means a combined process model, which involves the transfer in the liquid phase followed by the chemical reaction at the surface of the solid. Kinetic parameters as rate coefficient of reaction, k(r) with values ranging from (5.02±1.62) 10-4 to (8.00±1.55) 10-4 (s-1) and transfer coefficient, k(t), ranging from (8.40±0.50) 10-5 to (10.42±0.65) 10-5 (m s-1) were determined.

Keywords: Acid Mine Waste Water, Activation, Activation Energy, Adsorption, Adsorption Properties, Analysis, and Macro-Kinetic Mechanism, Apatite, Aqueous-Solutions, Diffusion, Efficiency, Experimental, Heavy Metal, Heavy Metal Removal, Heavy Metals, Hydroxyapatite, Kinetic, Kinetic Parameters, Kinetic Study, Mechanism, Metal, Metals, Model, Neutralization, Precipitation, Purification, Removal, Retention, Sorption, Sulphuric Acid, Transfer Coefficient, Transformation, Treatment, Waste Water, Water, Zinc

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Full Text: [2008\Can J Che Eng86, 23.pdf](2008/Can%20J%20Che%20Eng86,%2023.pdf)

Abstract: The marine biomaterial Posidonia oceanica (L.) fibres were used as a novel low-cost biological adsorbent for the removal of reactive textile dye (Cibacron Red) from aqueous solutions. Batch experiments were carried out for sorption kinetics and isotherms. Operating variables studied were contact time, fibres quantity, temperature, pH, and chemical pre-treatment. The equilibrium state was reached within 48 h. Biosorption capacity seems to be enhanced by, increasing the biosorbent mass. Rising the temperature has also a positive effect on dye removal rate. Maximum colour removal was observed at pH 5.5. Pre-treating fibres with H3PO4 and HNO3 solutions increased considerably the adsorption capacity. Kinetic and equilibrium data for raw fibres were well described by the pseudo-second order and Freundlich models, respectively. Besides, the thermodynamic study has showed that the dye-adsorption phenomenon onto P. oceanica biomass was favourable, endothermic and spontaneous.

Keywords: Adsorbent, Adsorption, Aqueous Solutions, Aqueous-Solutions, Azo, Biomass, Biosorbent, Biosorption, Capacity, Cellulose, Decolorization, Dye, Dye Removal, Dyes, Effluent, Endothermic, Equilibrium, Experiments, Freundlich, Isotherms, Kinetic, Kinetics, Models, pH, Pre-Treatment, Pretreatment, Pseudo-Second Order, Removal, Sorption, Sorption Kinetics, Temperature, Thermodynamic, Waste-Water

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Full Text: [2008\Can J Che Eng86, 72.pdf](2008/Can%20J%20Che%20Eng86,%2072.pdf)

Abstract: A simple method has been developed for the solid phase extraction of chromium(VI) based on the adsorption of its diphenylcarbazide (DPC) complex on an alumina column. The effect of various parameters such as acidity, stability of the column, sample volume, and interfering ions have been studied in detail. The adsorbed complex could be easily desorbed using sulphuric acid and the concentration of chromium has been established using atomic absorption spectrophotometry and visible spectrophotometry. The calibration graph was linear in the range of 0-1 μg/mL chromium(VI) with a detection limit of 4 μg/L. A highest preconcentration factor of 125 could be obtained for 5000 mL sample volume using glass wool as support for alumina. Chromium(VI) could be effectively separated from other ions such as zinc, nickel, copper, chloride, sulphate, and nitrate and the method has been successfully applied to study the recovery of chromium in spiked well water and tap water samples.

Keywords: Absorption, Adsorption, Alumina, Aqueous Solutions, Carbon, Chloride, Chromium, Copper, Cr(VI), Diphenylcarbazide, Equilibrium, Glass Wool, Kinetics, Nickel, Preconcentration, Recovery, Removal, Speciation, Spectrophotometry, Stability, Sulphuric Acid, Water, Zinc

? Zeng, Y.P., Ju, S.G., Xing, W.H. and Chen, C.L. (2008), Adsorption of mercaptan from model gasoline on 13X loaded with Zn2+. *Canadian Journal of Chemical Engineering*, **86** (2), 186-191.

Full Text: [2008\Can J Che Eng86, 186.pdf](2008/Can%20J%20Che%20Eng86,%20186.pdf)

Abstract: Adsorption of mercaptan on 13X loaded with Zn2+ from model gasoline was studied at different concentration and temperatures. The results indicate that high temperature and low concentration favour the removal of mercaptan from the model gasoline. The adsorptive amount of the untreated adsorbents loaded with Zn2+ is less than the treated with heat obviously, but the adsorbed amount is not enhanced distinctly by the way of increasing the treating temperature. A pseudo-first-order mechanism has been proposed to describe the adsorption in the model gasoline system. The desulphurizing capability increases due to the Zn2+ impregnated. With the concentration of Zn2+ higher, the adsorptive amount for ethanethiol increases. Adsorption mechanism shows that it is a chemical adsorption. Two different methods of regeneration were investigated.

Keywords: 13X, Adsorbents, Adsorption, Desulfurization, Fuels, Gasoline, Mechanism, Mercaptan, Methods, Model, Oil, PI-Complexation, Regeneration, Removal, Sorbents, Sulfur, Temperature, Zeolite, Zn2+

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Full Text: [2009\Can J Che Eng87, 69.pdf](2009/Can%20J%20Che%20Eng87,%2069.pdf)

Abstract: The present investigation was undertaken to compare the adsorption efficiency of a low cost adsorbent, periwinkle shell-based granular activated carbon (PSC) with the adsorption efficiency of the commercial activated carbon (CAC) and a ratio 1:1 mixture of PSC and CAC (PSC/CAC) with respect to uptake of the organic components responsible for the chemical oxygen demand (COD) of industrial wastewater. The influence of treatment time, adsorbent dose, pH of the media, agitation speed and adsorbent particle size on the rate of percent COD removal is evaluated. PSC has shown quite effective adsorbent capacity for COD removal with 77.5% efficiency. Though its capacity is slightly lower than that of CAC with 79% efficiency, however the low material cost makes it an attractive option for the treatment of COD. The equilibrium adsorption study can be described by the Linear, Langmuir and Freundlich models. The mechanisms of the rate of adsorption of COD were analysed using the Elovich equation and a pseudo-second-order model. The models provided a very high degree of correlation of the experimental adsorption rate data suggesting either model could be used in design applications.

Keywords: Activated Carbon, Adsorption, Adsorption, Aqueous-Solutions, Chemical Oxygen Demand, Chemisorption, Color Removal, Dye, Efficient Removal, Elovich Equation, Fly-Ash, Kinetic, Kinetics, Periwinkle Shell, Sorption

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Full Text: [2009\Can J Che Eng87, 554.pdf](2009/Can%20J%20Che%20Eng87,%20554.pdf)

Abstract: The biosorption of Brill Red 5B from an aqueous solution, using *Cicca acida* plant’s leaves was investigated in a batch system with the influence of pH (1-6), temperature (25-35°C) and initial dye concentration (10-100 mg/L). Maximum biosorption was observed at initial pH of 2.0, temperature of 30°C and at the initial dye concentration of 100 mg/L. Batch biosorption kinetic was studied using the pseudo first and pseudo-second-order rate equations. From the result, it was observed that pseudo-second-order rate expression fitted the experimental data well when compared to pseudo first order kinetic model. The intra-particle diffusion coefficient (K-i) and effective diffusion coefficient (D-i) values obtained for the sorption of Brill Red 5B using *C. acida* plant’s leaves were found to be increased with increase in initial dye concentration.

Keywords: Activated Carbon, Aqueous Solution, Basic-Dyes, Batch, Batch System, Biomass, Biosorption, Biosorption Kinetic, Brill Red 5B, *Cicca acida*, Concentration, Data, Decolorization, Diffusion, Diffusion Coefficient, Dye, Experimental, Expression, First, First Order, Heavy-Metals, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherms, Kinetic, Kinetic Model, Kinetics, Methylene-Blue Biosorption, Model, Organic Pollutants, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Reactive Dye, Removal, *Rhizopus arrhizus*, Solution, Sorption, Temperature, Waste, Water

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Full Text: [2009\Can J Che Eng87, 896.pdf](2009/Can%20J%20Che%20Eng87,%20896.pdf)

Abstract: Environmental pollution caused by the presence of toxic materials such as cadmium is becoming global problem and concern. This paper presents a report on kinetics of Cd2+ removal from aqueous solutions through adsorption using powdered corn cobs (PCC). Corn cobs were collected from a selected location, washed to remove sand, air dried, ground and sieved into different particle sizes. The selected properties of PCC were determined using acid digestion method. Adsorption capacities through kinetics of Cd2+ removal from synthetic solutions, typical raw water and domestic-institutional wastewater were studied. Effects of pH, PCC particle size, initial concentration of Cd2+ and temperature on adsorption capacities were monitored through pseudo first- and second-order models, Elovich and intraparticle diffusion models to present adsorption rate parameters. The study revealed that PCC contained 86.89% volatile solids, had 4.56% acid solubility, 0.52 water solubility and 2.33% ash content. FCC removed Cd2+ from aqueous solutions (synthetic, raw water, and wastewater). The relationship between time and concentration of Cd2+ remaining in the solution followed exponential functions with squared correlation coefficient ranging from 0.9928 to 0.9993, 0.8701 to 0.9284, and 0.8514 to 0.9290 for synthetic solution, raw water, and typical domestic-institutional wastewater, respectively. Mechanism of cadmium adsorption onto PCC was in two separate stages linear portions in the first parts, while the final parts are curves indicating intraparticle diffusion. It was concluded that PCC is an effective adsorbent for Cd2+ removal. The estimated production cost was 0.068 USD as against 0.50, 2.12, and 3.12 USD for producing adsorbents from empty fruit bunches; pencom shell and sugar cane based activated carbons, respectively.

Keywords: Activated Carbons, Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Rate, Air, Amorphous Iron Hydroxide, Aqueous Solution, Aqueous Solutions, Aqueous-Solution, Bagasse Fly-Ash, Cadmium, Cadmium Adsorption, Cd2+, Cd2+ Removal, Concentration, Corn, Correlation, Correlation Coefficient, Cost, Diffusion, Divalent Metal-Ions, Elovich, Environmental, Environmental Pollution Control, FCC, First, Functions, Hazelnut Shell, Heavy-Metals, Hexavalent Chromium, Industrial-Waste-Water, Intraparticle Diffusion, Kinetics, Location, Low-Cost Adsorbents, Mechanism, Models, Natural Water, Particle Size, PCC, pH, Pollution, Removal, Sand, Second Order, Second-Order, Shell Activated Carbon, Size, Solubility, Solution, Solutions, Temperature, Toxic, Wastewater, Water

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Full Text: [2009\Can J Che Eng87, 921.pdf](2009/Can%20J%20Che%20Eng87,%20921.pdf)

Abstract: Due to rapid industrialisation, the presence of heavy metals in water and wastewater is a matter of environmental concern. Though some of the metals are essential for our system but if present beyond their threshold limit value (TLV), they are harmful and their treatment prior to disposal becomes inevitable. The present communication has been addressed to the removal of Cr(VI) from aqueous solutions by nanoparticles of iron. Nanoparticles of iron were prepared by sol-gel method. The characterisation of the nanoparticles was carried out by XRD and TEM analysis. Batch experiments were adopted for the adsorption of Cr(VI) from its solutions. The effect of different important parameters such as contact time and initial concentration, pH, adsorbent dose, and temperature on removal of chromium was studied. The removal of chromium increased from 88. 5% to 99.05% by decreasing its initial concentration from 15 to 5 mg L-1 at optimum conditions. Removal of Cr(VI) was found to be highly pH dependent and a maximum removal (100%) was obtained at pH 2.0. The process of removal was governed by first and pseudo-second-order kinetic equations and their rate constants were determined. The process of removal was also governed by intraparticle diffusion. Values of the thermodynamic parameters viz. ΔG°, ΔH°, and ΔS° at different temperatures were determined. The data generated in this study can be used to design treatment plants for chromium rich industrial effluents. Adsorption results indicate that nanoiron particles can be effective for the removal of chromium from aqueous solutions.

Keywords: Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Analysis, Aqueous Solutions, Aqueous-Solutions, Arsenic Removal, Biosorption, Chromium, Chromium(VI), Communication, Concentration, Contact Time, Cr(VI), Data, Design, Diffusion, Disposal, Effluents, Environmental, Equilibrium, Experiments, First, Heavy Metals, Hexavalent, Intraparticle Diffusion, Iron, Kinetic, Kinetic Equations, L1, Metals, Nanoiron, Nanoparticles, Oxide, Particles, pH, pH-Dependent, Plants, Pseudo Second Order, Pseudo-Second-Order, Rate Constants, Removal, Rice Husk, Sol-Gel, Solutions, TEM, Temperature, Thermodynamic, Thermodynamic Parameters, Treatment, Value, Wastewater, Water, Wollastonite, XRD

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Full Text: [2009\Can J Che Eng87, 957.pdf](2009/Can%20J%20Che%20Eng87,%20957.pdf)

Abstract: Ethylene absorption from an ethylene-ethane gaseous mixture in the silver nitrate solution is studied at different temperatures and concentrations. Unlike the previous studies, in which the absorption was studied by batch processes, a semi-continuous process is applied in the present research. The results show that increase in temperature reduces the amount of absorbed ethylene and absorption time. The amount of absorbed ethylene is increased in solutions with higher concentrations of AgNO3, whereas the mole ratio of absorbed ethylene per silver nitrate is decreased by increasing the AgNO3 concentration. Total absorption is modelled as a function of the temperature and concentration of absorbing solution. The estimated values from the model are in good agreement with the experimental data.

Keywords: Absorption, Aqueous Silver-Nitrate, Batch, Concentration, Data, Ethylene Absorption, Experimental, Function, Gaseous Mixture, Liquid Membrane Contactors, Model, Nitrate, Olefin, Paraffin Separation, Research, Salt, Selective Membranes, Semi-Continuous Process, Silver, Silver Nitrate Solution, Solubility, Solution, Solutions, Sorption, Temperature

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Full Text: [2010\Can J Che Eng88, 109.pdf](2010/Can%20J%20Che%20Eng88,%20109.pdf)

Abstract: The brewer’s yeast was used as adsorbent for the removal of Ni(II) and Cd(II) metal ions from aqueous solution. The surface of the brewer’s yeast had three main functional groups of sulfonate, carboxyl, and amine groups. The pH of solution played an important role on the uptake of metal ions, and optimum adsorption was obtained at pH 6. Acid solution (pH 3) was efficient for the desorption of Ni(II) and Cd(II) ions from loaded brewer’s yeast and the desorption efficiency was higher than 90%. The rate of metal ions adsorption onto brewer’s yeast was rapid with short contact time. The kinetics of the adsorption process was found to follow the pseudo-second-order kinetic model. Langmuir and Freundlich isotherm models were used to fit the experimental data with Langmuir isotherm model having a better fit. The maximum uptakes of Ni(II) and Cd(II) by brewer’s yeast were estimated to be 5.34 and 10.17 mg/g, respectively.

Keywords: Adsorbent, Adsorbents, Adsorption, Aqueous Solution, Aqueous-Solution, Biomass, Biosorption, Brewer’s Yeast, Cadmium, Cd(II), Cd(II) Ions, Competitive Adsorption, Copper, Cu(II), Data, Desorption, Efficiency, Equilibrium, Experimental, Fly-Ash, Freundlich, Freundlich Isotherm, Functional Groups, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Metal, Metal Ions, Model, Models, Ni(II), Nickel, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Role, Solution, Surface, Time, Uptake, Yeast

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Full Text: [2010\Can J Che Eng88, 417.pdf](2010/Can%20J%20Che%20Eng88,%20417.pdf)

Abstract: The removal of phenol from solution was investigated using macroporous resin The effects of initial concentration, pH, and temperature on phenol removal were studied The experimental results indicated that the adsorption capacity reached equilibrium state within 20 min and adsorption followed pseudo-second-order kinetic model Langmuir isotherm model could be better to describe the isothermal adsorption of phenol, the maximum adsorption capacity (Q(m)) and Langmuir constant (K-L) were 103.64 mg/g and 0 2719 Macroporous resin after reached to saturation has a high desorption percentage, indicating that H-103 is an excellent reusing adsorption material It provided theoretical references for practical application in phenolic wastewater treatment.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous-Solution, Dyes, Equilibrium, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Macroporous Resin, Maximum Adsorption Capacity, Phenol, Phenolic Wastewater, Removal, Sorption, Wastewater, Wastewater Treatment

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Full Text: [2010\Can J Che Eng88, 693.pdf](2010/Can%20J%20Che%20Eng88,%20693.pdf); [2010\Can J Che Eng-Ho.pdf](2010/Can%20J%20Che%20Eng-Ho.pdf)

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Full Text: [2011\Can J Che Eng89, 284.pdf](2011/Can%20J%20Che%20Eng89,%20284.pdf)

Abstract: Adsorption of phenol from aqueous solution onto cashew nut shell (CNS) was investigated to assess the possible use of this adsorbent. The influence of various parameters such as contact time, phenol concentration, adsorbent dose, pH, and temperature has been studied. Studies showed that the pH of aqueous solutions affected phenol removal as a result of decrease in removal efficiency with increasing solution pH. The experimental data were analysed by the Langmuir equation. Equilibrium data fitted well with the Langmuir model with maximum monolayer adsorption capacity of 5.405 mg/g. Thermodynamic parameters such as Δ*G*º, Δ*H*º, and Δ*S*º have also been evaluated and it has been found that the sorption process was feasible, spontaneous, and exothermic in nature. The pseudo-first-order and pseudo-second-order kinetic models were selected to follow the adsorption process. 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 phenol could be described by the pseudo-second-order equation, suggesting that the adsorption process is presumable a chemisorption. The CNS investigated in this study showed good application potential for the removal of phenol from aqueous solution.

Keywords: 4-Nitrophenol, Activated Carbon, Adsorption, CNS, Equilibrium, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, pH, Phenol, Removal, Sorption, Thermodynamic, Thermodynamics, Waste-Water

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Full Text: [2011\Can J Che Eng89, 593.pdf](2011/Can%20J%20Che%20Eng89,%20593.pdf)

Abstract: The present study investigates the sorption potential of barley husk for the removal of solar red BA from aqueous solution. Sorption capacity, q (mg/g), of barley husk decreased with increasing initial dye concentration. The sorption equilibrium established within 90 min using 0.10 g biosorbent while it was prolonged to 135 min with increasing amount of biosorbent (0.25-0.50 g). The equilibrium data were fitted to Freundlich and Langmuir isotherms at different biosorbent doses. The results indicated the applicability of Freundlich isotherm at low-biosorbent dose. Pseudo-second-order kinetic model was found to be best fit to the biosorption data with three biosorbent doses. The equilibrium thermodynamic data for the adsorption of the dyes gave ΔG(0) values -79.77 kJ/mol at 303 K indicated the process to be occurred spontaneously at low temperature. FTIR analysis and SEM imaging of biosorbent were also carried out.

Keywords: Activated-Sludge Biomass, Adsorption, Adsorption Behavior, Aqueous Solution, Basic-Dyes, Biosorbent, Biosorption, Bottom Ash, Coir Pith, Direct Dye, Dye, Dyes, Equilibrium, Equilibrium Modelling, Freundlich, Freundlich and Langmuir Isotherms, Freundlich Isotherm, FTIR, FTIR Analysis, Hordeum Vulgare, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Linked Chitosan Beads, Potential Adsorbents, Reactive Dye, Removal, *Rhizopus-Arrhizus*, Sorption, Temperature, Thermodynamic, Thermodynamic Data, Thermodynamics, Waste-Water

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Full Text: [2011\Can J Che Eng89, 833.pdf](2011/Can%20J%20Che%20Eng89,%20833.pdf)

Abstract: The ability of glutaraldehyde cross-linked chitosan beads (GCC beads) as synthetic adsorbent for adsorptive removal of Pb(II) ions from aqueous solutions is investigated in the present study. The biosorbent has been characterised by Brunner, Emmett, and Teller (BET) analysis, Fourier transform infrared (FTIR) spectroscopy and scanning electron microscopy (SEM) techniques. Equilibrium and column flow adsorption characteristics of Pb(II) ions on the biosorbent were studied. The effects of experimental variable parameters such as pH, concentration of metal ion, amount of adsorbent, contact time, temperature and interfering ions on adsorption have been investigated. The equilibrium data are fitted to pseudo-first order, pseudosecond order, fractionary order, chemisorption, Weber-Morris and Boyd models. Based on R(2) and error function values, it is observed that the kinetic data are better fitted to pseudo-second-order kinetic model and chemisorption model. The experimental data are analysed using Langmuir, Freundlich, and Sips adsorption isotherm models. The monolayer adsorption capacity of GCC beads as obtained from Langmuir isotherm at 35 degrees C is found to be 204.0 mg/g. The thermodynamic constants of the adsorption process: Delta H(0), Delta S(0) and Delta G(0) are evaluated. The results show that biosorption of Pb(II) ions on GCC beads are endothermic and spontaneous.

Keywords: Activated Carbon, Adsorption, Biosorption, Cadmium, Chitosan, Cu(II), Equilibrium, Glutaraldehyde Cross-Linked Chitosan Beads, Ions, Isotherm, Isotherm Models, Kinetics, Kinetics, Langmuir Isotherm, Metal Ion, Model, Parameters, Pb(II), Pb(II) Ions, pH, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Sorption, Thermodynamics

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Full Text: [2011\Can J Che Eng89, 921.pdf](2011/Can%20J%20Che%20Eng89,%20921.pdf)

Abstract: This paper deals with kinetics and equilibrium studies on the adsorption of arsenic species from simulated groundwater containing arsenic (As(III): As(V):: 1:1), Fe, and Mn in concentrations of 0.188, 2.8, and 0.6 mg/L, respectively, by Cu(2+) impregnated granular-activated carbon (GAC-Cu). Effects of agitation period and initial arsenic concentration on the removal of arsenic species have also been described. Although, most of the arsenic species are adsorbed within 8 h of agitation, equilibrium reaches after similar to 24 h. Amongst various kinetic models investigated, the pseudo-second order model is more adequate to explain the adsorption kinetics and film diffusion is found to be the rate-controlling step for the adsorption of arsenic species on GAC-Cu. Freundlich isotherm is adequate to explain the adsorption equilibrium. However, empirical polynomial isotherm gives more accurate prediction on equilibrium specific uptakes of arsenic species. Maximum specific uptake (q(max)) for the adsorption of As(T) as obtained from Langmuir isotherm is 180 mu g/g.

Keywords: Adsorbents, Adsorption, Adsorption Kinetics, Aqueous-Solution, Arsenic, As(III), Contaminated Water, Diffusion, Equilibrium, GAC-Cu, Husk Carbon, Iron Oxyhydroxide, Isotherm, Isotherms, Kinetic Models, Kinetics, Langmuir Isotherm, Laterite, Model, Parameters, Pseudo-Second Order, Pseudo-Second-Order, Sorption, Surface Complexion

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Full Text: [2011\Can J Che Eng89, 1247.pdf](2011/Can%20J%20Che%20Eng89,%201247.pdf)

Abstract: The adsorption of strontium and barium from aqueous solution onto expanded perlite (EP) has been investigated as a function of pH, contact time, adsorbent dosage, and temperature. Sorption experiments indicated that the sorption capacity was dependent on operating variables and the process was strongly pH-dependent. Equilibrium isotherm data were analysed using Langmuir, Freundlich, and Dubinin-Radushkevich isotherm models. The adsorption was well described by Langmuir isotherm model. The maximum adsorption capacity was found to be 1.14 and 2.486 mg/g for Sr(II) and Ba(II) from the Langmuir isotherm model at 20ºC, respectively. Two simplified kinetic models viz. pseudo-first-order and pseudo-second-order models were tested to describe the adsorption process. The kinetic data indicated that adsorption fitted well with the pseudo-second-order kinetic model. Using the equilibrium constant value obtained at four (20, 30, 40, and 50ºC) different temperatures, the thermodynamic parameters of the adsorption (Δ*G*º, Δ*H*º, and Δ*S*º) were also determined. The results showed that the adsorption of Sr (II) and Ba (II) ions on EP was exothermic and spontaneous.

Keywords: Adsorbent, Adsorption, Aqueous Solution, Barium, Bentonite, Cadmium, Dubinin-Radushkevich Isotherm, Equilibrium, Equilibrium Isotherm, Expanded Perlite, Freundlich, Isotherm, Kaolinite, Kinetic, Kinetic Model, Kinetic Models, Langmuir, Langmuir Isotherm, Montmorillonite, Perlite, pH, Pseudo Second Order, Removal, Silica, Sorption, Strontium, Surfaces, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2011\Can J Che Eng89, 1545.pdf](2011/Can%20J%20Che%20Eng89,%201545.pdf)

Abstract: Alginic acid fiber was used as a novel adsorbent to remove methylene blue from aqueous solution, and adsorption mechanisms were investigated. System variables, including contact time, pH, temperature, and initial concentration were examined to investigate the effect on adsorption in batch experiments. The results showed that equilibrium reached in less than 20 min and pH significantly influenced the equilibrium value. Langmuir, Freundlich, and Temkin isotherm models were employed to analyse the isotherm behaviours. It was found the isotherm behaviours conform to Freundlich and Temkin models well, indicating a chemisorption process. Pseudo-first-order, pseudo-second-order, and intraparticle diffusion models were employed to investigate kinetic behaviours. The kinetic behaviour is best described by pseudo-second-order model. Thermodynamic parameters indicate that the process is spontaneous and exothermic.

Keywords: Adsorbent, Adsorption, Adsorption, Alginic Acid Fiber, Aqueous-Solutions, Biosorption, Equilibrium, Freundlich, Isotherm, Isotherm Models, Kinetic, Kinetic Models, Langmuir, Leaf Powder, Methylene Blue, Peel, pH, Removal, Sorption, Thermodynamic, Thermodynamic Parameters

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Full Text: [2011\Can J Che Eng89, 1554.pdf](2011/Can%20J%20Che%20Eng89,%201554.pdf)

Abstract: The aim of the present study is to investigate the influence of free, carboxymethyl cellulose (CMC) immobilised, PVA-alginate immobilised, and HCl treated rice husk on the removal of Direct Red-31 and Direct Orange-26 dyes. The biosorption capacity of the rice husk increased with HCl treatment (67.39 and 45.34 mg/g) and decreased with PVA-alginate immobilisation (9.73 and 10.03 mg/g) as compared to the free biomass (65.56 and 45.58 mg/g) at 200 mg/L dye concentration for Direct Red-31 and Direct Orange-26, respectively. Equilibrium data were best described by Langmuir Type 1 for Direct Red-31 and Direct Orange-26 (free, CMC immobilised, PVA-alginate immobilised, and HCl treated). Best correlation coefficients for Direct Red-31 and Direct Orange-26 using free, CMC immobilised, PVA-alginate immobilised, and HCl treated rice husk were obtained for pseudo-second order and Elovich kinetic models. Values of Gibbs free energy (Δ*G*°) and enthalpy change (Δ*H*°) indicated that reaction was spontaneous and endothermic in nature at the studied temperatures. FT-IR studies showed the involvement of carbonyl, carboxyl, and amide groups in the biosorption process. SEM exhibited the morphological changes on the biosorbent surface and BET analysis to determine the surface area is also carried out.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, BET, Biosorbent, Biosorption, Biosorption, Congo Red, Direct Dyes, Equilibrium, Fly-Ash, FTIR, Immobilisation, Kinetic, Kinetic Models, Langmuir, Methylene-Blue, Modelling, Modifications, Pretreatments, Reactive Dye, Removal, Treated Biomass

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Abstract: The difference between adsorption isotherms and absorption spectra of methyl orange bound to human and to bovine albumin at pH 6.8, 9.1, and 11.0 has been studied. Exaltation of the spectrum of methyl orange bound to human albumin is not necessarily correlated with total binding capacity. However, above pH 6.8, heterogeneity of the binding sites for methyl orange on human albumin increases so markedly that it is reflected in an appreciable increase in extinction coefficient for the first three or four anions bound. The exaltation is accompanied by an increased −ΔF° of binding. Increase in ionic strength diminishes exaltation, and denaturation of the protein destroys it. These effects were not observed for bovine albumin. Results are interpreted in terms of a limited reversible expansion of the human protein molecules, without unfolding, due to intramolecular, electrostatic repulsion between groups.

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Full Text: [-1959\Can J Che-Rev Can Chi34, 1719.pdf](-1959/Can%20J%20Che-Rev%20Can%20Chi34,%201719.pdf)

Abstract: The temperature dependence of the rate constant, k, in the heterogeneous oxidation of carbon monoxide on the surface of silver permanganate – zinc oxide, indicates that in the temperature range of about 11° to 40°C, the process is subject to diffusion or transport control and the experimental activation energy is 1.4 to 1.9 kcal. per mole. In the range of 11° to −3°C. the rate of the surface chemical reaction decreases with a corresponding increase in activation energy to 15 kcal. in this transition stage. At lower temperatures the system is subject to chemical control and E rises to about 27 kcal.

Four adsorption isotherms for water vapor on this reagent have been obtained in the range of −10° to 20°C. The isotherms are sigmoid and indicative of Type II adsorption.

The mechanism of this heterogeneous reaction is discussed on the basis of several possibilities for providing oxygen ions in the electron–ion exchange step of the over-all reaction.

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Full Text: [-1959\Can J Che-Rev Can Chi35, 689.pdf](-1959/Can%20J%20Che-Rev%20Can%20Chi35,%20689.pdf)

Abstract: The rates of adsorption at constant pressure of n-heptane on ‘Spheron 6’ carbon black have been measured between 0° and 30 °C. in the pressure range 0.005–0.120 mm., using a sensitive quartz spiral technique. From the results the diffusion coefficient has been calculated both as a function of temperature and as a function of surface concentration, and the activation energy for diffusion calculated as a function of surface concentration. The heat of adsorption, calculated as a function of surface concentration from isotherms measured under the above conditions, is the same as the activation energy. Accordingly, a model is proposed in which the heptane molecules diffuse into the powder mass by a series of jumps across the interparticle space. The distribution of heptane within the carbon bed at various times during adsorption has been calculated.

Notes: highly cited

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Full Text: [-1959\Can J Che-Rev Can Chi36, 1384.pdf](-1959/Can%20J%20Che-Rev%20Can%20Chi36,%201384.pdf)

Abstract: This system illustrates “partial molecular sieve action”. Methane has a higher affinity for the sorbent and hence is preferentially sorbed at equilibrium, while nitrogen diffuses through the crystal more rapidly and thus is preferentially taken up during the early stages of sorption. Measurements were made with the pure gases and with mixtures at 0 °and −79.4 °C. The sorption isotherms fit Langmuir equations and the isosteric heats of sorption are essentially independent of concentration. The sorption rates for the pure gases may be characterized by diffusion coefficients, D, calculated in the usual manner assuming the flux of diffusion to be proportional to the concentration gradient. The resultant values for D increase with increasing sorbate concentration. Diffusion of a mixture may be formally characterized by D’s for each component. While that for methane is approximately the same as for methane alone, D for nitrogen in mixtures is much larger than for the pure gas and also varies with composition. This, as well as the existence of a temporary maximum in the amount of nitrogen sorbed, may be explained by considering the driving force for diffusion to be the gradient in chemical potential rather than in concentration.

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Full Text: [-1959\Can J Che-Rev Can Chi37, 315.pdf](-1959/Can%20J%20Che-Rev%20Can%20Chi37,%20315.pdf)

Abstract: Direct measurement of the surface concentration Г of Methylene blue, adsorbed from a phosphate buffer solution onto an ideally polarized mercury electrode, has produced a Lang-muir-type isotherm. The maximum value of Г, Г*m*, was found to be dependent on the potential applied (*E*). Surface tension measurements showed that the rate-controlling process is not diffusion, but, presumably, the exchange of Methylene blue cation (MB+) with phosphate ions. A model for this process has been proposed. This allowed the calculation of the rate constant of adsorption (*ka*) from the surface tension values as a function of time (*ka* ~ 5×10−5 cm/sec; *dka*/*dE* ~ 30×10−5). There is some evidence for the occurrence of a consecutive process, most likely the combination of adsorbed MB+ to dimers.

Ahmed, S.M. (1966), Studies of the dissociation of oxide surfaces at the liquid-solid interface. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **44** (14), 1663-1670.

Full Text: [1960-80\Can J Che-Rev Can Chi44, 1663.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi44,%201663.pdf)

Abstract: The dissociation of surface hydroxyl groups of crystalline SiO2, ZrO2, and ThO2, in aqueous suspensions, has been studied as a function of pHs at different ionic strengths of KNO3. The surface groups of quartz dissociate as weak acids, while those of ZrO2 and ThO2 dissociate amphoterically. A reversible double layer is formed at the oxide–solution interface, and H+ and OH− function as the potential-determining ions. Quantitative data have been obtained on (a) surface charge densities, (b) zero point of charge, (c) differential capacities of the double layer on quartz and ZrO2, and (d) the effect of surface charge density and ionic strength on the interfacial tension. The differential capacities indicate specific adsorption of NO3− on ZrO2 and ThO2 while NO3− has zero affinity for quartz surfaces. At low negative charge densities, solvated K+ are adsorbed on quartz and ZrO2 through coulombic interactions while at pHs > 10 specific adsorption of K+ predominates. ThO2 appears to exhibit a greater tendency for the specific adsorption of K+.

Ahmed, S.M. (1966), Erratum: Studies of the dissociation of oxide surfaces at the liquid-solid interface. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **44** (22), 2769.

Full Text: [1960-80\Can J Che-Rev Can Chi44, 2769.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi44,%202769.pdf)

Haque, R. and Reeves, L.W. (1966), Chemical shift changes in fluoroanions of some diamagnetic salts. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **44** (22), 2769-2772.

Full Text: [1960-80\Can J Che-Rev Can Chi44, 2769-1.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi44,%202769-1.pdf)

? Baret, J.F. and Bois, A.G. (1968), Kinetics of competitive adsorption. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **46** (20), 3211-3214.

Full Text: [1960-80\Can J Che-Rev Can Chi46, 3211.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi46,%203211.pdf)

Abstract: A partir du modèle de Langmuir nous avons déduit une expression de la cinétique de l’adsorption compétitive

dont la forme simple permet une confrontation avec les résultats expérimentaux. En effet, une détermination en deux temps des constantes N, p, N’ et p’ permet de montrer que cette relation décrit bien la cinétique d’adsorption de l’alcool laurique en compétition avec l’ergostérol à l’interface huile–eau.

Gamble, D.S., Schnitzer, M. and Hoffman, I. (1970), Cu2+-fulvic acid chelation equilibrium in 0.1 *m* KCl at 25.0°C. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **48** (20), 3197-3204.

Full Text: [1960-80\Can J Che-Rev Can Chi48, 3197.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi48,%203197.pdf)

Abstract: Cu2+ reacts with fulvic acid to form a site-bound chelate on the fulvic acid polymer molecules. It is deduced from literature evidence that this chelate is the same type that Cu2+ forms with salicylic acid. This is supported by a Job’s continuous variations plot. The mass action quotient for the chelate formation in 0.1 m KCl at 25.0°C has been measured as a function of the degree of ionization of the chelating carboxyl groups. The strength of the Cu2+ – fulvic acid chelate is comparable to that of other bidentate Cu2+ chelates.

Tewari, P.H., Campbell, A.B. and Lee, W. (1972), Adsorption of Co2+ by oxides from aqueous solution. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **50** (11), 1642-1648.

Full Text: [1960-80\Can J Che-Rev Can Chi50, 1642.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi50,%201642.pdf)

Abstract: The adsorption of Co(II) by Fe3O4, Al2O3, and MnO2 has been studied as a function of Co(II) concentration, solution-pH, and temperature. It is observed that the adsorption of cobalt increases markedly with the solution pH between pH 5 and 7.5. Above pH 8 adsorption becomes increasingly masked by precipitation of Co(OH)2 and no resolution of these two contributions to the loss of Co(II) from solution is possible. A log θ/(1–θ) vs. pH plot is found to be linear between pH 5 and 7.5, where θ is the fraction of occupied adsorption sites. The presence of 0.1 m Ba2+ and Mg2+ in the solution does not seem to affect the hydrogen ion dependence of the adsorption of Co(II) on alumina.

The adsorption results have been analyzed by the Langmuir adsorption isotherm over a wide range of Co(II) concentration (10−6–10−3 m). The adsorption of Co(II) is found to be an endothermic process and increases markedly with temperature between 30 and 100°C. The heat of adsorption decreases with increasing surface coverage of the oxides. At saturation coverage, the heats of adsorption for Co(II) on Al2O3, MnO2, and Fe3O4 are −14.9, −14.3, and −6.3 kcal/mol, respectively. Hydrolysis of Co(II) is suggested as a possible mechanism for the marked dependence of adsorption on pH and temperature.

? Jolicoeu, C. and Philip, P.R. (1974), Enthalpy-entropy compensation for micellization and other hydrophobic interactions in aqueous solutions. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **52** (10), 1834-1839.

Full Text: [1960-80\Can J Che-Rev Can Chi52, 1834.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi52,%201834.pdf)

Abstract: The temperature dependence of the critical micelle concentration for 26 ionic and 48 non-ionic surfactants in aqueous solutions has been reexamined and used to calculate ΔHm0 and ΔSm0, the heats and entropies of micellization, at 25 and 50°C. ΔHm0 and ΔSm0 values exhibit a significant correlation with compensation temperatures (Tc) of 319 and 222 °K at 25°C for the groups of ionic and non-ionic surfactants respectively. These results are compared with Tc values which are expected to be characteristic of pairwise interactions between hydrophobic solutes.

Guy, R.D., Chakrabarti, C.L. and Schramm, L.L. (1975), The application of a simple chemical model of natural waters to metal fixation in particulate matter. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **53** (5), 661-669.

Full Text: [1960-80\Can J Che-Rev Can Chi53, 661.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi53,%20661.pdf)

Abstract: A simple chemical model was used to investigate the mechanisms controlling the distribution of metals between soluble and particulate fractions in natural waters. The model particulates used were potassium bentonite, hydrous MnO2, and solid humic acid. The soluble species in natural waters were modelled by soluble humic acid, tannic acid, and bicarbonate. The sorption curves for Cu(II), Cd(II), and Zn(II) onto humic acid and MnO2 obeyed Langmuir adsorption isotherms whereas the sorption of the above ions onto bentonite followed a Freundlich isotherm. Chemical analysis of the total model using atomic absorption spectroscopy and differential pulse anodic stripping voltammetry indicated that copper distribution depends on the pH of the suspension: above pH 6.0, 50 % of the copper is sorbed onto the particulates whereas the copper in solution is in a complexed form; between pH 6 and 3.8 the soluble copper is distributed between organic complexes and “free” copper ion; between pH 4.2 to 2.5 copper is being desorbed from the particulates; and below pH 2.5 all the copper is present in solution as “free” copper ion.

Gamble, D.S., Langford, C.H. and Tong, J.P.K. (1976), The structure and equilibrium of a manganese(II) complexes of fulvic acid sturied by ion exchange and nuclear magnetic resonance. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **54** (8), 1239-1245.

Full Text: [1960-80\Can J Che-Rev Can Chi54, 1239.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi54,%201239.pdf)

Abstract: The binding of Mn2+ to a well characterized fulvic acid sample is reported based on the competition with K+ in an ion exchange equilibration. The free energy of binding of to fulvic acid is only 1–2 kJ/equivalent more favourable than that for K+. This suggests an outer sphere electrostatic structure for the complex. The suggestion is confirmed by observation of minimal change in the presence of fulvic acid of the effect of paramagnetic Mn2+ on the nmr spectra of water. The interpretation of nmr spectra is supported by comparison with nmr measurements of Mn2+ complexes with simple ligands and contrast with nmr measurements on Fe3+ – fulvic acid complexing. The latter is confirmed as inner sphere.

Deczky, K. and Langford, C.H. (1978), Application of water nuclear magnetic resonance relaxation times to study of metal complexes of the soluble soil organic fractions fulvic acid. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **56** (14), 1947-1951.

Full Text: [1960-80\Can J Che-Rev Can Chi56, 1947.pdf](1960-80/Can%20J%20Che-Rev%20Can%20Chi56,%201947.pdf)

Abstract: The binding of the paramagnetic metal ions Mn2+, Cu2+, and Fe3+ to the acid soluble organic fraction of soils, fulvic acid, has been examined. The measurements use effects on paramagnetic ion induced longitudinal (T1) and transverse (T2) relaxation in the proton magnetic resonance signal of solvent water. The effects of the fulvic acid sample are compared to model ligand effects. Evidence is developed to suggest that Mn2+ forms outer sphere complexes with fulvic acid. On the contrary, Cu2+ and Fe3+ appear to form inner sphere complexes.

Jones, J.B. and Schwartz, H.M. (1982), Enzymes in organic synthesis. 23. Effects of organic solvents on horse liver alcohol dehydrogenase-catalyzed oxidation. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **60**, 1030-1033.

Full Text: [1982\Can J Che-Rev Can Chi60, 1030.pdf](1982/Can%20J%20Che-Rev%20Can%20Chi60,%201030.pdf)

Abstract: The effects have been evaluated of up to 50% (v/v) of methanol, tert-butyl alcohol, dimethylsulfoxide, sulfolane, acetonitrile, dimethylformamide, N-methyl-2-pyrrolidone, hexamethylphosphoramide, acetone, 2-butanone, tetrahydrofuran, dimethoxyethane, diglyme, and dioxane on horse liver alcohol dehydrogenase (HLADH)-catalyzed oxidation of the representative alcohol substrate cyclohexanol. With the exception of dimethylsulfoxide and dimethylformamide, all solvents tested are suitable for use as cosolvents with HLADH in the oxidative and reductive directions.

? Jachula, J., Kolodynska, D. and Hubicki, Z. (2010), Removal of Cd(II) and Pb(II) complexes with glycolic acid from aqueous solutions on different ion exchangers. *Canadian Journal of Chemistry-Revue Canadienne de Chimie*, **88** (6), 540-547.

Full Text: Can J Che-Rev Can Chi88, 540.pdf

Abstract: Utilisant l’acide glycolique (AG) comme agent complexant, on a etudie la sorption des ions Cd(II) et Pb(II) presents dans diverses solutions aqueuses sur differents echangeurs d’ions. L’acide glycolique est aussi utile en synthese organique pour les reactions d’oxydation et de reduction, d’esterification et de polymerisation de longues chaines. Dans le cadre de notre travail, les experiences ont ete effectuees a l’aide des echangeurs d’ions chelatants Purolite S-930, Purolite S-940, Purolite S-950, Diaion CR-20, Wofatit MC-50 ainsi que des echangeurs cationiques Purolite C-104, Lewatit CNP-80 et Lewatit SP-112. Par le biais d’experiences par lots, on a determine l’influence de la concentration initiale des ions Cd(II) et Pb(II) et de l’acide glycolique ainsi que du temps de contact sur le pourcentage de sorption. On a utilise des modeles cinetiques du pseudo-premier ordre et du pseudo-deuxieme ordre pour decrire les donnees cinetiques ainsi que les constantes de vitesse. Les donnees experimentales ajustees en faisant appel aux modeles d’adsorption de Langmuir et de Freundlich ont ete appliquees pour decrire les isothermes d’equilibre et pour determiner les constantes isothermes. Les concentrations de cadmium(II) et de plomb(II) dans les raffinats ont ete determinees par une methode de spectroscopie d’absorption atomique (SAA).

Keywords: Adsorption, Copper, Equilibrium, Glycolic Acid, Heavy-Metal Ions, Ion Exchangers, Isotherm, Kinetics, Langmuir, Metal-Ions, Pb(II), Peat, Removal, Reverse-Osmosis, Sorption, Sorption, Water

# Title: Canadian Journal of Civil Engineering

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Cameron, R.C. (1978), Treatment of complex landfill leachate with peat. *Canadian Journal of Civil Engineering*, **5** (1), 83-97.

Full Text: Can J Civ Eng5, 83.pdf

Abstract: The use of cheap, locally available peat as a treatment method for landfill leachate was investigated by passing leachate through plexiglass columns filled with an amorphous-granular peat. Preliminary adjustment of pH showed that reducing pH to 4.8 dramatically reduced adsorption. Increasing the pH to 8.4, metal removal was increased owing to filtration of precipitated metals. The best adsorption of metals occurred at the ‘natural’ pH of 7.1. Manganese was found to be the limiting pollutant. At the 0.05 mg/l maximum acceptable manganese concentration 94% of the total metals were removed, requiring 159 kg of peat per 1000 l of leachate.

Resting the peat for 1 month did significantly increase removal capacity.

Desorption of some contaminants occurred when water was percolated through the peat. The desorption test effluent was not toxic to fish although iron, lead and COD (chemical oxygen demand) exceeded acceptable values.

Chemical pretreatment using lime and ferric chloride achieved significant iron, manganese and calcium removals. Chemical pretreatment followed by peat adsorption offered no advantage other than reducing toxicity to fish.

Peat treatment alone was effective in reducing concentrations to a level that was non-toxic to fish.

Viraraghavan, T. and Ayyaswami, A. (1987), Use of peat in water pollution control: A review. *Canadian Journal of Civil Engineering*, **14** (2), 230-233.

Full Text: Can J Civ Eng14, 230.pdf

Abstract: Peat, besides being plentiful and inexpensive, possesses several other qualities that make it an effective medium for the removal of pollutants. This paper presents a review of its use in water pollution control — in the treatment of sanitary and industrial wastewaters.

Keywords: Peat, Water Pollution Control, Wastewater Treatment, Onsite Wastewater Systems, Industrial Wastes

Viraraghavan, T. and Ayyaswami, A. (1989), Batch studies on septic tank effluent treatment using peat. *Canadian Journal of Civil Engineering*, **16** (2), 157-161.

Full Text: Can J Civ Eng16, 157.pdf

Abstract: Batch studies were conducted to determine the efficiency of Saskatchewan horticultural peat to remove biochemical oxygen demand (BOD), chemical oxygen demand (COD), phosphorus, nitrogen, and indicator microorganisms from septic tank effluent. Results of the studies showed that peat was effective in adsorbing 35–50% of dissolved BOD, COD, and organic carbon from the septic tank effluent and in removing indicator microorganisms to the extent of 45–70%. The studies showed that peat has the potential to be used as a medium for septic tank effluent treatment in areas with high water table and with bedrock at shallow depths. Because of leaching of pollutants from peat in the 2-h batch studies, it is necessary to conduct long-term column studies to observe the length of time up to which leaching continues and to evaluate the performance of a peat filtration system under dynamic conditions.

Keywords: Batch Studies, Septic Tank Effluent, Treatment, Peat, Adsorption Isotherms, Indicator Microorganisms

Zytner, R., Biswas, N. and Bewtra, J.K. (1989), Adsorption and desorption of perchloroethylene in soils, peat moss and granular activated carbon. *Canadian Journal of Civil Engineering*, **16** (6), 798-806.

Full Text: Can J Civ Eng5, 83.pdf

Abstract: Studies were conducted to evaluate the adsorption–desorption isotherms of a common dry cleaning solvent, perchloroethylene (PCE), in soils, peat moss, and granular activated carbon. The results obtained followed the Freundlich Isotherm, and the organic carbon content of the media was the most significant controlling factor in the adsorption–desorption process. The peat moss exhibited the highest residual saturation concentration for pure PCE amongst all the media tested. The desorption studies indicated that PCE had medium mobility in soil and was not significantly affected by moderate changes in pH.

Keywords: Adsorption, Desorption, Freundlich Isotherm, Granular Activated Carbon, Peat Moss, Perchloroethylene, Soils

Bruneau, M. (1995), Performance of masonry structures during the 1994 Northridge (Los Angeles) earthquake. *Canadian Journal of Civil Engineering*, **22** (2), 378-402.

Full Text: [1995\Can J Civ Eng5, 83.pdf](1995/Can%20J%20Civ%20Eng5,%2083.pdf)

Abstract: The surface magnitude 6.8 Northridge earthquake which struck the Los Angeles area on January 17, 1994, damaged a large number of engineered buildings, of nearly ah construction types. As earthquakes of at least similar strength are expected to occur in most of eastern and western Canada, the study of the effects of this earthquake is of particular significance to Canada. This paper, as part of a concerted multi-paper reporting effort, concentrates on the damage suffered by masonry buildings during this earthquake, and explains why the various types of observed failures occurred. The seismic performance of all masonry construction similar to that commonly found in Canada is reviewed, but a particular emphasis is placed on providing an overview of damage to unreinforced masonry structures which had been rehabilitated before this earthquake. To provide a better appreciation of the impact of this earthquake on masonry buildings, and a better assessment of the engineering significance of their damage in a Canadian perspective, this paper first reviews the evolution of building code requirements for unreinforced masonry buildings up to the seismic retrofit ordinances enacted prior to this earthquake. Examples of various damage types, as observed by the author during his reconnaissance visit to the stricken area, are then presented, along with technically substantiated descriptions of the causes for this damage, and cross-references to relevant clauses from Canadian standards and codes, as well as the recently published Canadian Guidelines for the Seismic Evaluation of Existing Buildings, whenever appropriate.

Viraraghavan, T. and Cleven, L.O. (1997), Phosphorus removal at the Regina Wastewater Treatment Plant. *Canadian Journal of Civil Engineering*, **24** (3), 506-513.

Full Text: [C\Can J Civ Eng24, 506.pdf](C/Can%20J%20Civ%20Eng24,%20506.pdf)

Abstract: The City of Regina Wastewater Treatment Plant includes primacy treatment followed by aerated lagoons and final clarifiers; alum is added ahead of final clarifiers for phosphorus removal. Because of a concern for eutrophication of the Qu’Appelle River system, effluent phosphorus limit has been set at 1 mg/L; however, the plant has not been able to meet this limit consistently. An analysis of the plant operating data showed that effluent phosphorus levels were closely related to effluent suspended solids and that erratic chemical dispersal and flocculation may be the problem. A jar testing program was undertaken to determine the effects of different mixing regimes on phosphorus removal efficiencies. It was found that effluent phosphorus levels less than 1 mg/L could be achieved using a 2-5 min rapid mix followed by a 15 min flocculation period at alum and polymer dosages of approximately 125 and 1 mg/L respectively. The addition of a rapid mix basin ahead of the final clarifier far the proper mixing of alum and polymer was suggested as a solution to maintain effluent levels below 1 mg/L consistently.

Keywords: Wastewater Treatment, Phosphorus Removal, Jar Test, Chemical Treatment, Alum and Polymer Addition

Wasay, S.A., Parker, W.J. and Van Geel, P.J. (2001), Contamination of a calcareous soil by battery industry wastes. I. Characterization. *Canadian Journal of Civil Engineering*, **28** (3), 341-348.

Full Text: [C\Can J Civ Eng28, 341.pdf](C/Can%20J%20Civ%20Eng28,%20341.pdf)

Abstract: A study of soil contamination due to the disposal of waste from a battery industry was conducted. The soil particle size, organic matter content, and buffering capacity were characterized. The heavy metal content of the soil was characterized with soil depth, soil particle size, and with respect to the fraction of the soil by which it was retained. Lead was found to be the dominant contaminant with all other metals present at considerably lower concentrations. Most of the lead was retained in the fraction of the soil that had a particle size less than 2 mm. This fraction represented 40.8% of the soil and contained 24 600 mg Pb/kg of soil. A particle size analysis indicated that 45.3% of soil particles were found to be greater than 4.75 mm. The pH of the contaminated soil in water was found to be 7.6 and was similar to the background soil. The similarity in pH was attributed to the high calcium content of the native soil. The lead content in the native soil that was collected 100 m away from the contaminated site was found to be 1967 mg/kg in the soil with particle sizes less than 2 mm (contaminated soil). The difference in pH between KCl solution (pH 7.0) and in water was found to be -0.6 indicating that the pH value was above the point of zero salt effect. An evaluation of the buffering capacity revealed that 297 mL of 0.5 M HNO3 per kg of soil was required to substantially modify the soil pH. The heavy metals in the soil were sequentially extracted to quantify the water soluble, exchangeable, carbonate, oxides, organic matter, and residual fractions. The Pb concentrations were mainly found in the carbonate and oxide fractions of the soil.

Keywords: Heavy Metals, Soil Pollution, Characterization, Retention Form, Heavy-Metals, Retention, Adsorption, Matter, Oxide

Wasay, S.A., Parker, W.J. and Van Geel, P.J. (2001), Contamination of a calcareous soil by battery industry wastes. II. Treatment. *Canadian Journal of Civil Engineering*, **28** (3), 349-354.

Full Text: [C\Can J Civ Eng28, 349.pdf](C/Can%20J%20Civ%20Eng28,%20349.pdf)

Abstract: This study evaluated treatment of a soil that was heavily contaminated by the disposal of waste from a Pb battery industry. The site was of interest from a remediation point of view, since the soil contained substantial quantities of calcareous material. Treatment involved extraction of the metals from the soil using aqueous solutions of EDTA (ethylenediaminetetraacetic acid). The impact of pH, EDTA concentration, and reaction time on the extent of leaching of Pb was evaluated. The leaching efficiency was found to be independent of pH over a range of values from 4 to 8.2. The leaching of Pb and Ca increased with EDTA concentration with 99% of the Pb removed at an EDTA dosage of 3.2 M/kg soil. The removal efficiencies of Cu, Cr, Cd, Ni, and Zn were consistently less than that of Pb; however, with their lower initial concentrations, acceptable levels were achieved for all metals except Cd. A two-reaction model was successfully used to describe the results of a batch extraction test. The results indicated relatively rapid extraction kinetics for a substantial fraction of the Pb contamination. Treatment of the liquid effluent from the soil treatment process with nano-level filtration indicated that both the EDTA and Pb were consistently removed at efficiencies greater than 98%. The nano-filtration process was not affected by pH over a range of values from 4.8 to 7.6.

Keywords: Soil Washing, Pb, EDTA, pH Effect, Kinetic, Leachate Treatment, Heavy-Metals, Organic-Acids, Clay Soils, Remediation, Extraction, Column

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? Law, E.H. and Simpson, S.H. (2010), Aspirin use rates in diabetes: A systematic review and cross-sectional study. *Canadian Journal of Diabetes*, **34** (3), 211-217.

Abstract: OBJECTIVE: Recent studies have shown that low-dose aspirin is not effective for the primary prevention of cardiovascular (CV) events in diabetes. Pharmacologic evidence suggests, however, that an adequate antiplatelet effect in diabetes requires a dose of >100 mg daily. This study was designed to identify the dose of aspirin most commonly used in diabetes. METHODS: This study included a systematic review of the literature and a cross-sectional study in community pharmacies across Alberta, Canada. MEDLINE and Web of Science were used to identify studies reporting aspirin use rates in diabetes. The average rate across studies was calculated by weighting study-specific rates by number of participants in each study. Additional information was gathered from a survey completed by senior-year pharmacy students using information on cardiovascular disease (CVD) and aspirin use collected from people with diabetes. RESULTS: The systematic review identified 33 studies reporting a weighted average aspirin use rate of 41%. Among those with an indication for primary or secondary prevention, aspirin was used by 27 and 73%, respectively. The mean age of the 182 survey participants was 61 +/- 14 years; 50% were women, 81% had type 2 diabetes and 19% had had a previous CV event. of the 176 participants with >= 1 indication for aspirin use, 118 (67%) were using aspirin regularly. The most common dose, taken by 106 of the 118 regular aspirin users (90%), was 81 mg daily. CONCLUSIONS: Aspirin use is more common in people with an indication for secondary prevention. However, the most common dose used is <100 mg daily, which may not provide adequate CV protection.

Keywords: Adults, Antiplatelet Therapy, Aspirin, Canada, Cardiovascular, Cardiovascular Disease, Cardiovascular Risk, Cardiovascular Risk-Factors, Controlled-Trial, Diabetes, Disease, Heart-Disease, Information, Intervention, Literature, Low-Dose Aspirin, Mellitus, Pharmacies, Pharmacy, Prevention, Primary, Primary Prevention, Primary-Care, Review, Science, Secondary Prevention, Students, Survey, Systematic, Systematic Review, Type 2, Type 2 Diabetes, Web of Science, Women

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? Hess, E.P., Thiruganasambandamoorthy, V., Wells, G.A., Erwin, P., Jaffe, A.S., Hollander, J.E., Montori, V.M. and Stiell, I.G. (2008), Diagnostic accuracy of clinical prediction rules to exclude acute coronary syndrome in the emergency department setting: A systematic review. *Canadian Journal of Emergency Medicine*, **10** (4), 373-382.

Abstract: Objective: We sought to determine the diagnostic accuracy of clinical prediction rules to exclude acute coronary syndrome (ACS) in the emergency department (ED) setting. Methods: We searched MEDLINE, EMBASE, Web of Science and the Cochrane Database of Systematic Reviews. We contacted content experts to identify additional articles for review. Reference lists of included studies were hand searched. We selected articles for review based on the following criteria: 1) enrolled consecutive ED patients; 2) incorporated variables from the history or physical examination, electrocardiogram and cardiac biomarkers; 3) did not incorporate cardiac stress testing or coronary angiography into prediction rule; 4) based on original research; 5) prospectively derived or validated; 6) did not require use of a computer; and 7) reported sufficient data to construct a 2 8 2 contingency table. We assessed study quality and extracted data independently and in duplicate using a standardized data extraction form. Results: Eight studies met inclusion criteria, encompassing 7937 patients. None of the studies verified the prediction rule with a reference standard on all or a random sample of patients. Six studies did not report blinding prediction rule assessors to reference standard results, and vice versa. Three prediction rules were prospectively validated. Sensitivities and specificities ranged from 94% to 100% and 13% to 57%, and positive and negative likelihood ratios from 1.1 to 2.2 and 0.01 to 0.17, respectively. Conclusion: Current prediction rules for ACS have substantial methodological limitations and have not been successfully implemented in the clinical setting. Future methodologically sound studies are needed to guide clinical practice.

Keywords: Accuracy, Acute Coronary Syndrome, Acute Myocardial-Infarction, Artificial Neural-Network, Biomarkers, Cardiac Ischemia, Chest-Pain, Cochrane, Computer-Derived Protocol, Decision Rules, Diagnosis, EMBASE, Emergency Department, Emergency Medical Services, European-Society, History, MEDLINE, Methods, Myocardial Infarction, Practice, Prospective Validation, Research, Review, Risk Stratification, Science, St-Segment Elevation, Stress, Systematic, Systematic Review, Unstable Angina, Web of Science

? Jensen, J.L., Cheung, K.W., Tallon, J.M. and Travers, A.H. (2010), Comparison of tracheal intubation and alternative airway techniques performed in the prehospital setting by paramedics: A systematic review. *Canadian Journal of Emergency Medicine*, **12** (2), 135-140.

Abstract: This systematic review included controlled clinical trials comparing tracheal intubation (TI) with alternative airway techniques (AAT) (bag-mask ventilation and use of extraglottic devices) performed by paramedics in the prehospital setting. A priori outcomes to be assessed were survival, neurologic outcome, airway management success rates and complications. We identified trials using EMBASE, MEDLINE, CINAHL, The Cochrane Library, Web of Science, author contacts and, hand searching. We included 5 trials enrolling a total of 1559 patients. No individual study showed any statistical difference in outcomes between the TI and AAT groups. Because of study heterogeneity, we did not pool the data. This is the most comprehensive review to date on paramedic trials. Owing to the heterogeneity of prehospital systems, administrators of each system must individually consider their airway management protocols.

Keywords: Airway, Author, Bag-Mask Ventilation, Cardiopulmonary Arrest, Clinical Trials, Cochrane, Controlled Clinical Trials, EMBASE, Endotracheal Intubation, Extraglottic, Field, Life-Support, Management, MEDLINE, Morbidity, Outcome, Outcomes, Paramedic, Prehospital, Review, Science, Severe Head-Injury, Statistical, Success, Supraglottic, Survival, Systematic, Systematic Review, Tracheal Intubation, Traumatic Brain-Injury, Tube, Web of Science

? Fox, J.L., Vu, E.N., Doyle-Waters, M., Brubacher, J.R., Abu-Laban, R. and Hu, Z.X. (2010), Prophylactic hypothermia for traumatic brain injury: A quantitative systematic review. *Canadian Journal of Emergency Medicine*, **12** (4), 355-364.

Abstract: Introduction: During the past 7 years, considerable new evidence has accumulated supporting the use of prophylactic hypothermia for traumatic brain injury (TBI). Studies can be divided into 2 broad categories: studies with protocols for cooling for a short, predetermined period (e.g., 24-48 h), and those that cool for longer periods and/or terminate based on the normalization of intracranial pressure (ICP). There have been no systematic reviews of hypothermia for TBI that include this recent new evidence. Methods: This analysis followed the recommendations of the Cochrane Handbook for Systematic Reviews of Interventions and the QUOROM (quality of reporting of meta-analyses) statement. We developed a comprehensive search strategy to identify all randomized controlled trials (RCTs) comparing therapeutic hypothermia with standard management in TBI patients. We searched EMBASE, MEDLINE, Web of Science, the Cochrane Central Register of Controlled Trials, the Cochrane Database of Systematic Reviews, Proceedings First and Papers First. Additional relevant articles were identified by hand-searching conference proceedings and bibliographies. All stages of study identification and selection, quality assessment and analysis were conducted according to prospectively defined criteria. Study quality was determined by assessment of each study for the use of allocation concealment and outcome assessment blinding. Studies were divided into 2 a priori defined subgroups for analysis based on cooling strategy: short term 48 h), and long term or goal-directed (> 48 h and/or continued until normalization of ICP). Outcomes included mortality and good neurologic outcome (defined as Glasgow Outcome Scale score of 4 or 5). Pooling of primary outcomes was completed using relative risk (RR) and reported with 95% confidence intervals (CIs). Results: of 1709 articles, 12 studies with 1327 participants were selected for quantitative analysis. Eight of these studies cooled according to a long-term or goal-directed strategy, and 4 used a short-term strategy. Summary results demonstrated lower mortality (RR 0.73, 95% Cl 0.62-0.85) and more common good neurologic outcome (RR 1.52, 95% Cl 1.28 1.80). When only short-term cooling studies were analyzed, neither mortality (RR 0.98, 95% Cl 0.75-1.30) nor neurologic outcome (RR 1.31, 95% Cl 0.94-1.83) were improved. In 8 studies of long-term or goal-directed cooling, mortality was reduced (RR 0.62, 95% Cl 0.51-0.76) and good neurologic outcome was more common (RR 1.68, 95% Cl 1.44-1.96). Conclusion: The best available evidence to date supports the use of early prophylactic mild-to-moderate hypothermia in patients with severe TBI (Glasgow Coma Scale score 8) to decrease mortality and improve rates of good neurologic recovery. This treatment should be commenced as soon as possible after injury (e.g., in the emergency department after computed tomography) regardless of initial ICP, or before ICP is measured. Most studies report using a temperature of 32 34 C. The maximal benefit occurred with a long-term or goal-directed cooling protocol, in which cooling was continued for at least 72 hours and/or until stable normalization of intracranial pressure for at least 24 hours was achieved. There is large potential for further research on this therapy in prehospital and emergency department settings.

Keywords: Analysis, Assessment, Brain, Brain Injuries, Cardiac-Arrest, Children, Cochrane, Confidence Intervals, Cooling, Emergency Department, Hypothermia, Induced, Injury, Intracranial-Pressure, Management, MEDLINE, Methods, Moderate Hypothermia, Mortality, Outcome, Outcomes, Phase-Ii, Prehospital, Pressure, Primary, Prophylactic Hypothermia, Protocol, Quantitative, Randomized Controlled Trials, Relative Risk, Research, Review, Risk, Scale, Science, Severe Head-Injury, Strategy, Systematic, Systematic Review, Systematic Reviews, TBI, Temperature, Term Mild Hypothermia, Therapeutic Hypothermia, Therapy, Traumatic Brain Injury, Treatment, Web of Science

# Title: Canadian Journal of Fisheries and Aquatic Sciences

Full Journal Title: [Canadian Journal of Fisheries and Aquatic Sciences](http://pubs.nrc-cnrc.gc.ca/rp-ps/volumes.jsp?jcode=cjfas&lang=eng&exp=66)

ISO Abbreviated Title:

JCR Abbreviated Title: Can J Fish Aquat Sci

ISSN: 0706-652X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bentzen, E. and Taylor, W.D. (1991), Estimating Michaelis-Menten parameters and lake water phosphate by the rigler bioassay - importance of fitting technique, plankton size, and substrate range. *Canadian Journal of Fisheries and Aquatic Sciences*, **48** (1), 73-83.

Full Text: Can J Fis Aqu Sci48, 73.pdf

Abstract: Evaluation of the Michaelis-Menten parameters V(m) and K(t) for phosphate (PO43-) uptake by plankton is diffucult because of differences in nutrient uptake by the various species. Studies using simulated data have shown that fitting the equation by nonlinear regression is preferable to linearized transformations for estimating V(m) and K(t); however, the actual velocity of PO43- uptake by lake plankton, a cannot be measured because the ambient concentration of PO43- (P(n)) is unknown. For natural plankton, a better fit is demonstrated using another nonlinear model which fits the uptake rate constant for (PO4)-P-32(3-) directly to the PO43- added in the kinetic experiment, and the mixed community effect is minimized by isolating different plankton size fractions. Another consequence of not knowing P(n) is that the estimate of K(t) cannot be distinguished from P(n), and the sum of the two is always obtained. The low substrate region of the Michaels -- Menten curve is used in the Rigler bioassay as a means of estimating the upper bound to P(n). Error in the uptake rate constants influences the estimate of the Rigler P(n), and the Rigler maximum P(n) is equal to the estimated (K(t) + P(n)) of the 0.2-1 μm size fraction.

Keywords: Ambient, Ambient Concentration, Bacterial, Bioassay, Community, Competition, Concentration, Constants, Deviations, Equation, Experiment, Fitting, Fraction, Fractions, Fresh-Water, Kinetic, Kinetics, Lake, Low, Microorganisms, Model, Natural, Nonlinear, Nonlinear Regression, Nutrient, Nutrient Uptake, Parameters, Phosphate, Phosphorus Uptake, Phytoplankton, Plankton, Radiotracer, Rate, Rate Constant, Rate Constants, Regression, Size, Size Fractions, Species, Substrate, Upper, Uptake, Velocity

# Title: Canadian Journal of Forest Research-Revue Canadienne de Recherche Forestiere

Full Journal Title: Canadian Journal of Forest Research-Revue Canadienne de Recherche Forestiere

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

ISBN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Klenk, N.L., Dabros, A. and Hickey, G.M. (2010), Quantifying the research impact of the Sustainable Forest Management Network in the social sciences: A bibliometric study. *Canadian Journal of Forest Research-Revue Canadienne de Recherche Forestiere*, **40** (11), 2248-2255.

Full Text: [2010\Can J For Res40, 2248.pdf](2010/Can%20J%20For%20Res40,%202248.pdf)

Abstract: This research note presents the results of a bibliometric analysis that was conducted to better understand the impact that Sustainable Forest Management Network (SFMN) funded research had in the forest-related social and Aboriginal research communities. We applied two indicators of research impact: (i) research outputs and (II) citations. Our results suggest that the SFMN’s research outputs were highest in the fields of economics, sociology, and political science and law. The number of research articles that acknowledged the SFMN was 30% of the total research output of the SFMN-funded Principal Investigators. These articles represented 3% of the social science articles published in the Forestry Chronicle (the journal most frequently used by SFMN-funded Principal Investigators). Research output related to Aboriginal forestry indicated that the SFMN had a significant influence on the development of the field. Our citation analysis indicated that the average number of citations per SFMN-acknowledged publication in the social sciences was approximately the same as the international impact standard in the field. These results suggest that the SFMN-funded research in the social sciences compared very well with the international research standards in forest-related social sciences.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Study, Canada, Citation, Citation Analysis, Citations, Collaboration, Development, Field, Forest, Indicators, Journal, Management, Output, Press, Productivity, Publication, Research, Research Output, Research Outputs, Research Performance, Science, Sciences, Sociology

# Title: Canadian Journal of Gastroenterology

Full Journal Title: Canadian Journal of Gastroenterology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

ISBN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Vanner, S.S. (2011), A bibliometric analysis of digestive health research in Canada: “Fair is foul, and foul is fair”. *Canadian Journal of Gastroenterology*, **25** (11), 601-602.

Full Text: 2011\Can J Gas25, 601.pdf

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Canada, Research

? Tuitt, D., Knight, F. and Lipman, T. (2011), A bibliometric analysis of digestive health research in Canada. *Canadian Journal of Gastroenterology*, **25** (11), 609-614.

Full Text: [2011\Can J Gas25, 609.pdf](2011/Can%20J%20Gas25,%20609.pdf)

Abstract: Measurement: of the impact and influence of medical/scientific journals, and of individual researchers has become more widely practiced in recent decades. Tills is driven, in part, by the increased availability of data regarding citations of research articles, and by increased competition for research funding. Digestive disease research has been identified as a particularly strong discipline in Canada. The authors collected quantitative data on the impact and influence of Canadian digestive health research. The present study involved an analysis of the research impact (Hirsch factor) and research influence (Influence factor) of 106 digestive health researchers in Canada. Rankings of the top 25 researchers on the basis of the two metrics were dominated by the larger research groups at the University of Toronto (Toronto, Ontario), McMaster University (Hamilton, Ontario), and the Universities of Calgary (Calgary, Alberta) and Alberta (Edmonton, Alberta), but with representation by other research groups at the Universities of Manitoba (Winnipeg, Manitoba), Western Ontario (London, Ontario) and McGill University (Montreal, Quebec). Female and male researchers had similar scores for the two metrics, as did basic scientists versus clinical investigators. Strategic recruitment, particularly of established investigators, can have a major impact on the ranking of research groups. Comparing these metrics over different time frames can provide insights into the vulnerabilities and strengths of research groups.

Keywords: Analysis, Authors, Bibliometric, Bibliometric Analysis, Canada, Citations, Competition, Digestive Disease, Digestive Health, Disease, Female, Funding, Impact, Impact, Index, Indicators, Influence, Journals, Male, Measurement, Metrics, Quantitative, Quebec, Ranking, Rankings, Recruitment, Research, Research Impact, Researchers, Universities, University

# Title: Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie

Full Journal Title: Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie

ISO Abbreviated Title: Can. J. Inf. Libr. Sci.-Rev. Can. Sci. Inf. Bibl.

JCR Abbreviated Title: Can J Inform Lib Sci

ISSN: 1195-096X

Issues/Year: 4

Journal Country/Territory: Canada

Language: Multi-Language

Publisher: Canadian Assoc Information Science

Publisher Address: Po Box 6174, Station J, Ottawa, Ontario K2A 1T2, Canada

Subject Categories:

Information Science & Library Science: Impact Factor

? Stephenson, M.S. (1993), The Canadian-Library-Journal, 1981-91 - An Analysis. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **18** (2), 1-18.

Abstract: By means of a set of selected descriptive bibliometric techniques and variables, the Canadian Library Journal was analysed for the period 1981-91. During the period studied, the journal remained relatively stable on most of the variables examined. Small variations were discernible, both during the 10-year period 1981-90, and also in comparison to an earlier 1968-80 study by Steer. The major exception was the growth in the percentage of research-based articles during the last seven years analysed. Among specific findings were: over half (52.8%) of the items published in CLJ, excluding letters and reviews, were articles; of the total 644 authors, 284 (44.1%) were men and 360 (55.9%) were women; the majority (79%) of authors were from Ontario, British Columbia, Alberta, and Quebec, with over half (57.5%) of authors of all types of items living in Ontario. When the data analysis was limited to articles, the same percentage of authors was from Ontario; when the data analysis was limited to articles, 49.3% were written by librarians and 24.7% by library school faculty or students. The five most popular subject areas over the decade were management, the profession, automation, collection management, and reference; 23.7% of all the articles analysed used a research-based approach; and there was virtually no collaborative authorship during the period studied, with 82.9% of the articles written by a single author

Keywords: ACRL Conference Papers, Authorship, Bibliometric, College, English, Information, Information-Science, Institutional Affiliations, Journal, Periodical Literature, Research Articles, SCI, Science

? Rousseau, R. and Rousseau, S. (1993), Informetric distributions: A tutorial review. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **18** (2), 51-63.

Abstract: The notions “informetric” or “bibliometric” distributions refer to a set of mathematical representations and formulations of regularities observed in bibliographies, lists of authors, citation lists, and similar data. In this article we review some of these functions (e.g., Lotka’s, Leimkuhler’s, and Bradford’s formulations), and we show that these regularities occur not only in library or information science settings, but almost everywhere in the sciences, social sciences, and humanities. As an example we analyse song texts of the singer/songwriter Thomas Dolby and conclude that word usage in Dolby’s Astronauts and Heretics perfectly fits a Leimkuhler function. Moreover, Lotka’s inverse square law yields an acceptable description of the corresponding frequency distribution.

Keywords: Bradford Law, Citation, Humanities, Information Science, Review, Science, Social Sciences, Zipf

? Rousseau, R. (1998), Convolutions and their applications in information science. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **23** (3), 29-47.

Full Text: 1998\Can Jou Inf Lib Sci23, 29.pdf

Abstract: Convolution is a mathematical operation between sequencer or between functions. Starting om an elementary approach. based on the multiplication of polynomials. we present exact definitions of this operation. Ir is shown that it can easily he interpreted from a system theoretic and from a stochastic point of view. Examples are given of its use and potential in the information sciences. In particular. convolutions can he used to explain observed phenomena such as the decline in the use of older literature (obsolescence) or the influence of publication delays on the aging of scientific literature. (C) Canadian Journal of Information and, Library Science.

Keywords: Counts, Lotka’s Law, Obsolescence

Egghe, L. and Rousseau, R. (2002), A general frame-work for relative impact indicators. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **27** (1), 29-48.

Full Text: [2002\Can Jou Inf Lib Sci27, 29.pdf](2002/Can%20Jou%20Inf%20Lib%20Sci27,%2029.pdf)

Abstract: This article brings the underlying structure of different relative indicators to the forefront. This leads to a powerful device for constructing new indicators. Special attention is given to the relative impact of a journal within a set of journals, a so-called meta-journal. Examples of relative impact factors are calculated for a group of information science, and for a group of management journals. Advantages of relative impact indicators are highlighted. These indicators are further studied in the context of regression analysis. Finally, it is shown that, compared to the Ramirez, Garcia, and Del Rio (2000) renormalized impact factor, the relative impact factor is more sensitive to changes of relative contributions of journals within a journal set.

Keywords: Elative Impact, Global Impact, Average Impact, Journal Impact Factor, Regression Lines, Pearson Correlation Coefficient, Information Science Journals, Management Journals, Activity Index, Attractivity Index, S&T Indicators, Research Performance

? Cordes, R. (2003), Is grey literature ever used? Using citation analysis to measure the impact of GESAMP, an international marine scientific advisory body. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **27** (3), 109-127.

Full Text: 2003\Can Jou Inf Lib Sci27, 109.pdf

Abstract: Citation analysis was used to measure the impact of GESAMP, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, which since 1969 has published reports for the United Nations and seven of its agencies. Web of Science was used to search for citations to 114 publications, of which 15 are journal articles or books. Citations to grey literature can be difficult to locate and interpret, but two-thirds of the 1436 citations, in 1178 citing papers, are to grey literature items. The distribution of citations and self-citation are examined. Journal versions were cited more than corresponding reports. Core journals for GESAMP citations include seven environmental science journals and a social science journal. This paper confirms that citation searching can successfully measure the impact of organizations producing grey literature. Such publications can be very influential, diffusing widely from their source.

Keywords: Analysis, Citation, Citation Analysis, Citations, Environmental-Protection, Journals, Publications, Science, Self-Citation, Web of Science

? Cordes, R. (2004), Is grey literature ever used? Using citation analysis to measure the impact of GESAMP, an international marine scientific advisory body. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **28** (1), 49-69.

Full Text: [2004\Can Jou Inf Lib Sci28, 49.pdf](2004/Can%20Jou%20Inf%20Lib%20Sci28,%2049.pdf)

Abstract: Citation analysis was used to measure the impact of GESAMP, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, which since 1969 has published reports for the United Nations and seven of its agencies. Web of Science was used to search for citations to 114 publications, of which 15 are Journal articles or books. Citations to grey literature can be difficult to locate and interpret, but two-thirds of the 1436 citations, in 1178 citing papers, are to grey literature items. The distribution of citations and self-citation are examined. Journal versions were cited more than corresponding reports. Core journals for GESAMP citations include seven environmental science journals and a social science journal. This paper confirms that citation searching can successfully measure the impact of organizations producing grey literature. Such publications can be very influential, diffusing widely from their source.

Keywords: Analysis, Citation, Citation Analysis, Citations, Environmental-Protection, Journals, Publications, Science, Self-Citation, Web of Science

? Glanzel, W. and Schuber, A. (2005), A concise review of the role of author self-citations in information science, bibliometrics, and science policy. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **29** (3), 357.

Full Text: [2005\Can Jou Inf Lib Sci29, 357.pdf](2005/Can%20Jou%20Inf%20Lib%20Sci29,%20357.pdf)

Keywords: Bibliometrics, Information Science, Science

? Ajiferuke, I. (2005), Inter-university collaboration in Canada. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **29** (4), 407-418.

Full Text: [2005\Can Jou Inf Lib Sci29, 407.pdf](2005/Can%20Jou%20Inf%20Lib%20Sci29,%20407.pdf)

Abstract: This study examines the extent of inter-institutional collaboration between scholars in the 48 major Canadian universities, and also determines the factors that influence such collaboration. Documents included in the Science Citation Index Expanded, Social Science Citation Index, and Arts & Humanities Citation Index of the online ISI’s Web of Science database for 1991-2004 were used as sources of data for the study. Making use of the author’s affiliation field, we were able to determine the number of publications co-authored by scholars ill each pair of universities. Multiple regression analysis was used to determine the influence of factors such as geographical distance, province, language, time zone, age, and peer group on collaboration. Only province and peer group were included in the final regression model.

Keywords: Affiliation, Age, Analysis, Canada, Citation, Collaboration, Data, Database, Field, Group, Influence, Language, Model, Peer, Peer Group, Publications, Regression, Regression Analysis, Regression Model, Science Citation Index, Social Science Citation Index, Sources, Universities, Web of Science

? Prime-Claverie, C., Pouchot, S., Lafouge, T. and Epron, B. (2006), Visibility of the scientific production: A scientometric study at the University of Lyon. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **30** (1-2), 104.

Full Text: [2006\Can Jou Inf Lib Sci30, 104.pdf](2006/Can%20Jou%20Inf%20Lib%20Sci30,%20104.pdf)

? Taataaeil, N. and Beheshti, J. (2007), Interdisciplinary outreach of library and information science research as reflected in “Essential Science Indicators”. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **31** (3-4), 278.

Full Text: [2007\Can Jou Inf Lib Sci31, 278.pdf](2007/Can%20Jou%20Inf%20Lib%20Sci31,%20278.pdf)

Keywords: Research

? Tsay, M.Y. (2008), Analysis and comparison of citation data between Journals of Education, Library & Information Science, and Management. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **32** (1-2), 55-73.

Full Text: [2008\Can Jou Inf Lib Sci32, 55.pdf](2008/Can%20Jou%20Inf%20Lib%20Sci32,%2055.pdf)

Abstract: This study analyzes and compares the journal citation data on education, library and information science, and management, based on information from SSCI Journal Citation Reports (2004), a subscription-based database. The correlation between each of the fifteen pairs of source items and five kinds of citation data-citation count, impact factor, immediacy index, citing half-fife, and cited half-fife-are examined based on the Pearson correlation tests. The Fisher’s z-transform is employed to test the significant difference between the Pearson correlation coefficient for each pair of citation data from the three subject areas. The significance of mean difference of each citation data was examined by t test. The similarities and differences in citation data among the three subjects are identified.

Keywords: Bibliometric Analysis, Citation, Impact, Impact Factor, Management, Obsolescence

? Jank, D.A. (2010), Toward a unifying ontology for human-information interaction. *Canadian Journal of Information and Library Science-Revue Canadienne des Sciences de l Information et de Bibliotheconomie*, **34** (4), 403-432.

Full Text: 2010\Can Jou Inf Lib Sci34, 403.pdf

Abstract: Research agendas in human-information interaction (HII) are often varied and thematically divergent. Through the interdisciplinary lens of information studies, a more convergent view of HII scholarship emerges. The purpose of this paper is twofold: to provide a summary of dissertation research that taxonomically documents the divergent scholarship in human-information interaction, and to construct a unifying ontology of HII discourse, using bibliometric techniques, that may serve as a map of the research front of human-information interaction for the information scientist.

Keywords: Attitudes, Behavior, Bibliometric, Bibliometric Techniques, Classification, Cocitation Analysis, Context, Discourse, Domain Analysis, Human-Information Interaction, Information, Information Seeking Behavior, Interaction, Interdisciplinary, Model, Online, Ontology, Purpose, Relationship Theory, Research, Research Front, Scholarship, Science, Seeking, Taxonomy, Techniques

# Title: Canadian Journal of Mathematics-Journal Canadien de Mathematiques

Full Journal Title: Canadian Journal of Mathematics-Journal Canadien de Mathematiques

ISO Abbreviated Title: Can. J. Phys.

JCR Abbreviated Title: Can J Phys

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Einstein, A. and Infeld, L. (1949), On the motion of particles in general relativity theory. *Canadian Journal of Mathematics-Journal Canadien de Mathematiques*, **1** (3), 209-241.

Full Text: [-1959\Can J Mat1, 209.pdf](-1959/Can%20J%20Mat1,%20209.pdf)

# Title: Canadian Journal of Microbiology

Full Journal Title: [Canadian Journal of Microbiology](http://pubs.nrc-cnrc.gc.ca/rp-ps/volumes.jsp?jcode=cjm&lang=eng&exp=55)

ISO Abbreviated Title: Can. J. Microbiol.

JCR Abbreviated Title: Can J Microbiol

ISSN: 0008-4166

Issues/Year: 12

Journal Country/Territory: Canada

Language: Multi-Language

Publisher: Natl Research Council Canada

Publisher Address: Research Journals, Montreal Rd, Ottawa, Ontario K1A 0R6, Canada

Subject Categories:

Biochemistry & Molecular Biology: Impact Factor 1.105, 217/310 (2000)

Biotechnology & Applied Microbiology

Immunology Microbiology: Impact Factor.(2000)

? Stemke, G.W., Knight, W.S., Butz, E. and Gates, D.J. (1974), Mechanism of bacteriophage-T4 neutralization: Effects of univalent antibody fragments on T4 adsorption-kinetics. *Canadian Journal of Microbiology*, **20** (4), 499-508.

Full Text: Can J Mic20, 499.pdf

Abstract: Bacteriophage T4 is neutralized by univalent antibody fragment Fab’ with apparent two-target neutralization kinetics. By the use of conditional lethal (amber) T4 mutants, it was shown that partially neutralized preparations of phages adsorb to bacteria with kinetics suggesting a mixture of fast and slow adsorbers; the ratio of fast to slow phages fits well that predicted by Poisson distribution of phages with, respectively, no (zero hit) and one (one hit) Fab’ complexed. A portion of the infectivity of one-hit phages seems due to phage-Fab’ dissociation, but the larger portion (80%) of the infectivity is due to weak adsorption of phages complexed still with one Fab’. It was shown that antibody to tail fiber is responsible for this effect. Phage adsorption heterogeneity was a possible explanation of kinetics obtained using phages which had not been treated with Fab’.

Williams, R.T. and Crawford, R.L. (1983), Effects of various physochemical factors on microbial activity in peatlands: Aerobic biodegradative processes. *Canadian Journal of Microbiology*, **29** (10), 1430-1437.

Full Text: Can J Mic29, 1430.pdf

Abstract: The quantitative relationships between the biodegradative activities of peatland microorganisms and several relevant physiochemical environmental parameters were examined. Temperature decrease from 30 to 4°C was found to slow, but not eliminate, microbial activity (mineralization of 14C compounds to 14CO2). Microbial activity generally was higher at ambient peatland pH’s (pH 3–4.5), rather than at more neutral pH’s, in the media used. Low oxygen tension significantly decreased the metabolic activities of peatland surface-inhabiting microbes. Individual pure cultures isolated from peatlands exhibited different responses to decreasing pH, oxygen tension, and temperature; demonstrating great physiological diversity among peatland microbes. Concentrations of nutrients such as nitrogen and phosphorus appear not to limit severely most microbial activities in peatland habitats.

Duquino, H.H. and Rosenberg, F.A. (1987), Antibiotic-resistant *Pseudomonas* in bottled drinking water. *Canadian Journal of Microbiology*, **33** (4), 286-289.

Full Text: Can J Mic33, 286.pdf

Abstract: Eight different bottled drinking waters were tested weekly over an 8-month period to determine the diversity of their Pseudomonas population and their sensitivity to eight antibiotics used in treating Pseudomonas infections. Nine species of Pseudomonas were recovered, with P. stutzeri (24%) and P. diminuta (18.8%) being the most common isolates. Sensitivity patterns of environmental and clinical isolates were shown to differ to some degree. Statistical analyses indicated a significant effect of specific antibiotic on the size of the inhibition zone, a significant difference between species and size of inhibition zone, and a strong species–antibiotic interaction. Distribution of species within the brands of water was also significantly different in 68% of the paired comparisons.

González, C., Gutiérrez, C. and Grande, T. (1987), Bacterial flora in bottled uncarbonated mineral drinking water. *Canadian Journal of Microbiology*, **33** (12), 1120-1125.

Full Text: Can J Mic33, 1120.pdf

Abstract: A quantitative study of bacterial populations in mineral water was carried out. Samples were stored at 6 and 20°C, and the colony counts were determined on tryptone agar plates incubated at 22 and 37°C. Samples were collected from the spring source in sterile glass flasks and from the bottling factory in conventional plastic and glass containers. In both cases, the initial population (101–102 cfu/mL water) increased to 105–106 cfu/mL after 3 days storage as determined from plate counts incubated at 22°C. The levels reached by this population were similar to those of samples of mineral water obtained at the market stage. Results from plate counts incubated at 37°C showed that populations in samples collected at the bottling factory reached 102–103 cfu/mL. No growth was observed in water collected from spring source. Bacterial multiplication was not stopped even when water was stored at 6°C. Caulobacter was the genus found most frequently in both types of samples, followed by Sphaerotilus-Leptothrix. Acinetobacter calcoaceticus and Pseudomonas fluorescens were frequently found in only two springs, and Pseudomonas putida, Arthrobacter, Aeromonas hydrophila, and Corynebacterium were isolated less frequently. Janthinobacterium was recovered only once from a single spring. A giant bacterium closely resembling Hyphomicrobium and a budding one similar to Pasteuria were recovered from all samples of a single spring and from some of the commercial samples.

Korhonen, L.K. and Martikainen, P.J. (1991), Comparison of the survival of *Campylobacter jejuni* and *Campylobacter coli* in culturable form in surface water. *Canadian Journal of Microbiology*, **37** (7), 530-533.

Full Text: Can J Mic37, 530.pdf

Abstract: Six *Campylobacter* jejuni and six *Campylobacter* coli strains were isolated from cows and pigs, and their survival in lake water was compared by viable counts. *Campylobacter* jejuni survived longer in culturable form than C. coli in untreated and membrane-filtered water both at 4 and 20°C. This difference in survival time may be a reason why C. jejuni is generally isolated from surface waters more frequently than C. coli. Both species survived better in filtered than in untreated water. This suggests that predation and competition for nutrients affect the survival of both *Campylobacter* species in the aquatic environment.

Warburton, D.W., Dodds, K.L., Burke, R., Johnston, M.A. and Laffey, P.J. (1992), A review of the microbiological quality of bottled water sold in Canada between 1981 and 1989. *Canadian Journal of Microbiology*, **38** (1), 12-19.

Full Text: Can J Mic38, 12.pdf

Keywords: Bottled Water, Quality, Pathogens, Regulations, Natural Mineral Water, Drinking-Water, Yersinia-Enterocolitica, Bacterial-Colonization, Aeromonas-Hydrophila, Indicator Bacteria, Municipal Raw, Well Water, Supplies, Transmission

Warburton, D.W., Bowen, B. and Konkle, A. (1994), The survival and recovery of *Pseudomonas aeruginosa* and its effect upon salmonellae in water: Methodology to test bottled water in Canada. *Canadian Journal of Microbiology*, **40** (12), 987-992.

Full Text: Can J Mic40, 987.pdf

Abstract: Methodology used to support changes to the Regulations for bottled water in the Food and Drugs Act of Canada, which include criteria for *Pseudomonas aeruginosa* (0 colony-forming units/100 mL of water), was used to assess the survival of P. aeruginosa in inoculated bottled water. The effects of P. aeruginosa on the survival of Salmonella spp. in bottled water were also investigated. The methodology used in the isolation included the use of hydrophobic grid membrane filters, a resuscitation step on tryptic soy agar, and selective plating on P. aeruginosa selective agar for P. aeruginosa and on xylose lysine desoxycholate agar for salmonellae. *Pseudomonas aeruginosa* and salmonellae proliferated and survived in inoculated water for up to 100 days or longer. *Pseudomonas aeruginosa* had a synergistic effect on the survival of salmonellae, enabling them to survive for more than 140 days in double distilled water.

Keywords: *Pseudomonas aeruginosa*, Salmonellae, Bottled Water, Methodology, Natural Mineral Waters, Microbiological Quality, Sold

Bashan, Y. and Holguin, G. (1997), *Azospirillum*-plant relationships: Environmental and physiological advances (1990-1996). *Canadian Journal of Microbiology*, **43** (2), 103-121.

Full Text: Can J Mic43, 103.pdf

Abstract: This review presents a critical and comprehensive analysis of the developments in environmental and physiological studies related to *Azospirillum* interactions with plants based on information published between 1990 and 1996. It was designed as an update of a previous review with a similar scope. Apart from an update, this review emphasizes the central issues of *Azospirillum* research today, such as coinoculation with other microorganisms and hormonal studies, shows the less researched areas, and proposes possible avenues for the exploitation of this bacterium in areas other than agriculture.

Keywords: *Azospirillum*, Bacterial Inoculation, Plant-Bacteria Interaction, Plant Growth Promoting Rhizobacteria, Rhizosphere Bacteria, Linked-Immunosorbent-Assay, Wheat Triticum-Aestivum, Maize Zea-Mays, Rhizosphere Bacterium Azospirillum, Phosphate-Solubilizing Bacteria, Biological Nitrogen-Fixation, Poly-Beta-Hydroxybutyrate, Medic Medicago-Polymorpha, Brasilense Strain Cd, 2,4-dichlorophenoxyacetic Acid

Dowd, S.E. and Pillai, S.D. (1997), A rapid viability assay for *Cryptosporidium* oocysts and *Giardia* cysts for use in conjunction with indirect fluorescent antibody detection. *Canadian Journal of Microbiology*, **43** (7), 658-662.

Full Text: Can J Mic43, 658.pdf

Abstract: There is an ur ent need to develop rapid methods to determine the viability of Cryptosporidium oocysts and Giardia cysts in environmental samples, especially water. The inclusion of the vital dye propidium iodide (PI) by oocysts and cysts has been previously shown to correlate well with nonviability. The ability of nonviable oocysts and cysts to include PI has been employed to develop a rapid viability determination method that could be used in conjunction with the current indirect fluorescent antibody (IFA) method for detecting oocysts and cysts, The efficacy of this PI-IFA method to detect and determine the viability status of oocysts/cysts has been tested using oocyst samples inactivated by three different approaches. The ability to incorporate PI staining with IFA detection provides the advantage of both detection and viability determination at the same time, using the same sample.

Keywords: Propidium Iodide, Viability, Oocysts, Cysts, Detection, Propidium Iodide, Invitro Excystation, Animal Infectivity, Water-Supplies, Parvum, Immunofluorescence, Identification, Diacetate, Ozone

Borrell, N., Figueras, M.J. and Guarro, J. (1998), Phenotypic identification of *Aeromonas genomospecies* from clinical and environmental sources. *Canadian Journal of Microbiology*, **44** (2), 103-108.

Full Text: Can J Mic44, 103.pdf

Abstract: A collection of 983 Aeromonas isolates from environmental and clinical sources have been identified to the genomospecies level. A phenotypic method identified 93% of the strains. The use of citrate and the production of acid from sorbitol enabled the members of the Aeromonas hydrophila complex to be separated. The most common genomospecies from intestinal sources were Aeromonas veronii biotype sobria and Aeromonas caviae. The former, together with A. hydrophila, was the most frequently isolated species of extraintestinal origin. Most pathogenic species were very prevalent in environmental samples, with A. veronii biotype sobria being the most common in lakes and reservoirs (41.5%) and in treated drinking water (25.0%), and A. caviae was the most common in sea water (26.0%) and milk products (35.5%). Aeromonas hydrophila (18.1%) was the second most prevalent species isolated in untreated drinking water. Since Aeromonas infections are generally regarded as a water-and food-borne diseases, the high environmental prevalence of these pathogenic genomospecies should be regarded as an important threat to public health.

Reynolds, K.A., Roll, K., Fujioka, R.S., Gerba, C.P. and Pepper, I.L. (1998), Incidence of enteroviruses in Mamala Bay, Hawaii using cell culture and direct polymerase chain reaction methodologies. *Canadian Journal of Microbiology*, **44** (6), 598-604.

Full Text: Can J Mic44, 598.pdf

Abstract: The consequence of point and nonpoint pollution sources, discharged into marine waters, on public recreational beaches in Mamala Bay, Hawaii was evaluated using virus cell culture and direct reverse transcriptase-polymerase chain reaction (RT-PCR). Twelve sites, nine marine, two freshwater (one stream and one canal), and one sewage, were assessed either quarterly or monthly for 1 year to detect the presence of human enteric viruses. Water samples were concentrated from initial volumes of 400 L to final volumes of 30 mL using Filterite electronegative cartridge filters and a modified beef extract elution procedure. Cell culture was applied using the Buffalo Green Monkey kidney cell line to analyze samples for enteroviruses. Positive samples were also evaluated by RT-PCR, using enterovirus-specific primers. Levels of RT-PCR inhibition varied with each concentrated sample. Resin column purification increased PCR detection sensitivity by at least one order of magnitude in a variety of sewage outfall and recreational marine water samples but not in the freshwater canal samples. Using cell culture, viable enteroviruses were found in 50 and 17% of all outfall and canal samples, respectively. Samples were positive at beaches 8% of the time. These data illustrate the potential public health hazard associated with recreational waters. Using direct PCR, viruses were detected at the outfall but were not found in any beach or canal samples, in part, owing to substances that inhibit PCR. Therefore, conventional cell culture is the most effective means of detecting low levels of infectious enteroviruses in environmental waters, whereas direct RT-PCR is rendered less effective by inhibitory compounds and low equivalent reaction volumes.

Payment, P. (1999), Poor efficacy of residual chlorine disinfectant in drinking water to inactivate waterborne pathogens in distribution systems. *Canadian Journal of Microbiology*, **45** (8), 709-715.

Full Text: Can J Mic45, 709.pdf

Abstract: To evaluate the inactivating power of residual chlorine in a distribution system, test microorganisms (*Escherichia coli*, Clostridium perfringens, bacteriophage phi-X 170, and poliovirus type 1) were added to drinking water samples obtained from two water treatment plants and their distribution system. Except for *Escherichia coli*, microorganisms remained relatively unaffected in water from the distribution systems tested. When sewage was added to the water samples, indigenous thermotolerant coliforms were inactivated only when water was obtained from sites very close to the treatment plant and containing a high residual chlorine concentration. Clostridium perfringens was barely inactivated, suggesting that the most resistant pathogens such as *Giardia lamblia*, *Cryptosporidium parvum*, and human enteric viruses would not be inactivated. Our results suggest that the maintenance of a free residual concentration in a distribution system does not provide a significant inactivation of pathogens, could even mask events of contamination of the distribution, and thus would provide only a false sense of safety with little active protection of public health. Recent epidemiological studies that have suggested a significant waterborne level of endemic gastrointestinal illness could then be explained by undetected intrusions in the distribution system, intrusions resulting in the infection of a small number of individuals without eliciting an outbreak situation.

# Title: Canadian Journal of Ophthalmology-Journal Canadien d’Ophtalmologie

Full Journal Title: Canadian Journal of Ophthalmology-Journal Canadien d’Ophtalmologie

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Micieli, J.A., Micieli, A. and Smith, A.F. (2010), Identifying systemic safety signals following intravitreal bevacizumab: Systematic review of the literature and the Canadian Adverse Drug Reaction Database. *Canadian Journal of Ophthalmology-Journal Canadien d’Ophtalmologie*, **45** (3), 231-238.

Abstract: Objective: As the off-label use of intravitreal bevacizumab continues for an increasing number of ocular conditions, a systematic review of the literature aimed at detecting temporally associated systemic adverse events was undertaken. Design: Systematic review of the literature and a health regulatory database. Participants: A total of 22 different clinical studies representing 12 699 patients Methods: A systematic review indexed by Ovid MEDLINE, EMBASE, ISI Web of Science, the Cochrane database (CENTRAL), and the Canadian Adverse Drug Reaction Information System Database was performed. All clinical studies with at least 100 eyes injected with bevacizumab and case reports documenting suspected events were included for review. Results: A total of 22 different clinical studies were reviewed, including an international internet survey, 6 retrospective studies assessing the safety of intravitreal bevacizumab, and 15 clinical trials. The most common adverse systemic event reported in these studies, representing 12 699 patients was an increase in blood pressure (0.46% of patients), followed by cerebrovascular accidents (0.21% of patients), and myocardial infarction (0.19% of patients). The 6 case reports documented suspected events not previously identified and only 1 systemic event from the Health Canada database was retrieved. Conclusions: The systemic events temporally associated with intravitreal bevacizumab are mainly of cardiovascular and neurological origin and can be predicted from an exaggerated pharmacology, although a causal association cannot be established at this time. Health Canada’s spontaneous drug reporting system is an underutilized resource and a more active surveillance system such as a patient registry may be better suited to establish the low rates of systemic adverse events following bevacizumab use in ophthalmology.

Keywords: Antiangiogenic Therapy, Avastin, Bevacizumab, Blood, Blood Pressure, Blood-Pressure, Canada, Cardiovascular, Case Reports, Choroidal Neovascularization Secondary, Clinical Trials, Cochrane, Degeneration, Diabetic Macular Edema, Drug, EMBASE, Health, Heart-Rate, Injection, ISI, Literature, MEDLINE, Metastatic Colorectal-Cancer, Methods, Myocardial Infarction, Pharmacovigilance, Pressure, Ranibizumab, Review, Safety, Science, Study-Group Pacores, Surveillance, Survey, Systematic, Systematic Literature Review, Systematic Review, Vascular Endothelial Growth Factor, Web of Science

# Title: Canadian Journal of Physics

Full Journal Title: [Canadian Journal of Physics](http://pubs.nrc-cnrc.gc.ca/rp-ps/volumes.jsp?jcode=cjp&lang=eng&exp=87)

ISO Abbreviated Title: Can. J. Phys.

JCR Abbreviated Title: Can J Phys

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tudge, A.P. (1961), Studies in chromatographic transport. II. Effect of adsorption isotherm shape. *Canadian Journal of Physics*, **39** (11), 1611-1618.

Full Text: Can J Phy39, 1611.pdf

Abstract: When an adsorbate with a complex adsorption isotherm is transported chromatographically, concentration shocks, either stable or unstable, can occur. Methods are given for determining the transport behavior of each type of shock. Mistakes in the literature are corrected.

# Title: Canadian Journal of Plant Science

Full Journal Title: Canadian Journal of Plant Science

ISO Abbreviated Title: Can. J. Plant Sci.

JCR Abbreviated Title: Can J Plant Sci

ISSN: 0008-4220

Issues/Year: 4

Journal Country/Territory: Canada

Language: Multi-Language

Publisher: Agr Inst Canada

Publisher Address: Suite 907 151 Slater St, Ottawa, Ontario K1P 5H4, Canada

Subject Categories:

Agriculture Plant Sciences: Impact Factor 0.484, 94/137 (2000)

? Harper, J.A. (1992), Citation accuracy in the *Canadian Journal of Plant Science*. *Canadian Journal of Plant Science*, **72** (2), 487-488.

Abstract: A check of 5 % of the citations in the bibliographies of articles in Canadian Journal of Plant Science, volumes 37-38 (1957-1958) and 69-70 (1989-1990), for accuracy identified errors in approximately 38% of the citations.

Keywords: Citations, References, Errors, Plant Science

? Poulton, P.R. (1996), The rothamsted long term experiments: Are they still relevant. *Canadian Journal of Plant Science*, **76**, 559-571.

Abstract: Maintaining soil fertility and sustaining or increasing crop yield is of worldwide importance. Many factors impact upon the complex biological, chemical and physical processes which govern soil fertility. Changes in fertility caused by acidification, declining levels of organic matter, or P and K status may take many years to appear. These properties can in turn be affected by external influences such as atmospheric pollution, global change, or changes in land management practice. Long-term experiments provide the best practical means of studying changes in soil properties and processes and providing information for farmers, scientists and policy makers. This paper shows how the experiments run at Rothamsted in southeast England continue to provide data which are highly relevant to today’s agriculture and wider environmental concerns. Examples are given of how crop yield is affected by soil organic matter, by pests and disease and by P nutrition. The effect of atmospheric pollution on soil acidity and the mobilization of heavy metals are also examined. The need for making better use of existing long-term experiments is stressed.

# Title: Canadian Journal of Psychiatry-Revue Canadienne de Psychiatrie

Full Journal Title: Canadian Journal of Psychiatry-Revue Canadienne de Psychiatrie

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Maunder, R.G. (2007), Using publication statistics for evaluation in academic psychiatry. *Canadian Journal of Psychiatry-Revue Canadienne de Psychiatrie*, **52** (12), 790-797.

Full Text: [2007\Can J Psy52, 790.pdf](2007/Can%20J%20Psy52,%20790.pdf)

Abstract: Objective: The validity of using publication statistics to evaluate university faculty is not established. This study aimed to determine if publication statistics vary among psychiatric faculty members of different academic rank and if there are biases among disciplines. Method: Using the 10 most recent publications written by psychiatric faculty members at 2 schools of medicine, we compared the time to publish 10 papers, the 5-year impact, the citation rate, and the citation ratio according to academic rank and school. Leaders in neuroscience were compared with leaders in clinical subspecialties. Results: All statistics were associated with academic rank (P ≤ 0.001) and there were significant differences between the 2 schools. There were more basic scientists than clinical subspecialists in the 80th percentile for 5-year impact (P = 0.04), but the latter disciplines performed equally in citation ratio. Conclusions: Publication statistics differ among academic ranks. Citation ratio minimizes the effect of biases among disciplines. Publication statistics may provide useful information for evaluating psychiatric faculty.

Keywords: Authorship, Bibliometrics, Citation, Evaluation, Faculty, Impact, Journal Impact Factor, Medical, Papers, Publication, Publication Statistics, Publications, Schools, Statistics

? Elie, D., Gagnon, P., Gagnon, B. and Giguere, A. (2010), Using psychostimulants in end-of-life patients with hypoactive delirium and cognitive disorders: A literature review. *Canadian Journal of Psychiatry-Revue Canadienne de Psychiatrie*, **55** (6), 386-393.

Full Text: 2010\Can J Psy55, 386.pdf

Abstract: Objective: To review the research about psychostimulant effects on cognitive functions in end-of-life patients diagnosed with hypoactive delirium or cognitive disorders. Method: The MEDLINE (1966-March 2008), EMBASE (1974-March 2008), PsycINFO (1806-March 2008), IPA (1970-March 2008), CINAHL (1982-March 2008), ISI Web of Science (1945-March 2008), Current Contents (March 2007-March 2008), Access Medicine (2001-March 2008), and ProQuest Dissertations & Theses (1980-March 2008) databases were searched with keywords related to delirium, cognition, psychostimulants, and palliative care for French or English articles in a dementia-free and hyperactive delirium-free end-of-life population. Cognitive functions had to be assessed before and after initiation of the psychostimulant treatment. Moreover, treatment had to be initiated after the onset of cognitive impairments. Results: A total of 173 studies were screened. Five studies on methylphenidate and 1 study on caffeine met inclusion criteria and were included in this review. Two studies were case reports, 2 were open-label trials, and 2 were double-blind, crossover randomized placebo-controlled trials. Three studies were conducted with hypoactive delirium patients and all studies were conducted in an advanced cancer patient population. Conclusions: The reviewed studies support the use of methylphenidate to improve end-of-life patient cognitive functions, particularly in the case of hypoactive delirium. Caffeine seems to have beneficial effects on psychomotor activity. Further well-designed studies are needed to consolidate these findings.

Keywords: AIDS-Related Complex, Caffeine, Cancer, Cancer-Patients, Case Reports, Cognition, Cognitive Disorders, Databases, Depression, Dextroamphetamine, Dissertations, Double-Blind, Fatigue, ISI, Literature Review, Medically Ill, MEDLINE, Methylphenidate, Palliative Care, Placebo-Controlled Trial, Psychomotor, Research, Review, Science, Treatment, Web of Science

? Amari, E., Rehm, J., Goldner, E. and Fischer, B. (2011), Nonmedical prescription opioid use and mental health and pain comorbidities: A narrative review. *Canadian Journal of Psychiatry-Revue Canadienne de Psychiatrie*, **56** (8), 495-502.

Full Text: [2011\Can J Psy56, 495.pdf](2011/Can%20J%20Psy56,%20495.pdf)

Abstract: Objective: In North America, the prevalence of nonmedical prescription opioid use (NMPOU), and morbidity and mortality related to prescription opioid analgesics (POAs) has risen sharply. Epidemiologic studies have suggested a high prevalence of mental health and pain comorbidities in NMPOU samples. Given the potential importance for interventions, a narrative review was conducted on studies reporting data on the co-occurrence of NMPOU with mental health problems and pain symptoms in general, treatment, or special populations. Method: A search of MEDLINE, PubMed, PsycINFO, and Web of Science using defined search terms yielded 74 studies on NMPOU and mental health and (or) pain. Thirty-nine studies published between 1997 and 2009 were included in the review-based on the data they provided on NMPOU and mental health and pain comorbidities. Results: Our review found strong associations between NMPOU and the comorbidities of interest. Associations between NMPOU and mental health were strongest for depression (OR range 1.2 to 4.3) followed by anxiety disorders (OR range 1.2 to 3.0) in general and treatment populations. The prevalence of pain ranged from 14.5% to 61.5% in general, treatment, and street drug user samples reporting NMPOU. Conclusions: The extensive associations observed between NMPOU and mental health and pain comorbidities suggest that effective preventive or treatment interventions for NMPOU must consider and attend to these comorbidities. As POAs are widely available and used in North America, POAs may increasingly be used in nonmedical ways for pain or mental health problems not effectively diagnosed or treated.

Keywords: Anxiety, Anxiety Disorders, Chronic Noncancer Pain, College-Students, Comorbidity, Dependence Symptoms, Depression, Drug, Dual Diagnosis, Epidemiologic Studies, Health, Interest, Interventions, Medline, Mental Health, Mental Illness, Methadone-Maintenance Treatment, Morbidity, Mortality, National Epidemiologic Survey, Nonmedical Prescription Opioid Use, Opioid, Pain, Prevalence, Primary-Care, Pubmed, Review, Science, Self-Medication Hypothesis, Substance Misuse, Substance Use Disorders, Symptoms, Treatment, Treatment Interventions, United-States, Web of Science

# Title: Canadian Journal of Public Health-Revue Canadienne de Sante Publique

Full Journal Title: Canadian Journal of Public Health-Revue Canadienne de Sante Publique

ISO Abbreviated Title: Can. J. Public Health

JCR Abbreviated Title: Can J Public Health

ISSN: 0008-4263

Issues/Year:

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Language:

Publisher: Canadian Public Health Assoc, Ottawa

Publisher Address:

Subject Categories:

: Impact Factor

? Noble, C.D. (1972), Our beleaguered environment. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **63** (3), 277-279.

? Bowmer, E.J. and Campbell, J.A. (1972), Index of drinking water pollution-total coliform MPN tests: Confirmed test versus completed test. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **63** (4), 355-358.

? Bako, G., Smith, E.S., Hanson, J. and Dewar, R. (1982), The geographical distribution of high cadmium concentrations in the environment and prostate cancer in Alberta. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **73** (2), 92-94.

? Joly, J.R. (1984), *Legionella* and the environment. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **75** (1), 57-60.

? Grover, B. (1984), Canadian participation in the international drinking water supply and sanitation decade. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **75** (1), 74-78.

? Wigle, D.T., Mao, Y., Semenciw, R., Smith, M.H. and Toft, P. (1986), Contaminants in drinking-water and cancer risks in canadian cities. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **77** (5), 335-342.

? Chambers, L.W., Shimoda, F., Walter, S.D., Pickard, L., Hunter, B., Ford, J., Deivanayagam, N. and Cunningham, I. (1989), Estimating the burden of illness in an Ontario community with untreated drinking water and sewage disposal problems. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **80** (2), 142-148.

Abstract: The Hamilton-Wentworth regional health department was asked by one of its municipalities to determine whether the present water supply and sewage disposal methods used in a community without piped water and regional sewage disposal posed a threat to the health of its residents. Three approaches were used: assessments by public health inspectors of all households; bacteriological and chemical analyses of water samples; and completion of a specially designed questionnaire by residents in the target community and a control community. 89% of the 227 residences in the target community were found to have a drinking water supply that, according to the Ministry of Environment guidelines, was unsafe and/or unsatisfactory. According to on-site inspections, 32% of households had sewage disposal problems. Responses to the questionnaire revealed that the target community residents reported more symptoms associated with enteric infections due to the water supply. Two of these symptoms, diarrhea and stomach cramps, had a relative risk of 2.2 when compared to the control community (p less than 0.05). The study was successfully used by the municipality to argue for provincial funding of piped water.

? Hrudey, S.E., Soskolne, C.L., Berkel, J. and Fincham, S. (1990), Drinking water fluoridation and osteosarcoma. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **81** (6), 415-416.

? Hertzman, C., Ward, H., Ames, N., Kelly, S. and Yates, C. (1991), Childhood lead exposure in Trail revisited. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **82** (6), 385-391.

Abstract: We sought to identify modifiable determinants of elevated blood lead levels in preschool children; to compare the current situation with past information; to determine historical trends in environmental lead contamination in Trail; and to find a basis for identifying appropriate precautions and protection against future lead exposure. In Phase 1, blood samples were drawn from all children aged 2 to 5. In Phase 2, children in the highest and lowest quartile of blood leads were surveyed by questionnaire. Environmental samples of drinking water, paint, housedust, soil and vegetables were taken from their residences, and soil samples were collected from nearby parks. The average blood lead level was 13.8 micrograms/dl, range 4 to 30 micrograms/dl. This is approximately 40% lower than in 1975, when a previous survey was done, but is high compared to other places in Canada. The study of environmental determinants of lead revealed that soil lead levels and, secondarily, housedust lead levels are the principal determinants of high blood lead. Children with high blood leads also tended to concentrate in neighbourhoods near the lead-zinc smelter.

? Kraus, A.S. and Forbes, W.F. (1992), Aluminum, fluoride and the prevention of Alzheimer’s disease. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **83** (2), 97-100.

Abstract: The evidence regarding the link between aluminum and Alzheimer’s disease is summarized. This evidence suggests strongly that aluminum is one of the etiologic or contributing factors in the occurrence of Alzheimer’s disease. One reported study suggests that relatively high fluoride in drinking water plays a preventive role in Alzheimer’s disease. The rationale for this is the evidence that aluminum and fluoride compete for absorption in the gut. However, this study had methodologic limitations, and no firm conclusion can be drawn. Further investigation of relatively high fluoride in drinking water as a preventive measure for Alzheimer’s disease should receive high priority.

? Mathias, R.G., Riben, P.D. and Osei, W.D. (1992), Lack of an association between endemic *Giardia*sis and a drinking water source. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **83** (5), 382-384.

Abstract: Waterborne outbreaks of *Giardia*sis have been documented in many areas of North America associated with contaminated surface water supplies. The Greater Vancouver Water District (GVWD) administers the distribution of surface waters to 1.4 million people. We wished to determine if endemic *Giardia*sis was associated with this water supply. One hundred and eighty cases, an equal number of laboratory (enteric) controls and 94 neighbourhood (friend) controls were interviewed by questionnaire. The cases and controls were similar in age, sex and community of residence. Risk factors for *Giardia*sis included having a child under six in the house and travel, both in B.C. but outside of the GVWD, and in Africa, the Americas, south of the U.S. or Asia. The cases drank 3.6 cups of water per day, the enteric controls 3.5 and the friend controls 3.7. These amounts are similar to those reported ingested in outbreak studies. Water consumption was not a risk for endemic *Giardia*sis.

? (1998), (1997), declaration of the environment leaders of the Eight on children’s environmental health. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **89** (1), S5-8, S5-S9.

Abstract: On May 5-6, (1997), Administrator Carol M. Browner hosted the Environment Leaders’ Summit of the G7 countries plus Russia, known as “the Eight, “ in Miami, Florida. Children’s Environmental Health was the centerpiece topic for discussion at the Summit, which resulted in the 1997 Declaration of the Environment Leaders of the Eight on Children’s Environmental Health and its annexed Implementation Actions on Protecting Children’s Health and Environment Which the Environment Leaders of the Eight Have Agreed to Promote Within Their Governments and Countries. These documents provide a framework for domestic, bilateral and international efforts to improve the protection of children’s health from environmental threats and specify concrete actions that the Eight will undertake to begin the process of incorporating characteristics of infants and children into environmental science, risk assessments and protection regimes.

? Levallois, P., Grondin, J. and Gingras, S. (1998), Knowledge, perception and behaviour of the general public concerning the addition of fluoride in drinking water. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **89** (3), 162-165.

Abstract: A telephone survey was carried out in, (1994), in the Quebec City region, among 1006 people living in two municipalities where tap water is fluoridated and 1003 people living in two municipalities where there is no fluoridation. Knowledge of the main benefit associated with the use of fluoride (prevention of tooth decay) in drinking water was not different in fluorated versus non-fluoridated municipalities (20.4% vs 19.4%, p = 0.57). Knowledge of its main disadvantage (increase of dental fluorosis) was very low and similar in both groups (3.1% vs 2.0%, p = 0.11). Opposition to fluoridation was slightly higher in fluoridated areas (22.0% vs 18.3%, p = 0.04), and the use of fluoridated supplements for children was much less important in fluoridated areas (4.4% vs 12.4%, p = 0.001). No changes in the measures of association (odds ratios) were found after adjustment for the different characteristics of the participants (age, family income, education). Opposition to fluoridation was lower among those who believed their tap water was fluoridated (even if not): 19.9% vs 34.5%, p < 0.001. This study demonstrates that there is still need for public health education on the uses of fluorides.

Manuel, D.G., Shahin, R., Lee, W. and Grmusa, M. (1999), The first reported cluster of food-borne cyclosporiasis in Canada. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **90** (6), 399-402.

Abstract: INTRODUCTION: Prior to, (1996), sporadic cases of cyclosporiasis in Canada were most often associated with foreign travel and outbreaks throughout the world were associated with contaminated drinking water. In May, (1996), the North York Public Health Department was notified of three laboratory-confirmed cases of cyclosporiasis among persons who attended a luncheon at a religious institution. A ceremonial bath (mikvah) was initially identified as a possible source of exposure to contaminated water.

METHODS: Guests of a luncheon were interviewed regarding food, beverage and water exposure. The institution kitchen and water sources were inspected and environmental testing was performed. RESULTS: Eating strawberry flan, decorated with rasberries and blueberries, was associated with developing illness (relative risk = 2.13, p = 0.02). There was no evidence that water exposure was associated with illness.

DISCUSSION: This event was the index Canadian cluster of a widespread North American outbreak associated with imported Guatemalan raspberries. The local investigation highlights the role of public health departments in multijurisdictional food-borne outbreaks of emerging pathogens.

? Tricco, A.C., Runnels, V., Sampson, M. and Bouchard, L. (2008), Health, health promotion, and public health a bibliometric analysis. *Canadian Journal of Public Health-Revue Canadienne de Sante Publique*, **99** (6), 466-471.

Full Text: [2008\Can J Pub Hea99, 466.pdf](2008/Can%20J%20Pub%20Hea99,%20466.pdf)

Abstract: Objective: Bibliometric analysis can be used to objectively compare the usage of terms over time. The purpose of this research was to compare the use of population health, health promotion, and public health using bibliometric indicators of the published literature. Methods: Bibliometric indicators, Such as scientific productivity and the overlap between the terms, were analyzed in the Web of Science. Indexing Of Population health, health promotion, and public health was explored in MEDLINE, CINAHL, and EMBASE. Results: The most productive country in population health was Canada, while the most productive country in health promotion and public health was the United States. The number of published articles using the public health term was surpassed by health promotion around 1990. Both were surpassed by population health around 2000. Population health was the only concept which lacked an index term in all three databases. Discussion: There has been a shift in the usage of public health, health promotion, and population health concepts over time. Country analysis revealed that Canadian researchers are leaders in population health, while researchers based in the United States are leaders in public health and health promotion. This may indicate differences rooted in the social, historical and economic traditions. Although the publication rate of articles described as ‘population health’ research is increasing, it is lacking an index term across major electronic databases. We suggest that without timely acceptance of terms, new concepts that represent different ways of thinking about health may be limited, delayed or glossed over.

Keywords: Acceptance, Analysis, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Canada, Care, Country, Databases, Economic, Health, Health Promotion, Health-Promotion, Index, Indicators, Literature, Medicine, Medline, Population, Population Health, Population Health, Productivity, Promotion, Public, Public Health, Publication, Publication Rate, Purpose, Research, Science, Scientific Productivity, Social, Term, Time, United States, Web of Science

# Title: Canadian Journal of Statistics-Revue Canadienne de Statistique

Full Journal Title: Canadian Journal of Statistics-Revue Canadienne de Statistique

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

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Subject Categories:

: Impact Factor

? Genest, C. (1997), Statistics on statistics: measuring research productivity by journal publications between 1985 and 1995. *Canadian Journal of Statistics-Revue Canadienne de Statistique*, **25** (4), 427-443.

Abstract: Sixteen international journals publishing statistical theory were surveyed over the Ii-year period beginning in 1985. Paper, author and adjusted page counts yield cursory measures of productivity for institutions and countries that contributed to fundamental statistical research during that period. These data clearly identify Canada as one of the main contributors to the development of the discipline in the past decade. They also provide valuable information on the evolution of publication habits, in terms of the volume of research, the length of papers, coauthorship practices, etc.

Keywords: Bibliometrics, Coauthorship, Countries, Development, Economics Departmental Rankings, Journals, Papers, Productivity, Productivity Rankings, Publications, Publishing, Refereed Journals, Research, Research Productivity, Statistical Research, Statistics

? Genest, C. (1999), Probability and statistics: A tale of two worlds? *Canadian Journal of Statistics-Revue Canadienne de Statistique*, **27** (2), 421-444.

Abstract: This comparative study of research productivity and publication habits in probability and statistics completes the paper that was published in this Journal at the end of 1997. It is based on a ten-year survey of eighteen international journals, half of which are specialized in probability theory and the other half in statistics. Paper, author and adjusted page counts yield cursory measures of productivity for countries and institutions that contributed to fundamental research in these two related fields during the period 1986-1995. These data also reveal significant cultural differences between probabilists and statisticians in the volume of research, the length of papers, coauthorship practices, etc. Canada is seen to be one of the strongest contributors to the development of these two disciplines.

Keywords: Bibliometrics, Coauthorship, Countries, Development, Journals, Papers, Patterns, Productivity, Productivity Rankings, Refereed Journals, Research, Research in Probability and Statistics, Research Productivity, Statistics

? Genest, C. and Guay, M. (2002), Worldwide research output in probability and statistics: an update. *Canadian Journal of Statistics-Revue Canadienne de Statistique*, **30** (2), 329-342.

Abstract: The authors update the work of Genest (1997, 1999) on world research output in probability and statistics. The rankings they produce of countries and institutions are based on a survey of papers published between 1986 and 2000 in 25 specialized journals of high reputation in these two fields. The contribution of Canadian probabilists and statisticians is highlighted.

Keywords: Authors, Bibliometrics, Countries, Journals, Papers, Productivity, Productivity Rankings, Rankings, Refereed Journals, Research, Research Output, Statistics

# Title: Canadian Journal of Soil Science

Full Journal Title: [Canadian Journal of Soil Science](http://pubservices.nrc-cnrc.ca/rp-ps/volumes.jsp?jcode=cjss&lang=eng&exp=89)

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Publisher Address: Suite 907 151 Slater St, Ottawa, Ontario K1P 5H4, Canada

Subject Categories:

Agriculture, Soil Science: Impact Factor 0.597, 17/29 (2000)

? John, M.K. (1972), Cadmium adsorption maxima of soils as measured by Langmuir isotherm. *Canadian Journal of Soil Science*, **52** (3), 343-350.

Full Text: [1960-80\Can J Soi Sci52, 343.pdf](1960-80/Can%20J%20Soi%20Sci52,%20343.pdf)

Abstract: Thirty surface soils were equilibrated with four cadmium chloride solutions in a study of cadmium adsorption by soils. The data fitted the Langmuir isotherm. Where, the amount adsorbed by the soil *x*/*m* and the solution concentration at equilibrium is C, simple correlation coefficients, relating four pairs of C/*x*/*m* and C for each soil, averaged 0.993. Adsorption maxima for all soils were similar in magnitude and correlated with aluminum and zinc soluble in 0.01 M CaCl2. The coefficients related to the bonding energy generally decreased in the order: organic > heavy clay > sandy and silt loam > sandy soils, and were correlated with total aiuminum and iron. From a set of 13 soil properties, linear regression equations to predict the Langmuir parameters included only those variables that contributed significantly.

? Khan, S.U. (1973), Equilibrium and kinetic studies of adsorption of 2,4-D and picloram on humic acid. *Canadian Journal of Soil Science*, **53** (4), 429-434.

Full Text: [1960-80\Can J Soi Sci53, 429.pdf](1960-80/Can%20J%20Soi%20Sci53,%20429.pdf)

Abstract: Equilibrium and kinetic studies of the adsorption of 2,4-D (2,4-dichlorophenoxy acetic acid) and picloram (4-amino-3,5,6-trichloropicolinic acid) on a humic acid have been made. The equilibrium data followed the Freundlich-type isotherm. Rate constants, activation energies, heats of activation, and entropies of activation were calculated for the adsorption of the two herbicides on humic acid. The rate data indicated a physical type of adsorption. In the overall adsorption process the rate-limiting step for the initial period was shown to be the diffusion of the herbicide molecules to the surface of humic acid. However, the rate-limiting process at longer time intervals was interpreted to be intraparticle diffusion of the herbicide molecules into the interior of the humic acid particles.

? Bowman, B.T. (1979), Method of repeated additions for generating pesticide adsorption-desorption isotherm data. *Canadian Journal of Soil Science*, **59** (4), 435-437.

Full Text: [1960-80\Can J Soi Sci59, 435.pdf](1960-80/Can%20J%20Soi%20Sci59,%20435.pdf)

Abstract: An improved method is suggested for obtaining desorption isotherm data, which avoids problems associated with decanting supernatant solutions. This technique is also useful in obtaining adsorption isotherm data at equilibrium concentrations approaching the solubility limit of the absorbate.

Ali, M.W., Zoltai, S.C. and Radford, F.G. (1988), A comparison of dry and wet ashing methods for the elemental analysis of peat. *Canadian Journal of Soil Science*, **68** (2), 443-447.

Full Text: [1988\Can J Soi Sci68, 443.pdf](1988/Can%20J%20Soi%20Sci68,%20443.pdf)

Abstract: Peat samples were digested by dry and wet ashing for analysis by inductively coupled plasma spectrometry (ICP-AES). Results were comparable for Ca, Mg, Fe, K, Mn and P. Values for Zn, S, Cu, Ti, Na and Pb were consistently higher by wet ashing. Dry ashing gave much higher values for Al and Ni than wet ashing.

Keywords: Elements, Wet Ashing, Dry Ashing, Peat, ICP-AES

? Marshall, V.G., Reynolds, S. and Dangerfield, J.A. (1990), Predicting urea hydrolysis at low-temperatures in British-Columbia forest soils. *Canadian Journal of Soil Science*, **70** (3), 519-523.

Full Text: [1990\Can J Soi Sci70, 519.pdf](1990/Can%20J%20Soi%20Sci70,%20519.pdf)

Abstract: Urease activity in 14 sites, representing a wide range of forest and soil types, was determined by a non-buffer method. Urease activity in L-H horizons ranged from 23–203 μg N hydrolyzed (g soil)−1 h−1 at 40 °C. In all soils, urease activity decreased dramatically with depth. At 0 °C, hydrolysis was estimated at 26.8 and 1.9 μg N g−1 h−1 for L-H and Bf horizons, respectively, for one site. Theoretical estimation of hydrolysis at 0 °C for the site with the lowest activity suggested that an operational application of urea (200 kg N ha−1) applied to snow could be hydrolyzed within 6 days in the rooting zone of all the soils studied.

Keywords: Urease Activity, Energy of Activation, Forest Fertilization, Brunisols, Luvisols, Podzols

? Bolton, K.A. and Evans, L.J. (1996), Cadmium adsorption capacity of selected Ontario soils. *Canadian Journal of Soil Science*, **76** (2), 183-189.

Full Text: [1996\Can J Soi Sci76, 183.pdf](1996/Can%20J%20Soi%20Sci76,%20183.pdf)

Abstract: The retention of Cd by selected Ontario soils with a range of soil properties was investigated. Batch adsorption experiments were carried out at the actual (unadjusted) pH of the soil and at a range of pH values adjusted by the addition of acid or base. For all soils, Cd adsorption increased with increasing pH and with increasing Cd solution concentration. The adsorption data was fitted, by a linear least squares technique, to the Langmuir adsorption isotherm. Maximum adsorption, qmax, at unadjusted soil pH values ranged from less than 8 mmol kg-1 for the Fox sandy soil to 64.8 mmol kg-1 for the Hanbury heavy clay soil. Calculated Cd adsorption maxima were regressed against measured soil properties to determine the most important properties involved in the adsorption of Cd. Multiple linear regression analysis revealed the best model to be qmax = 8.33 + 0.67 (organic carbon) + 4.37 (inorganic-poorly crystalline Fe, Fe-pc). Surface complexation modeling indicates that humic surfaces account for adsorption at pH values beginning at approximately 3.5 and that hydrous ferric oxide surfaces account for Cd adsorption at pH values greater than 7.

Keywords: Cadmium Adsorption, Langmuir Isotherm, Surface Complexation, Soil Contamination, Calcareous Soils, Organic-Matter, Sorption, Copper, Acid, Water, Iron, Metals, Zinc

De Pieri, L.A., Buckley, W.T. and Kowalenko, C.G. (1997), Cadmium and lead concentrations of commercially grown vegetables and of soils in the Lower Fraser Valley of British-Columbia. *Canadian Journal of Soil Science*, **77** (1), 51-57.

Full Text: [1997\Can J Soi Sci77, 51.pdf](1997/Can%20J%20Soi%20Sci77,%2051.pdf)

Abstract: The cadmium (Cd) and lead (Pb) concentrations in various tissues of economically important crops (potato, cabbage, cauliflower, carrot, turnip, corn and lettuce) grown in three regions within the Lower Fraser Valley were examined in a survey study. The objective of the study was to determine the current concentrations of Cd and Pb in Fraser Valley vegetables and vegetable-producing soils as background data for pollution evaluation and reference purposes. Concentrations of both metals in the vegetable tissues and the soils (based on total metal analysis) were similar to those reported for uncontaminated soils of the world. Cadmium in edible parts of vegetables had site means that varied from 0.03 to 1.74 μg-1 DM, while mean soil Cd in these sites varied from 0.17 to 1.02 μg-1. Mean Pb in edible parts of vegetables at these sites varied from 0.03 to 0.16 μg-1 DM, while soils varied from 4.9 to 26.4 μ Pb g-1. Potatoes grown on Spetifore soil series exhibited a high concentration of Cd in the tubers (site mean of 1.74 μg-1 DM) and coincided with high extractable soil sulphur and sodium contents, which showed the influence of a marine environment on that soil. A comparison between a cultivated and uncultivated adjacent site showed that the soil at the former had almost double the Cd concentration of the latter. The Pb concentration at the two sites did not differ. The increased Cd in the cultivated site coincided with a greater amount of extractable phosphorus and potassium, which may indicate a history of excessive fertilizer application. No clear relationship was observed between total soil and plant tissue concentration for Cd or Pb. Cadmium was more variable in the plant tissues than Pb, particularly in the leaves.

? Ghabbour, E.A., Davies, G., Dunfee, R.L., Smith, N.A. and Vozzella, M.E. (2001), Adsorption of nucleic acid constituent uracil on copper(II)-loaded, solid peat and soil-derived humic acids. *Canadian Journal of Soil Science*, **81** (3), 309-316.

Full Text: [2001\Can J Soi Sci81, 309.pdf](2001/Can%20J%20Soi%20Sci81,%20309.pdf)

Abstract: Humic acids (HA) in compost, peats and soils sorb organic compounds selectively. This paper investigates the micro- and macroscopic properties of solid HAs isolated from a German peat (GHA) and a New Hampshire soil (NHA) using tightly bound copper(II) and nucleic acid constituent uracil adsorption as analytical probes. Isotherm measurements at 5.0-35.0 degreesC show that tightly bound Cu(II) decreases the amount of uracil adsorbed by GHA at mM or lower uracil concentrations whereas previous work revealed the opposite effect for bound Hg(II). Site capacity comparisons are consistent with lower coordination numbers for RA-bound Hg(II) than for RA-bound Cu(II). Low coordination numbers leave Hg(II) sites open for uracil binding. Enthalpy and entropy changes for uracil adsorption on GHA, NHA, their Cu(Il) and Hg(Il)-loaded forms and on compost-derived HA are linearly correlated, indicating that HAs are free energy buffers. Water and bound metals evidently play major roles in HA-solute interactions and in HA aggregation/disaggregation.

Keywords: Humic Acids, Metal Binding, Nucleic Acid Constituents, Uracil, Adsorption, Isotherms, Thermodynamics, Aqueous Nucleobases, Nucleosides, Nucleotides, Substances, Binding, Sulfur, Model

Zeng, L., Johnson, R.L., Li, X. and Liu, J. (2003), Phosphorus removal from aqueous solutions by sorption on two volcanic soils. *Canadian Journal of Soil Science*, **83** (5), 547-556.

Full Text: [C\Can J Soi Sci83, 547.pdf](C/Can%20J%20Soi%20Sci83,%20547.pdf)

Abstract: The use of low-cost materials for P removal is of interest for developing cost-effective techniques for preventing P pollution. This paper reports a study on phosphate removal from aqueous solutions by sorption on two volcanic soils. The raw and HCl-treated soils were characterized with respect to oxalate-extractable and dithionite-extractable Al and Fe contents, surface area, and P sorption capacities. The phosphate sorption isotherms, kinetics, pH effects, and desorbability were evaluated in batch tests. The measured isotherm data were well fitted by the Freundlich and Temkin models. Phosphate sorption on these soils was relatively fast and the kinetics could be satisfactorily described by the simple Elovich and power function equations. The two soils had maximum phosphate sorption capacities of approximately 0.85 and 1.35 mg g-1 gram of soil at pH 6.0-6.5. The pH had different effects on phosphate sorption on these soils, likely due to either calcium phosphate precipitation or surface repulsion of the negatively charged phosphate species at a higher pH. Column flow-through tests using both synthetic phosphate solution and liquid swine manure confirmed the phosphate removal ability of the volcanic soils. It was concluded that volcanic soils could be potential low-cost materials for controlling P pollution from agricultural sources.

Keywords: Phosphate Removal, Volcanic Soil, Sorption, Isotherm, Kinetics, Desorption, Phosphate Adsorption, Elovich Equation, Waste-Water, Aluminum, Iron, Mechanisms, Kinetics, Release, Oxides

# Title: Canadian Journal of Surgery

Full Journal Title: [Canadian Journal of Surgery](http://www.cma.ca/issues); [Canadian Journal of Surgery](http://web.ebscohost.com/ehost/detail?vid=1&hid=17&sid=89e6b20f-f295-4c2f-9e64-08cf56357d33%40sessionmgr15&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=1IS)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wood Dauphinee, S. (1996), Quality-of-life assessment: Recent trends in surgery. *Canadian Journal of Surgery*, **39** (5), 368-372.

Full Text: 1996\Can J Sur39, 368.pdf

Abstract: A literature review conducted for a 1989 article on assessing the quality of life in surgical studies revealed that quality of life was more often mentioned than measured. Few authors reported the use of known, standardized scales. The objective of this study was to determine if and to what extent this situation has changed. A MEDLINE search of surgical studies published between 1989 and 1995 produced over 277 abstracts of surgical studies containing the words ‘‘quality of life.’’ The abstracts were studied in three time periods: 1989-1990, 1991-1992 and 1993-1995. Findings indicated that the use of the term ‘‘quality of life’’ increased markedly over the study period, and studies using standardized measures escalated from 27.4% in 1989-1990 to 48.3% in 1993-1995. Those abstracts not stating how quality of life was assessed decreased from 48.4% in the early period to 21.7% in the last period. Of the abstracts reporting studies that used quality of life measures, 33% came from cancer studies, 21.7% from cardiovascular or respiratory studies, 14.8% from gastroenterology studies, 13.4% from nephrology studies and 6.1% from orthopedic studies. Surgical investigators selected a variety of global measures of quality of life as well as disease-specific instruments. The abstracts also revealed that surgeons are using quality-of-life assessment to monitor patients over time, to help select patients for surgery, to determine the effects of surgical treatment and for making policy decisions. Notwithstanding the limitations of this project, there is evidence in the literature that surgeons are increasingly willing to assess the impact of the surgical interventions by quality-of-life measures and are becoming more familiar with the diverse measures used to assess quality of life.

Keywords: Assessing, Assessment, Cancer, Cardiovascular, Evidence, Familiar, Gastroenterology, Impact, Interventions, Life, Literature, Literature Review, MEDLINE, Nephrology, Patients, Policy, Quality, Quality of, Quality of Life, Reporting, Review, Scales, Surgery, Surgical Treatment, Term, Treatment, Trends

? Bhandari, M., Patenall, V., Devereaux, P.J., Tornetta, P., Dirschl, D., Leece, P., Ramanan, T. and Schemitsch, E.H. (2005), Am observational study of duplicate presentation rates between two national orthopedic meetings. *Canadian Journal of Surgery*, **48** (2), 117-122.

Full Text: [2005\Can J Sur48, 117.pdf](2005/Can%20J%20Sur48,%20117.pdf)

Abstract: Background: National meetings such as those of the American Academy of Orthopaedic Surgeons (AAOS) and the Canadian Orthopaedic Association (COA) are invaluable in the dissemination of new research findings. Given the limits of meeting agendas, investigators who present the same paper at multiple meetings prevent other presentations on potentially important original research. To determine the incidence of duplicate presentation of research between recent COA and AAOS meetings and between national meetings (AAOS and subspecialty), we conducted an observational study. Methods: We hand-searched all podium papers and posters from the 2001 COA annual meeting for duplicate presentation at the 2001 and 2002 AAOS annual meetings and subspecialty meetings held in the USA. We evaluated summary data abstracted from the duplicate presentations for consistency. Results: Of 148 presentations at the 2001 COA meeting, 29 presentations (paper and poster) were duplicated at the 2001 or 2002 AAOS meeting: effectively I paper in 5 (19.5%). Canadian investigators were significantly more likely to present the same paper at both meetings than Americans (79% v. 13%, respectively; p < 0.01). Those who presented papers at COA altered their AAOS presentations in a variety of ways: by changing the wording in the title of their paper (24% of the time), adding or removing authors (38%), changing authorship order (34%) and changing the sample size (31%). Duplicate presentation rates between AAOS and other orthopedic subspecialty meetings averaged 11.4% (range 3.4%-26.4%). Conclusions: We identified a 20% duplicate presentation rate between the COA and AAOS annual meetings, and an 11% rate between the AAOS and subspecialty meetings. Stricter enforcement of guidelines and improved dissemination of research findings at both national meetings may limit this practice.

Keywords: Abstracts, Authors, Authorship, Dissemination, Guidelines, Incidence, Methods, Observational, Observational Study, Papers, Practice, Publication Rates, Research, Society, USA

? Bhandari, M., Busse, J., Devereaux, P.J., Montori, V.M., Swiontkowski, M., Tornetta, P., Einhorn, T.A., Khera, V. and Schemitsch, E.H. (2007), Factors associated with citation rates in the orthopedic literature. *Canadian Journal of Surgery*, **50** (2), 119-123.

Full Text: [2007\Can J Sur50, 119.pdf](2007/Can%20J%20Sur50,%20119.pdf)

Abstract: Introduction: Investigators aim to publish their work in top journals in an effort to achieve the greatest possible impact. One measure of impact is the number of times a paper is cited after its publication in a journal. We conducted a review of the highest impact clinical orthopedic journal (Journal of Bone and joint Surgery, American volume U Bone joint Surg Am]) to determine factors associated with subsequent citations within 3 years of publication. Methods: We conducted citation counts for all original articles published in J Bone joint Surg Am 2000.(12 issues). We used regression analysis to identify factors associated with citation counts. Results: We identified 137 original articles in the J Bone Joint Surg Am. There were 749 subsequent citations within 3 years of publication of these articles. Study design was the only variable associated with subsequent citation rate. Meta-analyses, randomized trials and basic science papers received significantly more citations (mean 15.5, 9.3 and 7.6, respectively) than did observational studies (mean retrospective 5.3, prospective 4.2) and case reports (mean 1.5) (p = 0.01). These study designs were also significantly more likely to be cited in the general medical literature (p = 0.02). Conclusion: Our results suggest that basic science articles and clinical articles with greater methodological safeguards against bias (randomized controlled trials and meta-analyses) are cited more frequently than are clinical studies with less rigorous stud), designs (observational studies and case reports).

Keywords: Analysis, Citation, Citation Counts, Citation Rates, Citations, Impact Factor, Journals, Publication, Quality, Science, Self-Citations

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Subject Categories:

: Impact Factor

? Maclean, H.I. (1972), Introductory course on informatics/documentation - Mikhailov, AI and Giljarevskij, RS. *Canadian Library Journal*, **29** (4), 347-348.

? Malinski, R. (1975), Understanding scientific literature - Bibliometric approach - Donohue, JC. *Canadian Library Journal*, **32** (1), 73-74.

# Title: Canadian Medical Association Journal

Full Journal Title: [Canadian Medical Association Journal](http://www.cmaj.ca/contents-by-date.0.shtml)

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Medicine, General & Internal: Impact Factor 2.808, / (2001)

? Morgan, P.P. (1983), CMAJS citation patterns. *Canadian Medical Association Journal*, **129** (6), 524.

? Korock, M. (1985), Is there a future for homeopathy? *Canadian Medical Association Journal*, **135** (2), 134-136.

? Smith, G.F. (1986), Guidelines for people responsible for education and day-care of children with HTLV-III/LAV infection. *Canadian Medical Association Journal*, **132** (7), 840-&.

? Squires, B.P. (1992), Citation rate - a measure of excellence. *Canadian Medical Association Journal*, **146** (3), 341.

? Alle, U.D., Navas, L. and King, S.M. (1993), Effectiveness of intrapartum penicillin prophylaxis in preventing early-onset group B streptococcal infection: Results of a metaanalysis. *Canadian Medical Association Journal*, **149** (11), 1659-1665.

Full Text: [1993\Can Med Ass J149, 1659.pdf](1993/Can%20Med%20Ass%20J149,%201659.pdf)

Abstract: Objective: To determine the effectiveness of intrapartum penicillin prophylaxis in preventing early-onset group B streptococcal (GBS) infection in neonates of women whose birth canals are colonized by group B streptococci.

Data sources: Articles published between 1966 and 1992 identified from MEDLINE, EMBASE, the Science Citation Index and the Oxford Perinatal Database; the bibliographies of primary studies, textbooks and review articles and published abstracts from major conferences and symposia.

Data selection: Studies were selected if four criteria were met: (a) the target population was intrapartum women and neonates, (b) the intervention was penicillin prophylaxis, (c) invasive early-onset GBS infection was an outcome measure, and (d) the studies were controlled trials or cohort studies. Seven primary studies were identified, four of which were randomized controlled trials.

Data extraction: Explicit methodologic criteria were used by two of the authors to assess independently the study quality; one of the reviewers was blind as to author, institution and journal. The baseline characteristics of the population, intervention and outcome were summarized twice and checked for accuracy by two of the authors.

Data synthesis: Five of the studies showed a trend toward a beneficial effect of penicillin prophylaxis, and two showed a statistically significant effect. The pooled odds ratio indicated a 30-fold reduction (95% confidence interval 0.0013 to 0.17) in the incidence of early-onset GBS infection with intrapartum penicillin prophylaxis. Subgroup analyses did not change these results. The magnitude of improvement observed did not differ between women with prenatal risk factors (premature rupture of the membranes and premature labour) and those without these risk factors.

Conclusions: There is accumulative evidence that intrapartum penicillin prophylaxis is effective in preventing early-onset GBS infection. Such therapy is beneficial to women whose birth canals are colonized with group B streptococci. Further studies are needed to determine the optimum timing and method of detecting vaginal colonization during pregnancy.

Keywords: Controlled Trial, Disease, Chemoprophylaxis, Colonization, Sepsis, Transmission, Pregnancies, Septicemia, Newborn, Infant

? Lexchin, J. and Holbrook, A. (1994), Methodologic quality and relevance of references in pharmaceutical advertisements in a *Canadian Medical Journal*. *Canadian Medical Association Journal*, **151** (1), 47-54.

Full Text: [1994\Can Med Ass J151, 47.pdf](1994/Can%20Med%20Ass%20J151,%2047.pdf)

Abstract: Objective: To evaluate the methodologic quality and relevance of references in pharmaceutical advertisements in the Canadian Medical Association Journal (CMAJ).

Design: Analytic study.

Data source: All 114 references cited in the first 22 distinct pharmaceutical advertisements in volume 146 of CMAJ.

Main outcome measures: Mean methodologic quality score (modified from the 6-point scale used to assess articles in the American College of Physicians’ Journal Club) and mean relevance score (based on a new 5-point scale) for all references in each advertisement.

Main results: Twenty of the 22 companies responded, sending 78 (90%) of the 87 references requested. The mean methodologic quality score was 58% (95% confidence limits [CL] 51% and 65%) and the mean relevance score 76% (95% CL 72% and 80%). The two mean scores were statistically lower than the acceptable score of 80% (p < 0.05), and the methodologic quality score was outside the preset clinically significant difference of 15%. The poor rating for methodologic quality was primarily because of the citation of references to low-quality review articles and “other” sources (i.e., other than reports of clinical trials). Half of the advertisements had a methodologic quality score of less than 65%, but only five had a relevance score of less than 65%.

Conclusions: Although the relevance of most of the references was within minimal acceptable limits, the methodologic quality was often unacceptable. Because advertisements are an important part of pharmaceutical marketing and education, we suggest that companies develop written standards for their advertisements and monitor their advertisements for adherence to these standards. We also suggest that the Pharmaceutical Advertising Advisory Board develop more stringent guidelines for advertising and that it enforce these guidelines in a consistent, rigorous fashion.

Keywords: Information-Sources, Physicians, Accuracy, Preference, Promotion, Patterns, Adoption, Drugs

? Levy, A.R. and McGregor, M. (1995), How has extracorporeal shock-wave lithotripsy changed the treatment of urinary stones in Quebec? *Canadian Medical Association Journal*, **153** (12), 1729-1736.

Full Text: [1995\Can Med Ass J153, 1729.pdf](1995/Can%20Med%20Ass%20J153,%201729.pdf)

Abstract: Objectives: To determine the number of people who underwent treatment of urinary stones in Quebec before and after the introduction of extracorporeal shock-wave lithotripsy (ESWL) and to determine how the introduction of ESWL influenced resource utilization.

Design: Before-after study; data were obtained from administrative databases and hospital-based cost estimates.

Setting: The 68 acute care hospitals in Quebec in which treatment of urinary stones is undertaken.

Patients: Quebec residents admitted to hospital for treatment of urinary stones between the fiscal years 1984 and 1992.

Outcome measures: Number of people treated for urinary stones per year, total number of procedures per year (including open surgery, percutaneous procedures, retrograde procedures and ESWL), and annual resources (including number of hospital bed-days and direct costs) for treatment of urinary stones used overall and in hospitals with and without ESWL services.

Results: Over the study period the number of people treated for urinary stones increased by 59%. As well, the combined frequency of ESWL and surgery (the two main treatment methods) increased by 107%. These increases were largely due to rates of treatment that grew by 52% among women and by 34% among men. The total number of hospital bed-days decreased by 28%, which reflected shorter hospital stays for ESWL. However, despite this decrease, the total direct annual costs were 7% higher in 1992 than in 1984 because of the increased numbers of people treated and procedures performed. In the three hospitals that offered ESWL the number of hospital bed-days and the direct costs of treating urinary stones increased by 49% and $2.5 million respectively. In the 65 other hospitals these figures decreased by 41% and about $2.9 million respectively.

Conclusions: Because of increased intervention rates the total cost of treating urinary stones has risen since the introduction of ESWL. The introduction of ESWL has also been associated with a shift in the use of resources for treating urinary stones to hospitals with a lithotriptor. The reasons for the increased intervention rates are unknown. However, given the possibility of negative health effects and the increased costs, studies to determine whether the increased rates improve health outcomes are warranted.

Keywords: Percutaneous Nephrolithotomy, Cost-Effectiveness, Urolithiasis, Experience, Calculi

? Goel, V. (1995), Necromancing the stones. *Canadian Medical Association Journal*, **153** (12), 1739-1741.

Full Text: [1995\Can Med Ass J153, 1739.pdf](1995/Can%20Med%20Ass%20J153,%201739.pdf)

Abstract: Since its introduction 15 years ago extracorporeal shock-wave lithotripsy (ESWL) has become a standard treatment for urinary stones. The author comments on the results of Adrian R. Levy and Maurice McGregor’s study of the use of ESWL for urinary stones in Quebec (see pages 1720 to 1736 of this issue). The rapid increase in the use of ESWL that occurred in the first 2 years of the study points to the fact that the application of a new technology is often quickly expanded before thorough assessments of effectiveness and safety have been carried out. New technologies also lead to shifts in cost distribution that must be considered in cost analyses. The author argues that continuing research is needed to document the dissemination of new technologies and points to methodologic concerns that should be addressed to make such research as fruitful as possible.

Keywords: Shock-Wave Lithotripsy, Kidney-Stones

? Marshall, K.G. (1996), Prevention. How much harm? How much benefit? 2. Ten potential pitfalls in determining the clinical significance of benefits. *Canadian Medical Association Journal*, **154** (12), 1837-1843.

Full Text: [1996\Can Med Ass J154, 1837.pdf](1996/Can%20Med%20Ass%20J154,%201837.pdf)

Abstract: A preventive program is only of value if it has proven benefits that outweigh any adverse consequences, unfortunately, determination of the clinical significance of reported benefits is not always easy. The first article of this series discussed the confusion caused by reporting results in terms of relative rates. In this article, 10 other pitfalls that may lead to misunderstanding of the degree of benefits are reviewed. These pitfalls are: the type of outcome chosen (surrogate v. clinically significant), the risk level in the population screened, the interval between the intervention and the benefit, the duration of intervention required to achieve the benefit, the overshadowing of one benefit by another, the application of a benefit for one variant of a disease to another variant, lower benefits in community settings than in clinical trials, publication bias, preferential citation of studies showing beneficial effects and “false-negative” results of studies. These pitfalls are illustrated through examples from the current medical literature.

Keywords: Postmenopausal Estrogen Therapy, Localized Prostatic-Cancer, Coronary Heart-Disease, Physical-Activity, Trials, Complications, Management, Mortality, Level, Risk

? Capen, K. (1996), When patient care is shared, who is the most responsible physician? *Canadian Medical Association Journal*, **154** (6), 885-886.

Full Text: [1996\Can Med Ass J154 885.pdf](1996/Can%20Med%20Ass%20J154%20885.pdf)

Abstract: Ottawa lawyer Karen Capen examines the care of five Ontario physicians who faced charges of professional misconduct after apatient they cared for died in 1988. The investigation, which focused on the concept of “most responsible physician, “ serves as a cautionary tale for all doctors who share the care of a patient with colleagues.

? Davies, D., Langley, J.M. and Speert, D.P. (1996), Rating authors’ contributions to collaborative research: The PICNIC survey of university departments of pediatrics. *Canadian Medical Association Journal*, **155** (7), 877-882.

Full Text: [1996\Can Med Ass J155 877.pdf](1996/Can%20Med%20Ass%20J155%20877.pdf)

Abstract: Objectives: To determine how department chairs in pediatrics rate involvement in medical research and to determine whether faculty deans’ offices have written criteria for evaluating research activity when assessing candidates for promotion or tenure.

Design: Cross-sectional mailed survey and telephone survey.

Setting: Canadian faculties of Medicine.

Participants: Chairs of the 16 Canadian university departments of pediatrics and deans’ offices of the 16 university medical faculties.

Main outcome measure: Weight assigned by department chairs to contributions to published research according to author’s research role and position in list of authors and the method of listing authors.

Results: Fifteen of 16 chairs responded. Twelve submitted a completed survey, two described their institutions’ policies and one responded that the institution had no policy. Eleven reported that faculty members were permitted or requested to indicate research roles on curricula vitae. There was a consensus that all or principal investigators should be listed as authors and that citing the research group as collective author was insufficient. The contribution of first authors was rated highest for articles in which all or principal investigators were listed. The contribution of joint-principal investigators listed as first author was also given a high rating. In the case of collective authorship, the greatest contribution was credited to the principal investigator of the group. Participation of primary investigators in multicentre research was rated as having higher value than participation in single-centre research by seven respondents and as having equal value by four. Only one dean’s office had explicit written criteria for evaluating authorship.

Conclusions: Most departments of pediatrics and medical faculty deans’ offices in Canadian universities have no criteria for assessing the type of contribution made to published research. In view of the trend to use multicentre settings for clinical trials, guidelines for weighting investigators’ contributions are needed.

Keywords: Journals, Trends

Margolese, R.G., Cantin, J., Bouchard, F., Caines, J., Beaulieu, M.D., Little, C.D., Levine, M.N., Mickelson, W.P., McGregor, M., MacFarlane, J.K., McCready, D.R., Shibata, H.R., Ambus, U., Beliveau, N.J., Bottorff, J., Cameron, B., Cormier, R., Frenette, J., Gelmon, K.A., Gordon, P., Grunfeld, E., Hauch, S., Kader, H.A., Knaus, R., McNeil, J., Miller, C., Mirsky, D.J., Morris, F., Premi, J., Snell, L. and Whamond, E. (1998), 1. The palpable breast lump: Information and recommendations to assist decision-making when a breast lump is detected. *Canadian Medical Association Journal*, **158**, S3-S8.

Full Text: [C\Can Med Ass J158, S3.pdf](C/Can%20Med%20Ass%20J158,%20S3.pdf)

Abstract: Objective: To provide information and recommendations for assisting women and their I physicians in making the decisions necessary to establish or exclude the presence of cancer when a lump is felt in the breast.

Evidence: Guidelines are based on a systematic review of published evidence and expert opinion. References were identified through a computerized citation search using MEDLINE (from 1966) and CANCERLIT (from 1985) to January 1996. Nonsystematic review of breast cancer literature continued to January 1997.

Benefits: Exclusion or confirmation of the presence of cancer with the minimum of intervention and delay.

Recommendations:

Investigation of women with a breast lump or suspicious change in breast texture starts with a history, physical examination and usually mammography.

The clinical history should establish how long the lump has been noted, whether any change has been observed and whether there is a history of biopsy or breast cancer. Risk factors for breast cancer should be noted, but their presence or absence should not influence the decision to investigate a lump further.

The physical examination of the breast should aim to identify those features that distinguish malignant from benign lumps.

Mammography can often clarify the nature of the lump and detect clinically occult lesions in either breast.

Fine-needle aspiration can establish whether the lump is solid or cystic. When a tumour is solid, cells can be obtained for cytologic examination.

Ultrasonography is an alternative method to fine-needle aspiration for distinguishing a cyst from a solid tumour.

Whenever reasonable doubt remains as to whether a lump is benign or malignant, a biopsy should be carried out.

When surgical biopsy is used, the aim is to remove the whole lump in one piece along with a surrounding cuff of normal tissue.

Core biopsy, either clinically or image-guided, can usually establish or exclude malignancy, thus reducing the need for surgical biopsy.

Thermography and light scanning are not recommended diagnostic procedures. The value of magnetic resonance imaging is still under investigation. It is nota routine diagnostic procedure at this time.

The choice of procedure should take into account the experience of the diagnostician and availability of the technology in question.

The work-up should be completed expeditiously and the patient kept fully informed throughout.

Even when malignancy is not found, it may be prudent, in some cases, to arrange followup surveillance.

Validation: Guidelines were reviewed and revised by the Writing Committee, expert primary reviewers, secondary reviewers selected from all regions of Canada and by the Steering Committee. The final document reflects a consensus of all these contributors.

Keywords: Fine-Needle Aspiration, Core Biopsy, Cancer, Communication, Management, Carcinoma, Diagnosis, Cytology, Lesions, Health

Margolese, R.G., Beaulieu, M.D., Caines, J.S., Bouchard, F., Olivotto, I.A., Nolan, M.C., Thain, S.K., Levine, M.N., Mickelson, W.P., McGregor, M., Shibata, H.R., Wilkinson, R.H., Agranovich, A.L., Ahmed, D.S., Baird, R.M., Craven, N., Dort, J.C., Grainger, N., Leaghey, S.M., Lohfeld, L., Nolan, E., Norris, B.D., Rebbeck, P.M., Sawka, C.A., Shaw, K. and Smith, P. (1998), Mastectomy or lumpectomy? The choice of operation for clinical stages I and II breast cancer. *Canadian Medical Association Journal*, **158**, S15-S21.

Full Text: [C\Can Med Ass J158, S15.pdf](C/Can%20Med%20Ass%20J158,%20S15.pdf)

Abstract: Objective: To assist women and their physicians in making the most clinically effective and personally acceptable decision regarding the choice of primary surgery for potentially curable breast cancer.

Options: Breast-conserving surgery (BCS; also referred to as lumpectomy or wide local excision) or mastectomy.

Outcomes: Local recurrence, metastasis-free survival, overall survival, cosmetic results.

Evidence: Systematic computerized citation search using MEDLINE (from 1980) and CANCERLIT (from 1985) databases to September 1995. Nonsystematic review of breast cancer literature until January 1997.

Benefits: Minimization of disfigurement offered by BCS.

Harms: The need for radiotherapy and the greater costs associated with BCS.

Recommendations:

For patients with stage I or II breast cancer, BCS followed by radiotherapy is generally recommended. In the absence of special reasons for selecting mastectomy, the choice between BCS and mastectomy can be made according to the patient’s circumstances and personal preferences.

Mastectomy should be considered in the presence of any of the following:

(a) factors that increase the risk of local recurrence such as extensive malignant-type calcifications visible on the mammogram, multiple primary tumours or failure to obtain tumour-free margins;

(b) physical disabilities that preclude lying flat or abducting the arm, preventing the use of radiotherapy;

(c) absolute contraindications for radiotherapy such as pregnancy or previous irradiation of the breast or relative contraindications such as systemic lupus erythematosus or scleroderma;

(d) large tumour size in proportion to breast size;

(e) the patient’s clear preference for mastectomy.

The following factors are not contraindications for BCS: the presence of a centrally located tumour mass, axillary lymph-node involvement or the presence of breast implants.

Before deciding between BCS and mastectomy, the physician must make a full and balanced presentation to the patient concerning the pros and cons of these procedures.

Whenever an open biopsy is performed on the basis of even modest suspicion of carcinoma, the procedure should be, in effect, a lumpectomy, using wide local excision of the intact tumour surrounded by a cuff of tumour-free tissue (by palpation and visual inspection).

The following recommendations should be observed to provide optimum clinical and cosmetic results:

(a) Tumour-involved margins should be revised;

(b) Separate incisions should be used for removal of the primary tumour and for the axillary dissection except when these coincide anatomically;

(c) Radial incisions should not be used except when directly medial or lateral to the nipple;

(d) Drains and approximation sutures should not be used in the breast parenchyma.

Validation: The guidelines were reviewed and revised by a writing committee, expert primary reviewers, secondary reviewers selected from all regions of Canada, and by the Steering Committee. The final document reflects a consensus of all these contributors and has been endorsed by the Canadian Association of Radiation Oncologists.

Keywords: Comparing Total Mastectomy, Extensive Intraductal Component, Surgical Adjuvant Breast, Early Local Recurrence, Radiation-Therapy, Segmental-Mastectomy, Conservative Surgery, Conserving Therapy, Tumor-Excision, Follow-Up

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Full Text: 1998\Can Med Ass J159, 129.pdf

Keywords: Journal, Medical

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Full Text: [C\Can Med Ass J161, 977.pdf](C/Can%20Med%20Ass%20J161,%20977.pdf)

Keywords: Citation

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Full Text: [C\Can Med Ass J161, 979.pdf](C/Can%20Med%20Ass%20J161,%20979.pdf)

Gagnon, R.E., Macnab, A.J. and Gagnon, F.A. (2000), A quantitative ranking of Canada’s research output of original human studies for the decade 1989 to 1998. *Canadian Medical Association Journal*, **162** (1), 37-40.

Full Text: [C\Can Med Ass J162, 37.pdf](C/Can%20Med%20Ass%20J162,%2037.pdf)

Abstract: Background: Since 1987 research articles have been catalogued with the author’s affiliation address in the 40 databases of the Medical Literature Analysis and Retrieval System (MEDLARS) of the National Library of Medicine, Bethesda, Md. The present study was conducted to examine the Canadian entries in MEDLARS to interpret past and future trends and to combine the MEDLARS demographic data with data from other sources to rank Canadian research output of human studies both nationally and internationally.

Methods: The PUBMED Web site of the National Library of Medicine was used to count medical articles archived in MEDLARS and published from Jan. 1, 1989, through Dec. 31, 1998. The articles attributed to Canadian authors were compared by country, province, city, medical school, hospital, article type, journal and medical specialty.

Results: During the study period Canadian authors contributed on average 3% (standard deviation [SD] 0.2%) of the worldwide MEDLARS content each year, which translated to a mean of 11 067 (SD 1037) articles per year; 49% were human studies, of which 13% were clinical or controlled trials, and 55% involved people aged 18 years or less. In total, 68% of the articles were by authors affiliated with Canadian medical schools; those affiliated with the University of Toronto accounted for the greatest number (8604), whereas authors affiliated with McGill University had the greatest rate of annual increase in the quantity published (8%). Over one-third (38%) of the articles appeared in Canadian journals. When counted by specialty, 17% of the articles were by authors with clinical specialties, 5% by those with surgical specialties and 3% by those with laboratory specialties.

Interpretation: The annual rate of increase in research output for Canada was more than 3 times higher than that seen world wide. Canada is now ranked seventh among countries contributing human studies to MEDLARS. The increase indicates that Canada’s medical schools are productive, competitive in making contributions to medical science and are supporting Canadian journals.

Keywords: Impact, Journals, Bias

Garfield, E. (2000), Impact of abstracts and short reports - Response. *Canadian Medical Association Journal*, **162** (4), 489-490.

Full Text: [C\Can Med Ass J162, 489.pdf](C/Can%20Med%20Ass%20J162,%20489.pdf)

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Full Text: [C\Can Med Ass J162, 490.pdf](C/Can%20Med%20Ass%20J162,%20490.pdf)

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Full Text: [C\Can Med Ass J168, 1013.pdf](C/Can%20Med%20Ass%20J168,%201013.pdf)

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Full Text: [C\Can Med Ass J168, 1168.pdf](C/Can%20Med%20Ass%20J168,%201168.pdf)

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Full Text: [C\Can Med Ass J168, 1229.pdf](C/Can%20Med%20Ass%20J168,%201229.pdf)

Abstract: Introduces a series of articles addressing the outbreak of the severe acute respiratory syndrome in a number of countries including Canada in 2003, published in the May 2003 issue of the ‘Canadian Medical Association Journal.’

Maunder, R., Hunter, J., Vincent, L., Bennett, J., Peladeau, N., Leszcz, M., Sadavoy, J., Verhaeghe, L.M., Steinberg, R. and Mazzulli, T. (2003), The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *Canadian Medical Association Journal*, **168** (10), 1245-1251.

Full Text: [C\Can Med Ass J168, 1245.pdf](C/Can%20Med%20Ass%20J168,%201245.pdf)

Abstract: Background: The outbreak of *severe* *acute* *respiratory* *syndrome* (SARS) in Toronto, which began on Mar. 7, 2003, resulted in extraordinary public health and infection control measures. We aimed to describe the psychological and occupational impact of this event within a large hospital in the first 4 weeks of the outbreak and the subsequent administrative and mental health response.

Methods: Two principal authors met with core team members and mental health care providers at Mount Sinai Hospital, Toronto, to compile retrospectively descriptions of the experiences of staff and patients based on informal observation. All authors reviewed and analyzed the descriptions in an iterative process between Apr. 3 and Apr. 13, 2003.

Results: In a 4-week period, 19 individuals developed SARS, including 11 health care workers. The hospital’s response included establishing a leadership command team and a SARS isolation unit, implementing mental health support interventions for patients and staff, overcoming problems with logistics and communication, and overcoming resistance to directives. Patients with SARS reported fear, loneliness, boredom and anger, and they worried about the effects of quarantine and contagion on family members and friends. They experienced anxiety about fever and the effects of insomnia. Staff were adversely affected by fear of contagion and of infecting family, friends and colleagues. Caring for health care workers as patients and colleagues was emotionally difficult. Uncertainty and stigmatization were prominent themes for both staff and patients.

Interpretation: The hospital’s response required clear communication, sensitivity to individual responses to stress, collaboration between disciplines, authoritative leadership and provision of relevant support. The emotional and behavioural reactions of patients and staff are understood to be a normal, adaptive response to stress in the face of an overwhelming event.

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Full Text: [C\Can Med Ass J168, 1259.pdf](C/Can%20Med%20Ass%20J168,%201259.pdf)

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Full Text: [C\Can Med Ass J168, 1265.pdf](C/Can%20Med%20Ass%20J168,%201265.pdf)

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Full Text: [C\Can Med Ass J168, 1289.pdf](C/Can%20Med%20Ass%20J168,%201289.pdf)

Keywords: Intravenous Ribavirin, Hepatitis-C, Safety, Trial

Maskalyk, J. and Hoey, J. (2003), SARS update. *Canadian Medical Association Journal*, **168** (10), 1294-1295.

Full Text: [C\Can Med Ass J168, 1294.pdf](C/Can%20Med%20Ass%20J168,%201294.pdf)

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Full Text: [C\Can Med Ass J168, 1308.pdf](C/Can%20Med%20Ass%20J168,%201308.pdf)

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Full Text: [C\Can Med Ass J168, 1311.pdf](C/Can%20Med%20Ass%20J168,%201311.pdf)

Dwosh, H.A., Hong, H.H.L., Austgarden, D., Herman, S. and Schabas, R. (2003), Identification and containment of an outbreak of SARS in a community hospital. *Canadian Medical Association Journal*, **168** (11), 1415-1420.

Full Text: [C\Can Med Ass J168, 1415.pdf](C/Can%20Med%20Ass%20J168,%201415.pdf)

Abstract: Background: Severe acute respiratory syndrome (SARS) is continuingto spread around the world. All hospitals must be prepared tocare for patients with SARS. Thus, it is important to understandthe transmission of this disease in hospitals and to evaluatemethods for its containment in health care institutions. Wedescribe how we cared for the first 2 patients with SARS admittedto our 419-bed community hospital in Richmond Hill, Ont., andthe response to a SARS outbreak within our institution.

Methods: We collected clinical and epidemiological data aboutpatients and health care workers at our institution who duringa 13-day period had a potential unprotected exposure to 2 patientswhose signs and symptoms were subsequently identified as meetingthe case definition for probable SARS. The index case at ourhospital was a patient who was transferred to our intensivecare unit (ICU) from a referral hospital on Mar. 16, 2003, wherehe had been in close proximity to the son of the individualwith the first reported case of SARS in Toronto. After 13 daysin the ICU, a diagnosis of probable SARS was reached for ourindex case. Immediately upon diagnosis of our index case, respiratoryisolation and barrier precautions were instituted throughoutour hospital and maintained for a period of 10 days, which isthe estimated maximum incubation period reported for this disease.Aggressive surveillance measures among hospital staff, patientsand visitors were also maintained during this time.

Results: During the surveillance period, 15 individuals (10hospital staff, 3 patients and 2 visitors) were identified asmeeting the case definition for probable or suspected SARS, in addition to our index case. All but 1 individual had haddirect contact with a symptomatic patient with SARS during theperiod of unprotected exposure. No additional cases were identifiedafter infection control precautions had been implemented for8 days. No cases of secondary transmission were identified inthe 21 days following the implementation of these precautionsat our institution.

Interpretation: SARS can easily be spread by direct personalcontact in the hospital setting. We found that the implementationof aggressive infection control measures is effective in preventingfurther transmission of this disease.

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Full Text: [C\Can Med Ass J168, 1381.pdf](C/Can%20Med%20Ass%20J168,%201381.pdf)

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Full Text: [2004\Can Med Ass J170, 1925.pdf](2004/Can%20Med%20Ass%20J170,%201925.pdf)

Abstract: Background: Author self-citation is the practice of citing one’s previous publications in a new publication. Its extent is unknown. We studied author self-citation, choosing the major clinical field of diabetes mellitus to represent the general medical literature. Methods: We identified every article about diabetes mellitus in 170 hand-searched clinical journals published in 2000. For every article, we recorded the bibliographic citation an publication type (original or review article) and assessed the methodologic rigour. Citation information was obtained from the ISI Web of Knowledge in April 2003. Results: Of 49 028 articles, 289 were about diabetes mellitus and had citation information. Citation counts ranged from 0 to 347 (median 6, interquartile range [IQR] 2-12). Author self-citation counts ranged from 0 to 16 (median 1, IQR 0-2). Author self-citations accounted for an average of 18% (95% confidence interval [CI] 15%-21%) and a median of 7% (95% CI 5%-11%) of all citations of each publication that was cited at least once (n = 266). Original articles had double the mean proportion of author self-citations compared with review articles (19% v. 9%; median 7% v. 0%, difference 7%, 95% CI 0-10%). Methodologic rigour and review type were not significantly associated with subsequent author self-citation. Interpretation: Nearly one-fifth of all citations to articles about diabetes mellitus in clinical journals in the year 2000 were author self-citations. The frequency of self-citation was not associated with the quality of publications. These findings are likely applicable to the general clinical medicine literature and may have important implications for the assessment of journal or publication importance and the process of scientific discovery.

Keywords: Author, Citation, Citations, Diabetes Mellitus, ISI, Journals, Knowledge, Medicine, Publication, Publications, Self-Citations

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Full Text: [2004\Can Med Ass J170, 1929.pdf](2004/Can%20Med%20Ass%20J170,%201929.pdf)

Keywords: Impact Factor, Journals

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Full Text: [2004\Can Med Ass J171, 1024.pdf](2004/Can%20Med%20Ass%20J171,%201024.pdf)

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Full Text: [2004\Can Med Ass J171, 1024-1.pdf](2004/Can%20Med%20Ass%20J171,%201024-1.pdf)

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Full Text: [2007\Can Med Ass J175, 1389.pdf](2007/Can%20Med%20Ass%20J175,%201389.pdf)

Abstract: We summarized the findings of several studies of ours to compare the quantity and quality of published research from around the world for the years 1995 to 2003. We evaluated the number of articles published and their mean journal impact factor. We also studied the research productivity of various areas adjusted for gross domestic product (GDP) and population. We found that Western Europe leads the world in published research on infectious diseases-microbiology (82 342 articles [38.8%]) and in cardiopulmonary medicine (67 783 articles [39.5%]), whereas the United States ranks first in the fields of preventive medicine, public health and epidemiology both in quantity (23 918 articles [49.1%]) and quality of published papers. However, after adjustments for GDP, Canada ranked first, with the United States and Oceania following closely behind. All of the developing regions had only small research contributions in all of the biomedical fields examined.

Keywords: Analysis, Bibliometric Analysis, Canada, Diseases, Epidemiology, Europe, GDP, Health, Impact, Impact Factor, Medicine, Population, Preventive Medicine, Productivity, Public Health, Quality, Quantity, Research, Research Productivity, Trends, United States

? Stanbrook, M.B., Flegel, K., Sibbald, B., Wooltorton, E., McDonald, N., Attaran, A. and Hebert, P.C. (2007), Congratulations to our colleagues at Open Medicine. *Canadian Medical Association Journal*, **177** (1), 59-61.

Full Text: [2007\Can Med Ass J177, 59.pdf](2007/Can%20Med%20Ass%20J177,%2059.pdf)

Keywords: Bibliometric Analysis

# Title: Canadian Metallurgical Quarterly

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Coetzer, G., Giesekke, E.W. and Guest, R.N. (1997), Hexavalent chromium in the recovery of ferrochromium from slag. *Canadian Metallurgical Quarterly*, **36** (4), 261-268.

Full Text: [C\Can Met Qua36, 261.pdf](C/Can%20Met%20Qua36,%20261.pdf)

Abstract: A successful jigging process has been developed to recover ferrochromium metal from waste dumps. The potential for generating Cr(VI) during this operation has been investigated. The tests conducted indicate that there is no evidence for the continual release of Cr(VI) during the jigging operation. For instance, where Cr(VI) was detected it more likely occurs from the slag than from the metal and could arise either from the partially altered chromite or baghouse dust found on the dump. The removal of Cr(VI) from a synthetic solution containing 40 mgl-1 Cr(VI) was investigated. Reduction with ferrous sulphate followed by filtration or coagulation with lime were effective in removing Cr(VI) from this solution to achieve levels < 0.1 mgl-1, conforming to those stipulated by the World Health Organisation for discharge into lakes and rivers. If necessary, this could be applied to remove Cr(VI) from the jigging-plant effluent. The removal of Cr(VI) by adsorption on coke was also investigated. This is only effective under acidic conditions and does not apply to alkaline jigging-plant effluent. Published by Elsevier Science Ltd. All rights reserved.

Keywords: Removal

? Ibanez, J.P. and Umetsu, Y. (2008), Uptake of Cd2+ from aqueous solutions using protonated dry alginate beads. *Canadian Metallurgical Quarterly*, **47** (1), 45-50.

Full Text: 2008\Can Met Qua47, 45.pdf

Abstract: The use of protonated dry alginate beads for the uptake of cadmium ions from aqueous solutions was studied at 25°C. The uptake of Cd2+ produced a release of protons, for which a molar ratio d[H+]/d[Cd2+] of 2.0 was established. This ion exchange was the mechanism of cadmium uptake which followed a pseudo-second order kinetic model. The uptake was strongly dependent on the solution pH up to a value of 4.5 after which it remained constant. The maximum Cd-uptake was computed in 285.7 mg per gram of alginate beads (dry wt.) at pH 4.5 by the Langmuir adsorption model. A residual concentration of around 0.09 mg/L of Cd2+ which allowed safety discharge of some types of effluents having this heavy metal ion, was reached with a solution initially having 25 mg/L of Cd2+. EPMA-EDX of Cd-loaded beads showed a uniform distribution of the metal ions throughout the structure of the alginate bead, regardless the solution pH.

Keywords: Adsorption, Alginate, Aqueous Solutions, Biomass, Biosorption, Cadmium, Cd2+, Cobalt, Heavy Metal, Heavy-Metals Uptake, Ion Exchange, Ion-Exchange, Kinetic, Langmuir, Mechanism, Metal, Metal Ions, Model, pH, Pseudo-Second Order, Safety, Solution, Structure

? Štrkalj, A., Rađenović, A. and Malina, J. (2011), Use of waste anode dust for sorption of Ni(II) from aqueous solution. *Canadian Metallurgical Quarterly*, **50** (1), 3-9.

Full Text: [2011\Can Met Qua50, 3.pdf](2011/Can%20Met%20Qua50,%203.pdf)

Abstract: This study was aimed at investigating the sorption of Ni(II) ions on anode dust which is an industrial waste material of aluminium production. The effects of various parameters such as the initial pH, contact time, temperature and initial concentration were studied. The thermodynamic parameters were determined. The positive values of enthalpy change ΔH suggested the endothermic nature of the sorption process. The sorption kinetic data could be described well using a pseudo-second-order model and the equilibrium data could be fitted well to the Langmuir and Freundlich isotherm. It can be concluded that the obtained sorption capacity for Ni(II) ions is a good indicator of the anode dust potential for use in an aqueous sorption system.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Biosorption, Chromium, Equilibrium, Equilibrium, Fly-Ash, Freundlich, Freundlich Isotherm, Heavy-Metal Ions, Isotherm, Kinetic, Langmuir, Ni(II), Ni(II) Ions, Nickel, pH, Removal, Sorption, Sorption Isotherms, Thermodynamic, Thermodynamic Parameters, Waste, Waste Anode Dust, Water

# Title: Canadian Psychology-Psychologie Canadienne

Full Journal Title: Canadian Psychology-Psychologie Canadienne

ISO Abbreviated Title: Can. Psychol.-Psychol. Can.

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Language: Multi-Language

Publisher: Canadian Psychol Assoc

Publisher Address: 151 Slater St, Ste 205, Ottawa, Ontario K1P 5H3, Canada

Subject Categories:

Psychology: Impact Factor 0.516, / (2000)

? Endler, N.S. and Edwards, J.M. (1987), The stars revisited - What are the stars of the 1970s doing in the 1980s. *Canadian Psychology-Psychologie Canadienne*, **28** (2), 148-160.

? Evans, D.R. (1997), Health promotion, wellness programs, quality of life and the marketing of psychology. *Canadian Psychology-Psychologie Canadienne*, **38** (1), 1-12.

Abstract: This paper focusses on fifteen years of research into the definition of quality of life and the factors that influence it. The initial phase of the research involving the development of the Quality of Life Questionnaire and the identification of general and specific factors that impact on life quality is considered. As governments and companies seek to reduce health costs, attention has turned to the potential impact of health promotion programs, and wellness programs on health costs. Hence, a second aim of this paper is to discuss the application of the research to health promotion and the development of wellness programs. A strategy to enhance quality of life using the Quality of Life Questionnaire, and group interventions to enhance specific personality characteristics are described. Finally, the current research program is used as a case study to demonstrate some of the factors that contribute to the invisibility of psychology.

Keywords: Of-Life, Dispositional Optimism, Self-Esteem, Care, Questionnaire, Satisfaction, Perspective

# Title: Canadian Respiratory Journal

Full Journal Title: Canadian Respiratory Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liak, C. and Fitzpatrick, M. (2011), Coagulability in obstructive sleep apnea. *Canadian Respiratory Journal*, **18** (6), 338-348.

Full Text: 2011\Can Res J18, 338.pdf

Abstract: BACKGROUND: Obstructive sleep apnea (OSA) is a common disorder that affects both quality of life and cardiovascular health. The causal link between OSA and cardiovascular morbidity/mortality remains elusive. One possible explanation is that repeated episodes of nocturnal hypoxia lead to a hypercoagulable state that predisposes patients to thrombotic events. There is evidence supporting a wide array of hematological changes that affect hemostasis (eg, increased hematocrit, blood viscosity, platelet activation, clotting factors and decreased fibrinolytic activity). OBJECTIVE: To provide a comprehensive review of the current evidence associating OSA with increased coagulability, and to highlight areas for future research. METHODS: Keyword searches in Ovid Medline were used to identify relevant articles; all references in the articles were searched for relevant titles. The Web of Science was used to identify articles citing the relevant articles found using the Ovid Medline search. All original peer-reviewed articles, meta-analyses and systematic reviews regarding the pertinent topics between 1990 and present were selected for review. RESULTS: Hematocrit, blood viscosity, certain clotting factors, tissue factor, platelet activity and whole blood coagulability are increased in patients with OSA, while fibrinolysis is impaired. CONCLUSION: There is considerable evidence that OSA is associated with a procoagulant state. Several factors are involved in the procoagulant state associated with OSA. There is a need for adequately powered clinical studies involving well-matched control groups to address potential confounding variables, and to accurately delineate the individual factors involved in the procoagulant state associated with OSA and their response to treatment.

Keywords: Activation, Blood, Blood-Pressure, C-Reactive Protein, Cardiovascular, Cardiovascular Health, Cardiovascular Risk-Factors, Coagulation, Confounding, Control, Control Groups, Disorder, Hemostasis, Hypercoagulable, Hypoxia, Ischemic-Stroke, Lead, Medline, Myocardial-Infarction, Nasal Cpap Treatment, Obstructive Sleep Apnea, Patients, Plasminogen-Activator Inhibitor-1, Platelet Activation, Positive Airway Pressure, Quality, Quality of Life, Research, Review, Science, Systematic, Systematic Reviews, Topics, Treatment, Venous Thromboembolism, Web of Science

# Title: Canadian Urological Association Journal

Full Journal Title: [Canadian Urological Association Journal](http://www.cuaj.ca/en/past-issues.asp)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hennessey, K., Afshar, K. and MacNeily, A.E. (2009), The top 100 cited articles in urology. *Canadian Urological Association Journal*, **3** (4), 293-302.

Full Text: [2009\Can Uro Ass J3, 293.pdf](2009/Can%20Uro%20Ass%20J3,%20293.pdf)

Abstract: Background: We identified and analyzed the characteristics of the 100 most frequently cited articles published between 1965 and 2007 in journals pertaining to urology and related fields. Methods: We selected 69 of the highest impact urology and sub-specialty journals and 22 of the highest impact general medical and medical research journals from the 2006 edition of journal Citation Reports: Science edition. We identified the 100 most frequently cited urological articles published in these 91 journals using the Science Citation Index Expanded (1965-present). We reviewed and analyzed the articles. Results: The top 100 articles were cited a mean of 629 times (range 418-1435) and published between 1965 and 2003, with 89% published after 1979 and 54% published in the 1990s. Fifteen journals were represented, led by The New England Journal of Medicine (30), The Journal of Urology (22) and Lancet (11). Ninety publications originated from North America (81) or the United Kingdom (9). Johns Hopkins University (13), Harvard University (5), Stanford University (5) and University of California, Los Angeles (5) published the most articles. Five urologists were first authors of 2 or more of the articles. Fifty-six articles reported observational studies. Oncology (51) and transplantation (20) were the most commonly represented urological subfields. Conclusion: These top-cited articles in urology identify topics and authors that contributed to major advances in urology. Observational studies and randomized controlled trials in oncology published in high-impact urological or medical journals constitute the most common type of highly cited publications.

Keywords: Citation, Citation-Classics, Journals, Publications, Research, Science, Transplantation, United Kingdom

# Title: Cancer

Full Journal Title: [Cancer](http://www3.interscience.wiley.com/cgi-bin/jtoc?ID=28741)

ISO Abbreviated Title: Cancer

JCR Abbreviated Title: Cancer

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Issues/Year: 24

Journal Country/Territory: United States

Language: English

Publisher: Wiley-Liss

Publisher Address: Div John Wiley & Sons Inc, 605 Third Ave, New York, NY 10158-0012

Subject Categories:

Oncology: Impact Factor 3.941, 21/114 (2002)

Cavallo, F., Gerber, M., Marubini, E., Richardson, S., Barbieri, A., Costa, A., Decarli, A. and Pujol, H. (1991), Zinc and copper in breast cancer: A joint study in northern Italy and southern France. *Cancer*, **67** (3), 738-745.

Abstract: The relationship between breast cancer and two trace elements, zinc (Zn) and copper (Cu), was investigated by means of an hospital based case-control study at Milan (Italy) and Montpellier (France). Variables concerning dietary intake of Zn and Cu (in Milan) and their blood levels (both in Milan and Montpellier) were measured. Dietary intake, evaluated through a questionnaire of the dietary history type, and blood levels of Zn and Cu were measured in 261 cases and 261 controls. Cu blood level showed a contradictory tendency in the two samples (higher in controls in Milan, higher in cases in Montpellier), which tended to lessen after adjustment for related variables. No odds ratios (OR) in the different quantiles, nor X2 for trend reached statistical significance. A sharp difference was evidenced on the opposite with regard to Zn blood values in cases and controls. In both samples Zn mean values are significantly higher in cases than in controls, and the difference remains significant in the two samples even after adjustment for related variables. The pooled OR computed from the two samples, after adjustment for known risk factors and related variables, reaches in the fourth quartile a value of 9.5 (CI: 4.9-18.2). Dietary intake of the two minerals (measured only in Milan sample) showed no difference between cases and controls, but a stronger relationship between dietary and blood Zn was evidenced in cases with respect to controls. The authors suggest that the higher Zn level in cases might be related with an higher incorporation of Zn in cancer cases and that the same mineral might play a possible role in tumor growth promotion.

Keywords: Containing Superoxide-Dismutase, Cu-Zn Ratio, Serum Zinc, Glutathione-Peroxidase, Ascorbic-Acid, Human-Tissues, Plasma, Growth, Tumor, Benign

? Pelikan, S. and Moskowitz, M. (1993), Effects of lead time, length bias, and false-negative assurance on screening for breast-cancer. *Cancer*, **71** (6), 1998-2005.

Zinn, K.R., Chaudhuri, T.R., Cheng, T.P. Morris, J.S. and Meyer, Jr., W.A. (1994), Production of No-carrier-added 64Cu from zinc metal irradiated under boron shielding. *Cancer*, **73** (3), 774-778.

Abstract: Background. Positron emission tomography offers advantages for radioimmunodiagnosis of cancer but requires radionuclides of appropriate half-life that have high specific activity and high radio-purity. This work was designed to develop a viable method to produce and purify Cu-64, which has high specific activity, for positron emission tomography. Methods. Cu-64 was produced at the University of Missouri Research Reactor by the nuclear reaction, Zn-64 (n, p)Cu-64. Highly pure zinc metal (99.9999%) was irradiated in a specially designed boron nitride lined container, which minimized thermal neutron reactions during irradiation. A new two-step procedure was developed to chemically separate the no-carrier-added Cu-64 from the zinc metal target. Results. Cu-64 recovery for 24 runs averaged 0.393 (±0.007) mCi per milligram of zinc irradiated. The boron-lined irradiation container reduced unwanted zinc radionuclides 14.3-fold. Zinc radionuclides and non-radioactive zinc were separated successfully from the Cu-64. The new separation technique was fast (2 hours total time) and highly efficient for removing the zinc. The zinc separation factor for this technique averaged 8.5×10-8, indicating less than 0.0000085% of the zinc remained after separation. Thus far, the highest Cu-64 specific activity at end of irradiation was 683 Ci/mg Cu, with an average of 512 Ci/mg Cu for the last six analyzed runs. Conclusion. The boron-lined irradiation container has sufficient capacity for 75-fold larger-sized zinc targets (up to 45 g). The new separation technique was excellent for separating Cu-64, which appears to be a radionuclide with great potential for positron emission tomography.

Keywords: (Cu)-C-64, Copper-64, Radionuclide, Radioisotope, Radioimmunodiagnosis, Positron Emission Tomography, Neutron-Activation Analysis

DeNardo, G.L., Kroger, L.A., DeNardo, S.J., Miers, L.A., Salako, Q., Kukis, D.L, Fand, I., Shen, S., Renn, O. and Meares, C.F. (1994), Comparative toxicity studies of yttrium-90 MX-DTPA and 2-IT-BAD conjugated monoclonal antibody (BrE-3). *Cancer*, **73** (3), 1012-1022.

Abstract: Background. BrE-3 is a monoclonal antibody that has promise for imaging and therapy of human adenocarcinoma. Because of observations in therapeutic trials of yttrium-90 (Y-90) escape from radioimmunoconjugates and uptake by the skeleton with resultant bone marrow toxicity, the authors attempted to evaluate the importance of this factor by a comparison of the LD (50) in healthy mice treated with Y-90 that had been chelated with either of two high affinity chelators, methylbenzyldiethylene-triaminepentaacetic acid (MX-DTPA) or bromoacetamidobenzyl-1, 4, 7, 10-tetraazocyclododecane-N, N’, N”, N”‘-tetraacetic acid (BAD). Methods and Results. Bone marrow hematopoietic toxicity was dose-limiting and the source of death for both chelators. The LD (50) for Y-90-BrE-3-MX-DTPA was 220.9 µCi, and that for Y-90-BrE-3-2IT-BAD was 307.8 µCi. Whole-body autoradiography revealed substantially greater uptake of Y-90 in the skeleton when MX-DTPA was used as the chelator. Conclusions. These observations suggest that Y-90 escape to bone is a significant factor in the maximum tolerated dose of radioimmunoconjugate that can be used in therapeutic trials. These results probably underestimate the importance of Y-90 escape since Y-90 in the skeleton of patients is likely to be more significant than in mice because more of the Y-90 energy is absorbed in the marrow of larger species.

Keywords: Antibody, Radioimmunotherapy, Immunoconjugates, Chelates, Y-90, Colorectal-Carcinoma Xenografts, Bifunctional Chelate Techniques, Human Colonic Tumor, Nude-Mice, Metal-Ions, Y-90, Radioimmunotherapy, CO17-1A, Agents, Cancer

Zaloudek, C., Treseler, P.A. and Powell, C.B. (1996), Postarthroplasty histiocytic lymphadenopathy in gynecologic oncology patients: A benign reactive process that clinically may be mistaken for cancer. *Cancer*, **78** (4), 834-844.

Abstract: BACKGROUND. A distinctive histiocytosis occurs in the regional draining lymph nodes after large joint replacements, resulting in lymphadenopathy that may mimic cancer both grossly and microscopically. Postarthroplasty histiocytic lymphadenopathy has most often been observed in males during surgery for prostate cancer.

METHODS. The authors present three examples of postarthroplasty histiocytic lymphadenopathy that occurred in gynecologic oncology patients. We studied the clinical, histologic, and immunohistochemical features of all three cases and the ultrastructure of one of them.

RESULTS. Most involved lymph nodes were enlarged, but histiocytosis was also seen in normal sized lymph nodes. Microscopically, histiocytes with abundant granular cytoplasm were present in the lymph node parenchyma, and, to a lesser extent, in the sinuses. Normal lymph node architecture was variably effaced and the histiocytic infiltrate extended focally into the perinodal tissue. Small, black metal particles were present in the histiocytes in every case. Birefringent polyethylene particles were a prominent finding in all three cases as confirmed by positive modified oil red O staining, and, in one case, by electron microscopy. The histiocytes were strongly immunoreactive for CD68, but immunostains for S100 protein, MAC 387, and cytokeratin were negative.

CONCLUSIONS. Enlargement of the lymph nodes in cancer patients who have had large joint replacements may be due to a benign histiocytosis rather than to metastatic cancer. The histologic features of the lymphadenopathy are distinctive and recognizable in routine histologic preparations. Polyethylene wear particles shed from joint prostheses are the most common substances in the histiocytes and are the most likely cause of the histiocytosis. (C) 1996 American Cancer Society.

Keywords: Hip Prosthesis, Arthroplasty, Polyethylene, Lymph Nodes, Histiocytosis, Lymphadenopathy, Acquired Immunodeficiency Syndrome, Polyethylene Wear Debris, Finger Joint Prostheses, Silicone Lymphadenopathy, Hip-Replacement, Lymph-Nodes, Metal Carcinogenesis, Sinus Histiocytosis, Artificial Joint, Identification

? Akl, E.A., Kamath, G., Yosuico, V., Kim, S.Y., Barba, M., Sperati, F., Cook, D.J. and Schunemann, H.J. (2008), Thromboprophylaxis for patients with cancer and central venous catheters. *Cancer*, **112** (11), 2483-2492.

Abstract: BACKGROUND. Central venous catheter (CVC) placement increases the risk of thrombosis and subsequent death in patients with cancer. The objective of this systematic review was to determine the efficacy and safety of anticoagulation in reducing mortality and thromboembolic events in cancer patients with a CVC. METHODS. The authors searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, and ISI the Web of Science databases. They included randomized controlled trials in patients with cancer comparing unfractionated heparin (UFH), low-molecular-weight heparin (LMWH), vitamin K antagonists, fondaparinux, or ximelagatran with no intervention, placebo, or each other. The standard methods of the Cochrane Collaboration were used for the analyses. RESULTS. of 3986 identified citations we included 9 randomized clinical trials, none of which evaluated fondaparinux or ximelagatran. Heparin therapy (UFH or LMWH) was associated with a trend toward a reduction in symptomatic deep venous thrombosis (DVT) (relative risk (RR), 0.43; 95% confidence interval (95% CI), 0.18-1.06), but there was no statistically significant effect on mortality (RR, 0.74; 95% CI, 0.40-1.36), infection (RR, 0.91; 95% CI, 0.36-2.28), major bleeding (RR, 0.68; 95% CI, 0.10-4.78), or thrombocytopenia (RR, 0.85; 95% CI, 0.49-1.46). The effect of warfarin on symptomatic DVT also was not statistically significant (RR, 0.62; 95% CI, 0.30-1.27). CONCLUSIONS. The balance of benefits and downsides of thromboprophylaxis in cancer patients with CVC are uncertain. Clinicians together with their patients must weigh these factors carefully when making decisions regarding thromboprophylaxis.

Keywords: Anticoagulants, Authors, Balance, Bleeding Complications, Cancer, Central Vein Catheter, Central Venous, Central Venous Catheterization, Citations, Clinical Trials, Cochrane, Collaboration, Continuous-Infusion, Databases, Dose Unfractionated Heparin, Double-Blind, Efficacy, EMBASE, Heparin, Infection, Intervention, ISI, Low-Molecular-Weight, MEDLINE, Mortality, Neoplasms, Prevention, Pulmonary-Embolism, Randomized Clinical Trials, Randomized Controlled Trials, Randomized Controlled-Trial, Relative Risk, Review, Risk, Safety, Science, Systematic, Systematic Review, Therapy, Thromboembolism, Thrombosis, Thrombosis, Trend, Venous Thrombosis, Warfarin, Web of Science

? Nelson, C.J., Lee, J.S., Garnboa, M.C. and Roth, A.J. (2008), Cognitive effects of hormone therapy in men with prostate cancer. *Cancer*, **113** (5), 1097-1106.

Abstract: BACKGROUND. Men who receive androgen-deprivation therapy (ADT) for prostate cancer experience several side effects from this treatment. A few recent Studies have examined the cognitive implications of ADT and how they impact a patient’s treatment decision-making, occupational Pursuits, and quality of life. For this report, the authors explored possible mechanisms for this association, reviewed research in animal studies and aging men, and examined the growing literature focused on the relation between ADT and cognitive functioning in patients with prostate cancer. METHODS. A systematic literature search was conducted using the PUBMED and Information Sciences Institute Web of Knowledge-Web of Science databases to identify relevant Studies that investigated the relation between ADT in men with prostate cancer and its cognitive effects. RESULTS. Testosterone and its derivatives may have an impact on cognition through several mechanisms in the brain, as supported by Studies of animals and in aging men. Studies that researched the impact of ADT on cognition in patients with prostate cancer patients were designed relatively well but suffered from small sample sizes. Between 47% and 69% of men on ADT declined in at least I cognitive area, most commonly in visuospatial abilities and executive functioning. Some Studies reported contradictory results With increased functioning in verbal memory. CONCLUSIONS. There is a strong argument that androgen-ablation therapy is linked to Subtle but significant cognitive declines in men with prostate cancer. The authors believe that clinicians should become aware of this correlation as the use of ADT increases and should inform and monitor patients for this possible side effect of treatment.

Keywords: Adt, Aging, Altered Cognitive Function, Androgen Ablation, Androgen Deprivation Therapy, Authors, Brain, Cancer, Cognition, Databases, Decision Making, Decision-Making, Dihydrotestosterone, Elderly-Men, Estradiol, Healthy Older Men, Impact, Literature, Male Rats, Memory, Occupational, Prostate Cancer, PUBMED, Quality of Life, Quality-of-Life, Research, Science, Serum Testosterone, Sex-Hormones, Systematic, Testosterone, Testosterone Supplementation, Therapy, Treatment, Verbal Memory, Working-Memory Task

? Etzioni, D.A., El-Khoueiry, A.B. and Beart, R.W. (2008), Rates and predictors of chemotherapy use for stage III colon cancer a systematic review. *Cancer*, **113** (12), 3279-3289.

Abstract: Despite consensus regarding the benefits of chemotherapy for stage III colon cancer, multiple reports have found significant variations in rates of use. In the current study, the authors attempted to systematically review reports of the community rates at which chemotherapy is administered for stage III colon cancer in the US, and in so doing plan strategies for improving rates of use. A systematic search strategy was undertaken using MEDLINE, Web of Science, and bibliographies to find reports of the rates at which patients with stage III colon cancer receive chemotherapy. A total of 22 studies published since 1990 were identified, with rates of chemotherapy use ranging from 39% to 71%. Age and comorbidity were found to be the most significant patient factors, but Studies also found racial/ethnic and socioeconomic disparities in the rates of chemotherapy. Patients treated at teaching hospitals did not clearly receive chemotherapy more often. Oncologists and Surgeons who treat a higher volume of colorectal cancer patients were more likely to have chemotherapy initiated in their patients. The authors developed a Conceptual model of the process pathway experienced by patients with stage III colon cancer to demonstrate areas of potential underuse of chemotherapy Nearly half of patients with stage III chemotherapy in the US do not receive chemotherapy. Although many patients are too old or frail to benefit appropriately, for many patients chemotherapy is simply not initiated. Attention needs to be focused on systematic approaches to prevent systems failures that result in underuse. Guidelines regarding chemotherapy use in elderly patients are especially important. Cancer 2008;113:3279-89. (C) 2008 American Cancer Society.

Keywords: Adjuvant Chemotherapy, Adjuvant-Chemotherapy, Age, Attention, Authors, Cancer, Care, Chemotherapy, Colon, Colonic Neoplasms, Colorectal Cancer, Colorectal-Cancer, Comorbidity, Disparities, Elderly, Elderly-Patients, Health Disparities, Hospitals, MEDLINE, Model, Patient, Population, Quality of Healthcare, Race, Ethnicity, Radiation-Therapy, Rectal-Cancer, Review, Science, Strategy, Systematic, Systematic Review, Teaching Hospitals, US, Web of Science

# Title: Cancer Causes & Control

Full Journal Title: [Cancer Causes & Control](http://www.springerlink.com/app/home/journal.asp?wasp=ede3d109da9043a0819a1bd09dbebd9e&referrer=parent&backto=linkingpublicationresults,1:100150,1)

ISO Abbreviated Title: Cancer Causes Control

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Subject Categories:

Oncology: Impact Factor, 2.896, 33/114 (2002)

Public, Environmental & Occupational Health: Impact Factor, 3.044, 5/85

Koivusalo, M., Pukkala, E., Vartiainen, T., Jaakkola, J.J. and Hakulinen, T. (1997), Drinking water chlorination and cancer: A historical cohort study in Finland. *Cancer Causes & Control*, **8** (2), 192-200.

Full Text: [C\Can Cau Con8, 192.pdf](C/Can%20Cau%20Con8,%20192.pdf)

Abstract: Chlorination of water rich in organic material is known to produce a complex mixture of organochlorine compounds, including mutagenic and carcinogenic substances. A historical cohort study of 621,431 persons living in 56 towns in Finland was conducted in order to assess the relation between historical exposure to drinking water mutagenicity and cancer. Exposure to quantity of mutagenicity was calculated on the basis of historical information of raw water quality and water treatment practices using an empirical equation relating mutagenicity and raw water pH, KMnO4 value and chlorine dose. Cancer cases were derived from the population-based Finnish Cancer Registry and follow-up time in the study started in 1970. Age, gender, time period, social class, and urban residence were taken into account in Poisson regression analysis of the observed numbers of cases using expected numbers of cases standardized for age and gender as a basis. Excess risks were calculated using a continuous variable for mutagenicity for 3,000 net rev/l exposure representing an average exposure in a town using chlorinated surface water. After adjustment for confounding, a statistically significant excess risk was observed for women in cancers of the bladder (relative risk [RR] = 1.48, 95 percent confidence interval [CI] = 1.01-2.18), rectum (RR = 1.38, CI = 1.03-1.85), esophagus (RR = 1.90, CI = 1.02-3.52), and breast (RR = 1.11, CI = 1.01-1.22). These results support the magnitude of excess risks for rectal and bladder cancers found in earlier epidemiologic studies on chlorination by-products and give additional information on exposure-response concerning the mutagenic compounds. Nevertheless, due to the public health importance of water chlorination, uncertainty related to the magnitude of observed risks, and the fact that excess risks were observed only for women, the results of the study should be interpreted with caution.

Cantor, K.P. (1997), Drinking water and cancer. *Cancer Causes & Control*, **8** (3), 292-308.

Full Text: [C\Can Cau Con8, 292.pdf](C/Can%20Cau%20Con8,%20292.pdf)

Abstract: Epidemiologic evidence on the relation between contaminants in drinking water and cancer is reviewed. The reviewed studies cover exposure to: disinfection byproducts; nitrate; arsenic and other metals; volatiles and contaminants from hazardous waste sites; asbestiform fibers; radionuclides; and fluoride. Most investigations are ecologic, with some confirmation of elevated risk from individual-based studies. In the case of waterborne arsenic, and possibly chlorination byproducts, there is a consistent but small body of epidemiologic evidence of an association with one or more types of cancer. Nitrate in groundwater has increased greatly over the years, and the demonstration of endogenous nitrosation among highly exposed subjects raises concern of elevated cancer risk. However, the epidemiologic data are not yet sufficient to draw a conclusion. There is a diversity of studies among populations exposed to water contaminated with pesticides, volatile organics, or mixtures from hazardous waste sites. Studies of asbestiform fibers and radionuclides in water are not conclusive, but there are suggested elevations of several cancer sites in highly exposed populations. There is no suggestion that fluoride in drinking water is linked with elevated risk of cancer. As topics for epidemiologic evaluation, drinking water contaminants pose methodologic problems common to studies designed to detect relatively small elevations in risk, with the added challenge of assessing exposures for many years in the past. Nevertheless, epidemiologic assessment is valuable and clearly warranted, given the potential public health impact of small risk elevations among very large exposed populations, and the limitations of toxicologic experiments in assessing carcinogenic risk of complex mixtures or of compounds for which appropriate animal models are not available.

? Colditz, G.A. (1999), Year 2000 Cancer mortality falls in the United States Science Citation Index rises for the journal *Cancer Causes and Control* increases circulation. *Cancer Causes & Control*, **10** (6), 483.

Full Text: [1999\Can Cau Con10, 483.pdf](1999/Can%20Cau%20Con10,%20483.pdf)

Keywords: Citation, Control, Journal, Mortality, Science Citation Index, United States

? Ladeiras-Lopes, R., Pereira, A.K., Nogueira, A., Pinheiro-Torres, T., Pinto, I., Santos-Pereira, R. and Lunet, N. (2008), Smoking and gastric cancer: Systematic review and meta-analysis of cohort studies. *Cancer Causes & Control*, **19** (7), 689-701.

Full Text: 2008\Can Cau Con19, 689.pdf

Abstract: Objective We conducted a systematic review of studies addressing the relation between cigarette smoking and gastric cancer to estimate the magnitude of the association for different levels of exposure and cancer locations. Methods Published cohort, case-cohort, and nested case-control studies were identified through PUBMED, Scopus, and Web of Science searches, from inception to July 2007. Relative risk (RR) estimates referring to the comparison of two categories of exposure (e.g., current smokers vs. never smokers) were combined using a random effects model. Generalized least squares regression was used for trend estimation. Heterogeneity was quantified using the I-2 statistic. Results Forty-two articles were considered for the systematic review. Comparing current smokers with never smokers: the summary RR estimates were 1.62 in males (95% CI: 1.50-1.75; I-2 = 46.0%; 18 studies) and 1.20 in females (95% CI: 1.01-1.43; I-2 = 49.8%; nine studies); the RR increased from 1.3 for the lowest consumptions to 1.7 for the smoking of approximately 30 cigarettes per day in the trend estimation analysis; smoking was significantly associated with both cardia (RR = 1.87; 95% CI: 1.31-2.67; I-2 = 73.2%; nine studies) and non-cardia (RR = 1.60; 95% CI: 1.41-1.80; I-2 = 18.9%; nine studies) cancers. Conclusions Our study provides solid evidence to classify smoking as the most important behavioral risk factor for gastric cancer.

Keywords: 26-Year Follow-Up, Alcohol-Consumption, Analysis, Cancer, Case-Control Studies, Cigarette-Smoking, Cohort Studies, Gastric Cancer, Intestinal Metaplasia, Japanese Population, Male British Doctors, Meta-Analysis, Methods, Model, Nested Case-Control, PUBMED, Review, Risk, Science, Scopus, Smoking, Stomach Neoplasms, Stomach-Cancer, Systematic, Systematic Review, Tobacco Smoking, Trend, United-States Veterans, Web of Science

? Moriarty, C.M., Jensen, J.D. and Stryker, J.E. (2010), Frequently cited sources in cancer news coverage: A content analysis examining the relationship between cancer news content and source citation. *Cancer Causes & Control*, **21** (1), 41-49.

Full Text: [2010\Can Cau Con21, 41.pdf](2010/Can%20Cau%20Con21,%2041.pdf)

Abstract: The media are a frequent and sometimes sole source of cancer information for many people. News coverage of cancer can be influential to cancer-related practices such as prevention or detection behaviors, and sources cited by journalists may be influential in shaping this coverage. A content analysis (n = 3,656 stories) revealed that the most frequently cited sources in cancer news articles-research institutions and medical journals-receive disproportionately more attention compared to the National Cancer Institute (NCI), the American Cancer Society (ACS), and pharmaceutical companies. Research institutions were cited twice as frequently as medical journals, and more than three times as frequently as pharmaceutical companies. Most clinical trial stories were optimistic or neutral in tone, and tone was significantly related to citations of pharmaceutical companies and medical journals. Implications for effects of cancer coverage on behaviors, and the influence of sources such as research institutions and pharmaceutical companies, are discussed.

Keywords: Breast-Cancer, Cancer, Cancer Control, Citation, Citations, Clinical Trial, Content Analysis, Health Research, Information, Journalists, Journals, Media, Media Coverage, Medical, Pharmaceutical Companies, Popular Press, Press Releases, Prevention, Publication Bias, Research, Screening Mammography, Television

? Wilson, J.C., Anderson, L.A., Murray, L.J. and Hughes, C.M. (2011), Non-steroidal anti-inflammatory drug and aspirin use and the risk of head and neck cancer: A systematic review. *Cancer Causes & Control*, **22** (5), 803-810.

Full Text: 2011\Can Cau Con22, 803.pdf

Abstract: Background Use of non-steroidal anti-inflammatory drugs (NSAIDs) has been associated with a reduced risk of several cancers. This is thought to be through the inhibitory action on the cyclooxygenase (COX) enzyme, COX-2. Evidence for NSAIDs preventing head and neck cancer (HNC) is conflicting. We conducted a systematic literature review to investigate the association between NSAID/aspirin use and risk of head and neck cancer (HNC). Methodology MEDLINE, EMBASE, PUBMED, Cochrane Library, and Web of Science were systematically searched using terms for NSAIDs/aspirin, HNC, and observational/intervention study designs to identify studies published by December 2009. Results of 9,268 articles identified, two population-based prescribing database studies and three case-control studies met the selection criteria. The studies investigated different HNC sites. Only one study found a significant protective association of aspirin use with HNC risk (OR 0.75, 95% CI 0.58-0.96), and one showed a significantly increased risk of oral/oropharyngeal cancer with non-low-dose aspirin NSAID use (OR 3.5, 95% CI 1.8-6.7). Many of the studies identified lacked information on important confounding factors. Conclusion No definitive conclusion on the effect of NSAIDs/aspirin on HNC risk was possible. Aspirin may protect against HNC, although further robust large-scale studies are required to clarify any possible association.

Keywords: Aspirin, Cancer, Case-Control Studies, Celecoxib, Cochrane, Cohort, Colorectal-Cancer, Confounding, Cox-2, Cyclooxygenase-2 Expression, Drug, EMBASE, Head And Neck Cancer, Information, Inhibition, Literature, Literature Review, MEDLINE, Methodology, Mortality, Non-Steroidal Antiinflammatory Drugs, Oral Premalignant Lesions, Prevention, PUBMED, Review, Risk, Science, Squamous-Cell Carcinoma, Systematic, Systematic Literature Review, Systematic Review, Upper Aerodigestive Tract, Web of Science

# Title: Cancer Epidemiology

Full Journal Title: Cancer Epidemiology

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Alam, S.S., Cantwell, M.M., Cardwell, C.R., Cook, M.B. and Murray, L.J. (2010), Maternal body mass index and risk of testicular cancer in male offspring: A systematic review and meta-analysis. *Cancer Epidemiology*, **34** (5), 509-515.

Abstract: Objectives: To date a number of studies have examined the association between maternal weight and testicular cancer risk although results have been largely inconsistent. This systematic review and meta-analysis investigated the nature of this association. Methods: Search strategies were conducted in Ovid MEDLINE (1950-2009), EMBASE (1980-2009), Web of Science (1970-2009), and CINAHL (1937-2009) using keywords for maternal weight (BMI) and testicular cancer. Results: The literature search produced 1689 hits from which 63 papers were extracted. Only 7 studies met the pre-defined criteria. Random effects meta-analyses were conducted. The combined unadjusted OR (95% Cl) of testicular cancer in the highest reported category of maternal BMI compared with the moderate maternal BMI was 0.82 (0.65-1.02). The Cochran’s Q P value was 0.82 and the corresponding I(2) was 0%, both indicating very little variability among studies. The combined unadjusted OR (95% Cl) for testicular cancer risk in the lowest reported category of maternal BMI compared to a moderate maternal BMI category was 0.88 (0.65-1.20). The Cochran’s Q P value was 0.05 and the corresponding I(2) was 54%, indicating evidence of statistical heterogeneity. The combined unadjusted OR (95% Cl) of testicular cancer risk per unit increase in maternal BMI was 1.01 (0.97-1.06). The Cochran’s Q test had a P value of 0.05 and the corresponding I(2) was 55% indicating evidence of statistical heterogeneity. Conclusion: This meta-analysis, which included a small number of studies, showed that a higher maternal weight does not increase the risk of testicular cancer in male offspring. Though an inverse association between high maternal BMI and testicular cancer risk was detected, it was not statistically significant. Further primary studies with adjustment for appropriate confounders are required. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Age, Birth-Order, Bmi, Body Mass Index, Cancer, Cohort, Cryptorchidism, Disorders, Epidemiology, Estrogen Exposure, Germ-Cell Cancer, Literature, Maternal, Meta-Analysis, Methods, Obesity, Papers, Parity, Pregnancy, Pregnancy, Primary, Review, Risk, Science, Statistical, Systematic, Systematic Review, Testicular Cancer, Testicular Neoplasms, Variability, Web of Science, Weight

# Title: Cancer Epidemiology Biomarkers & Prevention

Full Journal Title: [Cancer Epidemiology Biomarkers & Prevention](http://cebp.aacrjournals.org/content/by/year)

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Oncology: Impact Factor 4.354, 10/103 (2000); Impact Factor 5.140, 14/114 (2002)

Public, Environmental & Occupational Health: Impact Factor 3.572, 3/85 (1999); Impact Factor 4.354, 2/89 (2000)

? Warner, M.L., Moore, L.E., Smith, M.T., Kalman, D.A., Fanning, E. and Smith, A.H. (1994), Increased micronuclei in exfoliated bladder cells of individuals who chronically ingest arsenic-contaminated water in Nevada. *Cancer Epidemiology Biomarkers & Prevention*, **3** (7), 583-590.

Full Text: [1994\Can Epi Bio Pre3, 583.pdf](1994/Can%20Epi%20Bio%20Pre3,%20583.pdf)

Abstract: It is well established that inorganic arsenic is causally associated with lung cancer via inhalation and skin cancer via ingestion. Epidemiological evidence based on studies in Taiwan suggests that ingestion of inorganic arsenic may also cause other more fatal internal cancers, with the highest relative risks reported for bladder cancer. Here, we have used a biological marker of response, the micronucleus assay in exfoliated bladder cells, to evaluate the possible genotoxic effects of chronic arsenic ingestion on the bladder. The overall objective of this study was to compare the frequency of micronucleated cells in exfoliated bladder and buccal cells between a group of 18 individuals in Nevada who chronically ingested high levels of inorganic arsenic from their well water (average level, 1,312 micrograms/liter) and an individually matched control group with low exposure to arsenic (average level, 16 micrograms/liter). A 1.8-fold increase (90% confidence interval, 1.06-2.99) was observed in the weighted mean frequency of micronucleated bladder cells in the exposed group (2.79 per 1000 cells) compared with the unexposed group (1.57 per 1000 cells). In addition, the frequency of micronucleated bladder cells was positively associated with the urinary concentration of inorganic arsenic plus its methylated metabolites (Spearman correlation = 0.33; P = 0.03). In contrast, there was no increase in micronucleated buccal cells associated with arsenic ingestion (frequency ratio = 1.0; 90% confidence interval, 0.65-1.53). The results of this study provide evidence that chronic ingestion of high levels of inorganic arsenic in drinking water is associated with an increased frequency of micronucleated bladder cells. These findings are consistent with a genotoxic effect of arsenic on bladder cells, but a larger study is needed to confirm them.

Keywords: Disease Endemic Area, Well Water, Malignant Neoplasms, Nuclear Anomalies, Urothelial Cells, Drinking-Water, Buccal Smears, Oral-Mucosa, Cancer Risk, Mutagenicity

? Moore, L.E., Smith, A.H., Hopenhayn Rich, C., Biggs, M.L., Kalman, D.A. and Smith, M.T. (1997), Micronuclei in exfoliated bladder cells among individuals chronically exposed to arsenic in drinking water. *Cancer Epidemiology Biomarkers & Prevention*, **6** (1), 31-36.

Full Text: [1997\Can Epi Bio Pre6, 31.pdf](1997/Can%20Epi%20Bio%20Pre6,%2031.pdf)

Abstract: Inorganic arsenic is an established cause of lung and skin cancer. Epidemiological evidence from Taiwan suggests that arsenic causes more fatal internal cancers, with the highest relative risks reported for bladder cancer. We conducted a cross-sectional biomarker study in a Chilean male population chronically exposed to high (70 subjects) and low (55 subjects) arsenic levels in their drinking water (average concentrations, 600 and 15 micrograms As/liter, respectively). A fluorescent version of the exfoliated bladder cell micronucleus (MN) assay was used employing fluorescence in situ hybridization with a centromeric probe to identify the presence (MN+) or absence (MN-) of whole chromosomes within micronuclei, thereby determining the mechanism of arsenic-induced genotoxicity in vivo. We divided the study population into quintiles by urinary arsenic levels and found an exposure-dependent increase in micronucleated cell prevalence in quintiles 2-4 (urinary arsenic, 54-729 micrograms/liter). The largest increase appeared when quintile 4 was compared to quintile 1 [prevalence ratio, 3.0; 95% confidence interval (CI), 1.9-4.6]. The prevalence of MN+ increased to 3.1-fold in quintile 4 (95% CI, 1.4-6.6), and the prevalence of MN-increased to 7.5-fold in quintile 3 (95% CI, 2.8-20.3), suggesting that chromosome breakage was the major cause of MN formation. Prevalences of total MN, MN+, and MN-returned to baseline levels in quintile 5 (urinary arsenic, 729-1894 micrograms/liter), perhaps due to cytostasis or cytotoxicity. These results add additional weight to the hypothesis that ingesting arsenic-contaminated water enhances bladder cancer risk and suggest that arsenic induces genetic damage to bladder cells at drinking water levels close to the current United States Maximum Contaminant Level of 50 micrograms/liter for arsenic.

Keywords: Aneuploidy-Inducing Agents, In-Situ Hybridization, Human-Lymphocytes, Toxicity, Mucosa

? Hsueh, Y.M., Chiou, H.Y., Huang, Y.L., Wu, W.L., Huang, C.C., Yang, M.H., Lue, L.C., Chen, G.S. and Chen, C.J. (1997), Serum beta-carotene level, arsenic methylation capability, and incidence of skin cancer. *Cancer Epidemiology Biomarkers & Prevention*, **6** (8), 589-596.

Full Text: [1997\Can Epi Bio Pre6, 589.pdf](1997/Can%20Epi%20Bio%20Pre6,%20589.pdf)

Abstract: To elucidate the associations of arsenic-induced skin cancer with serum p-carotene level and arsenic methylation capability, a total of 654 residents of age 30 or older were recruited from three arseniasis-hyperendemic villages in Taiwan and regularly examined for skin lesions during the follow-up period. There were 33 cases affected with newly diagnosed skin cancer during the follow-up, giving an incidence of 14.74 per 1000 person-years. Although most study subjects had stopped consuming high-arsenic artesian well water more than 20 years ago, the risk of skin cancer was found to increase significantly with cumulative arsenic exposure before the cessation of drinking artesian well water in a dose-response relationship. Frozen serum samples collected at the recruitment from newly developed skin cancer cases and matched controls were tested for beta-carotene levels by high-performance liquid chromatography. Frozen urine samples of these subjects were examined by high-performance liquid chromatography to speciate arsenite (AsIII), arsenate (AsV), monomethylarsonic acid (MMA), and dimethylarsinic acid and then quantitated by hydride generator combined with atomic absorption spectrometry. Skin cancer cases had a significantly lower serum level of beta-carotene than matched healthy controls. Although the primary methylation capability indexed by the ratio of MMA/(AsIII + AsV) was greater in cases than in controls, the secondary methylation capability indexed by the ratio of dimethylarsinic acid/MMA was lower in cases than in controls. An elevated proportion of MMA in total urinary arsenic level was associated with an increased risk of skin cancer. Subjects with a cumulative arsenic exposure of greater than or equal to 20.0 mg/liter-year and a proportion of MMA in total urinary arsenic level >26.7% had a multivariate-adjusted odds ratio of developing skin cancer as high as 20.91 (95% confidence interval, 2.63-166.5) compared with those who had a cumulative arsenic exposure of <20.0 mg/liter-year and a MMA percentage of less than or equal to 2 6.7%. Whether the association with capability of inorganic methylation is also applied to cancers of internal organs, including lung, liver, and urinary bladder, remains to be elucidated.

Keywords: Performance Liquid-Chromatography, Multiple Risk-Factors, Artesian Well Water, Malignant Neoplasms, Blackfoot Disease, Alpha-Tocopherol, Drinking-Water, Metabolism, Mice, Mortality

? Moore, L.E., Smith, A.H., Hopenhayn Rich, C., Biggs, M.L., Kalman, D.A. and Smith, M.T. (1997), Decrease in bladder cell micronucleus prevalence after intervention to lower the concentration of arsenic in drinking water. *Cancer Epidemiology Biomarkers & Prevention*, **6** (12), 1051-1056.

Full Text: [1997\Can Epi Bio Pre6, 1051.pdf](1997/Can%20Epi%20Bio%20Pre6,%201051.pdf)

Abstract: Epidemiological studies performed in Taiwan, Argentina, and Chile suggest that ingestion of arsenic (As) may cause bladder cancer. Because of these findings, we previously investigated the relationship between As ingestion and genetic damage to the urothelium in two cross-sectional biomarker studies, one in Nevada and one in Chile. In both studies, we found that increased levels of micronucleated cells (MNCs) in exfoliated bladder cells were associated with elevated concentrations of As in drinking water, suggesting that As induces genetic damage to bladder cells. To further investigate this relationship, we conducted an intervention study in a subset of highly exposed men (n = 34) from the cross-sectional study in Chile. Subjects whose usual source of water contained about 600 micrograms/liter As were supplied with water lower in As (45 micrograms/liter) for 8 weeks, allowing ample opportunity for renewal and exfoliation of bladder epithelial cells. Mean urinary As levels decreased during the intervention from 742 to 225 micrograms/liter. Bladder MNC prevalence also decreased from 2.63 MNCs/1000 cells preintervention to 1.79 MNCs/1000 cells postintervention (P < 0.05). When the analysis was limited to individuals previously having subcytotoxic urinary As levels (< 700 micrograms/liter), the change between pre-and postintervention MNC was more pronounced: the level decreased from 3.54 to 1.47 MNCs/1000 cells, respectively (P = 0.002). Among smokers, MNC prevalences decreased from 4.45 MNCs/1000 cells preintervention to 1.44 MNCs/1000 cells postintervention (P = 0.002). Among nonsmokers, the decrease was much smaller: 2.04 MNCs/1000 cells preintervention to 1.90 MNCs/1000 cells postintervention (P = 0.25), suggesting that smoker’s bladder cells could be more susceptible to genotoxic damage caused by As. The reduction in bladder MNC prevalence with reduction in As intake provides further evidence that As is genotoxic to bladder cells.

Keywords: In-Situ Hybridization, Human-Lymphocytes, Urothelial Cells, Exfoliated Cells, Beta-Carotene, Well Water, Vitamin-A, Methylation, Damage, Aneuploidy

Yu, R.C., Hsu, K.H., Chen, C.J. and Froines, J.R. (2000), Arsenic methylation capacity and skin cancer. *Cancer Epidemiology Biomarkers & Prevention*, **9** (11), 1259-1262.

Full Text: [C\Can Epi Bio Pre9, 1259.pdf](C/Can%20Epi%20Bio%20Pre9,%201259.pdf)

Abstract: Chronic ingestion of arsenic from drinking water is associated with the occurrence of skin cancer. To clarify the role of arsenic methylation capacity in the development of arsenic-associated skin lesions, an epidemiological case-control study was conducted in the southwestern region of Taiwan, in which 26 skin disorder patients were matched with control subjects. The objective of this study was to determine whether arsenic methylation capacity of patients with skin disorders differed from that of matched controls. Both cases and controls had been exposed to similar high concentrations of arsenic in drinking water. Results indicated that skin lesion cases had higher percents of inorganic arsenic (InAs, 13.1±3.7%), methylarsonic acid (MMA, 16.4±3.2%), lower percent of dimethylarsinic acid DMA, 70.5±5.8%), and higher ratio of MMA to DMA (MMA/ DMA, 0.24±0.06) than matched controls (InAs: 11.43±2.1%; MMA: 14.6±2.6%; DMA: 73.9±3.3%; MMA/ DMA: 0.20±0.04), Individuals with a higher percentage of MMA (>15.5%) had an odds ratio of developing skin disorder 5.5 times (95% confidence interval, 1.22-24.81) higher than those having a lower percentage of MMA, This association was not confounded by hepatitis B surface antigen, cigarette smoking, or alcohol and tea consumption, It is concluded that arsenic biotransformation including methylation capacity may have a role in the development of arsenic-induced skin disorders.

Keywords: Drinking-Water, Well Water, Malignant Neoplasms, Urinary-Excretion, Metabolites, Glutathione, Hypothesis, Expression, Residents, Mortality

? Ley, C., Mohar, A., Guarner, J., Herrera-Goepfert, R., Figueroa, L.S., Halperin, D., Johnstone, I. and Parsonnet, J. (2004), *Helicobacter pylori* eradication and gastric preneoplastic conditions: A randomized, double-blind, placebo-controlled trial. *Cancer Epidemiology Biomarkers & Prevention*, **13** (1), 4-10.

Full Text: [2004\Can Epi Bio Pre13, 4.pdf](2004/Can%20Epi%20Bio%20Pre13,%204.pdf)

Abstract: Helicobacter pylori causes gastric adenocarcinoma; whether treatment of H. pylori infection prevents this cancer remains unknown. In a randomized, double-blind, placebo-controlled trial of H. pylori eradication, we determined whether treatment for H. pylori decreases gastric cancer risk, using preneoplastic conditions as surrogate markers. A total of 248 healthy volunteers (age >40 years) randomly received H. pylori treatment (omeprazole, amoxicillin, clarythromycin; n = 122) or matched placebo (n = 126) for 1 week. Endoscopy was performed at baseline and at 6 weeks and 1 year. Seven biopsies from each endoscopy were reviewed by two pathologists using the revised Sydney classification. Outcome measures were both a consensus “worst biopsy” diagnosis and a weighted index score that incorporated degrees of severity of preneoplasia from all biopsies. We compared change in these outcomes over time between the two treatment groups. H. pylori cure rates for compliant subjects in the treatment arm were 79.2% and 75.7% at 6 weeks and 1 year, respectively. No statistically significant change in the worst biopsy diagnosis was observed from 6 weeks to 1 year between placebo and treated subjects (for improvement/worsening, placebo, 19.4%/10.5%; treatment, 22.5%/8.3%; P = 0.74). Change in index score was favorably greater in treatment compared with placebo subjects (intention-to-treat analysis, P = 0.03); this finding was particularly evident in the antrum. H. pylori eradication gave more favorable gastric histopathologies over 1 year than no treatment.

Keywords: Classification, Follow-Up, Groups, Helicobacter Pylori, High-Risk, Infection, Intestinal Metaplasia, Natural-History, Population, Precancerous Lesions, Quantitative Assessment, Stomach-Cancer, Treatment

? Gandini, S., Lowenfels, A.B., Jaffee, E.M., Armstrong, T.D. and Maisonneuve, P. (2005), Allergies and the risk of pancreatic cancer: A meta-analysis with review of epidemiology and biological mechanisms. *Cancer Epidemiology Biomarkers & Prevention*, **14** (8), 1908-1916.

Full Text: 2005\Can Epi Bio Pre14, 1908.pdf

Abstract: Previous reports suggest that allergic disorders may protect against various types of cancer, but the association between history of allergy and pancreatic cancer risk has not been well studied. We did a systematic review and meta-analysis of published studies to evaluate the association of any type, and specific types, of allergy and the risk of pancreatic cancer. We did a comprehensive literature search using MEDLINE, PUBMED, and the ISI Web of Science databases to identify potential relevant case-control and cohort studies. Pooled relative risks (RR) and 95% confidence intervals (95% CI) were calculated using the fixed- and random-effects model. Fourteen population-based studies (4 cohort and 10 case-control studies) with a total of 3,040 pancreatic cancer cases fulfilled our inclusion criteria. A history of allergy was associated with a reduced risk of pancreatic cancer (RR, 0.82; 95% CI, 0.68-0.99). The risk reduction was stronger for allergies related to atopy MR, 0.71; 95% Cl, 0.64-0.80), but not for asthma (RR, 1.01; 95% Cl, 0.77-1.31). There was no association between allergies related to food or drugs and pancreatic cancer (RR, 1.08; 95% CI, 0.74-1.58). Overall, there was no evidence of publication bias. Allergies, in particular those related to atopy, seem to be associated with a decreased risk of pancreatic cancer. The hyperactive immune system of allergic individuals may, therefore, in some way lead to increased surveillance and protect against pancreatic cancer development.

Keywords: Acute Lymphoblastic-Leukemia, Airway Inflammation, Asthma, Bias, Cancer, Case-Control Studies, Cd8(+) T-Cells, Cohort Studies, Confidence Intervals, Databases, Development, Diabetes-Mellitus, Epidemiology, Gamma-Delta, History, ISI, Lead, Literature, MEDLINE, Meta-Analysis, Model, Pancreatic Cancer, Past Medical History, Publication, Publication Bias, Review, Risk, Risk Reduction, Science, Surveillance, Systematic, Systematic Review, Systematic Reviews, Tumor-Cells, United-States, Web of Science

? Kubo, A. and Corley, D.A. (2006), Body mass index and adenocarcinomas of the esophagus or gastric cardia: A systematic review and meta-analysis. *Cancer Epidemiology Biomarkers & Prevention*, **15** (5), 872-878.

Full Text: 2006\Can Epi Bio Pre15, 872.pdf

Abstract: Background: The incidence of esophageal adenocarcinoma has increased markedly in recent decades in many countries. Obesity is a potential risk factor, although the results of individual studies differ. We did a systematic review and statistical synthesis of studies that evaluated the association between body mass index (BMI) and the risk of esophageal adenocarcinorna or the adjacent gastric cardia adenocarcinoma. Methods: We identified potential studies using MEDLINE, the Web of Science database, a manual review of the literature and expert bibliographies. Studies were included if they reported (a) a measure of body mass; (b) the occurrence of esophageal or cardia adenocarcinorna diagnosis; and (c) a relative risk or odds ratio (OR) with confidence intervals (CI) or provided sufficient data to permit their calculation. Results: We identified 14 studies (2 cohort, 12 case-control; 2,488 esophageal and 2,509 cardia adenocarcinomas). A high BMI (> 25) was associated with an increased risk of esophageal adenocarcinoma (males, OR, 2.2; 95% CI, 1.7-2.7; females, OR, 2.0; 95% CI, 1.4-2.9). Higher levels of BMI were associated with increased risk (overweight males, OR, 1.8; 95% CI, 1.5-2.2; obese males, OR, 2.4; 95% CI, 1.9-3.2). The overall associations with cardia cancer were heterogeneous, although stratification by study location provided homogeneous results for populations from the United States or Europe. A high BMI was weakly associated with the risk of cardia adenocarcinoma (OR, 1.5; 95% CI, 1.3-1.8; P-heterogeneity = 0.38). Conclusions: Pooled results from observational studies support a positive association between high BMI and the risk for esophageal and possibly for cardia adenocarcinoma.

Keywords: Black-Men, Bmi, Body Mass Index, Cancer, Cancer Incidence, Cardia Adenocarcinoma, Confidence Intervals, Controlled Clinical-Trials, Diagnosis, Distal Stomach, Europe, Gastroesophageal-Reflux, Literature, Meta-Analysis, Methods, Nested Case-Control, Obesity, Observational Studies, Overweight, Ratio, Regional Variation, Relative Risk, Review, Rising Incidence, Risk, Risk-Factors, Science, Statistical, Systematic, Systematic Review, United-States, Web of Science

? Olsen, C.M., Bain, C.J., Jordan, S.J., Nagle, C.M., Green, A.C., Whiteman, D.C., Webb, P.M. and Australian Ovarian Cancer Study Group (2007), Recreational physical activity and epithelial ovarian cancer: A case-control study, systematic review, and meta-analysis. *Cancer Epidemiology Biomarkers & Prevention*, **16** (11), 2321-2330.

Full Text: [2007\Can Epi Bio Pre16, 2321.pdf](2007/Can%20Epi%20Bio%20Pre16,%202321.pdf)

Abstract: It remains unclear whether physical activity is associated with epithelial ovarian cancer risk. We therefore examined the association between recreational physical activity and risk of ovarian cancer in a national population-based case-control study in Australia. We also systematically reviewed all the available evidence linking physical activity with ovarian cancer to provide the best summary estimate of the association. The case-control study included women ages 18 to 79 years with a new diagnosis of invasive (n = 1,269) or borderline (n = 311) epithelial ovarian cancer identified through a network of clinics, physicians, and state cancer registries throughout Australia. Controls (n = 1,509) were randomly selected from the national electoral roll and were frequency matched to cases by age and state. For the systematic review, we identified eligible studies using Medline, the ISI Science Citation Index, and manual review of retrieved references, and included all case-control or cohort studies that permitted assessment of an association between physical activity (recreational/occupational/sedentary behavior) and histologically confirmed ovarian cancer. Meta-analysis was restricted to the subset of these studies that reported on recreational physical activity. In our case-control study, we observed weakly inverse or null associations between recreational physical activity and risk of epithelial ovarian cancer overall. There was no evidence that the effects varied by tumor behavior or histologic subtype. Twelve studies were included in the meta-analysis, which gave summary estimates of 0.79 (95% confidence interval, 0.70-0.85) for case-control studies and 0.81 (95% confidence interval, 0.57-1.17) for cohort studies for the risk of ovarian cancer associated with highest versus lowest levels of recreational physical activity. Thus, pooled results from observational studies suggest that a modest inverse association exists between level of recreational physical activity and the risk of ovarian cancer.

Keywords: Age, Assessment, Association, Australia, Behavior, Borderline, Breast-Cancer, Cancer, Case-Control, Case-Control Studies, Case-Control Study, Circulating Levels, Citation, Cohort, Confidence, Diagnosis, Estimates, Evidence, Exercise, Follow-up, Growth-Factor-I, Interval, Invasive, ISI, Large Cohort, Meta-Analysis, Metaanalysis, Network, NOV, Observational, Observational Studies, Ovarian Cancer, Physical, Physical Activity, Physicians, Population Based, Population-Based, Postmenopausal Women, Prostate-Cancer, Publication Bias, References, Registries, Review, Risk, Risk-Factors, Science, Science Citation Index, State, Systematic Review, Tumor, Women

? Lynch, B.M. (2010), Sedentary behavior and cancer: A systematic review of the literature and proposed biological mechanisms. *Cancer Epidemiology Biomarkers & Prevention*, **19** (11), 2691-2709.

Full Text: 2010\Can Epi Bio Pre19, 2691.pdf

Abstract: Background: Sedentary behavior (prolonged sitting or reclining characterized by low energy expenditure) is associated with adverse cardiometabolic profiles and premature cardiovascular mortality. Less is known for cancer risk. The purpose of this review is to evaluate the research on sedentary behavior and cancer, to summarize possible biological pathways that may underlie these associations, and to propose an agenda for future research. Methods: Articles pertaining to sedentary behavior and (a) cancer outcomes and (b) mechanisms that may underlie the associations between sedentary behavior and cancer were retrieved using Ovid and Web of Science databases. Results: The literature review identified 18 articles pertaining to sedentary behavior and cancer risk, or to sedentary behavior and health outcomes in cancer survivors. Ten of these studies found statistically significant, positive associations between sedentary behavior and cancer outcomes. Sedentary behavior was associated with increased colorectal, endometrial, ovarian, and prostate cancer risk; cancer mortality in women; and weight gain in colorectal cancer survivors. The review of the literature on sedentary behavior and biological pathways supported the hypothesized role of adiposity and metabolic dysfunction as mechanisms operant in the association between sedentary behavior and cancer. Conclusions: Sedentary behavior is ubiquitous in contemporary society; its role in relation to cancer risk should be a research priority. Improving conceptualization and measurement of sedentary behavior is necessary to enhance validity of future work. Impact: Reducing sedentary behavior may be a viable new cancer control strategy. Cancer Epidemiol Biomarkers Prev; 19(11); 2691-709. (C) 2010 AACR.

Keywords: Adiposity, Articles, Body-Mass Index, Breast-Cancer, Cancer, Cardiovascular, Cardiovascular-Disease Risk, Colorectal Cancer, Control, Databases, Growth-Factor-I, Health Outcomes, Impact, Intensity Physical-Activity, Life-Style Factors, Literature, Literature Review, Measurement, Methods, Mortality, Nih-Aarp Diet, Outcomes, Prostate Cancer, Research, Research Priority, Review, Risk, Science, Sitting Time, Strategy, Systematic, Systematic Review, Television Viewing Time, Validity, Vitamin-D Status, Web of Science, Women

# Title: Cancer Genetics and Cytogenetics

Full Journal Title: [Cancer Genetics and Cytogenetics](http://www.sciencedirect.com/science/journal/01654608)

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Genetics & Heredity: Impact Factor 1.529, / (2001)

Hecht, F., Hecht, B.K. and Sandberg, A.A. (1998), The journal “Impact Factor”: A misnamed, misleading, misused measure. *Cancer Genetics and Cytogenetics*, **104** (2), 77-81.

Full Text: [C\Can Gen Cyt104, 77.pdf](C/Can%20Gen%20Cyt104,%2077.pdf)

Abstract: The Institute for Scientific Information (ISI), a database publishing company that publishes Current Contents and Science Citation Index, has devised and promulgated what it terms the journal “impact factor. “ ISI describes this factor as a “measure of the frequency with which the ‘average article’ in a journal has been cited in a particular year.” The factor is a ratio between citations and recent citable published items calculated by dividing the number of all current citations of items published in a journal during the preceding 2 years by the number of articles published in those 2 years by that journal. What, if anything, is wrong with the “impact factor”? There is absolutely nothing incorrect with the calculation of the ratio itself. However, the “impact factor” is misnamed and misleading. Being misnamed and misleading, the “impact factor” has been misused. It is being held out as a measure of the importance of a specific journal article and the journal in which the article appeared. By extension, the “impact factor” is also being misused to gauge the relative importance of individual researchers, research programs, and even the institution hosting the research. We recommend that the term “impact factor” be abolished and that this measure be renamed in keeping with its actual role, that merely of a time-specific “citation rate index” and nothing more. What is currently called the “impact factor” should not be misused to evaluate journals or to validate the scientific relevance of a particular researcher or research program, especially in decisions regarding employment, funding, and tenure.

# Title: Cancer Immunology Immunotherapy

Full Journal Title: Cancer Immunology Immunotherapy

ISO Abbreviated Title: Cancer Immunol. Immunother.

JCR Abbreviated Title: Cancer Immunol Immun

ISSN: 0340-7004

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Oncology Immunology: Impact Factor

? Fagerberg, J. Frodin, J.E., Wigzell, H. and Mellstedt, H. (1993), Induction of an immune network cascade in cancer-patients treated with monoclonal-antibodies (Ab (1)). 1. May induction of Ab (1)-reactive T-cells and anti-anti-idiotypic antibodies (Ab (3)) lead to tumor-regression after MAb therapy. *Cancer Immunology Immunotherapy*, **37** (4), 264-270.

# Title: Cancer Investigation

Full Journal Title: Cancer Investigation

ISO Abbreviated Title: Cancer Invest.

JCR Abbreviated Title: Cancer Invest

ISSN: 0735-7907

Issues/Year: 8

Journal Country/Territory: United States

Language: English

Publisher: Marcel Dekker Inc

Publisher Address: 270 Madison Ave, New York, NY 10016

Subject Categories:

Oncology: Impact Factor 1.850, 62/114 (2002)

? Huizing, M.T., Misser, V.H.S., Pieters, R.C., Huinink, W.W.T., Veenhof, C.H.N., Vermorken, J.B., Pinedo, H.M. and Beijnen, J.H. (1995), Taxanes: A new class of antitumor agents. *Cancer Investigation*, **13** (4) 381-404.

Full Text: 1995\Can Inv13, 381.pdf

Abstract: Taxanes belong to a new group of antineoplastic agents with a novel mechanism of action for a cytotoxic drug. They promote microtubule assembly and stabilize the microtubules. Paclitaxel, the first agent in this group to become available, was isolated from the Pacific yew, Taxus brevifolia, in 1971. In preclinical and clinical studies, paclitaxel and its semisynthetic analog docetaxel exhibit significant antitumor activity. This review deals with the physicochemical properties, pharmacology, and results of preclinical and clinical trials of the taxanes.

Keywords: Phase-I Trial, Colony-Stimulating Factor, Taxol-Induced Neuropathy, 6-Hour Intravenous-Infusion, Cooperative-Oncology-Group, Metastatic Breast-Cancer, Water-Soluble Prodrugs, Cell Lung-Cancer, Every 21 Days, Ovarian-Cancer

? Steinmaus, C., Moore, L., Hopenhayn Rich, C., Biggs, M.L. and Smith, A.H. (2000), Arsenic in drinking water and bladder cancer. *Cancer Investigation*, **18** (2), 174-182.

Full Text: 2000\Can Inv18, 174.pdf

Keywords: Disease Endemic Area, Artesian Well Water, Malignant Neoplasms, Blackfoot Disease, Risk Assessment, Internal Cancers, Skin-Cancer, Taiwan, Methylation, Glutathione

? Sparber, A., Ford, D. and Kvochak, P.A. (2004), National Institutes of Health’s Clinical Center sets new policy on use of herbal and other alternative supplements by patients enrolled in clinical trials. *Cancer Investigation*, **22** (1), 132-137.

Full Text: [2004\Can Inv22, 132.pdf](2004/Can%20Inv22,%20132.pdf)

Abstract: The nationwide concern over the escalating use of herbal and other alternative dietary supplements is prompting a call for action in health care organizations. Not only is there mounting evidence to support a strong concern for patient safety, but the use of these products by people participating in biomedical research protocols has an added impact on the integrity of the research design and data gathering. These issues are of increasing concern to the National Institutes of Health’s hospital for. biomedical research, the Warren Grant Magnuson Clinical Center. Surveys completed in 2000 showed that 25-45% of Clinical Center patients reported taking herbal and other alternative dietary supplements. In 2001, the Clinical Center moved forward to develop and implement a policy to guide hospital staff in the management of patient use of herbal and alternative supplements. The policy established the requirement for all patients to be screened for supplement use upon admission or outpatient visit. Continued use of supplement products during hospitalization and/or outpatient enrollment on protocol require a physician’s authorizing order. The implementation of this policy has increased awareness and provided an important step forward in protecting patient safety and preserving the scientific. integrity of the research at the NIH’s Clinical Center.

Keywords: Adults, Alternative, Awareness, Biomedical, Biomedical Research, Cancer, Care, Clinical Trials, Design, Dietary Supplements, Health Care, Herbal, Hospital, Hospitalization, Impact, Management, Medicine, Patients, Policy, Protocol, Research, Research Design, Safety, St Johns Wort, Supplements, Therapies

# Title: Cancer Journal

Full Journal Title: Cancer Journal

ISO Abbreviated Title: Cancer J.

JCR Abbreviated Title: Cancer J

ISSN: 0765-7846

Issues/Year: 6

Journal Country/Territory: France

Language: Multi-Language

Publisher: Assoc Developpement Communication Cancerologique

Publisher Address: Cancer Journal, 7 Rue Guy Moquet, BP 8, 94801 Villejuif, France

Subject Categories:

Oncology: Impact Factor 2.422, 44/114 (2002)

? Nowak, D. and Drzewoski, J. (1996), Anthracycline-induced oxidative stress: Its role in the development of cardiac damage. *Cancer Journal*, **9** (6), 296-303.

Keywords: Anthracyclines, Doxorubicin, Oxidative Stress, Free Radicals, Cardiac Damage, Cardiac Toxicity, Antioxidants, Iron Chelators, Lipid Peroxidation, Advanced Breast-Cancer, Doxorubicin Cardiotoxicity, Free-Radicals, ICRF-187, Adriamycin, Heart, Women, Toxicity, Ambroxol, Invitro

# Title: Cancer Letters

Full Journal Title: [Cancer Letters](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=4992&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=815e641cb010fb9dc6eb8da33452cfa2)

ISO Abbreviated Title: Cancer Lett.

JCR Abbreviated Title: Cancer Lett

ISSN: 0304-3835

Issues/Year: 20

Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Sci Ireland Ltd

Publisher Address: Customer Relations Manager, Bay 15, Shannon Industrial Estate Co, Clare, IR

Subject Categories:

Oncology: Impact Factor 1.517, 58/103 (2000); Impact Factor 2.346, 46/114 (2002); Impact Factor 3.049, 50/123 (2005)

Grimmer, G. and Böhnke, H. (1975), Profile analysis of polycyclic aromatic hydrocarbons and metal content in sediment layers of a lake. *Cancer Letters*, **1** (2), 75-83.

Full Text: [C\Can Let1, 75.pdf](C/Can%20Let1,%2075.pdf)

Abstract: The question is investigated whether polycyclic aromatic hydrocarbons (PAH) in the annual sediment layers of a lake mainly result from air dust pollution. Sample layers taken from drilling cores going back to 1915 show no significant differences at the forest shore (no buildings) during this period. In contrast, samples taken from a built-up area of the shore (with a highway and a main railway line) show today 5 times the amount of PAH compared with 1915. The same trend is observed in the content of Zn, whereas Pb, Fe, Cr, Ni, Cu and Mn levels are constant. Identification or characterization of PAH was accomplished by comparison of the retention times and mass spectrometry of authentic compounds. Sixty-four PAH are described. The results indicate that the burden of carcinogenic PAH air pollutants has increased 5-fold from 1915-1970.

? Yahagi, T., Degawa, M., Seino, Y., Matsushima, T., Nagao, M., Sugimura, T. and Hashimoto, Y. (1975), Mutagenicity of carcinogenic azo dyes and their derivatives. *Cancer Letters*, **1** (2), 91-96.

Full Text: [1960-80\Can Let1, 91.pdf](1960-80/Can%20Let1,%2091.pdf)

Abstract: The mutagenicity of N,N-dimethyl-4-aminoazobenzene and N-methyl-4-aminoazobenzene and their derivatives was shown on *Salmonella typhimurium* TA100 and TA98. S-9 Mix, obtained from rat liver after injection of polychlorinated biphenyl, was obligatory for their mutagenic action. N-Acetoxy-N-methyl-4-aminoazobenzene and N-benzoyloxy-N-methyl-4-aminoazobenzene and their 4’-methoxycarbonyl derivatives were also mutagenic on TA100 and TA98 and did not require metabolic activation by S-9 Mix. It is suggested that the carcinogenic effects of azo dyes may involve modification of DNA.

Xia, L.W., Liang, S.X., Jiang, J.W., Zhou. X.J. and Li, J. (1988), Trace element content in drinking water of nasopharyngeal carcinoma patients. *Cancer Letters*, **41** (1), 91-97.

Full Text: [C\Can Let41, 91.pdf](C/Can%20Let41,%2091.pdf)

Abstract: Chinese in the Xiangxi region of Hunan province in China have a high incidence of nasopharyngeal carcinoma (NPC). For analyzing the relation between NPC and trace elements, the concentrations of 7 trace elements in drinking water (well water) of high-and low-incidence areas were measured (75 samples). The results showed that the concentrations of Ni, Zn and Cd in drinking water of high-incidence areas were significantly higher than those in low-incidence areas. Especially, the Ni level in drinking water had a significant positive correlation with NPC mortality. These observations are consistent with earlier studies. We also found a highly positive correlation between Ni/pH value in drinking water and NPC mortality. This suggests that only considering the ion concentration in drinking water is not enough, we should also pay attention to the pH of the drinking water when we study the relation between NPC and trace elements. Because the pH of the medium can strongly affect trace element chemical characteristics and its metabolic state in living systems, the M/pH (M, metal concentration) may be an important factor worthy of further research.

Panandiker, A., Fernandes, C., Rao, T.K. and Rao, K.V. (1993), Morphological transformation of Syrian hamster embryo cells in primary culture by Malachite Green correlates well with the evidence for formation of reactive free radicals. *Cancer Letters*, **74** (1-2), 31-36.

Full Text: [C\Can Let74, 31.pdf](C/Can%20Let74,%2031.pdf)

Abstract: Malachite green (MG) (green crystals with metallic luster and very soluble in water) is highly cytotoxic to mammalian cells and also acts as a liver tumor promoter. In view of its industrial importance and possible exposure to individuals, MG poses a potential environmental health hazard. We have studied the effect of MG on the formation of morphologically transformed colonies using Syrian hamster embryo (SHE) cell transformation assay. MG induced a dose-related increase in the formation of transformed foci, the optimum concentration being 0.05 micrograms/ml. Electron spin resonance (ESR) analysis using 5,5-dimethyl-1-pyrroline N-oxide (DMPO) as a spin-trapping agent showed the formation of reactive free radicals during the in vitro metabolism of MG. The present study suggests a close relationship between the morphological transformation of SHE cells by MG and the possible involvement of reactive free radical formation.

# Title: Cancer Prevention Research

Full Journal Title: Cancer Prevention Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? DeCensi, A., Puntoni, M., Goodwin, P., Cazzaniga, M., Gennari, A., Bonanni, B. and Gandini, S. (2010), Metformin and cancer risk in diabetic patients: A systematic review and meta-analysis. *Cancer Prevention Research*, **3** (11), 1451-1461.

Abstract: Metformin, an insulin-lowering agent, has been associated with decreased cancer risk in epidemiologic studies in diabetic patients. We performed a comprehensive literature search and meta-analysis of epidemiologic studies to assess the effect of metformin on cancer incidence and mortality in diabetic patients, using PUBMED, ISI Web of Science, EMBASE, and the Cochrane library until May 2009, with no language or time restrictions. Independent reports with sufficient information to allow risk estimation of cancer risk/mortality and a measure of uncertainty were reviewed and cross-checked independently by three investigators. Eleven studies were selected for relevance in terms of intervention, population studied, independence, and reporting of cancer incidence or mortality data, reporting 4,042 cancer events and 529 cancer deaths. A 31% reduction in overall summary relative risk (0.69; 95% confidence interval, 0.61-0.79) was found in subjects taking metformin compared with other antidiabetic drugs. The inverse association was significant for pancreatic and hepatocellular cancer, and nonsignificant for colon, breast, and prostate cancer. A trend to a dose-response relationship was noted. Metformin is associated with a decreased risk of cancer incidence compared with other treatments among diabetic patients. Given the retrospective nature of most studies and the possibility that the control treatments increase risk, phase II trials are needed before large cancer prevention trials are launched. Cancer Prev Res; 3(11); 1451-61. (C) 2010 AACR.

Keywords: Activated Protein-Kinase, Breast-Cancer, C-Peptide, Cancer, Cell-Growth, Cochrane, Control, Dose-Response, Epidemiologic Studies, Follow-Up, Hepatocellular-Carcinoma, Information, Insulin-Resistance, Intervention, ISI, Literature, Meta Analysis, Meta-Analysis, Metabolic Syndrome, Metformin, Mortality, Pancreatic-Cancer, Postmenopausal Women, Prevention, Prostate Cancer, Relative Risk, Review, Risk, Science, Systematic, Systematic Review, Trend, Web of Science

# Title: Cancer Research

Full Journal Title: [Cancer Research](http://cancerres.aacrjournals.org/contents-by-date.0.shtml)

ISO Abbreviated Title: Cancer Res.

JCR Abbreviated Title: Cancer Res

ISSN: 0008-5472

Issues/Year: 24

Journal Country/Territory: United States

Language: English

Publisher: Amer Assoc Cancer Research

Publisher Address: PO Box 11806, Birmingham, AL 35202

Subject Categories:

Oncology: Impact Factor 8.318, 7/114 (2002)

St. Clair, D.K. and Holland, J.C. (1991), Complementary DNA encoding human colon cancer manganese superoxide dismutase and the expression of its gene in human cells. *Cancer Research*, **51** (3), 939-943.

Full Text: [1991\Can Res51, 939.pdf](1991/Can%20Res51,%20939.pdf)

Abstract: Manganese superoxide dismutase (MnSOD) is a member of a family of metalloenzyme that catalyze the dismutation of the superoxide anion to H2O2. It has been shown that MnSOD activity in tumor cells is lower than that in their normal counterparts. To investigate the molecular basis for the reduced level of MnSOD activity in human tumor cells, the primary structure of human MnSOD has been determined from completmentary DNA (cDNA) isolated from a human colon carcinoma (HT-29) cDNA library. The sequence of the mature protein is composed fo 198 amino acids preceded by a 24-amino acid leader peptide. DNA sequence analysis revealed that the translated region of the human tumorMnSOD is virtually identical to the MnSOD sequence isolated from normal human sources but exhibits differences in both the 5’-and 3’-untranslated regions. DNA blot analysis of genomic DNA isolated from HT-29, simian virus-transformed human lung fibroblast (SV-40/WI-38), and parental human lung fibroblast (WI-38) cells showed an identical pattern of hybridization to that of MnSOD cDNA. RNA blot analysis revealed that tumor cells have lower levels of MnSOD mRNA. However, the half-life of the mRNA was the same (approximately 10 h) in tumor and normal cells. Immunological measurement of the level of MnSODin both normal and tumor cells also showed a reduced level of MnSOD protein in the tumor cells. These results suggest that the reduced level of MnSOD activity observed in human tumor cells is not due to a defect in the primary structure of the MnSOD protein, a change in the dosage of the MnSOD gene, or a decrease in the stability of MnSOD mRNA in tumor cells but rather is due to a defect or defects in the expression of the gene.

Keywords: Fibroblasts, Radicals, Sequence, Acid

Notes: highly cited

? Wakabayashi, K., Nagao, M., Esumi, H. and Sugimura, T. (1992), Food-derived mutagens and carcinogens. *Cancer Research*, **52** (7S), S2092-S2098.

Full Text: [1992\Can Res52, S2092.pdf](1992/Can%20Res52,%20S2092.pdf)

Abstract: Cooked food contains a variety of mutagenic heterocyclic amines. All the mutagenic heterocyclic amines tested were carcinogenic in rodents when given in the diet at 0.01-0.08%. Most of them induced cancer in the liver and in other organs. It is noteworthy that the most abundant heterocyclic amine in cooked food, 2-amino-1-methyl-6-phenylimidazo[4,5-b]pyridine, produced colon and mammary carcinomas in rats and lymphomas in mice but no hepatomas in either. 2-Amino-3-methylimidazo[4,5-g]quinoline induced liver cancer in monkeys. Formation of adducts with guanine by heterocyclic amines is presumably involved in their carcinogenesis. Quantification of heterocyclic amines in cooked foods and in human urine indicated that humans are continuously exposed to low levels of them in the diet. These low levels of heterocyclic amines are probably insufficient to produce human cancers by themselves. However, a linear relationship between DNA adduct levels and a wide range of doses of a heterocyclic amine was demonstrated in animals. It suggests that even very low doses of heterocyclic amines form DNA adducts and may be implicated in the development of human cancer under conditions in which many other mutagens-carcinogens. tumor promoters, and factors stimulating cancer progression exist.

Keywords: Sister-Chromatid Exchanges, Heterocyclic Amines, Cooked-Beef, 2-Amino-1-Methyl-6-Phenylimidazo<4,5-B>Pyridine Phip, Metabolic-Activation, 2-Amino-3,8-Dimethylimidazo<4,5-F>Quinoxaline Meiqx, P-32-Postlabeling Method, Pyrolysis Products, Soybean Globulin, DNA Modification

? Heaton, K.M., Ju, G. and Grimm, E.A. (1993), Human interleukin-2 analogs that preferentially bind the intermediate-affinity interleukin-2 receptor lead to reduced secondary cytokine secretion: Implications for the use of these interleukin-2 analogs in cancer-immunotherapy. *Cancer Research*, **53** (11), 2597-2602.

Full Text: [1993\Can Res53, 2597.pdf](1993/Can%20Res53,%202597.pdf)

Abstract: Cancer patients undergoing interleukin (IL)-2-based immunotherapy frequently experience dose-limiting side effects believed to be caused by the actions of such cytokines as IL-1ß, tumor necrosis factor (TNF)- and -ß, and interferon- (IFN-). Human peripheral blood mononuclear cells (PBMC) or monocyte-depleted peripheral blood lymphocytes were stimulated for up to 7 days by either of 2 IL-2 analogues (R38A or F42K) that bind to the intermediate-affinity IL-2ß receptor but have reduced abilities to bind the high-affinity IL-2 receptor. We previously reported that these IL-2 analogues retain the ability to generate lymphokine-activated killing by PBMC. In this study, we analyzed the cytokine content of supernatants from stimulated PBMC and peripheral blood lymphocyte cultures by enzyme-linked immunosorbent assay. The secretions of IL-1ß, TNF-, and -ß, and IFN- induced by either R38A or F42K were markedly reduced compared with secretions produced in response to recombinant wild-type IL-2. In 4 experiments, secretion was reduced an average of 39% for IL-1ß, 57% for TNF-, 83% for TNF-ß, and 86% for IFN-. Polymerase chain reaction analysis of recombinant wild-type IL-2 or analogue-stimulated PBMC did not reveal the presence of IL-2 mRNA; thus, differential production of endogenous IL-2 could not account for these findings. These data suggest the interaction of IL-2 and the high-affinity IL-2 receptor on human PBMC or peripheral blood lymphocyte is required for maximal secretion of IL-1ß, TNF-, TNF-ß, and IFN-. Because such cytokines are believed to mediate the toxicity seen with IL-2-based immunotherapies, IL-2 analogues with reduced binding to the high affinity IL-2 receptor may prove to be an effective and less toxic means of cancer treatment.

Watanabe, N., Goodwin, D.A., Meares, C.F., McTigue, M., Chaovapong, W., Ransone, C.M. and Renn, O. (1994), Immunogenicity in rabbits and mice of an antibody-chelate conjugate: Comparison of (*S*) and (*R*) macrocyclic enantiomers and an acyclic chelating agent. *Cancer Research*, **54** (4), 1049-1054.

Full Text: [1994\Can Res54, 1049.pdf](1994/Can%20Res54,%201049.pdf)

Abstract: The macrocyclic bifunctional chelating agent 2-(p-bromoacetamidobenzyl)-1,4,7,10-tetraazacyclododecanetetraacetic acid (BAD), forms inert metal complexes ideal for radioimmunotherapy. Kosmas et al. (Cancer Res., 52: 904-911, 1992) found 2-imminothiolane linker-(S)-BAD monoclonal antibody HMFG1 highly immunogenic in patients. We studied the immunogenicity of (S) and (R) enantiomers of 2-imminothiolane linker-BAD rabbit IgG, monoclonal antibody Lym-1, and Lym-1 2-imminothiolane linker-(S)-bromoacetamidobenzyl-EDTA in 15 rabbits. Five groups of three each were given 0.1, 1.0, or 10 mg of In-111 conjugate i.v., blood samples were taken daily for 14 days and biweekly for 70 days, and the plasma T-1/2 was calculated. A drop in plasma In-111 at 6-8 days coincided with the appearance of antibody on enzyme-linked immunosorbent assay. Specific anti-(S)-BAD, anti-(R)-BAD, anti-(S)-bromoacetamidobenzyl-EDTA, and anti-mouse IgG were measured. Rabbit IgG conjugates did not elicit an immune response. Mouse IgG conjugates were immunogenic on the first exposure, with both anti-1, 4, 7, 10-tetraazacylododecane N, N’, N”, N”‘-tetraacetic acid and anti-mouse responses. Anti-1, 4, 7, 10-tetraazacylododecane N, N’, N”, N”‘-tetraacetic acid was specific for the (S) or (R) enantiomer, but cross-reaction appeared with reboosting. A second injection of the opposite enantiomer gave a response to that enantiomer. Lym-1 bromoacetamidobenzyl-EDTA produced anti-bromoacetamidobenzyl-EDTA and anti mouse response.

Keywords: Monoclonal-Antibody, Metal-Ions, Pharmacokinetics, Responses, Reagents, Therapy

Cole, S.P.C., Sparks, K.E., Fraser, K., Loe, D.W., Grant, C.E., Wilson, G.M. and Deeley, R.G. (1994), Pharmacological characterization of multidrug resistant MRP-transfected human tumor cells. *Cancer Research*, **54** (22), 5902-5910.

Full Text: [1994\Can Res54, 5902.pdf](1994/Can%20Res54,%205902.pdf)

Abstract: We have previously identified and characterized a novel member of the ATP-binding cassette superfamily of transport proteins, multidrug resistance protein (MRP), and subsequently demonstrated that its overexpression is sufficient to confer multidrug resistance on previously sensitive cells (Cole et al., Science (Washington DC), 258: 1650-1654, 1992, Grant et al., Cancer Res. 54: 357-361, 1994). In the present study, we have transfected two different eukaryotic expression vectors containing MRP complementary DNA into HeLa cells to study the pharmacological phenotype produced exclusively by overexpression of human MRP. The drug resistance patterns of the two MRP-transfected cell populations were similar. They were characterized by a moderate (5-to 15-fold) level of resistance to doxorubicin, daunorubicin, epirubicin, vincristine, and etoposide, and a low (less than or equal to 3-fold) level of resistance to taxol, vinblastine, and colchicine. The transfectants were not resistant to 9-alkyl anthracyclines, mitoxantrone, or cisplatin. The MRP-transfected cells mere also resistant to some heavy metal anions including arsenite, arsenate, and trivalent and pentavalent antimonials but mere not resistant to cadmium chloride. Accumulation of radiolabeled vincristine was reduced by 45% in the MRP-transfected cells and could be restored to the levels found in sensitive cells by depletion of ATP. Rates of vincristine efflux did not differ greatly in the sensitive and resistant cells. The cytotoxic effects of vincristine and doxorubicin could be enhanced in a dose-dependent fashion by coadministration of verapamil. Cyclosporin A also increased vincristine toxicity but had less effect on doxorubicin toxicity. The degree of chemosensitization by verapamil and cyclosporin A was similar in MRP-transfected cells and in cells transfected with the vector alone, suggesting that sensitization involved mechanisms independent of MRP expression. Verapamil and cyclosporin A caused a modest increase in vincristine accumulation in the resistant cells but did not restore levels to those of the sensitive cells. Taken together, these data indicate that drug-resistant cell lines generated by transfection with MRP complementary DNA display some but not all of the characteristics of MRP-overexpressing cell lines produced by drug selection in vitro. They further demonstrate that the multidrug resistance phenotype conferred by MRP is similar but not identical to that conferred by P-glycoprotein and includes resistance to arsenical and antimonial oxyanions.

Keywords: DNA Topoisomerase-II, Epstein-Barr Virus, P-Glycoprotein, Drug-Resistance, HI60 Cells, HI-60 Cells, Cross-Resistance, Line, Mechanisms, Verapamil

Russo, C.A., Weber, T.K., Volpe, C.M., Stoler, D.L., Petrelli, N.J., Rodriguez-Bigas, M., Burhans, W.C. and Anderson, G.R. (1995), An anoxia inducible endonuclease and enhanced DNA breakage as contributors to genomic instability in cancer. *Cancer Research*, **55** (5), 1122-1128.

Full Text: [1995\Can Res55, 1122.pdf](1995/Can%20Res55,%201122.pdf)

Abstract: Fischer rat embryo fibroblasts subjected to temporary anoxia followed by an aerobic recovery period show genomic instability in the form of highly elevated CAD gene amplification rates. As revealed by flow cytometric analysis this is associated with DNA breakage in vivo, followed by repair during the recovery period. Such genomic instability parallels expression of a M (r) 29,000/31,000 endonuclease, this enzyme requires no added divalent metal ion and has a pH optimum of about 6.5. The same endonuclease was found to be expressed within healing wounds and in four of ten human colorectal cancers but was not seen in eight normal colorectal tissue samples. Our results indicate that DNA breakage resulting from endogenous endonuclease activity can have a substantial effect in modulating genomic instability.

Keywords: Polyacrylamide-Gel-Electrophoresis, Nonpolyposis Colon-Cancer, Wild-Type P53, Gene Amplification, Colorectal-Cancer, Normal Fibroblasts, Tumor Progression, Cells, Mutations, Mechanism

? Chiou, H.Y., Hsueh, Y.M., Liaw, K.F., Horng, S.F., Chiang, M.H., Pa, Y.S., Lin, J.S.N., Huang, C.H. and Chen, C.J. (1995), Incidence of internal cancers and ingested inorganic arsenic: A 7-year follow-up-study in Taiwan. *Cancer Research*, **55** (6), 1296-1300.

Full Text: [1995\Can Res55, 1296.pdf](1995/Can%20Res55,%201296.pdf)

Abstract: In order to elucidate the dose-response relationship between ingested inorganic arsenic and internal cancers, a total of 263 patients with blackfoot disease and 2293 healthy residents in the endemic area of arseniasis were recruited and followed up for 7 Sears. The information on consumption of high-arsenic artesian well water, sociodemographic characteristics, life-style and dietary habits, and personal and family history of cancers was obtained through standardized interviews. The occurrence of internal cancers among study subjects was determined through annual health examinations, home visit personal interviews, household registration data checks, and national death certification and cancer registry profile linkages. A dose-response relationship was observed between the long-term arsenic exposure from drinking artesian well water and the incidence of lung cancer, bladder cancer, and cancers of all sites combined after adjustment for age, sex, and cigarette smoking through Cox’s proportional hazards regression analysis. Blackfoot disease patients had a significantly increased cancer incidence after adjustment for cumulative arsenic exposure.

Keywords: Disease Endemic Area, Blackfoot Disease, Malignant Neoplasms, Well Water, Drinking-Water, Bladder, Mortality, Exposure, Liver, Lung

Wakabayashi, H., Cavanaugh, P.G. and Nicolson, G.L. (1995), Purification and identification of mouse lung microvessel endothelial cell-derived chemoattractant for lung-metastasizing murine RAW117 large-cell lymphoma cells: Identification as mouse monocyte chemotactic protein 1. *Cancer Research*, **55** (19), 4458-4464.

Full Text: [1995\Can Res55, 4458.pdf](1995/Can%20Res55,%204458.pdf)

Abstract: We reported recently that medium conditioned with mouse lung microvessel endothelial cells possessed chemotactic activity for a highly lung-metastatic variant (L17) of the RAW117 murine large-cell lymphoma cell line but not for the poorly metastatic parental cells (P) or a liver-metastasizing variant (H10). The chemotactic factor was purified to homogeneity by a five-step procedure involving hydrophobic interaction, Cibacron blue F3GA affinity, metal affinity, anion exchange, and reversed phase chromatography, followed by preparative gel electrophoresis. The purified material appeared as a single broad band when analyzed by SDS-PAGE, with an average molecular weight of 26,000. The factor was cleaved by cyanogen bromide treatment, and a partial amino acid sequence of one of the cleaved polypeptides proved identical to mouse monocyte chemotactic protein 1 (mMCP-1/JE). The amino acid composition of the factor also indicated similarity to mMCP-1/JE. Separately purified mMCP-1/JE significantly stimulated the chemotactic migration of RAW117 cells (L17>>H10, P). When recombinant human monocyte chemotactic protein 1 was compared to the purified endothelial cell chemotactic factor as a chemoattractant, similar migratory responses were observed in the RAW117 sublines. The chemotactic activity for L17 cells was significantly reduced from lung microvessel endothelial cell-conditioned medium after treatment with anti-mouse MCP-1 antibody. In contrast, the migration-stimulating activity of liver sinusoidal endothelial cell-conditioned medium to H10 cells was not affected by anti-mouse MCP-1. A major function of mMCP-1/JE is to recruit monocytes to inflammatory sites, and our results suggest that mMCP-1/JE also facilitates lymphoma lung invasion and metastasis.

Keywords: Walker Carcinosarcoma Cells, Smooth-Muscle Cells, Tumor-Cells, Pulmonary Metastases, Cancer Metastasis, Growth-Factors, Mice, Expression, Migration, Invasion

Hiraku, Y. and Kawanishi, S. (1996), Mechanism of oxidative DNA damage induced by δ-aminolevulinic acid in the presence of copper ion. *Cancer* *Research*, **56** (8), 1786-1793.

Full Text: [1996\Can Res56, 1786.pdf](1996/Can%20Res56,%201786.pdf)

Abstract: delta-Aminolevulinic acid (ALA) is a heme precursor accumulated in lead poisoning and acute intermittent porphyria, ALA-induced DNA damage in the presence of metal ions was investigated with a DNA sequencing technique and a high-performance liquid chromatograph equipped with an electrochemical detector, ALA caused damage to DNA fragments obtained from c-Ha-ras proto-oncogene in the presence of Cu(II), but only slightly in the presence of Fe(II). ALA + Cu(II) induced piperidine-labile sites at thymine residues, especially in the 5’-GTC-3’ and 5’-CTG-3’ sequences of double-stranded DNA. Catalase and bathocuproine inhibited DNA damage induced by ALA + Cu(II). Typical. OH scavengers did not inhibit DNA damage, suggesting that active species other than OH play a more important role in DNA damage. 8-Hydroxy-2’-deoxyguanosine formation by ALA increased with ALA concentration in the presence of Cu(II), Electron spin resonance studies using α-(1-oxy-4-pyridyl)-N-tert-butylnitrone as spin trap showed that carbon-centered radicals were generated during Cu(II)-catalyzed autoxidation of ALA, The major pathway of ALA autoxidation consists of the formation of 4, 5-dioxovaleric acid and NH4+, Formation of a pyrazine derivative through ALA autocondensation was also observed. Concomitantly, O2- and H2O2 were generated during the Cu(II)-catalyzed ALA autoxidation. These results indicate that H2O2 reacts with Cu(I) to form a crypto-OH radical, such as the Cu(I)peroxide complex, causing DNA damage, The possible mechanism for metal-dependent DNA damage by ALA is discussed in relation to the carcinogenicity of lead compounds and the increased frequency of liver cancer in acute intermittent porphyria.

Keywords: δ-Aminoisobutyric Acid, Hydrogen-Peroxide, Hepatocellular-Carcinoma, Superoxide-Dismutase, Dependent Damage, Smelter Workers, Singlet Oxygen, Lead-Exposure, Site, Radicals

Adam, L., Crépin, M. and Israél, L. (1997), Tumor growth inhibition, apoptosis, and Bcl-2 down-regulation of MCF-7*ras* tumors by sodium phenylacetate and tamoxifen combination. *Cancer Research*, **57** (6), 1023-1029.

Full Text: [1997\Can Res57, 1023.pdf](1997/Can%20Res57,%201023.pdf)

Abstract: We demonstrated previously the antitumoral and antiproliferative effects of sodium phenylacetate (NaPA) on malignant breast epithelial MCF-7ras cells and its lack of toxicity, The present in vivo protocols mere as follows: (I) a control group, (2) a NaPA-receiving group (450 mg/kg) through s.c. osmotic pumps (ALZA Corp.) for 2 weeks, followed by 2 weeks with no treatment, and (3) a tamoxifen (TAM)-receiving group (20 mg/kg two times per week). The second group was further divided as follows: (a) a group receiving same doses of NaPA, (b) a TAM-receiving group, and (c) a group receiving both NaPA and TAM. Although tumors treated by TAM alone (group 3) showed progressive regrowth after 6 weeks, indicating an escape from antiestrogen inhibition, the TAM-administered group, following 2 weeks of NaPA pretreatment (group 2b), showed significant tumor regression of about 40% after 8 weeks. This effect was amplified to over 60% (P < 0.001) by simultaneous administration of the two drugs (group 2c). The last group displayed about 30% apoptotic-like nuclei, together with lower proliferation index, and less tumor vascularization, as compared to less than 5% terminal deoxytransferase-mediated dUTP-X nick end labeling-positive nuclei, highly vascularized tumors, in the TAM-treated group. Furthermore, in vitro administration of 4-OH-tamoxifen induced a Bcl-2 up-regulation in MCF-7ras cells, which was completely abolished by NaPA pretreatment. The combination of NaPA and OHT induced significant cell differentiation with cell cycle accumulation in the G (0)-G (1) phase.

Keywords: Human-Breast-Cancer, Cell-Line, Nude-Mice, Expression, Estrogen, Antiestrogens, Proliferation, Transfection, Stimulation, Carcinoma

Kaplan, O., Kushnir, T., Askenazy, N., Knubovets, T. and Navon, G. (1997), Role of nuclear magnetic resonance spectroscopy (MRS) in cancer diagnosis and treatment: 31P, 23Na, and 1H MRS studies of 3 models of pancreatic cancer. *Cancer Research*, **57** (8), 1452-1459.

Full Text: [1997\Can Res57, 1452.pdf](1997/Can%20Res57,%201452.pdf)

Abstract: The role of nuclear magnetic resonance spectroscopy (MRS) in pancreatic cancer diagnosis and its treatment were assessed in three models of pancreatic neoplasms, Perfused MIA PaCa-2 human pancreatic cancer cells, s.c. implanted pancreatic tumors in hamsters, and pancreatic tumors induced in situ in rats by direct application of the carcinogen 7, 12-dimethyl benzanthracene, were studied by phosphorous (31P), sodium (23Na), and proton (1H) MRS. 31P spectra of pancreatic cancer were qualitatively similar to those of intact organs, There were, however, variations in peak intensities and ratios, Phosphomonoester signals were prominent in both normal pancreases and tumors, but their levels depended on the proliferation rate and on environmental conditions, Thus, the phosphomonoester: β-nucleoside triphosphate ratio was 1.15±0.32 in 90% confluency and 1.31±0.43 in 70% confluency, and this ratio increased upon lowering the perfusion rate. Total (intra-and extracellular) sodium concentrations, measured in the solid tumors, were 39-40 µmol/g wet weight in normal pancreases. Contrary to a previous hypothesis that malignant transformation is associated with increased sodium content, our 23Na MRS data showed that there were no significant differences between pancreatic tumors and intact organs. Proton spectra of perchloric acid extracts revealed several differences between tumors and amino acid taurine, from 1.17±0.39 µmol/g wet weight in pancreatic carcinoma in rats, and lactate levels that increased from 0.92±0.2 to 6.19±1.93 µmol/g wet weight, respectively. On the other hand, creatine and glutamate were higher in the normal pancreases. Pancreatic cancer is usually resistant to chemotherapy, and we evaluated the effects of the metabolic inhibitors 2-deoxyglucose and lonidamine on the human pancreatic cancer cells by MRS and cytotoxicity studies. The IC50 of Adriamycin and 2-deoxyglucose were 1.49±0.18×106 and 1.36±17 µg/ml, respectively. These results were similar to data obtained previously in multidrug-resistant human breast cancer cells, which were highly resistant (33-fold) to Adriamycin but were more susceptible (9-fold) to 2-deoxyglucose than their parental cells.

Keywords: Breast-Cancer, Cell-Lines, Multidrug Resistance, Taurine Levels, In-Vitro, NMR, Tumors, Invivo, Adenocarcinoma, Metabolism

Li, J.J. and Oberley, L.W. (1997), Overexpression of manganese-containing superoxide dismutase confers resistance to the cytotoxicity of tumor necrosis factor α and/or hyperthermia. *Cancer Research*, **57** (10), 1991-1998.

Full Text: [1997\Can Res57, 1991.pdf](1997/Can%20Res57,%201991.pdf)

Abstract: Human breast cancer cells (MCF-7) overexpressing manganese-containing superoxide dismutase (MnSOD) by stable or transient transfection were challenged with the cytotoxicity of tumor necrosis factor α (TNF-α), hyperthermia, and a combination of both, In contrast to the vector control and wild-type MCF-7 cells, the stable MnSOD transfectants showed significant resistance to the cytotoxicity of TNF-α (100 units/ml), heat at 43 or 45°C, and a combination of TNF-α and heat at 43°C. To probe the correlation of MnSOD levels with cell survival, cell sensitivity to TNF-α, heat at 43°C, or a combination of both was also measured after MnSOD cDNA transient transfection. The data showed that the level of cell resistance was proportional to the exogenous MnSOD gene expression, These results suggest that superoxide free radicals or their reaction products are responsible for much of the synergistic cytotoxicity of TNF-α and hyperthermia.

Keywords: Whole-Body Hyperthermia, Invitro Cyto-Toxicity, Human-Melanoma Cells, Heat-Shock, Hydrogen-Peroxide, Oxidative Stress, Therapeutic Efficacy, Cellular-Resistance, Expression, Protein

? Furuya, K.N., Bradley, G., Sun, D.X., Schuetz, E.G. and Schuetz, J.D. (1997), Identification of a new P-glycoprotein-like ATP-binding cassette transporter gene that is overexpressed during hepatocarcinogenesis. *Cancer Research*, **57** (17), 3708-3716.

Full Text: [1997\Can Res57, 3708.pdf](1997/Can%20Res57,%203708.pdf)

Abstract: The liver is remarkably insensitive to a variety of cytotoxins and expresses a number of known drug resistance genes. To isolate new P-glycoprotein (Pgp)-related genes, we screened a normal rat liver cDNA library at low stringency with a MDR1 cDNA fragment containing the P-loop and ATP binding site We isolated a novel cDNA closely related to the Pgps that is dramatically increased in hepatic neoplasia and refer to it as P-glycoprotein-related protein (PRP). The predicted protein shows PRP to be a member of the ATP-Binding Cassette (ABC) family of proteins, and a multisequence comparison of the nucleotide binding domain and the ABC family signature sequences reveals that PRP sequences are highly conserved with the greatest similarity to the yeast heavy metal transporter encoded by hmt1, However, the hydropathy plot analysis suggests that PRP does not have any prominent membrane-spanning domains and thus is not typical of ABC transporters. The PRP transcript is detected in many normal tissues. In the H35 hepatoma cell line, PRP was overexpressed compared to normal liver, Southern blot analysis of DNA from the H35 rat hepatoma cells reveals that the PRP gene was amplified compared to normal liver. The orotic acid model of hepatocarcinogenesis was used to determine if during stepwise progression to liver cancer, PRP changed with hepatocarcinogenesis. At the hyperplastic nodule stage, PRP expression was increased over its expression in normal surrounding liver. More dramatic increases in PRP expression were found in frank hepatic carcinomas, Cumulatively, these studies are the first to link a novel ABC family member to the hepatic neoplastic process, a role that may be recapitulated in other cells, considering the ubiquitous expression of PRP.

Keywords: Confers Multidrug Resistance, Peroxisomal Membrane-Protein, Glutathione S-Transferases, Regenerating Rat-Liver, Ovary Cell Mutants, Hepatocellular-Carcinoma, Chemical Hepatocarcinogenesis, Drug-Resistance, C-MYC, Complementary-DNA

? Glynn, R.W., Chin, J.Z., Kerin, M.J. and Sweeney, K.J. (2009), The relationship between breast cancer and research: A bibliometric study. *Cancer Research*, **69** (24), 564S.

Full Text: Can Res69, 564S.pdf

Abstract: Background: Thousands of articles are published every year in the medical literature relating to the diagnosis and treatment of cancer patients. An area of contention of late has been the amount of research time and money being devoted to breast cancer, to what some believe is to the detriment of research into other forms of malignancy. The aims of this study were to further investigate the relationship between malignancy and research, in order to better quantify the degree to which breast cancer is being over- or under-represented in the research world. Methods: Bibliometrics is the science of studying written communication by systematic measurement and analysis of research publications. In this study, we examined research output over a one-year period for the 26 most commonly diagnosed cancers in the UK. Our strategy was based on that employed by a group in Edinburgh in 2001, and involved correlating research output with incidence and mortality statistics. In addition, we sought to elucidate changes in research output over time and then to correlate these changes with improvements in survival. The survival data used was that published by Coleman et al in 2004, and represents changes in survival over 5 year periods between 1986 and 1999 in England and Wales. Results: A total of 73,798 publications were included in this study. Breast cancer received more research attention than any other malignancy in the time period of this study. Proportional to its incidence and associated mortality, however, breast cancer was markedly underrepresented. This relationship was consistent across publication and study types, and in the higher impact journals. There was a strong positive correlation between improvement in 5-year survival and research output (p = 0.003). Those malignancies enjoying the greatest increases in output included those involving the prostate, non-hodgkins lymphoma, breast and vaginal cancer. Conclusions: This study was intended to provide a snapshot-in-time of research output in malignancy. It has shown that, on the basis of both incidence and mortality, breast cancer is not receiving disproportionate attention by the research community, contrary to popular opinion. Whilst the absolute figures clearly reflect the success of the breast cancer advocacy community in raising and maintaining the profile of the disease, the evidence suggests that, if anything, breast cancer is not receiving the interest it deserves, based on its burden to society.

Keywords: Bibliometric, Research

# Title: Cancer Surveys

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ISO Abbreviated Title: Cancer Surv.

JCR Abbreviated Title: Cancer Surv

ISSN: 0261-2429

Issues/Year: 4

Journal Country/Territory: United States

Language: English

Publisher: Cold Spring Harbor Lab Press

Publisher Address: 1 Bungtown Rd, Plainview, NY 11724

Subject Categories:

Oncology: Impact Factor

? Forman, D. (1989), Are nitrates a significant risk factor in human cancer? *Cancer Surveys*, **8** (2), 443-458.

Abstract: This article focuses on the relationship between exposure to nitrates in the environment and subsequent risk of human cancer. The question of whether or not nitrates represent a cancer hazard is one of the most important public health issues arising from research into N-nitroso compounds. The reason for concern results from the endogenous reduction of nitrate to nitrite and subsequent nitrosation of amines, amides and proteins to give rise to carcinogenic N-nitroso compounds. The human evidence relating nitrate exposure to cancer, especially gastric cancer, has been largely based on geographic correlation studies, a relatively weak form of epidemiological methodology. In sum, this evidence and that from a small number of individually based studies does not support the hypothesis of a straightforward cause and effect association between nitrate exposure and cancer risk. Because many other factors besides nitrate are involved in the endogenous formation of N-nitrosation compounds, it is possible that exposure to nitrate is not a rate-limiting factor in most circumstances. This makes the setting of regulatory standards for nitrate exposure from the environment a complex issue.

# Title: Cancer Treatment Reports

Full Journal Title: Cancer Treatment Reports

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Sloane, E.M., Baum, J.G., Hubbard, S.M. and Wittes, R.E. (1984), Cancer-treatment reports 1959-1983 - Background review and tabular compilation of most cited articles. *Cancer Treatment Reports*, **68** (1), 329-337.

Full Text: 1984\Can Tre Rep68, 329.pdf

Keywords: Articles, Reports, Review

? Wittes, R.E. (1987), Paying for patient-care in treatment research: Who is responsible. *Cancer Treatment Reports*, **71** (2), 107-113.

# Title: Cancer Treatment Reviews

Full Journal Title: [Cancer Treatment Reviews](http://www.sciencedirect.com/science/journal/03057372)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rubens, R.D. and Coleman, R.E. (1999), Twenty-five years of reviewing cancer treatment. *Cancer Treatment Reviews*, **25** (1), 1-2.

Full Text: [1999\Can Tre Rev25, 1.pdf](1999/Can%20Tre%20Rev25,%201.pdf)

Keywords: Cancer, Treatment

? Shelley, M.D., Kumar, S., Wilt, T., Staffurth, J., Coles, B. and Mason, M.D. (2009), A systematic review and meta-analysis of randomised trials of neo-adjuvant hormone therapy for localised and locally advanced prostate carcinoma. *Cancer Treatment Reviews*, **35** (1), 9-17.

Full Text: [2009\Can Tre Rev35, 9.pdf](2009/Can%20Tre%20Rev35,%209.pdf)

Abstract: Background: We performed a systematic review and meta-analysis of randomised trials of neo-adjuvant hormone therapy (NHT) in localised and locally advanced prostate cancer to assess the effectiveness of this therapy. Methods: We searched MEDLINE, The Cochrane Library, Science Citation Index, LILACS and SIGLE for randomised trials comparing NHT plus primary therapy (radiotherapy or prostatectomy) with primary therapy alone. Data included information on study design, participants, interventions, and outcomes. Comparable data were extracted from eligible studies and pooled for meta-analysis with intention to treat principle. Findings: NHT prior to prostatectomy did not improve overall or disease-free survival, but did significantly reduce positive margin rates (RR 0.49, 95% Cl 0.42-0.56, p < 0.00001), organconfinement (RR 1.63, 95% CI 1.37-1.95, p < 0.0001) and lymph node invasion (RR 0.49, 95% Cl 0.42-0.56, p < 0.02). In one study NHT before radiotherapy significantly improved overall survival for men with Gleason 2-6 (p = 0.015). In addition, there was a significant improvement in both clinical disease-free survival (RR 1.46, 95% CI 1.24-1.71, p < 0.00001) and biochemical disease-free survival (RR 1.59, 95% CI 1.00-2.55, p = 0.05). Toxicities included hot flushes, gastrointestinal, hepatic and miscellaneous adverse events. Conclusions: NHT is associated with significant clinical benefit when given with radiotherapy and improves pathological outcome prior to prostatectomy but is of minimal value prior to radical prostatectomy. The decision to use hormone therapy should be discussed between the patient, the clinician and policy maker based on the benefits, toxicity and cost. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Ablation, Androgen Deprivation, Blockade, Cancer, Citation, Clinical, Clinician, Cost, Data, Decision, Design, Effectiveness, Endocrine Therapy, Estrogen, Events, Follow-up, Improvement, Information, Interventions, Medline, Men, Meta-Analysis, Metaanalysis, NEO-Adjuvant, Neo-Adjuvant Hormone Therapy, Outcome, Outcomes, Policy, Primary, Prostate Cancer, Prostatectomy, Radiation-Therapy, Radical Prostatectomy, Radiotherapy, Radiotherapy, Randomised, Rates, Review, Rights, Science, Science Citation Index, Study Design, Survival, Systematic Review, Therapy, Toxicity, Value

? Rollig, C. and Illmer, T. (2009), The efficacy of arsenic trioxide for the treatment of relapsed and refractory multiple myeloma: A systematic review. *Cancer Treatment Reviews*, **35** (5), 425-430.

Full Text: 2009\Can Tre Rev35, 425.pdf

Abstract: Arsenic trioxide (ATO) has been proposed as an option for the treatment of relapsing or refractory multiple myeloma. In order to critically appraise the published clinical evidence, a systematic search of the databases PUBMED, EMBASE, Web of Science and the Cochrane Library was performed. Studies were selected according to prospectively defined criteria. Eventually 16 articles met the inclusion criteria. Six trials evaluated ATO as a single agent or in combination with ascorbic acid and ten trials added ATO to other cytostatic agents. Apart from one randomized controlled trial (RCT), all other studies were designed as case series. The patient numbers were generally small. treatment regimens differed both regarding the dosage of ATO and combinations with other drugs. Monotherapy with ATO resulted in partial response rates between 0% and 17% and minimal responses of 7-33%, resulting in mean overall response rates of 30%. Overall response rates in combined regimens varied widely between 12% and 100%. Response rates for patients in the three arms of the RCT did not differ significantly. The results demonstrate the potential efficacy of ATO in refractory multiple myeloma, but the validity of these findings is reduced by considerable methodological flaws. RCTs should further investigate the efficacy of ATO or new arsenicals in order to overcome methodological concerns of the studies presented here. With respect to the higher evidence level of new substances such as bortezomib or lenalidomide, at present ATO has no role in routine management of relapsed or refractory myeloma. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Acid Combination Therapy, Arsenic, Ascorbic-Acid, Ato, Case Series, Cochrane, Databases, Efficacy, High-Dose Melphalan, I, Ii, Lenalidomide Plus Dexamethasone, Management, Multicenter, Multiple Myeloma, Phase-Ii, Plasmacytoma, PUBMED, Randomized Controlled Trial, Refractory, Relapsed, Review, Science, Stem-Cell Transplantation, Systematic, Systematic Review, Treatment, Trial, Validity, Vitamin-C Mac, Web of Science

? McCann, P., Stafinski, T., Wong, C. and Menon, D. (2011), The safety and effectiveness of endoscopic and non-endoscopic approaches to the management of early esophageal cancer: A systematic review. *Cancer Treatment Reviews*, **37** (1), 11-62.

Full Text: 2011\Can Tre Rev37, 11.pdf

Abstract: Introduction: Traditionally, management of early cancer (stages 0-IIA) has comprised esophagectomy, either alone or in combination with chemotherapy and/or radiotherapy. Recent efforts to improve outcomes and minimize side-effects have focussed on minimally invasive, endoscopic treatments that remove lesions while sparing healthy tissue. This review assesses their safety and efficacy/effectiveness relative to traditional, non-endoscopic treatments for early esophageal cancer. Methods: A systematic review of peer-reviewed studies was performed using Cochrane guidelines. Bibliographic databases searched to identify relevant English language studies published in the last 3 years included: PUBMED (i.e., MEDLINE and additional sources), EMBASE, CINAHL, The Cochrane Library, the UK Centre for Reviews and Dissemination (NHS EED, DARE and HTA) databases, EconLit and Web of Science. Web sites of professional associations, relevant cancer organizations, clinical practice guidelines, and clinical trials were also searched. Two independent reviewers selected, critically appraised, and extracted information from studies. Results: The review included 75 studies spanning 3124 patients and 10 forms of treatment. Most studies were of short term duration and non-comparative. Adverse events reported across studies of endoscopic techniques wore similar and less significant compared to those in the studies of non-endoscopic techniques. Complete response rates were slightly lower for photodynamic therapy (PDT) relative to the other endoscopic techniques, possibly due to differences in patient populations across studies. No studies compared overall or cause-specific survival in patients who received endoscopic treatments vs. those who received non-endoscopic treatments. Discussion: Based on findings from this review, there is no single “best practice” approach to the treatment of early esophageal cancer. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Argon Plasma Coagulation, Argon Plasma Coagulation, Bibliographic, Bibliographic Databases, Cancer, Chemotherapy, Clinical Trials, Cochrane, Cryoablation, Databases, Early Esophageal Cancer, Early-Stage Cancer, Effectiveness, EMBASE, Endoscopic Mucosal Resection, Esophagectomy, Extended Transthoracic Resection, Guidelines, High-Grade Dysplasia, Information, Management, MEDLINE, Methods, Minimally Invasive Esophagectomy, Outcomes, Photodynamic Therapy, Photodynamic Therapy PDT, Practice, Practice Guidelines, Professional, Professional Associations, PUBMED, Quality-of-Life, Radio Frequency Ablation, Radiotherapy, Randomized Clinical-Trial, Review, Safety, Science, Squamous-Cell Carcinoma, Survival, Systematic, Systematic Review, Therapy, Traditional, Transhiatal Laparoscopic Approach, Treatment, Uk, Web of Science

? Chen, T., Xu, T., Li, Y., Liang, C., Chen, J.X., Lu, Y.C., Wu, Z.G. and Wu, S.H. (2011), Risk of cardiac dysfunction with trastuzumab in breast cancer patients: A meta-analysis. *Cancer Treatment Reviews*, **37** (4), 312-320.

Full Text: 2011\Can Tre Rev37, 312.pdf

Abstract: Background: Trastuzumab is used widely for the treatment of early and advanced breast cancer. However, concerns have arisen regarding its cardiac toxicity. We did a systematic review and meta-analysis of published randomized controlled trials (RCT-s) to assess the overall risk of cardiac dysfunction associated with trastuzumab treatment. Methods: We searched PUBMED and Web of Science (January 1966-July 2009) and American Society of Clinical Oncology conferences held (January 2000-July 2009) for relevant articles and abstracts. Summary incidence rates, relative risks (RRs), and 95% confident intervals (CIs) were calculated using a fixed-effects or random-effects model. Results: 11,882 patients from 10 RCTs were included for analysis. The incidences of LVEF decrease and congestive heart failure (CHF) were 7.5% (95% CI 4.2-13.1) and 1.9% (95% CI 1.0-3.8) among patients receiving trastuzumab. Trastuzumab significantly increased the risk of LVEF decrease (RR = 2.13, 95% CI, 1.31-3.49; p = 0.003). In addition, it significantly increased the risk of CHF (RR = 4.19, 95% CI 2.73-6.42; p < 0.00001). The increased risk of CHF was observed in patients with early stage (RR = 4.05, 95% CI 2.49-6.58; p < 0.00001) as well as metastatic disease (RR = 4.75, 95% CI 1.93-11.71; p = 0.0007). Furthermore, trastuzumab significantly increased the risk of CHF (RR = 4.27, 95% CI 2.75-6.61, p < 0.00001) in patients receiving anthracycline-based chemotherapy, but not in patients receiving non-anthracycline chemotherapy (RR = 2.42, 95% CI 0.36-16.19, p = 0.36). Conclusion: The addition of trastuzumab to anthracycline-based chemotherapy significantly increase the risk of cardiac dysfunction in breast cancer patients. Further studies are recommended for non-anthracycline chemotherapy. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: 1st-Line Treatment, Adjuvant Chemotherapy, Analysis, Breast Cancer, Cancer, Chemotherapy, Clinical-Trials, Cyclophosphamide, Disease, Follow-Up, Gene Amplification, Heart Failure, Meta-Analysis, Methods, Model, Oncology, Oncology-Group, Paclitaxel, Phase-II Trial, PUBMED, Randomized Controlled Trials, Review, Risk, Safety, Science, Systematic, Systematic Review, Toxicity, Trastuzumab, Treatment, Web of Science

# Title: Caravelle-Cahiers du Monde Hispanique et Luso-Bresilien

Full Journal Title: Caravelle-Cahiers du Monde Hispanique et Luso-Bresilien

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ISSN:

Issues/Year:

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Subject Categories:

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? Fabre, V. (2002), Evolution of research on the Latin-American rural environment from 1983 to 2000: Bibliometric analysis of francophone travaux-universitaires and publications. *Caravelle-Cahiers du Monde Hispanique et Luso-Bresilien*, (79), 243-244

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Environment, Evolution, Francophone, Latin American, Publications, Research, Rural, Rural Environment

# Title: Carbohydrate Polymers

Full Journal Title: [Carbohydrate Polymers](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5224&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=bced4094e9570b83b49e287c4c485817); [Carbohydrate Polymers](http://sciencejournals.info/Carbohydrate_Polymers.html)

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Chemistry, Applied: Impact Factor 3.463, 3/70 (2010)

Chemistry, Organic: Impact Factor 3.463, 11/56 (2010)

Polymer Science: Impact Factor 3.463, 11/79 (2010)

Viebke, C. and Piculell, L. (1996), Adsorption of galactomannans onto agarose. *Carbohydrate Polymers*, **29** (1), 1-5.

Full Text: [C\Car Pol29, 1.pdf](C/Car%20Pol29,%201.pdf)

Abstract: New direct evidence for a mixed association between aggregated agarose and aqueous galactomannan is presented. Gel permeation chromatography of two galactomannans, locust bean gum (lbg) and guar gum (gg), on a column packed with unmodified and highly aggregated agarose showed that the eluted amount of lbg was greatly reduced compared to the injected amount, whereas the loss of gg was smaller. The loss of material was significantly smaller, especially for lbg, with sodium iodide (rather than sodium nitrate) in the eluent salt solution. No loss of material for either galactomannan under any salt condition was found on a column packed with a hydroxylated polymethacrylate gel. The results strongly suggest that galactomannans adsorb onto aggregated agarose, and that the adsorption depends on the chemical nature of both the adsorbent and the substrate.

Dronnet, V.M., Renard, C.M.G.C., Axelos, M.A.V. and Thibault, J.F. (1997), Binding of divalent metal cations by sugar-beet pulp. *Carbohydrate Polymers*, **34** (1-2), 73-82.

Full Text: [1997\Car Pol34, 73.pdf](1997/Car%20Pol34,%2073.pdf)

Abstract: The binding of divalent metal cations (Ca2+, Cd2+, Cu2+, Ni2+, Pb2+ and Zn2+) by sugar-beet pulp was studied. In the presence of 0.1 M NaNO3 the level of metal cation uptake was found to reach its maximum value very rapidly with the speed increasing both with the sugar-beet pulp concentration and with increasing initial pH of the suspension. Using a pH-metric method and by comparing binding isotherms drawn by measuring the free cation concentration after equilibration, a clear scale of decreasing selectivity was found as follows: Cu2+ similar to Pb2+ much greater than Cd2+ similar to Zn2+ > Ni2+ > Ca2+. Binding followed the Langmuir-type isotherm except for Ca2+ Adsorption may contribute to the binding phenomenon in addition to ion exchange, which may include electrostatic interactions and even chelation in the case of the more strongly bound cations. Sugar-beet pulp, which is cheap and highly selective, therefore seems to be a promising substrate to entrap heavy metals in aqueous solutions. Copyright (C) 1997 Elsevier Science Ltd. All rights reserved.

Keywords: Heavy-Metals, Aqueous-Solution, Marine-Algae, Cell-Walls, Biosorption, Biomass, Ions, Adsorption, Cadmium, Polysaccharides

Dronnet, V.M., Axelos, M.A.V., Renard, C.M.G.C. and Thibault, J.F. (1998), Improvement of the binding capacity of metal cations by sugar-beet pulp. 2. Binding of divalent metal cations by modified sugar-beet pulp. *Carbohydrate Polymers*, **35** (3-4), 239-247.

Full Text: [C\Car Pol35, 239.pdf](C/Car%20Pol35,%20239.pdf)

Abstract: Binding of some divalent cations (Ca2+, Cd2+, Cu2+, Ni2+, Pb2+ and Zn2+) in aqueous solution by saponified and cross-linked sugar-beet pulp was investigated. Saponification doubled the cation-exchange capacity, while cross-linking decreased specific surface area and hydration properties to low and stable values independent of pH and ionic strength conditions. The sorption isotherms indicated a high metal-binding capacity which increased with sorbent concentration, and followed a clear order of selectivity: Cu2+ similar to Pb2+ much greater than Zn2+ similar to Cd2+ > Ni2+ > Ca2+. The sorption data were better represented by the Langmuir isotherm than by the Freundlich one, suggesting that the monolayer sorption, mainly due to ion-exchange, would not be disturbed by lateral interactions between cations sorbed with similar sorption energies. The same order of selectivity could be drawn from the Langmuir parameters, sorption equilibrium constants (KL) and maximum binding capacities (Me(A)max). Whatever the cation, KL decreased with increasing sorbent concentration, while Me(b)max increased. Higher quantities of Cu2+ and Pb2+ than predicted by the one divalent cation to two carboxyl functions ratio were bound. This was attributed to the partial contribution to the sorption phenomenon of hydroxyl functions close to ionic sites, explaining the higher affinity of such cations for substrates. Cross-linked pulp exhibited higher metal-binding capacity per volume unit than the raw pulp. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Marine-Algae, Heavy-Metals, Biosorption, Sorption, Biomass, Ion, Adsorption, Exchange, Cadmium

Gocho, H., Shimizu, H., Tanioka, A., Chou, T.J. and Nakajima, T. (2000), Effect of polymer chain end on sorption isotherm of water by chitosan. *Carbohydrate Polymers*, **41** (1), 87-90.

Full Text: [C\Car Pol41, 87.pdf](C/Car%20Pol41,%2087.pdf)

Abstract: In this study, the sorption isotherms of water vapor by chitosans with various molecular weights were measured. The BET adsorption theory was modified for the system that has several different kinds of energy levels in the water adsorption sites, i.e. a hydroxyl group, an amino group, the polymer chain end, etc. and applied it to the experimental results in order to examine the effect of the polymer chain end on the sorption isotherm of water–chitosan using the parameters which represented the total number of adsorption sites, Vm, the interaction energy between water and the adsorption sites, K, and the number of adsorbed layers, n. Vm and K increased as the molecular weight decreased, and n remained constant. It has been proved that the increase in Vm and K were caused by the hydrophilic groups in the polymer chain end.

Keywords: Sorption Isotherm of Water, Water Vapor, Chitosan, Bet Equation, Logarithmic Viscosity Number, Polymer Chain End

Kweon, D.K., Choi, J.K., Kim, E. K. and Lim, S.T. (2001), Adsorption of divalent metal ions by succinylated and oxidized corn starches. *Carbohydrate Polymers*, **46** (2), 171-177.

Full Text: [C\Car Pol46, 171.pdf](C/Car%20Pol46,%20171.pdf)

Abstract: Corn starch was succinylated (degree of substitution, DS 0.03–0.07) with succinic anhydride in an aqueous alkaline medium (pH 10), or oxidized (DS 0.13–0.29) with sodium hypochlorite in the presence of 2,2,6,6-tetramethyl-1-piperidinyloxy (TEMPO) and sodium bromide, and the adsorption properties of the starches for Cu2+, Zn2+, Pb2+, and Cd2+ in their aqueous salt solutions were investigated under various conditions. Regardless of the metal type, the adsorption capacity of both ionic starches reached a state of equilibrium within 5–10min for starch dispersion in metal solutions. The succinylated starch was most effective in binding Pb2+, whereas the oxidized starch was effective for Cu2+ among the tested metal ions. Cd2+ was least effective in binding either to the succinylated or to the oxidized starch. However, the oxidized starch was partially soluble in aqueous solutions, and thus the starch dissolution resulted in reduced metal-adsorption efficiency. The metal-adsorption of both ionic starches followed the Langmuir adsorption isotherm. The maximum adsorption capacity (*Q*) and Langmuir constant (*b*) for a succinylated starch (DS 0.07) for Pb2+ were 0.534mmolg−1 and 2.276×10−3ppm−1, respectively. These values were higher than those of Cu2+, Zn2+, and Cd2+. The *Q* and *b* values for an oxidized starch (DS 0.29) for Cu2+ were significantly higher (1.245mmolg−1 and 14.98×10−3ppm−1, respectively) than those of Pb2+, Zn2+, and Cd2+. Therefore, among the tested ions, Pb2+ was adsorbed most effectively by the succinylated starch, and Cu2+ by the oxidized starch.

Keywords: Succinylated Starch, Oxidized Starch, Metal-Adsorption, Langumir Constant

Reddad, Z., Gérente, C., Andrès, Y., Ralet, M.C., Thibault, J.F. and Le Cloirec, P. (2002), Ni(II) and Cu(II) binding properties of native and modified sugar beet pulp. *Carbohydrate Polymers*, **49** (1), 23-31.

Full Text: [C\Car Pol49, 23.pdf](C/Car%20Pol49,%2023.pdf)

Abstract: The abilities of native and modified sugar beet pulps to remove Ni(II) and Cu(II) ions from aqueous solutions were compared. Their preparation by chemical treatments (saponification, hot 0.05 M HCl and cold 0.05 M NaOH extractions) is described. The sugar composition, which was strongly affected during these modifications, is discussed in terms of metal sorption efficiencies. ne influence of these modifications was also evaluated by comparing the content of the functional groups determined by potentiometric titration, and the rate and extent of Cu(II) and Ni(II) uptakes onto the raw and modified materials. Nickel and copper sorptions were fast and complete within 30 min and the kinetic parameters were calculated using a second order model. The equilibrium data fitted well with the Langmuir model and showed the affinity order of the materials for the metal ions. The base-extracted pulp and saponified pulp exhibited the highest Ni(II) and Cu(H) ion uptakes among the materials tested. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Sorbents, Polysaccharides, Metal Ions Adsorption, Modeling, Enzymatic Saccharification, *Pseudomonas-Aeruginosa*, Metal-Cations, Ion-Exchange, Biosorption, Capacity, Sorption, Fiber

? Ciesielski, W., Lii, C.Y., Yen, M.T. and Tomasik, P. (2003), Interactions of starch with salts of metals from the transition groups. *Carbohydrate Polymers*, **51** (1), 47-56.

Full Text: [2003\Car Pol51, 47.pdf](2003/Car%20Pol51,%2047.pdf)

Abstract: Interpretation of EPR spectra of combinations of gelatinized one of amylopectin, cornstarch, waxy cornstarch, and potato starch with one of Co(II), Cr(III), Cu(II), Fe(III), and Mn(II) produced evidence for the formation of the Werner-type complexes with metal central atom and polysaccharide as the ligand. Ligation of the central atom involved lone electron pairs of the polysaccharide hydroxyl groups. Results of complexation depended on metal cation and polysaccharide as well as a form in which it was examined. Formation of complexes with granular starch was additionally confirmed by appearance of starch granules soaked in aqueous salt solutions in scanning electron microscopy. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Amylopectin, Polysaccharide-Metal Complexes, Starch Pasting, Starch Swelling, Complexes, Gelatinization, Granules

? Knill, C.J. and Kennedy, J.F. (2003), Degradation of cellulose under alkaline conditions. *Carbohydrate Polymers*, **51** (2), 281-300.

Full Text: [2003\Car Pol51, 281.pdf](2003/Car%20Pol51,%20281.pdf)

Abstract: A review of the important area of cellulose degradation under alkaline conditions is presented; it focuses on its relevance to the possible disposal of radioactive wastes in an underground repository in which cement-based waste encapsulation grouts and backfill may be employed. An overview of the alkaline degradation pathways of monosaccharides and substituted monosaccharides is initially presented, before progressing to the reactions involved in the alkaline degradation of cellulose, namely end-wise degradation, termination, alkaline scission, and oxidative alkaline degradation. Physical factors affecting reaction rates and the alkaline degradation of hemicellulose are also discussed. A review of the identity of the commonly detected alkaline degradation products (and their numerous synonyms) is presented, along with discussion of the rates of degradation of cellulose.

Keywords: Alkaline, Cellulose, Degradation, Peeling, Saccharinic Acids

Arıca, M.Y., Arpa, C., Ergene, A., Bayramoğlu, G. and Genç, Ö. (2003), Ca-alginate as a support for Pb(II) and Zn(II) biosorption with immobilized Phanerochaete chrysosporium. *Carbohydrate Polymers*, **52** (2), 167-174.

Full Text: [C\Car Pol52, 167.pdf](C/Car%20Pol52,%20167.pdf)

Abstract: The basidio spores of Phanerochaete chryosporium were immobilized in alginate gel beads, and the immobilized spore containing alginate beads were incubated for the growth of fungus. The biosorption of Pb2+ and Zn2+ ions on alginate beads and both immobilized live and heat inactivated fungus was studied from artificial waste waters in the concentrations range of 30-600 mg 1-1. The surface charge density of the biosorbents varied with the pH of the medium and the maximum biosorption of heavy metal ions on the biosorbents was obtained between pH 5.0 and 6.0. The biosorption of Pb2+ and Zn2+ on the biosorbents increased as the initial concentration of Pb2+ and Zn2+ ions increased in the medium. Biosorption equilibrium was established about 1 h, the adsorbed heavy metal ions did not significantly change further with time. The maximum biosorption capacity (qm) of alginate beads and both immobilized live and heat inactivated fungus were 230, 282 and 355 mg for Pb2+ and 30, 37 and 48 mg for Zn per gram of dry biosorbents, respectively. The experimental biosorption equilibrium data for Pb2+, and Zn2+ ions were in good agreement with those calculated by Langmuir model. The affinity order of heavy metal ions was Pb2+ > Zn2+, (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Heavy Metals, Alginate, Immobilization, Fungal Biomass, Biosorption, Phanerochaete Chrysosporium, Heavy-Metals, Aqueous-Solutions, *Aspergillus-Niger*, Cadmium Removal, Biomass, Accumulation, Column, Fungi, Gels

Vold, I.M.N., Vårum, K.M., Guibal, E. and Smidsrød, O. (2003), Binding of ions to chitosan - selectivity studies. *Carbohydrate Polymers*, **54** (4), 471-477.

Full Text: [C\Car Pol52, 471.pdf](C/Car%20Pol52,%20471.pdf)

Abstract: Selectivity coefficients for binding of negative and positive ions to chitosans of different chemical composition have been determined by equilibrium dialysis. Chitosans with different fraction of acetylated units (F-A of 0.01 and 0.49) generally behaved similarly in their selectivity towards both negative and positive ions. No selectivity was found in the binding of chloride and nitrate ions, while chitosan showed a strong selectivity towards molybdate polyoxyanions, with selectivity coefficients around 100. Chitosan showed a strong selectivity towards copper (Cu2+) compared to the metal ions zinc (Zn2+), Cadmium (Cd2+) and nickel (Ni2+), with selectivity coefficients from 10 to 1000, while little or no selectivity could be detected with the other metal ions. Ionic strength and pH did not influence the selectivity coefficients of the chitosans towards the metal ions. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Beads, Chitosan, Complexation, Copper, Dependence, Equilibrium, Exchange Properties, Metal Ion, Metal-Ions, N-Acetylation, Selectivity Coefficient, Sorption

Hu, K.J., Hu, J.L., Ho, K.P. and Yeung, K.W. (2004), Screening of fungi for chitosan producers, and copper adsorption capacity of fungal chitosan and chitosanaceous materials. *Carbohydrate Polymers*, **58** (1), 45-52.

Full Text: [C\Car Pol58, 45.pdf](C/Car%20Pol58,%2045.pdf)

Abstract: Thirty-three fungal strains were screened for chitosan producers. Although chitosan is believed to occur only in Mucorales strains in the class of Zygomycetes, we found that chitosan was extractable from all the 33 strains from the four classes. High level of chitosan was extractable from some non-zygomycetes strains. Absidia glauca(+) was found to be a promising chitosan producer. High level of chitosan can be extracted from some common industrial fungi, implying that it is feasible to produce chitosan from industrial waste mycelia. Fungal chitosan derived from A. glauca(+) showed the highest adsorption capacity for Cu(II). The order of copper adsorption capacity for these chitinous/chitosanaceous materials is: fungal chitosan > alkali-insoluble materials (AIM) > crustacean chitosan > fungal biomass. The Langmuir and Freundlich constants for the Cu(H) adsorption isotherms were determined with Freundlich model providing a better description of the copper adsorption isotherms. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Fungal Chitosan, Fungal Alkali-Insoluble Materials, Absidia Glauca, Copper Adsorption, Isotherm, Mucor-Rouxii, Absidia, Extraction, Cultures

? Xu, S.M., Wang, J.L., Wu, R.L. and Wang, J.D. (2006), Effect of degree of substitution on adsorption behavior of Basic Green 4 by highly crosslinked amphoteric starch with quaternary ammonium and carboxyl groups. *Carbohydrate Polymers*, **66** (1), 55-59.

Full Text: [2006\Car Pol66, 55.pdf](2006/Car%20Pol66,%2055.pdf)

Abstract: A series of crosslinked amphoteric starches with different degrees of substitution (DS) of carboxymethyl groups synthesized by a semi-dry process are investigated as an absorbent for removal of basic dye. Basic Green 4 is used to study the absorption behavior under various conditions, including initial pH of solution, dose of amphoteric starches, and dye initial concentration, adsorption time, adsorption temperature, and DS of carboxymethyl groups. The results show that adsorption amount of amphoteric starch is dependent of initial pH of dye solution, dose of absorbents and adsorption time. The adsorption capacity is affected strongly by the DS of carboxymethyl groups in the absorbents. The adsorption isotherm is discussed by modeling Langmuir and Freundlich isotherm. The kinetic study shows that the pseudo-second-order model fits the experimental data better. Also, the thermodynamic parameters are shown.

Keywords: Amphoteric Starch, Basic Dyes, Adsorption, Crosslinked

? Chauhan, G.S., Chauhan, K., Chauhan, S., Kumar, S. and Kumari, A. (2007), Functionalization of pine needles by carboxymethylation and network formation for use as supports in the adsorption of Cr6+. *Carbohydrate Polymers*, **70** (4), 415-421.

Full Text: [2007\Car Pol70, 415.pdf](2007/Car%20Pol70,%20415.pdf)

Abstract: Pine needles and their carboxymethyl forms were functionalized by network formation with 2-acrylamido-2-methylpropanesulphonic acid (AAmPSA) in the presence of *N*,*N*-Methylene bisacrylamide. *N*-Tetramethylethylene diamine and ammonium persulfate were used as accelerator-initiator systems to prepare these hydrogels. The hydrogels were characterized by FTIR, SEM, and nitrogen analysis and for water uptake capacities before and after metal ion sorption with a view to evaluating their use in the removal of toxic ionic species from waste water. A detailed study of Cr6+ adsorption was carried out as a function of time, temperature, pH, and ionic strength. The thermodynamic parameters of adsorption such as Δ*H*0, Δ*S*0, and Δ*G*0 have been evaluated to understand the underlying mechanism of adsorption. In order to understand their reusability in possible technological applications, biodegradability of these hydrogels and their precursors was studied.

Keywords: 2-Acrylamido-2-Methylpropanesulphonic Acid, Acid, Adsorption, Ammonium, Analysis, Applications, Biodegradability, Biodegradation, Carboxymethylation, Cr6+, Diamine, Formation, FTIR, Function, Heavy-Metal Ions, Hydrogels, Hydrogels, Ion, Ionic Species, Ionic Strength, Mechanism, Metal, Metal Ion, Metal Ion Uptake, Modified Cellulosics, Network, Nitrogen, Order, Parameters, Persulfate, pH, Pine, Pine Needles, Precursors, Removal, SEM, Sorption, Species, Strength, Supports, Temperature, Thermodynamic, Thermodynamic Parameters, Time, Toxic, Uptake, Waste, Waste Water, Waste-Water, Water, Water Uptake

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Full Text: [2008\Car Pol72, 261.pdf](2008/Car%20Pol72,%20261.pdf)

Abstract: Removal of nickel(II) from aqueous solutions through adsorption on to biopolymer sorbents, such as calcium alginate (CA), chitosan coated calcium alginate (CCCA) and chitosan coated silica (CCS), was studied using equilibrium batch and column flow techniques. The biosorbents were characterized by FTIR, SEM, TGA and surface area analysis. The extent of adsorption was found to be a function of the pH of the solution, contact time, sorbate concentration and adsorbent dose. The optimum pH was found to be 5.0. The adsorption of Ni(II) ions on CA was comparatively higher THAn CCCA and CCS. Adsorption of Ni(II) on to the biopolymers followed pseudo-second order kinetics. The equilibrium adsorption data for Ni(II) on CA, CCCA and CCS were fitted to Freundlich, and Langmuir Isotherms. The maximum monolayer adsorption capacity of the biosorbents (CA, CCCA and CCS), as obtained from Langmuir adsorption isotherm, was found to be 310.4, 222.2 and 254.3 mg/g, respectively. Breakthrough curves were obtained for adsorption of Ni(II) on all the three adsorbents through column flow technique. The Ni(II) loaded biosorbents were regenerated using 0.1 M EDTA solution. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Isotherm, Alginate, Analysis, Aqueous Solutions, Biosorption, Calcium, Calcium Alginate, Capacity, Chitosan, Equilibrium, FTIR, Function, India, Isotherm, Kinetics, Langmuir, Monolayer, Nickel, pH, Pseudo-Second Order, Removal, Rights, SEM, Silica, Solution, Techniques, United States

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Full Text: [2008\Car Pol72, 456.pdf](2008/Car%20Pol72,%20456.pdf)

Abstract: Glutaraldehyde activated chitosan beads bearing beta-cyclodextrin cross-linked by 1,6-hexamethylene diisocyanate was prepared, and characterized by IR, XRD and TG-DTA. Its adsorption property of hydroquinone was investigated by spectrophotometry. The adsorption capacity increases with increasing temperature and pH value. The adsorption process can be better simulated by Freundlich isotherm equation (R-2 > 0.996) and the thermodynamic parameters such as free energy change, enthalpy change and entropy change were calculated. The adsorption of hydroquinone on chitosan beads bearing beta-cyclodextrin cross-linked by 1,6-hexamethylene diisocyanate is a spontaneous, endothermic and random process. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: 1,6-Hexamethylene Diisocyanate, Acid, Activated Carbon, Adsorption, Adsorption Capacity, Aqueous-Solutions, Beads, Beta-Cyclodextrin, Capacity, Chitosan, Chitosan Beads, Cross-Linked, Dyes, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Freundlich, Freundlich Isotherm, Glutaraldehyde, Hydroquinone, IR, Isotherm, Kinetics, pH, Ph Value, Preparation, Property, Removal, Rights, Separation, Spectrophotometry, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Value, Waste, Water, XRD

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Full Text: [2009\Car Pol75, 463.pdf](2009/Car%20Pol75,%20463.pdf)

Abstract: In the present study, we report the preparation of semi interpenetrating hydrogel networks (SIHNs) based on cross-linked poly (acrylamide) prepared through an optimized rapid redox-solution polymerization with N,N’-methylenebisacrylamide (MBA) in presence of three different carbohydrate polymers, namely gum acacia (GA), carboxymethylcellulose (CMC) and starch (SR). Highly stable and uniformly distributed silver nanoparticles have been obtained with hydrogel networks as nanoreactors via in situ reduction of silver nitrate (AgNO3) using sodium borohydride (NaBH4) as reducing agent. The formation of silver nanoparticles has been confirmed with ultraviolet visible (UV-vis) spectroscopy, Fourier transform infrared (FT-IR) spectroscopy, X-ray diffraction (XRD) analyses. Thermogravimetric analysis (TGA) provides the amounts of silver nanoparticles exist in the hydrogel networks. Transmission electron microscopy (TEM) results demonstrate that acacia employed hydrogels have regulated the silver nanoparticles size to 2-5 run where as CIVIC and starch composed hydrogel networks result in a heterogeneous size front 2 to 20 nm. The preliminary antibacterial activity performed to these hydrogel-silver nanocomposites. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Silver Nanoparticles, Carboxymethyl Cellulose, Gum Acacia, Starch, Autoreduction, Antibacterial Activity, Biomedical Application, Green Synthesis, Carboxymethyl Cellulose, Stabilized Silver, Hybrid Microgels, Metal, Polymer, Gold, Nanocomposites, Reduction, Platinum

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Full Text: [2009\Car Pol77, 643.pdf](2009/Car%20Pol77,%20643.pdf)

Abstract: This work describes the preparation of new chelating materials derived from cellulose and sugarcane bagasse for adsorption of Cu2+, Cd2+, and Pb2+ ions from aqueous solutions. The first part involved the mercerization treatment of cellulose and sugarcane bagasse with NaOH 5 mol, L Non- and mercerized cellulose and sugarcane bagasse were then reacted with ethylenediaminetetraacetic dianhydride (EDTAD) in order to prepare different chelating materials. These materials were characterized by mass percent gain, X-ray diffraction, FTIR, and elemental analysis. The second part consisted of evaluating the adsorption capacity of these modified materials for Cu2+, Cd2+, and Pb2+ ions from aqueous single metal solutions, whose concentration was determined by atomic absorption spectroscopy. These materials als showed maximum adsorption capacities for Cu2+, Cd2+, and Pb2+ ions ranging from 38.8 to 92.6 mg, g, 87.7 to 149.0 mg, g, and 192.0 to 333.0 mg, g, respectively. The modified mercerized materials showed larger maximum adsorption capacities than modified non-mercerized materials. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Absorption, Adsorption, Adsorption Capacities, Adsorption Capacity, Analysis, Aqueous Solutions, Atomic Absorption Spectroscopy, Bagasse, Cane Bagasse, Capacity, Cd(II), Cd2+, Cellulose, Concentration, Copper, Cu(II), Cu2+, EDTA, Ethylenediaminetetraacetic Dianhydride, First, Fly-Ash, FTIR, Heavy Metals, Industry Waste, Ion, Ions, Lead, Mercerization, Metal, Modified, Modified Sugarcane Bagasse, NaOH, Pb(II), Pb2+, Preparation, Removal, Rights, Solutions, Spectroscopy, Succinic Anhydride, Sugarcane, Treatment, Waste-Water, Work, X-Ray, X-Ray Diffraction

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Full Text: [2009\Car Pol78, 894.pdf](2009/Car%20Pol78,%20894.pdf)

Abstract: Gum kondagogu (*Cochlospermum gossypium*), an exudates tree gum from India was explored for its potential to decontaminate toxic metals (Pb2+ and Cd2+). Optimum biosorption of metals were determined by investigating the contact time, pH, initial concentration of metal ions and biosorbent dose at 25±2ºC. The maximum metal biosorption capacity for gum kondagogu was observed for Pb2+ (48.52 mg g-1) and Cd2+ (47.48 mg g-1) as calculated by Langmuir isotherm model. Kinetic studies showed that the biosorption rates could be described by pseudo-second-order expression. The metal interactions with biopolymer were assessed by FT-IR, SEM-EDXA and XPS analysis. Results based on these techniques suggest that mechanism of metal binding by the biopolymer involves micro-precipitation, ion-exchange and metal complexation. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Analysis, Aqueous-Solutions, Binding, Biomass, Biopolymer, Biosorbent, Biosorption, Biosorption Mechanisms, Botrytis-Cinerea, Cadmium, Capacity, Cd2+, Cellulose, Chitin Beads, Complexation, Concentration, Expression, FT-IR, FTIR, Gum Kondagogu, Heavy Metals, Heavy-Metals, India, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Studies, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanism, Metal, Metal Ions, Metals, Model, Natural, Nov, Pb2+, pH, Polymer, Potential, Pseudo Second Order, Pseudo-Second-Order, Rates, Removal, Rights, Techniques, Toxic, Toxic Metals, Tree Gum, Waste, XPS

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Full Text: [2010\Car Pol79, 184.pdf](2010/Car%20Pol79,%20184.pdf)

Abstract: In a previous work, chemically modified cellulose (EMC) and sugarcane bagasse (EMMB) were prepared from mercerized cellulose (MC) and twice-mercerized sugarcane bagasse (MMB) using ethylenediaminetetraacetic dianhydride (EDTAD) as modifying agent. In this work we described in detail the modification of these materials in function of reaction time and EDTAD amount in the reaction media. The resistance of ester bond at pH 1, 2, 11, and 12 was also evaluated by FTIR. The results were used to model the hydrolysis process and a kinetic model was proposed. The modified materials (EMMB and EMC) were used to adsorb Ca2+ and Mg2+ ions from aqueous single solutions. The adsorption isotherms were developed at two pH values. These materials showed maximum adsorption capacities for Ca2+ and Mg2+ ions ranging from 15.6 to 54.1 mg/g and 13.5 to 42.6 mg/g, respectively. The modified material from sugarcane bagasse (EMMB) showed larger maximum adsorption capacities than modified material from cellulose (EMC) for both metals. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Capacities, Adsorption Isotherms, Bagasse, Cd(II), Cellulose, Cu(II), EDTA, EMC, Ethylenediaminetetraacetic Dianhydride, Fly-Ash, FTIR, Function, Grafted, Hardness Removal, Hardness Water, Hydrolysis, Industry Waste, Ion, Ions, Isotherms, Kinetic, Kinetic Model, Media, Mercerization, Metal, Metals, Model, Modification, Modified, Modified Sugarcane Bagasse, Pb(II), pH, Removal, Resistance, Rights, Solutions, Succinic Anhydride, Sugarcane, Water, Work

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Full Text: [2010\Car Pol79, 1140.pdf](2010/Car%20Pol79,%201140.pdf)

Abstract: The citric acid modified wheat straw (MWS) was characterized and the adsorption properties of copper ion and methylene blue (MB) onto MWS were investigated in single adsorbate system by batch techniques. The mass loss during thermo-gravimetric analysis can be divided into steps related to moisture, cellulose and lignin. There were carbonyl group, hydroxyl group, etc. on surface of adsorbent from FTIR. Kinetic studies indicated that Cu2+ and MB adsorption followed the pseudo-second-order model. The adsorption may be controlled by external mass transfer followed by intra-particle diffusion mass transfer. The adsorption equilibrium data were fitted well by both the Freundlich and Langmuir models. The maximal equilibrium quantity of Cu2+ and MB from Langmuir model on MWS was 39.17 and 396.9 mg g-1 at 293 K, respectively. The thermodynamics parameters of adsorption systems indicated spontaneous and endothermic process. (c) 2009 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Equilibrium, Adsorption Properties, Agricultural Waste, Analysis, Aqueous-Solution, Batch, Batch Mode, Cellulose, Characterization, Citric Acid, Citric-Acid, Copper, Copper Ion, Cu2+, Data, Diffusion, Endothermic, Equilibrium, Freundlich, FTIR, FTIR Analysis, Heavy-Metal Ions, Intra-Particle Diffusion, Intraparticle Diffusion, Kinetic, Kinetic Studies, Langmuir, Langmuir Model, Lignin, Low-Cost Adsorbents, Mar, Mass Transfer, MB, Methylene Blue, Methylene Blue Adsorption, Mode, Model, Models, Modified, Modified Wheat Straw, Moisture, MWS, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rice Husk, Rights, Straw, Sugar-Beet Pulp, Surface, Systems, Techniques, TG Analysis, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2010\Car Pol80, 891.pdf](2010/Car%20Pol80,%20891.pdf)

Abstract: Biodegradable material, known as chitosan-coated sand (CCS), was utilized for removal of copper(II) and lead(II) ions in water. Batch experiments were conducted to investigate the adsorption effect under different initial concentration (C-o = 100, 500, 1000 and 2000 mg/L), solution pH (2, 3, 4, 5 and 6), and contact time (0.5, 1, 2, 4, 6, 12 and 24 h). Desorption studies were performed using diluted HCl solution (pH 1 and 3) and tap water (pH 7) on adsorbed metal ions. Langmuir and Freundlich adsorption models were used to describe static isotherms and constants. The data fitted well with Langmuir model at Q(max) value of 8.18 and 12.32 mg/g CCS for Cu(II) and Pb(II) ions at 4 h contact time, respectively. Kinetic studies followed the pseudo second-order reaction, which indicated that the chemical sorption is the rate-limiting step. Results of desorption process signified potential for recovering metal ions from CCS. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Chemical, Chitosan, Co, Concentration, Copper, Crab Shells, Cross-Linked Chitosan, Cu(II), Cu(II) Ions, Data, Desorption, Equilibrium, Experiments, Freundlich, Heavy-Metal, Ions, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Lead, Metal, Metal Ions, Model, Models, Pb(II), Pb(II) Ions, Permeable Reactive Barrier, pH, Potential, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Reaction, Reactive Dye, Removal, Rights, Sand, Second Order, Second-Order, Solution, Sorption, Time, Value, Water

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Full Text: [2010\Car Pol81, 305.pdf](2010/Car%20Pol81,%20305.pdf)

Abstract: In order to find an effective absorbent material based on chitosan which has good adsorption selectivity for heavy metals, we prepared thiourea-modified chitosan resin with Pb(II) as template (TMCR template). TMCR template was synthesized by using O-carboxymethylated chitosan to absorb Pb(II) ions first and then being cross-linked with a polymeric Schiff’s base of thiourea/glutaraldehyde. The effects of parameters such as pH, contact time, initial concentration and temperature on the adsorption of TMCR template were studied. The result showed the maximum uptake of Pb(II) was found to be 2.02 mmol/g at pH 6.0, 25ºC. Adsorption experiments showed the TMCR template had high selectivity for Pb(II) in solution containing binary mixtures with Cu(II), Zn(II), Cd(II) and Ni(II). The experimental data also indicated that the adsorption process was exothermic spontaneous and fit well with Lagergren’s pseudo-second-order model in comparison to pseudo-first-order kinetic. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Absorbent, Adsorption, Adsorption Behavior, Aqueous-Solution, Behavior, Binary Mixtures, Cd(II), Chitosan, Comparison, Concentration, Cross-Linked, Cross-Linked Chitosan, Cu(II), Data, Equilibrium, Exothermic, Experimental, Experiments, First, Heavy Metals, Ions, Kinetic, Kinetics, Metal-Ions, Metals, Microspheres, Model, Ni(II), Pb(II), Pb(II) Ions, pH, Polymeric, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Recovery, Resin, Rights, Schiff’s Base, Selectivity, Solution, Sorbents, Sorption, Temperature, Template, Thiourea, Uptake, Zn(II)

? Liu, Y., Sun, X.M. and Li, B.H. (2010), Adsorption of Hg2+ and Cd2+ by ethylenediamine modified peanut shells. *Carbohydrate Polymers*, **81** (2), 335-339.

Full Text: [2010\Car Pol81, 335.pdf](2010/Car%20Pol81,%20335.pdf)

Abstract: In this study, an absorbent material was prepared using peanut shells modified with epichlorohydrin and ethylenediamine. Peanut shells were modified by mixing with 10 mL ethylenediamine, 100 mL water and 1 g NaCO3 per 10 g shells at 60°C for 2 h. Factors affecting the adsorption behavior of Hg2+ and Cd2+, such as pH, initial metal concentration and adsorption time, were then investigated. Results suggested that optimal Hg2+ adsorption by modified peanut shells can be obtained by adding 0.2 g modified peanut shells per 25 mL of 10 mg/L Hg2+ and mixing at a fixed pH of 3.0 for 30 min. The adsorption rate was merely 37%, while after modification the adsorption rate can reach 100% for Hg2+. Data also suggested that separation of Hg2+ and Cd2+ can be achieved by maintaining the solution acidity to less than pH 2.5. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Peanut Shell, Modification, Adsorption, Hg2+, Cd2+, Heavy-Metal Removal, Aqueous-Solutions, Hull Pellets, Capacity, Kinetics, Water, Ions, Pb

? Liu, K., Li, X.F., Li, X.M., He, B.H. and Zhao, G.L. (2010), Lowering the cationic demand caused by PGA in papermaking by solute adsorption and immobilized pectinase on chitosan beads. *Carbohydrate Polymers*, **82** (3), 648-652.

Full Text: [2010\Car Pol82, 648.pdf](2010/Car%20Pol82,%20648.pdf)

Abstract: Pectins or polygalacturonic acids (PGA) were originated from alkaline peroxide bleaching of mechanical pulps and considered as the dominant troublesome substance, which seriously decreased the runability of the paper machine in process water closure. To find wide application of enzymes in lowering PGA concentration in papermaking industries, cross-linked chitosan beads were prepared. Results showed that the PGA-absorption capability of chitosan beads was greatly affected by its cross-linking degree. The activity of immobilized pectinase on cross-linked chitosan beads were also investigated and the highest activity of binary immobilized pectinase on cross-linked chitosan was achieved using 1.00% of activating reagent or 0.005% of glutaraldehyde. Cationic demand of PGA solutions was obviously lowered by increasing the temperature of enzymatic treatment. GPC analysis showed a sharp decrease in the molecular weight of PGA after enzymatic treatment. Besides, operational stability of the immobilize pectinase was analyzed to evaluate its application potential. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Analysis, Application, Beads, Candida-Rugosa Lipase, Cationic Demand, Chitosan, Closure, Concentration, Cross-Linked, Cross-Linked Chitosan, Crosslinked Chitosan, Crosslinking, Demand, Enzyme Immobilization, Glutaraldehyde, Immobilized, Immobilized Pectinase, Machine, Mechanical Pulp, Papermaking, Peroxide, Potential, Rights, Solute Adsorption, Solutions, Stability, Temperature, Treatment, Water

? Ofomaja, A.E. and Naidoo, E.B. (2010), Biosorption of lead(II) onto pine cone powder: Studies on biosorption performance and process design to minimize biosorbent mass. *Carbohydrate Polymers*, **82** (4), 1031-1042.

Full Text: [2010\Car Pol82, 1031.pdf](2010/Car%20Pol82,%201031.pdf)

Abstract: Biosorption kinetic modeling is frequently performed on both raw and modified biosorbents and changes in model parameters observed. Comparative studies on the relationship between best fitting model parameters and biosorption performance for raw and modified is scares in literature. In the present study, the effect of surface modification on the kinetic parameters of the best fitting kinetic model (pseudo-second order) for biosorption of lead(II) ions onto Raw and NaOH modified pine cone powder was examined and related with biosorption performance for each sample. Equilibrium biosorption studies performed showed that the Langmuir-1 isotherm gave a better fitting of the equilibrium data for all samples indicating that biosorption sites are homogenous regardless of surface modification. Based on the Langmuir-1 isotherm, a two-stage batch adsorber was designed to predict the minimum biosorbent amount to achieve a specified percentage lead(II) removal. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Aqueous-Solutions, Batch, Batch Adsorber Design, Biosorbent, Biosorbents, Biosorption, Biosorption Kinetic, Biosorption Performance, Changes, Citric-Acid, Contact Time, Data, Design, Equilibrium, Heavy-Metal Ions, Ions, Isotherm, Kinetic, Kinetic Model, Kinetic Modeling, Kinetic Parameters, Kinetic-Model, Langmuir-1 Model, Lead(II), Liquid-Phase Adsorption, Literature, Minimum, Model, Modeling, Modification, Modified, NaOH, NaOH Modification, NOV, Optimization, Optimization of Biosorbent Mass, Performance, Process Design, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rights, Surface, Surface Modification, Two Stage Batch Adsorber, Waste-Water

? Krishnapriya, K.R. and Kandaswamy, M. (2010), A new chitosan biopolymer derivative as metal-complexing agent: synthesis, characterization, and metal(II) ion adsorption studies. *Carbohydrate Research*, **345** (14), 2013-2022.

Full Text: [2010\Car Pol82, 2013.pdf](2010/Car%20Pol82,%202013.pdf)

Abstract: In this study, a new chitosan biopolymer derivative (CTSL) has been synthesized by anchoring a new vanillin-based complexing agent or ligand, namely 4-hydroxy-3-methoxy-5-[(4-methylpiperazin-1-yl)methyl] benzaldehyde, (L) with chitosan (CTS) by means of condensation. The new material was characterized by elemental (CHN), spectral (FTIR and solid state C-13 NMR), thermal (TG-DTA and DSC), structural (powder XRD), and morphological (SEM) analyses. The CTSL was employed to study the equilibrium adsorption of various metal ions, namely, Mn(II), Fe(II), Co(II), Cu(II), Ni(II), Cd(II), and Pb(II), as functions of pH of the solutions. Its kinetics of adsorption was evaluated utilizing the pseudo first order and pseudo second order equation models and the equilibrium data were analyzed by Langmuir isotherm model. The CTSL shows good adsorption capacity for metal ions studied in the order Cu(II) > Ni(II) > Cd(II) >= Co >= Mn(II) > Fe(II) > Pb(II) in all studied pH ranges due to the presence of many coordinating moieties present in it. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Analyses, Aqueous-Solution, Benzaldehyde, Biopolymer, C-13, Capacity, Cd(II), Characterization, Chitosan, Chitosan Derivatives, Co, Co(II), Complexation, Complexing Agent, Copper(II) Adsorption, CT, Cu(II), Data, Equilibrium, First, First Order, FTIR, Functions, Ions, Isotherm, Isotherm Model, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Ligand, Metal, Metal Ions, Metal-Polymer Complex, Mn(II), Model, Models, Ni(II), Ni(II) Ions, NMR, Parameters, Pb(II), pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rights, Salicylaldehyde, Schiff-Bases, Second Order, Second-Order, SEM, Solutions, State, Synthesis, Vanillin, XRD

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Full Text: [2011\Car Pol83, 495.pdf](2011/Car%20Pol83,%20495.pdf)

Abstract: The graft copolymerization of acrylamide onto chitosan in aqueous medium was investigated using potassium persulfate (PPS) as initiator The graft copolymer was characterized by Fourier transform infrared spectra analysis differential scanning calorimetric and thermogravimetric analysis The effects of polymerization variables such as the initiator concentration the ratio of monomer to chitosan as well as reaction temperature were studied and the grafting conditions were optimized The prepared polymers which have the highest percentage of grafting (PG) have been used in removal of Cu(II) ions from water by followed adsorption studies at pH = 7 The amount of metal Ion uptake of the polymers was determined by using atomic absorption spectrophotometer The effect of polymer mass and temperature on the adsorption of Cu(II) ions have been also reported Langmuir and Freundlich isotherm models were used to fit the experimental data The experimental data of the adsorption equilibrium from Cu(II) solution correlates well with the Langmuir isotherm equation (C) 2010 Elsevier Ltd All rights reserved.

Keywords: Absorption, Adsorption, Adsorption Equilibrium, Alginate, Analysis, Aqueous Medium, Aqueous-Solution, Beads, Characterization, Chitosan, Concentration, Copolymer, Copolymerization, Copper(II), Correlates, Cu(II), Cu(II) Ions, Data, Dye, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Graft, Graft Copolmerization, Graft Copolymerization, Grafted, Grafting, Ions, Isotherm, Langmuir, Langmuir Isotherm, Metal, Models, pH, Polymer, Polymerization, Polymers, Potassium, Removal, Rights, Schiff-Bases, Solution, Sorption, Synthesis, Temperature, Uptake, Water, Water Treatement

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Full Text: [2011\Car Pol83, 528.pdf](2011/Car%20Pol83,%20528.pdf)

Abstract: The comparative and competitive adsorption of Cu(II) Ni(II) and Pb(II) from aqueous solution using chitosan immobilized on bentonite (CHB) was investigated The adsorption data of single and binary systems indicated that Cu(II) and Pb(II) best fits Freundlich isotherm while NI(II) follows Langmuir In binary systems a decrease in adsorption capacities and isotherm constants was observed showing preference of adsorption in the order of Pb(II) > Cu(II) > Ni(II) Kinetic studies of single system indicated that the pseudo-second order is the best fit with high correlation coefficients (R-2 > 099) and low sum of error values (SE = 0 13-0 46%) Thermodynamic studies illustrated that adsorption of CHB are exothermic and causes a decrease in the entropy The adsorption of Pb(II) is spontaneous while Ni(II) is non-spontaneous at 25-55 C Cu(II) adsorption is only spontaneous at 25 C (C) 2010 Elsevier Ltd All rights reserved.

Keywords: Adsorption, Adsorption Capacities, Antagonistic, Aqueous Solution, Aqueous-Solution, Beads, Bentonite, Cadmium, Chitosan, Comparative and Competitive, Competitive, Competitive Adsorption, Copper, Correlation, Cu(II), Data, Entropy, Error, Exothermic, Freundlich, Freundlich Isotherm, Immobilized, Ions, Isotherm, Kinetic, Kinetic Studies, Langmuir, Lead, Mechanisms, Montmorillonite, Ni(II), Nickel, Pb(II), Preference, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Se, Solution, Systems, Thermodynamic, Water

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Full Text: [2011\Car Pol84, 430.pdf](2011/Car%20Pol84,%20430.pdf)

Abstract: A new amino modified starch (AMS) has been synthesized via grafting polymerization and ring-opening reaction using cassava starch as raw material and used as an adsorbent for the removal of Cd(II) ions from aqueous solution. The adsorbent was characterized by infrared spectroscopy (FT-IR), X-ray diffraction (XRD) patterns, scanning electron microscopy (SEM). Batch adsorption experiments were carried out as a function of pH, adsorption time, initial Cd(II) ions concentration and temperature. Moreover, the equilibrium, thermodynamics and kinetics of the adsorption process were further investigated. It is found that the effect of pH on adsorption is visible and the optimum value is 6-7. The present adsorption system can be described more favorably by the pseudo-second-order kinetic model. The adsorption equilibrium data are correlated well with the Langmuir isotherm model. Furthermore, the adsorption is a spontaneous and endothermic process with increased entropy, and the rise of temperature will benefit the adsorption. In addition, the adsorption-desorption studies show that the AMS adsorbent can be reused almost without any loss in the adsorption capacity over three cycles. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Amino Modified Starch, Cd(II), Competitive Removal, Cu(II) Ions, Dialdehyde Starch, Heavy-Metal Ions, Kinetic Model, Kinetics, Linked Amphoteric Starch, Ni(II), Sorption, Thermodynamics, Waste-Water, Zn(II)

? Wang, J.S., Peng, R.T., Yang, J.H., Liu, Y.C. and Hu, X.J. (2011), Preparation of ethylenediamine-modified magnetic chitosan complex for adsorption of uranyl ions. *Carbohydrate Polymers*, **84** (3), 1169-1175.

Full Text: [2011\ Car Pol84, 1169.pdf](2011/%20Car%20Pol84,%201169.pdf)

Abstract: Ethylenediamine-modified magnetic chitosan (EMMC) complex was developed as a novel magnetic adsorbent for the removal of uranyl ions. XRD spectrum indicated that the magnetic particles were pure Fe3O4 with a spinel structure, and the binding of chitosan did not result in a phase change. IR analysis demonstrated that Fe3O4 particles were successfully bounded by chitosan and more amino groups appeared in the EMMC samples. EMMC was found to be quite efficient to adsorb uranyl ions at pH 2-7. Equilibrium was established within 30 min, and the kinetic experimental data properly correlated with the pseudo-second-order kinetic model, indicating that the chemical sorption is the rate-limiting step. The adsorption data could be best interpreted by the Sips model with a maximum adsorption capacity of 82.83 mg U g-1. The EMMC can be regenerated with high efficiency, suggesting that this adsorbent is satisfactory to reuse uranyl ions. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Acid, Adsorption, Aqueous-Solution, Beads, Biosorption, Chitosan, Equilibrium, Kinetic Model, Magnetic, Metal-Ions, Modified, pH, Removal, Resin, Uranium, Uranyl Ions

? Ahmed, S.A. (2011), Batch and fixed-bed column techniques for removal of Cu(II) and Fe(III) using carbohydrate natural polymer modified complexing agents. *Carbohydrate Polymers*, **83** (4), 1470-1478.

Full Text: [2011\Car Pol83, 1470.pdf](2011/Car%20Pol83,%201470.pdf)

Abstract: Wood sawdust, a by-product of the world industry, is a low cost and promising industrial waste with cellulose-lignin polymeric structure. Its sorption properties after physical loading with Alizarin Red S (phase I) and Eriochrome Black T (phase II) for the removal of Fe(III) and Cu(II) under variable conditions of solution pH, contact times, weight of phase and concentration of the metal ion were investigated. Scanning electron microscope and Fourier transfer infrared spectra of phases before and after uptake of Fe(III) and Cu(II) were recorded to characterize the nature of the functional groups responsible for binding of these metal ions onto the studied modified polymers. Their equilibrium data were fitted with a Langmuir model. The adsorption kinetics data were best fitted with the pseudo-second-order. As a view to find a suitable application of phase I it was found that, Fe(III) in natural water samples were quantitatively recovered using column experiments. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Batch Technique, Copper, Cu(II), Electroplating Waste-Water, Equilibrium, Fixed Bed, Heavy Metals, Heavy-Metal, Ions, Kinetics, Langmuir, pH, Removal, Selective Separation, Silica-Gel, Solid-Phase Extractors, Water Samples, Wood Sawdust, Wood Sawdust

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Full Text: [2011\Car Pol84, 1169.pdf](2011/Car%20Pol84,%201169.pdf)

Abstract: Ethylenediamine-modified magnetic chitosan (EMMC) complex was developed as a novel magnetic adsorbent for the removal of uranyl ions. XRD spectrum indicated that the magnetic particles were pure Fe3O4 with a spinel structure, and the binding of chitosan did not result in a phase change. IR analysis demonstrated that Fe3O4 particles were successfully bounded by chitosan and more amino groups appeared in the EMMC samples. EMMC was found to be quite efficient to adsorb uranyl ions at pH 2-7. Equilibrium was established within 30 min, and the kinetic experimental data properly correlated with the pseudo-second-order kinetic model, indicating that the chemical sorption is the rate-limiting step. The adsorption data could be best interpreted by the Sips model with a maximum adsorption capacity of 82.83 mg U g-1. The EMMC can be regenerated with high efficiency, suggesting that this adsorbent is satisfactory to reuse uranyl ions. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Aqueous-Solution, Beads, Biosorption, Chitosan, Equilibrium, Kinetic, Kinetic Model, Magnetic, Metal-Ions, Modified, pH, Removal, Resin, Sorption, Uranium, Uranyl Ions

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Full Text: [2011\Car Pol84, 1350.pdf](2011/Car%20Pol84,%201350.pdf)

Abstract: In this study, chitosan was cross-linked with ethylenediamine (EDA) to prepare an outstanding sorbent for the removal of anionic dye eosin Y from aqueous solution. FTIR, DTG, XPS and zeta potential analysis were used to characterize the sorbent. The effect of particle size, solution pH, agitation rate, temperature, adsorbent dosage (50-500 mg/L), contact time (10 min-24 h) and initial concentration of dye (50-300 mg/L) on the adsorption process was investigated. Langmuir and Freundlich adsorption models were applied to describe the isotherms and isotherm constants, and the data fitted well with Langmuir model with a maximum adsorption capacity of 294.12 mg/g at 25ºC. Kinetic studies followed the pseudo second-order rate model, which indicated that the chemisorption is the rate-limiting step. Thermodynamic parameters such as enthalpy change (Δ*H*º= -5.004 kJ/mol), free energy change (Δ*G*º < 0) and entropy change (Δ*S*º = -11.656 J/(mol K)) indicate the exothermic and spontaneous nature of adsorption. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Behavior, Batch, Beads, Chitosan, Chitosan Derivative, Dye, Effluent Treatment, Eosin Y, Equilibrium, Freundlich, Ftir, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Mechanism, pH, Reactive Dye, Red, Removal, Sorbent, Thermodynamic, XPS

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Full Text: [2011\Car Pol85, 376.pdf](2011/Car%20Pol85,%20376.pdf)

Abstract: Microparticles with complex architectures based on the polyelectrolyte complexes between an acrylic ion exchange resin and two polysaccharides: gellan and xanthan gum were prepared and used for the adsorption of antibiotic in order to obtain a new drug delivery systems. Batch adsorption studies have been carried out to determine the effect of the contact time, temperature and the initial concentration of drug solution on the adsorption behavior. The Langmuir, Freundlich, Temkin and Dubinin-Radushkevich adsorption isotherms were used to model this behavior. The kinetics were fitted with the pseudo-first order, pseudo-second order, Elovich and intraparticle diffusion models. The best results were achieved with pseudo-second order kinetic model. The thermodynamic parameters (Delta G, Delta H, Delta S) were also calculated and the values indicate that the adsorption process was endothermic and spontaneous. The results showed that the microparticles with complex structures have a higher adsorption capacity, making it suitable for use in drug delivery systems. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solution, Base Anion-Exchangers, Batch, Batch Adsorption, Controlled-Release, Diffusion, Equilibrium, Freundlich, Ion Exchange, Ion Exchange Resin, Ion-Exchange, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Mechanism, Polysaccharide, Reactive Dye, Resin, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamic Studies

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Full Text: [2011\Car Pol86, 1533.pdf](2011/Car%20Pol86,%201533.pdf)

Abstract: In this study, equilibrium, kinetics and thermodynamics of Crystal Violet (CV) adsorption onto NaOH-modified rice husk (NMRH) was investigated. Experiments were carried out as function of contact time, initial solution pH (2-10), adsorbent dose (0.5-5 g) and temperature (293, 303 and 313 K). The adsorption was favoured at higher pHs and lower temperatures. Adsorption data were well described by the Freundlich model, although they could be modelled by the Langmuir model as well. The adsorption process followed the pseudo-second order kinetic model. The mass transfer model based on intraparticle diffusion was applied to the experimental data to examine the mechanisms of the rate controlling step. It was found that intraparticle diffusion was not the sole rate controlling step. The activation energy (E(a)) of the system was calculated as 50.51 kJ mol-1. Thermodynamic parameters suggest that the adsorption is a typical chemical process, spontaneous, and exothermic in nature. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Acid Dyes, Adsorbent, Adsorption, Aqueous Solution, Cationic Dyes, Coir Pith, Color Removal, Crystal Violet, Diffusion, Equilibrium, Equilibrium, Freundlich, Heavy-Metal, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Malachite-Green, NaOH-Modified Rice Husk, pH, Rice, Rice Husk, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste

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Full Text: [2012\Car Pol87, 1447.pdf](2012/Car%20Pol87,%201447.pdf)

Abstract: In order to increase the adsorption capacity of cationic starch and avoid the loss of cationic groups, novel and cost-effective cationic starch (CS) intercalated clay composite matrix was prepared by controlling the weight ratio of clay and CS. Intercalated microstructure of the composite matrix was characterized by FTIR and XRD, respectively. Reactive dye (brilliant blue X-BR) was used to study adsorption behaviors of the matrix under various parameters such as weight ratio of clay to CS. initial dye concentration, contact time and temperature. Adsorption equilibrium, thermodynamics and kinetics models were further investigated. The results showed that the adsorption capacity increased greatly with increasing the weight ratio of clay to CS from 0.1 to 0.2. and then decreased when the weight ratio up to 0.3. The adsorption isotherm fitted well with the Langmuir isotherm model with a maximum adsorption capacity of 122.0 mg/g. Kinetic study showed that the pseudo-second-order model provided a better correlation of experimental data. Furthermore, the thermodynamic parameters were also calculated. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Equilibrium, Brilliant Blue X-Br, Cationic Starch, Chitosan, Clay, Composite Matrix, Concentration, Effluent, Equilibrium, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Metal-Ions, Microstructure, Models, Preparation, Reactive Dye, Reactive Dyes, Removal, Sorption, Temperature, Thermodynamic, Thermodynamics, Waste-Water

# Title: Carbohydrate Research

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Full Text: [2007\Car Res342, 1189.pdf](2007/Car%20Res342,%201189.pdf)

Abstract: The physicochemical characterization of metal complexed with chitosan (CS) and its glutaraldehyde cross-linked derivative (CSGA) was investigated. Seven metal ions from chromium through zinc of the first row of the transition metals were selected for complexation. Structural features pertinent to where and how metals bind into both polymers are our main interest. studies using solid-state nmr spectroscopy and xrpd (x-ray powder diffraction) supported by esr spectroscopy, icp-oes (inductively couple plasma-optical emission spectroscopy) and far-ftir spectroscopy for metal interaction with nitrogen sites at C-2 of the metal-polymer complexes were performed. Theoretical calculations of the metal-polymer ratio, the approximate charges on nitrogen for both amine and imino-linker, and the proton affinity between an alcohol group from the polymer and an amino/imino group are reported. A helical coiled chitosan model and a 2C1L (two-chitosans with one linker) model are proposed here. The metal uptake mechanism for both polymers is concluded to be absorption within the polymers, rather than adsorption on the polymer surface. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Chitosan, Glutaraldehyde Cross-Linked Chitosan, Metal Interaction, Amine, Imine, Schiff Base, Metal Interaction, Metal-Polymer Complexes, Gel Beads, Powder Diffraction, Ion Sorption, Dilute Spins, NMR, Adsorption, Resolution, C-13, Membranes, Hydrogel

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Full Text: [2008\Car Res343, 1324.pdf](2008/Car%20Res343,%201324.pdf)

Abstract: The equilibrium isotherm data obtained by the sorption of tartrate, citrate, and EDTA onto chitosan were analyzed using Langmuir and Freundlich equations. The process fits best the Langmuir equation. Kinetic investigations showed that the sorption process obeys the pseudo-second-order kinetic equation. Sorption and desorption peculiarities, FTIR investigations, and measurements of molecular weight enable one to hypothesize that sorption proceeds along with the electrostatic interaction between the positively charged -NH3+ groups of chitosan and the negatively charged -COO- of carboxylic acids in the formation of amide bonds between the -NH2 groups of chitosan and the -COOH groups of the carboxylic acid. Electrolysis under galvanostatic conditions in a mixture of chitosan with a 0.1 mol L-1 Na2SO4 solution enables one to destroy the amide bonds in the cathode compartment of the electrochemical cell and to anodize organics in the anodic compartment. The choosing of relevant conditions of electrolysis enables one to obtain chitosan with properties (deacetylation degree, molecular weight, and sorption ability) similar to those of initial chitosan. After electrolysis the regenerated chitosan possesses the same or even higher ability for sorption of the carboxylic acids as the initial chitosan. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Chelating-Agents, Chitosan, Citrate, Desorption, Edta, Electrolysis, Equilibrium, Equilibrium Isotherm, Freundlich, FTIR, Heavy-Metals, Incineration, Interaction, Isotherm, Kinetic, Langmuir, Langmuir Equation, Metal-Ions, Organic-Acids, Pollutants, Pseudo-Second-Order, Regeneration, Removal, Rights, Solution, Sorbents, Sorption, Sorption Process, Tartrate, Water

? Krishnapriya, K.R. and Kandaswamy, M. (2009), Synthesis and characterization of a crosslinked chitosan derivative with a complexing agent and its adsorption studies toward metal(II) ions. *Carbohydrate Research*, **344** (13), 1632-1638.

Full Text: [2009\Car Res344, 1632.pdf](2009/Car%20Res344,%201632.pdf)

Abstract: A new chitosan derivative has been synthesized by crosslinking a metal complexing agent, [6,6’-piperazine-1,4-diyldiMethylene bis (4-methyl-2-formyl) phenol] (L), with chitosan (CTS). The resulting material (CCTSL) was characterized by elemental (CHN), spectral (FTIR and solid-state NMR), thermal (TGA and DTA), and structural (powder XRD and SEM) analyses. Adsorption experiments (pH dependency, kinetics, and equilibrium) of CCTSL toward various metal ions such as Mn(II), Fe(II), Co(II), Cu(II), Ni(II), Cd(II), and Pb(II) were carried out at 25ºC. The results showed that the adsorption was dependent on the pH of the solution, with a maximum capacity between pHs 6.5 and 8.5. The kinetics was evaluated by applying the pseudo-first-order and pseudo-second-order equation models and the equilibrium data were analyzed by Langmuir isotherm model. The maximum adsorption capacity was 1.21 mmol g-1 for Cu(II) and the order of adsorption capacities for the metal(II) ions studied was found to be Cu(II) > Ni(II) > Cd(II) ≥ Co(II) ≥ Mn(II) ≥ Fe(II) ≥ Pb(II). (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Adsorption Capacities, Adsorption Capacity, Analyses, Aqueous-Solution, Behavior, Capacity, Carboxymethyl-Chitosan, Cd(II), Characterization, Chitosan, Co(II), Complexing Agent, Copper(II) Adsorption, Crosslinked Chitosan, Crosslinking, CT, Cu(II), Data, Dependency, Equilibrium, Experiments, FTIR, Ions, Isotherm, Isotherm Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Metal, Metal Ions, Metal(II) Adsorption, Model, Models, Ni(II), NMR, Pb(II), pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Removal, Resin, Rights, Schiff-Bases, SEM, Solution, Sorbent Material, Synthesis, TGA, Waste-Water, XRD

? Huang, X.Y., Mao, X.Y., Bu, H.T., Yu, X.Y., Jiang, G.B. and Zeng, M.H. (2011), Chemical modification of chitosan by tetraethylenepentamine and adsorption study for anionic dye removal. *Carbohydrate Research*, **346** (10), 1232-1240.

Full Text: [2011\Car Res346, 1232.pdf](2011/Car%20Res346,%201232.pdf)

Abstract: To utilize the contribution of introduced amino groups to the adsorption of an anionic dye (eosin Y), a batch adsorption system was applied to study the adsorption of eosin Y from aqueous solution by tetraethylenepentamine (TEPA) modified chitosan (TEPA-CS). Experiments were carried out as a function of particle size, initial pH, agitation rate, adsorbent dosage, agitation period, temperature and initial concentration of eosin Y. The Langmuir and Freundlich models were used to fit the adsorption isotherms. From the values of correlation coefficients (R(2)), it was observed that the experimental data fit very well to the Langmuir model, giving a maximum sorption capacity of 292.4 mg/g at 298 K. Kinetic studies showed that the kinetic data were well described by the pseudo-second-order kinetic model. The thermodynamic study revealed negative value of enthalpy change (Delta H degrees) and free energy change (Delta G degrees), indicating spontaneous and endothermic nature of the adsorption of eosin V on to TEPA-CS. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Anionic Dye, Aqueous-Solutions, Beads, Behavior, Biosorption, Chemical Modification, Chitosan, Cross-Linked Chitosan, Dye Removal, Effluent Disposal, Equilibrium, Isotherms, Kinetic, Langmuir And Freundlich Models, Langmuir Model, Methylene-Blue, Model, Modification, pH, Pseudo-Second-Order, Reactive Dye, Sorbent, Sorption, Tetraethylenepentamine, Water

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Marsh, H. and Wynne-Jones, W.F.K. (1964), The surface properties of carbon-I the effect of activated diffusion in the determination of surface area. *Carbon*, **1** (3), 269-279.

Full Text: [C\Carbon1, 269.pdf](C/Carbon1,%20269.pdf)

Abstract: This study forms part of a research programme concerned with structure, reactivity and electron-spin-resonance properties of carbons prepared from eight organic polymers. The possible use of carbon dioxide, on a routine basis, in the determination of surface area of carbons has been investigated. The results show that the rate of diffusion of nitrogen molecules into the carbon at 77°K can be markedly low. This is caused by the temperature dependence of the rate of the diffusion. Surface area values, determined from the nitrogen isotherms, are accordingly too low. The rate of adsorption of carbon dioxide at 195°K is always very much higher than that of nitrogen and appreciable adsorption of carbon dioxide can occur where no adsorption of nitrogen is detectable. When the carbon structure is equally accessible to nitrogen and carbon dioxide, surface area values calculated from the carbon dioxide and nitrogen isotherms are comparable. The adsorption of carbon dioxide at 273°K can be shown to indicate if the adsorption of the carbon dioxide at 195°K is itself restricted.

Dubinin, M.M., Plavnik, G.M. and Zaverina, E.D. (1964), Integrated study of the porous structure of active carbons from carbonized sucrose. *Carbon*, **2** (3), 261-268.

Full Text: [C\Carbon2, 261.pdf](C/Carbon2,%20261.pdf)

Abstract: Porous structure of carbons obtained by activation of carbonized sucrose with carbon dioxide at 850°C was studied by the methods of adsorption and small-angle X-ray scattering. Both methods yield very similar results with the exception of the initial stage of activation where some discrepancy is observed. The latter is due to the presence in the initial carbonized sucrose of a considerable number of micropores inaccessible for the molecules being adsorbed. In the course of activation, up to 35 per cent burn-out, nearly the entire volume of the burnt-out substance forms micropores thereby increasing their volume by a factor of 2.5-3. The volume of the transitional pores also increases, but remains 15 to 20 times as small as that of the micropores. Two stages of activation may be distinguished. The first is characterized by the burn-out of the most reactive loose mass consisting principally of carbon radicals. At the second stage micropores are formed mainly through the burn-out of crystallites.

Allardice, D.J. (1966), The adsorption of oxygen on brown coal char. *Carbon*, **4** (2), 255-262.

Full Text: [C\Carbon4, 255.pdf](C/Carbon4,%20255.pdf)

Abstract: The adsorption of oxygen on degassed brown coal char has been investigated gravimetrically in the temperature range 25°–200°C and at pressures up to 1 atm. The adsorption occurs by two separate processes, one reversible and the other irreversible. Methods have been devised to investigate these processes independently. The reversible adsorption was found to be physical adsorption, while the irreversible process is a chemisorption conforming to the Elovich equation. A mechanism for this latter process has been suggested, involving rate control by a surface migration phenomenon.

Dubinin, M.M. and Plavnik, G.M. (1968), Microporous structures of carbonaceous adsorbents. *Carbon*, **6** (2), 183-192.

Full Text: [1960-80\Carbon6, 183.pdf](1960-80/Carbon6,%20183.pdf)

Abstract: The microporous structure of coals (anthracite and lean coal) carbonized and activated with water vapour at 900°C was investigated by the small-angle X-ray scattering and adsorption methods. As distinct from the previously studied active carbons from sucrose possessing uniform microporosity (inertia radii *R* = 6–7 Å), coals are characterized by a considerably greater polydispersity of micropores. Small-angle X-ray scattering data, which were in agreement with the results of the theoretical analysis of benzene adsorption isotherms, revealed coarser micropores of *R* = 6–7 Å along with fine micropores of *R* = 6–7 Å, in active coals. At low degrees of activation, fine micropores are predominant in the active carbons obtained. As burn-out increases the fraction of coarser micropores grows. It is believed that the size polydispersity of active coal micropores, which roughly corresponds to the radius range *R* = 4–15 Å, stems from the non-homogeneity of the structure of the initial products used for activation, i.e. anthracite and lean coal.

Marsh, H., Rand, B. and Robson, D. (1968), Gasification of carbon by carbon dioxide: Kinetic adsorption and ESR considerations. *Carbon*, **6** (2), 227.

Full Text: Carbon1,

McLintock, I.S. and Orr, J.G. (1968), The effect of oxygen adsorption on the electrical resistance of evaporated carbon films. *Carbon*, **6** (3), 309-323.

Full Text: [C\Carbon6, 309.pdf](C/Carbon6,%20309.pdf)

Abstract: The effect of oxygen on the electrical resistance of evaporated carbon films has been studied over the range — 196°C to 450°C. At all temperatures over this range oxygen increased the resistance. The sensitivity of the resistance to oxygen at 22°C depended on the temperature to which the films had previously been heat treated. For heat treatment temperatures (HTT’s) below 100°C oxygen had no effect on resistance at 22°C, but the oxygen sensitivity increased steadily for HTT’s above this value. Increases in resistance in contact with oxygen over the range 22–203°C were completely reversed only by evacuation at the temperature to which films had previously been heat treated. The effect of oxygen over this range is attributed to an irreversible chemisorption. The activation energies of chemisorption at 22–203°C, calculated from plots of change in resistance with time, increased with extent of reaction from 6 to 14 kcal/mole. Elovich kinetics were found to apply to oxygen chemisorption over the range 22–203°C. Physical adsorption is indicated at — 196°C. Preliminary results showed that water vapour also increased film resistance at 22°C but that only some of the sites which chemisorbed oxygen were capable of chemisorbing water vapour. The temperature dependence of the resistance of films at temperatures below that at which they had been heat treated followed expressions of the type *R* = *AT*−*B*, where *A* and *B* are constants, and not the usual semiconductor equation *R* = *Ro* *exp* (Δ*E*/2*kT*). This confirms the results of Blue and Danielson(42) rather than those of Hirabayashi *et al.*(46) Because of their structure, purity and high surface to volume ratio films are particularly suited to a study of the effect of gas adsorption on the electronic properties of carbon.

Freeman, E.M., Siemieniewska, T., Marsh, H. and Rand, B. (1970), A critique and experimental observations of the applicability to microporosity of the Dubinin equation of adsorption. *Carbon*, **8** (1), 7-17.

Full Text: [C\Carbon8, 7.pdf](C/Carbon8,%207.pdf)

Abstract: Adsorption isotherms of microporous carbons can often be linearised using the Dubinin equation of the first structural type. This equation does not describe a model process of adsorption and its origins and basis are not clearly understood but believed to be empirical. Possible reasons for the success of the Dubinin equation are discussed. The equation is certainly not of general applicability; its success is considered to depend ultimately upon a unique distribution of shapes and dimensions within the microporosity such as to create a distribution of adsorption potential within the micropore volume which resembles a Rayleigh-type distribution as predicted by the Dubinin equation. Most carbons possess such a microporosity, explaining the ability of the Dubinin equation to linearise so many isotherms from different carbons over a wide range of pressure. Reasons why non-linear Dubinin plots can be obtained are discussed and an experimental study reported of the use of a polar adsorbate molecule, ammonia, when marked deviations from Dubinin theory are encountered.

Mahajan, O.P., Morishita, M. and Walker, Jr., P.L. (1970), Dynamic adsorption of carbon dioxide on microporous carbons. *Carbon*, **8** (2), 167-179.

Full Text: [C\Carbon8, 167.pdf](C/Carbon8,%20167.pdf)

Abstract: The dynamic adsorption of CO2, at a partial pressure of about 4 Torr (total pressure, 1 atm), has been studied on two relatively pure carbon sieves and one commercial active carbon at 25°C. Regeneration of the carbon activity over a number of adsorption-desorption cycles has also been studied. The capacity of the carbon for CO2 and its regeneration depends not only upon the porous nature of the carbon but also on the amount and type of the impurities present on the carbon surface. The results show that a substantial proportion of CO2 adsorbed on the active carbon is held on impurities, the carbon with its large surface area acting as a support for these impurities.

Boehm, H.P. and Voll, M. (1970), Basic surface oxides on carbon: I. Adsorption of acids. *Carbon*, **8** (2), 227-240.

Full Text: [C\Carbon8, 227.pdf](C/Carbon8,%20227.pdf)

Abstract: Carbons, which are heated to about 1000°C in an inert atmosphere and are cooled to room temperature in the absence of oxygen, chemisorb mineral acid from aqueous solutions as well as O when O2 is admitted. Acid chemisorption is described by the Langmuir adsorption isotherm and is a function of pH only; the saturation value is constant up to 170°. Equilibrium constants and heats of protonation are estimated. Superimposed physical adsorption becomes important at acid concentrations above ~ 0, 1 moles/l. Chemisorbed as well as physisorbed acid may be displaced by organic substances. The hydrochlorides of the basic surface oxides are unstable *in vacuo* and towards hydrolysis. Measurements of pH and electrical conductivity of carbon suspensions indicate that there is a slow decomposition of the hydroxide form, even under water.

Bansal, R.C., Vastola, F.J. and Walker, Jr., P.L. (1971), Studies on ultra-clean carbon surfaces. III. Kinetics of chemisorption of hydrogen on graphon. *Carbon*, **9** (2), 185-192.

Full Text: [C\Carbon9, 185.pdf](C/Carbon9,%20185.pdf)

Abstract: The chemisorption of hydrogen on activated Graphon was studied over the range 80–600°C at a hydrogen pressure of 0.10 Torr and at 500°C over the pressure range 0.020–0.47 Torr. The Graphon was activated by preoxidation in oxygen to 18.6 per cent weight loss at 625°C. The oxidized sample had a BET surface area of 100 m2/g. Prior to adsorption measurements, the sample was outgassed at 1000°C at residual pressures < 10−8 Torr. Adsorption was followed for times up to 24 hr. Plots of amount of hydrogen adsorbed vs. log of time showed linear regions. In all, four linear regions were identified. The activation energy for chemisorption changed little within a linear region. However, it changed abruptly between linear regions, increasing over-all from 5.7 kcal/mole for the first linear region to 30.4 kcal/mole for the last. It is concluded that each linear region represents chemisorption on different discrete configurations of sites on the carbon surface.

Maggs, F.A.P. (1972), Dependence of adsorption isotherm on temperature. *Carbon*, **10** (1), 113.

Full Text: [C\Carbon10, 113.pdf](C/Carbon10,%20113.pdf)

Jonas, L.A. and Rehrmann, J.A. (1972), Kinetics of adsorption of organo-phosphorus vapors from air mixtures by activated carbons. *Carbon*, **10** (6), 657-663.

Full Text: [C\Carbon10, 657.pdf](C/Carbon10,%20657.pdf)

Abstract: The adsorption characteristics of activated carbons for the vapors of dimethyl methylphosphonate (DMMP) and of isopropyl methylphosphonofluoridate (IMPF) were studied under kinetic flow conditions. The carbon granules were packed to a reproducible bulk density in beds of uniform cross-sectional area and subjected to constant inlet vapor concentration, volume flow rate, and temperature but varying bed weights. The breakthrough time of the vapor through the bed, at an exit concentration equal to 1 per cent of the inlet concentration, was determined for each bed weight, and plotted as a straight line in accordance with the equation for adsorption kinetics. The kinetic saturation capacity of the carbon for each vapor was determined from the slope and the pseudo first order adsorption rate constant from the intercept. Kinetic equations were constructed for each vapor and, when solved simultaneously, showed that the breakthrough time for IMPF could be correlated with that of DMMP in accord with the equation *tb* (IMPF) = 0.911 *tb* (DMMP)−8.86 for activated carbon and *tb* (IMPF) = 1.084 *tb* (DMMP)−4.32 for the same carbon after impregnation with copper, silver, and chromium salts. The close agreement between the relationships of these organophosphorus vapors on the two carbons suggests that the prediction of adsorption of one vapor based upon prior characterization with a reference vapor, originally applicable only under equilibrium, can be extended for use under kinetic conditions. A method is presented for calculating the kinetic adsorption capacity of an activated carbon for IMPF from the experimental DMMP value using equilibrium relationships, and shown capable of predicting the capacity within 4.1 per cent.

Jonas, L.A. and Rehrmann, J.A. (1973), Predictive equations in gas adsorption kinetics. *Carbon*, **11** (1), 59-64.

Full Text: [C\Carbon11, 59.pdf](C/Carbon11,%2059.pdf)

Abstract: The experimental method of determining the operative parameters of adsorptive capacity and rate in the gas adsorption kinetics of packed bed sorbents relies upon the linear relationship between gas breakthrough time and sorbent weight. The slope and intercept of the straight line, resulting from such a plot, yields values for the gas saturation capacity and adsorption rate constant of the adsorbent. This relationship is shown in the modified Wheeler adsorption equation, originally derived from a continuity equation of mass balance between the gas entering an adsorbent bed and the sum of the gas adsorbed by plus that penetrating through the bed. We have found that for wellpacked adsorbent beds, the Dubinin-Polanyi equations for predicting adsorption space at equilibrium, based upon prior characterization of an adsorbent with a reference gas, could also be applied to gas flow conditions, and the kinetic capacity of the adsorbent predicted within close limits. Although no theoretical relationship exists for prediction of the adsorption rate constant, recent gas tests at high linear flow velocities have shown experimental evidence of the mass transfer limiting value for the rate constant. The functionalities of the kinetic saturation capacity and the mass transfer limited value for the adsorption rate constant have been incorporated into the modified Wheeler adsorption equation to provide an expanded equation permitting prediction by calculation of the breakthrough time of a gas through a well-packed bed of adsorbent granules.

Mcenaney, B. (1973), Dependence of adsorption-isotherm upon temperature. *Carbon*, **11** (5), 568-569.

Full Text: [C\Carbon11, 568.pdf](C/Carbon11,%20568.pdf)

Dubinin, M.M., Erashko, I.T., Kadlec, O., Ulin, V.I., Volshchuk, A.M. and Zolotarev, P.P. (1975), Kinetics of physical adsorption by carbonaceous adsorbents of biporous structure. *Carbon*, **13** (3), 193-200.

Full Text: [C\Carbon13, 193.pdf](C/Carbon13,%20193.pdf)

Abstract: The X-ray technique has been applied in adsorption of X-ray-contrast substances for analysis of the nature of mass transfer in carbonaceous microporous adsorbents. The paper described the results of experimental study into the kinetics of adsorption of vapors of n-pentane by zink chloride active carbon Supersorbon, of benzene by active carbons with molecular-sieve properties MSC-5A and MSC-6A, of water by active carbon MSC-5A, and of methanol by potassium sulphide active carbon SK using the gravimetric method at a constant adsorptive pressure. It is shown that the homogeneous adsorbent model is unsuitable for description of the adsorption kinetics in the indicated systems. A theory of kinetics of physical adsorption by adsorbents of biporous structure has been developed. With the aid of the statistical-moments method, analytic relationships have been obtained which enable one to calculate the diffusion coefficients separately for adsorbing and transport pores. With the use of these equations, experimental data on the adsorption kinetics in the system n-pentane-Supersorbon have been analyzed. The results of experimental study into the adsorption kinetics by the gravimetric method are in good agreement with the results of investigation on the kinetics of adsorption of bromobenzene by active carbon MSC-5A using the X-ray technique.

Dubinin, M.M. and Kadlec, O. (1975), New ways in determination of the parameters of porous structure of microporous carbonaceous adsorbents. *Carbon*, **13** (4), 263-265.

Full Text: [C\Carbon13, 263.pdf](C/Carbon13,%20263.pdf)

Abstract: Using active carbons as an example, a new method for determining the volume of micropores *vmi* and of the specific surface area of mesopores *Sme* from vapor adsorption isotherms within the range of *p*/*ps* = 1×10−5 − 0.2 is substantiated theoretically and experimentally. The initial section of the isotherm serves to determine the parameters of the equation of the theory of adsorption in micropores; this permits calculating the degrees of filling of the micropores, *F*. Then, in the range of *p*/*ps* = 0.02–0.2 one obtains a linear equation *V*/*F* = *vmi* + *Sme*(*t*/*F*), where *V* is adsorption in the volumes of a bulk liquid, and *t* is the thickness of the adsorption layer in the mesopores. The parameters of the experimental straight line directly express *vmi* and *Sme*.

Dubinin, M.M. and Kadlec, O. (1975), New ways in determination of the parameters of porous structure of microporous carbonaceous adsorbents. *Carbon*, **13** (6), 552.

Full Text: [C\Carbon13, 552.pdf](C/Carbon13,%20552.pdf)

Abstract: Using active carbons as an example, a new method for determining the volume of micropores *vmi* and of the specific surface area of mesopores *Sme* from vapor adsorption isotherms within the range of *p*/*ps* = 1×10−5 − 0.2 is substantiated theoretically and experimentally. The initial section of the isotherm serves to determine the parameters of the equation of the theory of adsorption in micropores; this permits calculating the degrees of filling of the micropores, *F*. Then, in the range of *p*/*ps* = 0.02–0.2 one obtains a linear equation *V*/*F* = *vmi* + *Sme*(*t*/*F*), where *V* is adsorption in the volumes of a bulk liquid, and *t* is the thickness of the adsorption layer in the mesopores. The parameters of the experimental straight line directly express *vmi* and *Sme*.

Finger, G. and Bülow, M. (1979), The applicability of the Dubinin-Astakhov equation in the sorption systems *n*-heptane/Saran carbon and benzene/Saran carbon. *Carbon*, **17** (1), 87-91.

Full Text: [C\Carbon17, 87.pdf](C/Carbon17,%2087.pdf)

Abstract: Sorption measurements in the systems n-heptane/Saran carbon and benzene/Saran carbon have shown that the data can be well described over the entire range of data by the Dubinin-Astakhov equation W = W0 exp [− (A/E)n]. Hereby, in both systems 2 < n < 3 was found. Because of the adjustability of the parameter n this equation has a broader applicability than the Dubinin-Radushkevich equation and, contrary to it, does not require the test as to pressure-depending validity ranges, provided data at high relative pressures are not taken into account.

John, P.T., Suri, D.K. and Nagpal, K.C. (1979), Application of john isotherm to predict the adsorption of a binary gas-mixture from the adsorption of individual component gases. *Carbon*, **17** (6), 491-493.

Full Text: [C\Carbon17, 491.pdf](C/Carbon17,%20491.pdf)

Abstract: It is shown that one can predict the adsorption of a binary gas mixture from the adsorption of individual component gases by means of John’s isotherm. It is found that the slope and intercept of John’s adsorption isotherm for binary mixture is equal to mean of the slopes and intercepts of individual adsorption isotherms. The relation given by Lewis *et al*. may be used to prove the validity of the above method.

Dubinin, M.M. (1979), Absorption equations for active carbons with inhomogeneous microporous structures. *Carbon*, **17** (6), 505-506.

Full Text: [C\Carbon17, 505.pdf](C/Carbon17,%20505.pdf)

? John, P.T. (1980), Characterization of the structure of porous carbons by means of a new adsorption isotherm. *Carbon*, **18** (1), 50-51.

Full Text: [1960-80\Carbon18, 37-71.pdf](1960-80/Carbon18,%2037-71.pdf)

? Koresh, J. and Soffer, A. (1980), Validity of the Langmuir isotherm and a related adsorption kinetics model in molecular sieve carbon. Carbon, **18** (1), 51-52.

Full Text: [1960-80\Carbon18, 37-71.pdf](1960-80/Carbon18,%2037-71.pdf)

Bradbury, A.G.W. and Shafizadeh, F. (1980), Chemisorption of oxygen on cellulose char. *Carbon*, **18** (2), 109-116.

Full Text: [C\Carbon18, 109.pdf](C/Carbon18,%20109.pdf)

Abstract: Investigation of a series of chars prepared by rapid pyrolysis of cellulose in the temperature range of 400–800°C has shown that they have a high chemisorptive affinity for oxygen. Maximum chemisorption occured on chars prepared at a HTT of 550°C. The Elovich equation was used to describe the kinetics of the process. The extent of chemisorption decreased with increasing HTT of the chars, although the surface area of the chars stayed approximately constant; indicating the presence of less reactive areas on the surface of chars formed at higher temperatures. As chemisorption progressed there was a corresponding increase in the intensity of several IR absorption bands, which were attributed to the formation of stable oxygen-containing functional groups. The chemisorption process, preceded by physical adsorption, does not influence the gasification reaction. The presence of impurities from pre-pyrolysis doping of cellulose could promote or inhibit the rate of gasification but had negligible effect on the initial rate of chemisorption. The role of these two processes in char combustion was discussed in the light of known concepts for the carbon-oxygen reaction.

Dubinin, M.M. (1980), Water vapor adsorption and the microporous structures of carbonaceous adsorbents. *Carbon*, **18** (5), 355-364.

Full Text: [C\Carbon18, 355.pdf](C/Carbon18,%20355.pdf)

Abstract: The principal role in adsorption of almost all vapors organic and inorganic substances on nonporous and microporous carbonaceous adsorbents is played by dispersion interactions. They are characterized by a considerable increase in adsorption potentials as a result of superposition of the fields of the opposite pore walls. This effect determines the entire specifics of adsorption in micropores and, in particular, the substantial increase in adsorbability. A theoretical estimate of the adsorption potentials of benzene and water in adsorption on graphite, and a comparison of the differential heats of adsorption of water vapors on a non-porous carbon black previously heated in a vacuum at 950°C and on an active carbon show that water adsorption is due to the formation of hydrogen bonds both between the oxygen complexes on the surface of carbonaceous adsorbents and between the adsorbed molecules themselves. Dispersion interactions are weak and can be neglected to a first approximation. It has been shown for microporous structures and the slitlike model that one can calculate, from the parameters *W*0 and *E*0 of the adsorption equation of the theory of volume filling of micropores (determined from the adsorption isotherm of a standard vapor, benzene) the volume of the micropores, their halfwidth, and the specific surface area of the micropore walls. The latter are in good agreement with the specific surface areas of the micropores, as estimated by the independent method of similarity of the adsorption isotherms of water in micropores and on the surface of a nonporous carbonaceous adsorbent. The application of the BET and *t*-methods to microporous carbonaceous adsorbents is physically unsubstantiated.

Dubinin, M.M. (1981), Inhomogeneous microporous structures of carbonaceous adsorbents. *Carbon*, **19** (4), 321-324.

Full Text: [C\Carbon19, 321.pdf](C/Carbon19,%20321.pdf)

Abstract: Ways for theoretical calcultion of the geometric surface area of the micropore walls of carbonaceous adsorbents with inhomogeneous microporous structures are considered for the slitlike micropore model. Two calculations methods have been worked out based on the theory of volume filling of micropores (TVFM) from the parameters of the adsorption equation proposed by Stoeckli and from the parameters of the binomial TVFM equation. An independent method for determining the geometric surface area of the micropore walls from water vapor adsorption isotherms served as a reference. When we used an active carbon with a wide micropore distribution all the three methods led to practically identical results, which indicated that the concept of the geometric surface area of carbonaceous adsorbents is physically feasible. The physical unfeasibility of a specific surface determined by the BET method for a microporous adsorbent is shown.

Stoeckli, H.F. (1981), On the theoretical foundation of the Dubinin-Astakhov equation. *Carbon*, **19** (4), 325-326.

Full Text: [C\Carbon19, 325.pdf](C/Carbon19,%20325.pdf)

Dubinin, M.M. and Serpinsky, V.V. (1981), Isotherm equation for water vapor adsorption by microporous carbonaceous adsorbents. *Carbon*, **19** (5), 402-403.

Full Text: [C\Carbon19, 402.pdf](C/Carbon19,%20402.pdf)

Dubinin, M.M. (1982), Microporous structures of carbonaceous adsorbents. *Carbon*, **20** (3), 195-200.

Full Text: [C\Carbon20, 195.pdf](C/Carbon20,%20195.pdf)

Abstract: The simplest model of the porous structure of carbonaceous adsorbents is proposed, in which the microporous zones are formed by the totality of contacting and merged carbon crystallites. The micropores limited in extent resulted from the burnout on activation of several atomic layers of carbon in the crystallites by gaseous oxidizers (intercrystallite micropores) and from some development of the spaces between contacting crystallites (intercrystallite micropores). The micropore zones are shaped into regular cubes. The slit-like spaces between part of the micropore zones represent the micropore volume, while the total surface area of the walls of such pores is the mesopore surface. The parameters of the model for typical samples of microporous carbonaceous adsorbents are calculated and discussed. The formation of intercrystallite slit-like micropores as a result of the burnout of carbon atomic layers in crystallites on avtivation is considered. It is shown that only a wide micropore distribution leading to the formation of the supermicropores practically results in deviation from the applicability of the one-term adsorption equation of the theory of volume filling of micropores.

Rodríguez-Reinoso, F., López-González, J.D. and Berenguer, C. (1982), Activated carbons from almond shellsv I: Preparation and characterization by nitrogen adsorption. *Carbon*, **20** (6), 513-518.

Full Text: [C\Carbon20, 513.pdf](C/Carbon20,%20513.pdf)

Abstract: Several series of activated carbons have been prepared from almond shells by mean of carbonization in a flow of nitrogen followed by activation in a flow of carbon dioxide. The carbonized material is essentially microporous with pore dimensions close to those of the nitrogen molecule as deduced from the comparison of nitrogen adsorption isotherms at 77 and 90 K. Activation with carbon dioxide leads to the appearance of micropores and to a considerable increase in surface area. The effects of preparation conditions on the adsorptive capacity of the carbons are also discussed.

De Groot, W.F.and Shafizadeh, F. (1983), Influence of inorganic additives on oxygen chemisorption on cellulosic chars. *Carbon*, **21** (1), 61-67.

Full Text: [C\Carbon21, 61.pdf](C/Carbon21,%2061.pdf)

Abstract: Chemisorption of oxygen on cellulosic chars is the initial step leading to gasification and is a significant factor in controlling chemical reactivity and heat release in smoldering and glowing combustion of cellulose. Oxygen chemisorption kinetics have been determined for chars (HTT 550°C) prepared from cellulose and cellulose treated with inorganic additives. Elovich kinetic analysis indicates that combustion behavior can be correlated with chemisorption kinetics. Addition of the same inorganic additives by grinding with pure cellulose chars had little or no effect on chemisorption kinetics. These data indicate that the mode of action on inorganic additives in enhancing or inhibiting the solid phase combustion of cellulose chars involves their influence on char functionality developed during pyrolysis. Chemisorption of oxygen on chars results in a decrease in free radical concentration, and heat treatment at 400°C in flowing nitrogen restores the original concentration. However, free radical concentrations do not differ significantly between additive treatments over most of the temperature range studied. Therefore, combustion behavior cannot be explained strictly in terms of changes in free radical concentration and other functional groups must also play a significant role.

Jaroniec, M., Piotrowska, J., Deryło, A. and Marczewski, A.W. (1984), Single-solute adsorption from dilute solutions on heterogeneous microporous solids. *Carbon*, **22** (2), 157-161.

Full Text: [C\Carbon22, 157.pdf](C/Carbon22,%20157.pdf)

Abstract: Adsorption from dilute solutions on heterogeneous microporous solids is discussed. Two equations corresponding to the exponential distribution of micropore volume are derived by applying the generalized integral equation introduced by Stoeckli. The utility of these equations for interpreting the experimental data available in, the literature is shown.

Dubinin, M.M. (1985), Generalization of the theory of volume filling of micropores to nonhomogeneous microporous structures. *Carbon*, **23** (4), 373-380.

Full Text: [C\Carbon23, 373.pdf](C/Carbon23,%20373.pdf)

Abstract: It is suggested that the nonhomogenity of the microporous structures of carbonaceous adsorbents should be expressed through the normal distribution of the micropore volume by sizes (halfwidth for the slitlike model). On the basis of the theory of the volume filling of micropores in vapor adsorption, a new Dubinin-Stoeckli adsorption equation is obtained. Its three parameters—the total volume of the micropores, their halfwidth for the maximum of the distribution curve, and dispersion—are identical to the parameters of normal distribution. This is true only when the initial vapor adsorption isotherm has been corrected for adsorption in mesopores. Then the parameters of the adsorption and distribution equations, which are determined from the experimental vapor adsorption isotherm, are real quantities. It is shown that the most rational method for determining the mesopore specific surface area necessary for correcting the isotherm is the Dubinin-Kadlec γ/*F* method identical to the *t*/*F* method. The concepts developed are experimentally substantiated.

Kraehenbuehl, F., Stoeckli, H.F., Addoun, A., Ehrburger, P. and Donnet, J.B. (1987), The use of immersion calorimetry in the determination of micropore distribution of carbons in the course of activation. *Carbon*, **24** (4), 483-488.

Full Text: [C\Carbon24, 483.pdf](C/Carbon24,%20483.pdf)

Abstract: The combination of gas-solid adsorption experiments with immersion calorimetry of carbons into liquids of increasing molecular dimensions leads to accurate micropore distributions in the range 0.4-0.8 nm. This technique is used to study the development of the micropore structure during activation of carbons with CO2 or KOH.

Keywords: Active Carbon, Microporosity, Distribution, Immersion Calorimetry, Activation

McEnaney, B. (1987), Estimation of the dimensions of micropores in active carbons using the Dubinin-Radushkevich equation. *Carbon*, **25** (1), 69-75.

Full Text: [C\Carbon25, 69.pdf](C/Carbon25,%2069.pdf)

Abstract: Decreases in the characteristic energy of the Dubinin-Radushkevich equation, *E*0, are correlated with increases in micropore sizes determined by molecular probes, *Wm*, using the empirical equation *Wm*= 4.691 *exp*(−0.0666*E*0); a similar equation can also be used to correlate the more limited data relating *E*0 to the Guinier radius of gyration, *Rg*. A new, semiempirical method is proposed which relates *E*0 to micropore sizes calculated from adsorption potentials in slit-shaped, model micropores. The two methods for estimating micropore size are applied to adsorption of Ar at 77 K on a steam-activated series of polymer carbons. Both methods show that micropore sizes increase progressively with activation, but for each carbon, the micropore size estimated from molecular probes is greater than that obtained using potentials in model micropores. The differences are attributed to different weightings of the pore size estimates in the micropore size distributions. Estimates based upon molecular probes are weighted towards the tail of the distribution, while those based on model pore potentials are weighted towards the smallest micropores. A method for estimating the size range of micropores is proposed where the lower limit is defined by the adsorption potential maximum in model pores and the upper limit is defined by the correlation between *Wm* and *E*0.

Keywords: Micropore Size, Adsorption Potential, Characteristic Energy, Dubinin-Radushkevich, Active Carbon

Barton, S.S. (1987), The adsorption of Methylene Blue by active carbon. *Carbon*, **25** (3), 343-350.

Full Text: [C\Carbon25, 343.pdf](C/Carbon25,%20343.pdf)

Abstract: The extent of adsorption of Methylene blue from an aqueous solution is a convenient indicator in the evaluation of active carbons. The adsorption process is, however, complicated by factors inherent in the structures of both the Methylene blue solution and the active carbon. These factors include the tendency of Methylene blue to form molecular aggregates in solution, molecular sieving imposed by the pore size distribution of the carbon and the heterogeneous nature of the energies of adsorption sites. Temperature variation of adsorption and calorimetric experiments show, however, that the results obtained can be rationalized on the basis of these structural factors and the kinetic effects which result from them.

Keywords: Active Carbon, Dye Adsorption, Pore Structure, Molecular Aggregates, Enthalpy of Immersion, Carbon

Dubinin, M.M. (1987), Generalization of the theory of volume filling of micropores to nonhomogeneous microporous structures. *Carbon*, **25** (5), 593-598.

Full Text: [C\Carbon25, 593.pdf](C/Carbon25,%20593.pdf)

Abstract: The theory underlying the absorption behavior of carbons is discussed as a basis for quantitative analysis of their adsorption properties and microporous structure. The equations of the theory of volume filling of micropores for homogeneous and inhomogeneous microporous structures and a rational method for determining the specific surface area of micropores are considered. Four principal parameters are proposed which describe the physical vapor adsorption with good accuracy and quantitatively characterize the microporous structure of carbonaceous adsorbents.

Keywords: Active Carbons, Adsorption in Micropores, Adsorption Equation, Micropore Structure

Ferro-García, M.A., Rivera-Utrilla, J., Rodríguez-Gordillo, J. and Bautista-Toledo, I. (1988), Adsorption of zinc, cadmium and copper on activated carbons obtained from agricultural by-products. *Carbon*, **26** (3), 363-373.

Full Text: [C\Carbon26, 363.pdf](C/Carbon26,%20363.pdf)

Abstract: Adsorption studies of Zn2+, Cd2+, and Cu2+ from aqueous solutions at 293 K and 313 K on three activated carbons are reported. These carbons were obtained by activation of almond shells, olive stones, and peach stones by heating in CO2 at 1123 K. From these isotherms some adsorption parameters have been determined. The influence of the solution pH on the adsorption processes has been studied. The extent of adsorption in the presence of Cl−, CN−, SCN−, or EDTA has been also investigated. The adsorptive behaviour of these activated carbons is explained on the basis of their chemical nature and porous texture.

Keywords: Adsorption, Activated Carbons, Almond Shells, Peach Stones, Olive Stones, Metal Ions

Dubinin, M.M. (1989), Fundamentals of the theory of adsorption in micropores of carbon adsorbents: Characteristics of their adsorption properties and microporous structures. *Carbon*, **27** (3), 457-467.

Full Text: [C\Carbon27, 457.pdf](C/Carbon27,%20457.pdf)

Abstract: At the basis of the theory of vapor adsorption in the micropores of carbon adsorbents of the most probable slit-like, limited-size type lie the dispersion interactions between the adsorbate and adsorbent atoms as well as between the atoms of the adsorbed substance themselves. As a consequence of commensurability of the pore sizes (half-widths) with those of the adsorbed molecules there occurs the volume filling of the available micropore space, i.e., the field of adsorption forces. Early stages of activation of carbons produce practically homogeneous micropores, the size of which may suitably be estimated by small-angle x-ray and calorimetry techniques involving measurements of the heats of immersion of adsorbents into liquids with different molecular size. The two methods give results that are in agreement. Dubinin and Radushkevich proposed an equation for homogeneous micropore structures with two parameters, the micropore volume *W*0 and the characteristic energy of adsorption *o*. With deviations not considerably in excess of 10%, the product of micropore half-width *x*0 by *E*0 is a constant. For nonhomogeneous micropores the reasonable approximation is to assume the normal micropore volume distribution. The Dubinin-Stoeckli equation obtained for this general situation involves three parameters *W*0, *E*0, and dispersion δ characterizing the distribution range. The parameters are effective since active carbons also contain larger mesopores, which exhibit weaker adsorption than micropores. The effective values of *W*00, *E*0 and δ, determined from the experimental adsorption isotherm of the standard benzene vapor at 293 K, allow the adsorption isotherms of other vapors within a temperature range of about 100 degrees to be estimated with reasonable accuracy. The real parameters for adsorption isotherms corrected for the adsorption in mesopores, i.e., the isotherms with the real parameters *W*00, *E*0, and δ, can be used for calculating the geometric surface area of micropores and their volume within a given size range. Thus, the effective micropore characteristics *W*00, *E*0, and δ are, together with the specific surface area of mesopores *Sme*, a quantitiative characteristic of the adsorption properties and microporous structure of each active carbon specimen. Benzene at 293 K and nitrogen at 77K are compared as reference vapors and their specificity is discussed.

Keywords: Active Carbons, Adsorption in Micropores, Adsorption Equations, Micropore Structure Benzene and Nitrogen as Standard Vapors

Stoeckli, H.F., Ballerini, L. and De Bernardini, S. (1989), On the evolution of micropore widths and areas in the course of activation. *Carbon*, **27** (3), 501-502.

Full Text: [C\Carbon27, 501.pdf](C/Carbon27,%20501.pdf)

Keywords: Carbonization, Activation, Micropore Width and Area

Stoeckli, H.F. (1990), Microporous carbons and their characterization: The present state of the art. *Carbon*, **28** (1), 1-6.

Full Text: [C\Carbon28, 1.pdf](C/Carbon28,%201.pdf)

Abstract: The relation between the microporous structure of carbons and the parameters of Dubinin’s theory are examined in their historical development. The emphasis is on the correlation between different techniques such as gas adsorption, immersion calorimetry, and high-resolution transmission electron microscopy. Whereas a satisfactory description is obtained for micropore systems below 1 nm, the description of larger micropores still relies on indirect determinations.

Keywords: Microporous carbons, adsorption, immersion calorimetry, pore-size distributions

Jaroniec, M., Lu, X., Madey, R. and Choma, J. (1990), Comparative studies of the overall adsorption isotherm associated with Dubinin-Astakhov equation. *Carbon*, **28** (1), 243-246.

Full Text: [C\Carbon28, 243.pdf](C/Carbon28,%20243.pdf)

Keywords: Adsorption, Activated Carbons, Dubinin-Astakhov Equation, Microporous Structure

Ismail, I.M.K. (1991), Microporosity of a graphitized rayon fabric oxidized in air. *Carbon*, **29** (1), 119-122.

Full Text: [C\Carbon29, 119.pdf](C/Carbon29,%20119.pdf)

Keywords: Carbon Fibers, Microporosity, CO2 Adsorption

? Caturla, F., Molina-Sabio, M. and Rodríguez-Reinoso, F. (1991), Preparation of activated carbon by chemical activation with ZnCl2. *Carbon*, **29** (7), 999-1007.

Full Text: [1991\Carbon29, 999.pdf](1991/Carbon29,%20999.pdf)

Abstract: Several series of activated carbons have been prepared by chemical activation of peach stones with ZnCl2 in order to show the effect of variables such as a precursor particle size, extent of impregnation, impregnation method, and carbonization temperature on surface area, porosity, and bulk density of the resulting activated carbons. The adsorption isotherms of n-butane at 273 K on all carbons prepared are of type I, with a defined plateau, the extent of which is a function of the preparation conditions. The main factor affecting the surface area and the micropore size distribution is the amount of Zn introduced in the precursor during impregnation. Partial gasification in CO2 of the carbons produces a considerable developing of surface area and porosity, maximum for burn-offs around 60-70%. In this way, it is possible to prepare activated carbons with very high surface area (larger than 3000 m2/g) compatible with a granular form and reasonable bulk density.

Keywords: ZnCl2 Activation, Activated Carbon, Peach Stones, Microporosity, Chemical Activation, Almond Shells

Petrov, N., Budinova, T. and Khavesov, I. (1992), Adsorption of the ions of zinc, cadmium, copper and lead on oxidized anthracite. *Carbon*, **30** (2), 135-139.

Full Text: [C\Carbon30, 135.pdf](C/Carbon30,%20135.pdf)

Abstract: The adsorption of Cu2+, Pb2+, Zn2+, and Cd2+ from aqueous solutions at 20°C on oxidized anthracite was studied. This oxidized anthracite was prepared by thermal oxidition of anthracite in flowing air. From these isotherms some adsorption parameters have been determined. The metal uptake increased with increasing pH of the solutions. The adsorption of the individual metal ions decreased when the other three ions were present in equal concentrations, but the total metal uptake was considerably higher than in the case of a single ion species. The adsorptive behaviour of oxidized anthracite is explained on the basis of its chemical nature and porous texture.

Keywords: Oxidized Anthracite, Metal Ion Adsorption, Surface Oxides, Water Purification

Leon, C.A.L.Y., Solar, J.M., Calemma, V. and Radovic, L.R. (1992), Evidence for the protonation of basal plane sites on carbon. *Carbon*, **30** (5), 797-811.

Full Text: [C\Carbon30, 797.pdf](C/Carbon30,%20797.pdf)

Abstract: The nature of the surface basicity of two series of highly pure, chemically and/or thermally pretreated carbons has been investigated by (a) HCl adsorption, (b) stepped temperature-programmed desorption, (c) electrophoresis, and (d) mass titration. Following a comprehensive review of the pertinent literature, it is concluded that two mechanisms are necessary and sufficient to account for the basic properties of carbons. For carbons having low oxygen contents, molar HCl/O adsorption ratios exceeding two indicate that an oxygen-free type of site is involved in the adsorption process. Evidence favoring electron donor-acceptor (EDA) interactions of the type C(pi) + H3O+ double-line arrow pointing left and right C(pi)-H3O+ is presented. The postulated C(pi) site and its interaction with adsorbed H3O+ ions is described in detail. As the oxygen content of the carbon increases, the molar HCl/O ratios decrease sharply and level off at nonzero values, which are small due to the presence of nonbasic surface oxides. When these are removed by heat treatment (at 1073 K), the molar HCl/O adsorption ratio is again found to exceed two at low oxygen coverages, but levels off at ca. 1 for higher oxygen coverages. Of all the basic surface oxides proposed in the literature, only the pyrone-type groups can account for this HCl/O ratio. Therefore, it is proposed that the basicity of carbon surfaces arises from a combination of EDA and pyrone-type interactions. The predominance of either will be dictated by the oxygen content of the carbon in question.

Keywords: Basic Carbons, Surface Chemistry, Acid Adsorption, Temperature-Programmed Desorption, Electrophoresis, Surface-Chemistry, Activated Carbon, Electrokinetic Properties, Adsorption, Coal, Water, Chemisorption, Temperature, Oxygen, Hydrophobicity

López-Ramón, M.V., Moreno-Castilla, C., Rivera-Utrilla, J. and Hidalgo-Alvarez, R. (1993), Activated carbons from a subbituminous coal: Pore texture and electrokinetic properties. *Carbon*, **31** (5), 815-819.

Full Text: [C\Carbon31, 815.pdf](C/Carbon31,%20815.pdf)

Abstract: Activated carbons were prepared from an original and demineralized subbituminous coal by a two-stage, pyrolysis and steam activation, treatment. The effect of demineralization, pyrolysis and steam activation processes on the evolution of the surface area, pore texture, and ζ potential has been investigated. The pyrolysis step increased the microporosity of the samples and decreased the negatively charged surface. The steam activation step increased the surface area and porosity as well as the surface basicity of the activated carbons. The electrokinetic behaviour of the carbons was affected by the presence of KNO3, because they specifically adsorbed either K− or NO3− ions depending on the sample. Finally, the demineralization process after the pyrolysis and steam activation was more effective than if the demineralization was carried out prior the two-stage treatment.

Keywords: Subbituminous Coal, Activated Carbon, Electrokinetic Behaviour

Milligan, M.S. and Altwicker, E. (1993), The catalytic gasification of carbon in incinerator fly ash. *Carbon*, **31** (6), 977-986.

Full Text: [C\Carbon31, 977.pdf](C/Carbon31,%20977.pdf)

Abstract: Four fly ashes collected from electrostatic precipitators—three from municipal solid waste incinerators and one from a coal-fired power plant—were studied for their potential to catalyze carbon gasification reactions. A fixed-bed tubular reactor employing mixtures of oxygen and nitrogen was used to measure CO and CO2 evolved from native carbon in fly ash in the temperature range 275–350°C. Experiments using pure carbon were also run for comparison. MSWI fly ash was discovered to accelerate carbon gasification rates by at least an order of magnitude. At 300°C, gasification rates of native carbon in the different MSWI fly ash ranged from 1–8 mg-C/g-min, compared to pure carbon gasification rates of 0.03–0.2 mg-C/g-min. Activated carbon, having a high internal surface area, mixed to MSWI fly ash also showed an accelerated gasification rate, suggesting that the catalytic action was long-range. No catalytic activity was observed with coal fly ash. Apparent activation energies for gasification of native carbon in MSWI fly ash ranged from 25–34 kcal/mole, while those for pure carbon ranged from 10–20 kcal/mole. The apparent activation energy of gasification in coal fly ash was 14 kcal/mole. The oxygen concentration dependence on gasification rate in fly ash was determined to be 0.54; that for pure carbon was 0.71.

Keywords: Catalytic Carbon Gasification, Fly Ash

Qadeer, R. and Hanif, J. (1994), Kinetics of zirconium ions adsorption on activated charcoal from aqueous solutions. *Carbon*, **32** (8), 1433-1439.

Full Text: [C\Carbon32, 1433.pdf](C/Carbon32,%201433.pdf)

Abstract: The batch kinetics of adsorption of the zirconium ions from aqueous solutions on activated charcoal has been investigated over a wide range of concentration of zirconium ions (1.0-5.0 g/l) and temperatures (10-50°C. The adsorption process of zirconium ions proceeds via two stages; the first stage is rather fast, followed by a much slower one. The Bangham equation was used to study the kinetics of the zirconium ions’ adsorption on activated charcoal. It is observed that the diffusion of zirconium ions into the pores of the activated charcoal controls the kinetics of the adsorption process. Moreover, zirconium ion adsorption obeys the Freundlich and Langmuir isotherms in the concentration range studied. The adsorption equilibrium constant (k(c)) values for zirconium ions adsorption on activated charcoal have also been calculated at different temperatures. Various thermodynamic quantities, Delta G, Delta H, and Delta S were computed from k(c) values. The results showed that the adsorption of zirconium ions on activated charcoal is an endothermic process.

Keywords: Zirconium, Adsorption, Activated Charcoal, Kinetics, Aqueous Solution, Selective Adsorption, Manganese-Dioxide, Acid-Solutions, Sorption

Rodríguez-Reinoso, F., Molina-Sabio, M. and González, M.T. (1995), The use of steam and CO2 as activating agents in the preparation of activated carbons. *Carbon*, **33** (2), 15-23.

Full Text: [C\Carbon33, 15.pdf](C/Carbon33,%2015.pdf)

Abstract: Four series of activated carbon have been prepared from carbonized olive stones. One of them, series D, was prepared using carbon dioxide as activating agent, and the other three, series AV, W, and H, with water vapor under different experimental conditions. Two of the series, D and H, were prepared in such a way that the gasification rate for both reactants was identical, in an attempt to reduce the effect of the relative differences in diffusion and accessibility of both gases to the interior of the particles. The changes in porosity of the original char during activation have been studied by adsorption of N2 at 77 K and CO2 at 273 K, as well as by mercury porosimetry. The results obtained show that carbon dioxide produces an opening, followed by widening, of narrow microporosity, whereas water vapor widens the microporosity from the early stages of the process, the resulting activated carbon exhibiting lower micropore volume. However, dilution of water vapor and high activation temperatures approach the development of total microporosity by steam to that of carbon dioxide, although there is a more important role of narrow microporosity widening in the former.

Keywords: Activated Carbon, CO2 Activation, Steam Activation, Porosity Development

Qadeer, R. and Hanif, J. (1995), Adsorption of dysprosium ions on activated-charcoal from aqueous solutions. *Carbon*, **33** (2), 215-220.

Full Text: [C\Carbon33, 215.pdf](C/Carbon33,%20215.pdf)

Abstract: The adsorption of dysprosium ions onto activated charcoal from aqueous solution has been investigated in relation to pertinent variables, such as shaking time, pH, concentration of dysprosium ions, and temperature. The conditions leading to maximum adsorption have been established. The adsorption of dysprosium ions obeys the Langmuir and the Dubinin-Radushkevich isotherm equations. Thermodynamic quantities, namely Delta H and Delta S, have been calculated from the slopes and intercepts of plots of In (K-D) versus 1/T. The results indicate that the adsorption of dysprosium ions on activated charcoal is an endothermic process. The influence of different cations and anions on the adsorption of dysprosium ions has been examined. The adsorption of other metal ions on activated charcoal has been measured under specified conditions to evaluate their selectivity. Approximately 98% of the dysprosium adsorbed on the activated charcoal was recovered using 40 ml of 3M HNO3 solution.

Keywords: Activated Charcoal, Dysprosium Ions, Adsorption, Aqueous Solution, Selectivity, Elution, Selective Adsorption

Bradley, R.H., Sheng, E., Sutherland, I. and Freakley, P.K. (1995), Adsorption of a diamine salt of carboxylic-acid by carbon-blacks. *Carbon*, **33** (2), 233-234.

Full Text: [C\Carbon33, 233.pdf](C/Carbon33,%20233.pdf)

Keywords: Adsorption, Diamine Salt, Carbon Black, XPS, Surface Oxygen, Rubber Compounding Ingredients, Cationic Surfactants, Multipurpose

Moreno-Castilla, C., Rivera-Utrilla, J., López-Ramón, M.V. and Carrasco-Marín, F. (1995), Adsorption of some substituted phenols on activated carbons from a bituminous coal. *Carbon*, **33** (6), 845-851.

Full Text: [C\Carbon33, 845.pdf](C/Carbon33,%20845.pdf)

Abstract: Adsorption at 298 K of phenol, p-cresol, m-chlorophenol, m-aminophenol, and p-nitrophenol from aqueous solutions on activated carbons obtained from an original and a demineralized bituminous coal has been studied. The adsorption capacity of the activated carbons depended on the surface area and porosity of the carbon, the solubility of the phenolic compound, and the hydrophobicity of the substituent. The relative affinity of the phenolic compound toward the surface of the carbon was related to the electron donor-acceptor complexes formed between the basic sites on the surface of the carbon and the aromatic ring of the phenol. The adsorption capacity of the carbon depended on the solution pH. As a result, the adsorption capacity began to decrease at a pH value that depended on the difference between the external and internal surface charge density, as measured by electrophoresis and pH measurement of the slurry, respectively.

Keywords: Substituted Phenols Adsorption, Activated Carbons, Bituminous Coal, Electrokinetic Properties, Surfaces

Aranovich, G.L. and Donohue, M.D. (1995), Adsorption-isotherms for microporous adsorbents. *Carbon*, **33** (10), 1369-1375.

Full Text: [C\Carbon33, 1369.pdf](C/Carbon33,%201369.pdf)

Abstract: Adsorption equilibria in slit pores are calculated using an analytic solution of the classical Ono-Kondo equation with modified boundary conditions. A new equation is developed for isotherms of gas adsorption on microporous adsorbents. This equation describes isotherms of Type I in the IUPAC classification scheme for temperatures below the critical point and also describes the unusual adsorption of supercritical fluids. This new equation predicts an isotherm that follows the behavior of the Dubinin-Radushkevich (DR) isotherm for relative pressures p/p (s) between 10-1 and 10-5. However, while the DR equation does not give correct behavior either for very low pressures or for moderate to high pressures, this new equation is valid over the whole range of relative pressures. Results obtained are compared with experimental data for adsorption of nitrogen, carbon dioxide, hydrogen sulfide, propane, carbon tetrachloride, ethanol, benzene, iso-octane, n-butane, and methane on activated carbon.

Menéndez, J.A., Illán-Gómez, M.J., León, C.A.L.Y. and Radovic, L.R. (1995), On the difference between the isoelectric point and the point of zero charge of carbons. *Carbon*, **33** (11), 1655-1657.

Full Text: [C\Carbon33, 1655.pdf](C/Carbon33,%201655.pdf)

Keywords: Point of Zero Charge, Isoelectric Point, Surface Chemistry, Activated Carbon

Mikhalev, Y. and Øye, H.A. (1996), Absorption of metallic sodium in carbon cathode materials. *Carbon*, **34** (1), 37-41.

Full Text: [C\Carbon34, 37.pdf](C/Carbon34,%2037.pdf)

Abstract: The absorption of sodium vapour in commercial cathode materials for aluminium electrolysis has been studied within the range 1020-1227 K and 3-600 Torr. The absorption increases strongly with decreasing degree of graphitization. The absorption of sodium in the commercial materials can be described as a BET isotherm with calculated surface area between 9 and 124 m2/g. The measured surface area by helium absorption, however, is less than 1 m2/g. Pure synthetic graphite behaves differently and a minimum sodium pressure is needed before absorption starts.

Keywords: Cathode, Carbon, Sodium, Absorption

López-delgado, A., Pérez, C. and López, F.A. (1996), The influence of carbon content of blast furnace sludges and coke on the adsorption of lead ions from aqueous solution. *Carbon*, **34** (3), 423-426.

Full Text: [C\Carbon34, 423.pdf](C/Carbon34,%20423.pdf)

Keywords: Lead, Adsorption, Blast Furnace Sludge, Coke, Aqueous Solution

Richter, H., Hernadi, K., Caudano, R., Fonseca, A. and Migeon, H.N. (1996), Formation of nanotubes in low pressure hydrocarbon flames. *Carbon*, **34** (3), 427-429.

Full Text: [C\Carbon34, 427.pdf](C/Carbon34,%20427.pdf)

Keywords: Nanotubes, Nanostructures, Soot, Flames, Combustion, Catalysis

Jin, H., Park, S.E., Lee, J.M. and Pyu, S.K. (1996), The shape-selectitvity of activated carbon fibers as a palladium catalyst support. *Carbon*, **34** (3), 429-431.

Full Text: [C\Carbon34, 429.pdf](C/Carbon34,%20429.pdf)

Keywords: Activated Carbon Fiber, Palladium, Catalyst, Shape-Selectivity

? Ahmadpour, A. and Do, D.D. (1996), The preparation of active carbons from coal by chemical and physical activation. *Carbon*, **34** (4), 471-479.

Full Text: [1996\Carbon34, 471.pdf](1996/Carbon34,%20471.pdf)

Abstract: A series of activated carbons was prepared from bituminous coal by chemical activation with potassium hydroxide and zinc chloride and also by physical activation with carbon dioxide. The effect of process variables such as carbonization time, temperature, particle size, chemical agents, method of mixing and impregnation ratio in the chemical activation process was studied in order to optimize those preparation parameters. Partial gasification of the high surface area carbon obtained by zinc chloride activation in CO2 with different exposure times shows some improvement in adsorption. The physical properties of the chemically activated carbon was also compared with those obtained purely by physical activation. The most important parameter in chemical activation of coal with both of the chemical agents was found to be impregnation ratio. Carbonization temperature is another variable which had a high effect on pore volume evolution. While increasing the carbonization temperature enhances surface area and pore volumes of KOH-activated carbon, it destroys carbon structure in the ZnCl2 carbon series. Under the experimental conditions investigated, the optimum conditions for high surface area carbons with KOH and ZnCl2 activation are identified. Copyright (C) 1996 Elsevier Science Ltd

Keywords: Coal, Chemical Activation, Physical Activation, Activated Carbon, KOH, Adsorption Properties, Phosphoric-Acid, Almond Shells, ZnCl2, Pyrolysis, Potassium

Seron, A., Benaddi, H., Beguin, F., Frackowiak, E., Bretelle, J.L., Thiry, M.C., Bandosz, T.J., Jagiello, J. and Schwarz, J.A. (1996), Sorption and desorption of lithium ions from activated carbons. *Carbon*, **34** (4), 481-487.

Full Text: [C\Carbon34, 481.pdf](C/Carbon34,%20481.pdf)

Abstract: The influence of surface functional groups on activated carbons on the adsorption and desorption of lithium ions, present in trace amounts in aqueous solution, has been studied in the absence and presence of an applied electric field.

Application of an electric current during the experiments dramatically increased the sorption of the ions. Moreover, lithium could be released into the solution by reversing the current, showing the reversibility of this process. In its absence, a significant enhancement in the lithium sorption uptake was found when phosphoric acid, trapped in the carbon pores was eliminated. To understand the differences induced by the chemical and electrochemical treatments of the materials, pore volumes and surface acidity were characterized. Copyright (C) 1996 Elsevier Science Ltd

Keywords: Adsorption, Desorption, Activated Carbons, Lithium Ions, Electrosorption, Porosity, Chemical Activation, Aqueous-Solution, Charcoal Cloth, Adsorption, Cadmium, Acidity, Copper, Zinc

Marcilla-Gomis, A., García-Cortés, A.N. and Martín-Martínez, J.M. (1996), A new approach to quantify the microporosity of activated carbons by analysing the N2/77 K and CO2/273 K adsorption data by the simplex flexible method. *Carbon*, **34** (12), 1531-1538.

Full Text: [C\Carbon34, 1531.pdf](C/Carbon34,%201531.pdf)

Abstract: A mathematical model has been applied to N2/77 K and CO2/273 K adsorption isotherms for a series of activated carbons prepared by carbonising olive stones in N2 and then activating them in CO, to six different levels of burn-off in the range 8-80%. Narrow and wide micropore volumes of activated carbons were calculated from the Dubinin-Radushkevich and Dubinin-Astakhov equations considering one, two and three micropore size distributions in each sample, and allowing a variation of the micropore volume and characteristic energy of each distribution with the burn-off. The flexible simplex method was applied to obtain the parameters of each distribution in the mathematical model. Generally, it was found that increasing the number of micropore size distributions above two did not significantly improve fits. Each isotherm was fitted using six parameters at most. However, various constraints were imposed, and the parameters were estimated from each isotherm using non-linear, least-squares regression analysis. The results obtained confirm the valuable use of CO2/273 K adsorption to quantify the narrow microporosity of activated carbons. Differences between N2/77 K and CO2/273 K adsorption in microporous activated carbons were due to the wide microporosity. An agreement between micropore volumes obtained from CO2/273 K adsorption and that corresponding to one of the two distributions of micropores obtained from N2/77 K adsorption was obtained. The Dubinin-Radushkevich equation was more successful than the Dubinin-Astakhov equation in the quantification of the microporosity with N2/77 K and CO2/273 K. On the other hand, the exponent n of the Dubinin-Astakhov equation was better correlated with the burn-off of the carbons than with the parameter B. Copyright (C) 1996 Elsevier Science Ltd

Keywords: Activated Carbon, Adsorption, Microporosity, Dubinin-Radushkevich Equation, CO2, Systems, Air

White, J.L. and Radovic, L.R. (1996), American Carbon Society: Aims and scope. *Carbon*, **35** (1), 167.

Full Text: [C\Carbon35, 167.pdf](C/Carbon35,%20167.pdf)

Avom, J., Ketcha Mbadcam, J., Noubactep, C. and Germain, P. (1997), Adsorption of Methylene blue from an aqueous solution on to activated carbons from palm-tree cobs. *Carbon*, **35** (3), 365-369.

Full Text: [C\Carbon35, 365.pdf](C/Carbon35,%20365.pdf)

Abstract: The adsorption of a ca 5.4×10−5 M aqueous solution of Methylene blue has been examined on five activated carbon samples. The equilibrium concentrations (Ce) were determined by spectrophotometry studies. The analysis of Freundlich adsorption isotherms obtained provides the adsorption capacity of each carbon sample.

Keywords: Activated Carbons, Adsorption, Spectrophotometry

? Daley, M.A., Mangun, C.L., DeBarr, J.A., Riha, S., Lizzio, A.A., Donnals, G.L. and Economy, J. (1997), Adsorption of SO2 onto oxidized and heat-treated activated carbon fibers (ACFS). *Carbon*, **35** (3), 411-417.

Full Text: [1997\Carbon35, 411.pdf](1997/Carbon35,%20411.pdf)

Abstract: A series of activated carbon fibers (ACFs) and heat-treated oxidized ACFs prepared from phenolic fiber precursors have been studied to elucidate the role of pore size, pore surface chemistry and pore volume for the adsorption of SO(2)and its catalytic conversion to H2SO4.

For untreated ACFs, the initial rate of SO2 adsorption from flue gas was shown to be inversely related to pore size. Ar longer times, the amount of SO2 adsorbed from flue gas was dependent on both the pore size and pore volume.

Oxidation of the ACFs, using an aqueous oxidant, decreased their adsorption capacity for SO2 from flue gas due to a decrease in pore volume and repulsion of the SO2 from acidic surface groups. IT these samples were heat-treated to desorb the oxygen containing function groups, the amount of SO2 adsorption increased. This increase in adsorption capacity was directly correlated to the amount of CO2 evolved during heat-treatment of the oxidized ACFs. The amount of SO2 adsorbed for these samples was related to the pore size, pore surface chemistry and pore volume. This analysis is explained in more derail in this paper. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon, Carbon Fibers, Heat Treatment, Adsorption, Microporosity

? László, K., Bóta, A. and Nagy, L.G. (1997), Characterization of activated carbons from waste materials by adsorption from aqueous solutions. *Carbon*, **35** (5), 593-598.

Full Text: [1997\Carbon35, 593.pdf](1997/Carbon35,%20593.pdf)

Abstract: Chars and activated carbons obtained from miscellaneous waste materials and by-products have been used to remove phenol and 2,3,4-trichlorophenol from one- and two-solute aqueous solutions. The effect of activation on the adsorption performance was studied. Activation not only improved the specific surface area and the adsorption capacity of chars but also affected the polarity of the surface. The best results were achieved with carbons from agricultural by-products. From two-component solutions the preferred adsorption of 2,3,4-trichlorophenol was experienced. The effectiveness of the removal of the non-preferentially adsorbing phenol is poor as long as the preferred trichlorophenol is present above a certain concentration. The greater the difference in the K values, the higher is this concentration. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon,Char, Activation, Adsorption, Chlorophenols, Desorption, Phenol

Tsai, W.T., Chang, C.Y. and Lee, S.L. (1997), Preparation and characterization of activated carbons from corn cob. *Carbon*, **35** (8), 1198-1200.

Full Text: [C\Carbon35, 1198.pdf](C/Carbon35,%201198.pdf)

Keywords: Activated Carbon, Activation, Agricultural By-Products, Lignocellulosic Materials, Phosphoric-Acid, Adsorption, Stones

Bernardo, E.C., Egashira, R. and Kawasaki, J. (1997), Decolorization of molasses’ wastewater using activated carbon prepared from cane bagasse. *Carbon*, **35** (9), 1217-1221.

Full Text: [C\Carbon35, 1217.pdf](C/Carbon35,%201217.pdf)

Abstract: The decolorization of synthetic melanoidin was studied using activated carbon from cane bagasse obtained from Thailand and Brazil. Melanoidin, a nitrogenous brown polymer present in molasses’ wastewater, is formed on the interaction between amino acids and carbohydrates. Bagasse, another by-product in the sugar industry, is a cheap material suitable for the preparation of activated carbon. Samples of cane bagasse were carbonized using nitrogen gas at 300°C and activated with steam at 800°C in a ceramic boat inside a horizontal electric furnace consisting of a batch reactor. Yields were determined and values of 10-20% were obtained. Proximate analyses show that the bagasse samples appear to be adequate precursors for activated carbon because of their low ash content. The activated carbons were characterized for their adsorptive capacities on melanoidin. Results showed that the activated carbons have high adsorptive capacities that favorably compare well with a commercial activated carbon. BET surface areas were determined using nitrogen gas for adsorption and results showed surface areas greater than 400 m2g-1, the value for most commercial activated carbons. The activated carbons produced are therefore comparable commercial ones. Regeneration of the spent carbon showed an increase in the adsorptive capacity and yield.

Keywords: Products, Shells, Activated Carbon, Activation, Carbonization, Adsorption, Surface Areas

Brasquet, C. and Le Cloirec, P. (1997), Adsorption onto activated carbon fibers: Application to water and air treatments. *Carbon*, **35** (9), 1307-1313.

Full Text: [C\Carbon35, 1307.pdf](C/Carbon35,%201307.pdf)

Abstract: The adsorption of polluted fluids is performed by activated carbon fibers (ACF). The adsorption is carried out in batch and in dynamic reactors. Classic models are applied and kinetic constants are computed. Results show that the performance of ACF is significantly higher than that of granular activated carbon (GAC) in terms of adsorption rate and selectivity for micropollutants. The breakthrough curves obtained with ACF adsorbers are particularly steep. suggesting a smaller mass transfer resistance than with GAC. The adsorption zone in the ACF bed is about 3.4 mm and is not really dependent on the water flow rate within the studied range. Applications are developed in water and air treatments. Examples are given in the micropollutants removal cf an aqueous solution. Air loaded with VOC is treated by fibers. Regeneration of this material is performed by heating by the Joule effect or electromagnetic induction. These approaches to water or air treatment processes are successfully put to use. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon, Carbon Fibers, Adsorption, Aquatic Humic Substances, Chlorination, Products

Otowa, T., Nojima, Y. and Miyazaki, T. (1997), Development of KOH activated high surface area carbon and its application to drinking water purification. *Carbon*, **35** (9), 1315-1319.

Full Text: [C\Carbon35, 1315.pdf](C/Carbon35,%201315.pdf)

Abstract: High-surface-area (over 3000 m2 g-1) active carbon (MAXSORB) was developed from a mixture of petroleum coke and an excess amount of potassium hydroxide. A considerable number (0.9-1.6 meq g-1) of surface functional groups were found compared to that of typical steam activated carbons (0.1-0.2 meq g-1). Breakthrough of sodium hypochlorite or chloroform was studied using model drinking water at 25°C, containing about 2 ppm of NaClO or 50 ppb of CHCl3. Regardless of the amount of surface functional groups, the performance of NaClO decomposition for MAXSORB was proportional to the BET surface area and reached a value of two to three times more than the typical steam activated carbon. There was an optimum BET surface area for CHCl3 removal, which was improved greatly by removing surface functional groups jy heat treatment at 700°C. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon, Activation, Bet Surface Area, Reactivity

Groszek, A.J. (1997), Irreversible and reversible adsorption of some heavy transition metals on graphitic carbons from dilute aqueous solutions. *Carbon*, **35** (9), 1329-1337.

Full Text: [C\Carbon35, 1329.pdf](C/Carbon35,%201329.pdf)

Abstract: The adsorption of various heavy transition metal compounds was studied using two different flow adsorption methodologies: flow injection adsorption and flow equilibrium adsorption analyses. In both cases the determinations were made of the heats of adsorption and the amounts of adsorption from dilute aqueous solutions.

The carbons used for the work included two different types of graphitised carbon black and active carbons prepared from coconut shells and coal. The work shows that in every case a significant proportion of the solutes was adsorbed irreversibly. Al the same time reversible adsorption of the solute also took place. The two graphitised carbons differed in respect of the extent of the irreversible adsorption of Hg(NO3)2 and KPtCl6, which appeared to be related to small differences in the amounts of polar sites on the surface of these carbons. There were also indications of the decomposition of the adsorbates soon after saturation of the surfaces took place.

These effects were much more pronounced for the adsorptions on active carbons which contained from 2-5% of their total surfaces in the form of hydrophilic sites. Generally the heats of irreversible adsorptions were very high, even on graphitised carbon blacks, approaching -200 kJ mol-1 at surface coverages below 1% of their BET N2 surface. (C) 1997 Elsevier Science Ltd.

Keywords: Carbon Black, Activated Carbon, Adsorption, Functional Groups, Heat of Adsorption, Activated Carbon

Toles, C.A., Marshall, W.E. and Johns, M.M. (1997), Granular activated carbons from nutshells for the uptake of metals and organic compounds. *Carbon*, **35** (9), 1407-1414.

Full Text: [C\Carbon35, 1407.pdf](C/Carbon35,%201407.pdf)

Abstract: Almond and pecan shells were chosen as hard, lignocellulosic precursors for the production of granular activated carbons (GACs) in order to create carbons for the adsorption of both organic compounds and metals. They were activated either chemically, with H3PO4, or physically, with CO2, under a variety of conditions. Following activation, a portion of the GACs were oxidized with air.

The acid-activated samples had higher BET surface areas and greater product yields than the CO2 activated carbons.

Unoxidized, CO2 activated carbons generally sequestered more Cu2+ from solution than the unoxidized acid-activated GACs, when evaluated in batch assays at pH 4.8. Oxidative treatment, however, improved Cu2+ adsorption in both types of carbon to levels significantly greater than comparable commercial carbons.

Nutshell-based carbons were also examined for their ability to adsorb a variety of low molecular weight organic compounds with differing polarities. For CO2 activated pecan shell carbons there was a distinct increase in organic uptake that was usually not altered by oxidation. Both acid- and CO2 activated pecan shell carbons took up similar amounts of the non-polar benzene and toluene, but the CO2 activated carbons took up more polar compounds.

There were several GACs that outperformed commercial carbons in their ability to adsorb significant quantities of Cu2+ or organics on the same carbon. Our data show that nutshells provide a plentiful and inexpensive precursor for the production of GACs which may be competitive with commercial carbons in wastewater or potable water treatment. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Coal, Activation, Bet Surface Area, Adsorption Properties, Lignocellulosic Materials, Porosity

Linders, M.J.G., van den Broeke, L.J.P., van Bokhoven, J.J.G.M., Duisterwinkel, A.E., Kapteijn, F. and Moulijn, J.A. (1997), Effect of the adsorption isotherm on one- and two-component diffusion in activated carbon. *Carbon*, **35** (9), 1415-1425.

Full Text: [C\Carbon35, 1415.pdf](C/Carbon35,%201415.pdf)

Abstract: Results are presented for the equilibrium adsorption isotherms of several components in an activated carbon. The amount adsorbed has been measured over a large pressure range using head space analysis. A distinct difference between the Dubinin-Radushkevich and the Langmuir model is observed especially for heavy component adsorption (propane and hexane). The contribution of the isotherm model to the concentration dependent diffusion process in the activated carbon is outlined using the Maxwell-Stefan theory. It is demonstrated that the various isotherm models give a different concentration dependence for the surface diffusion coefficient. An activated carbon membrane, a resin disk containing activated carbon particles, has been developed to measure steady-state and transient permeation. The experiments have been performed according to the Wicke-Kallenbach method. Experimental and simulated results of binary permeation of a mixture of nitrogen and propane agree well. The essential feature of concentration dependent diffusion, an overshoot in the transient profile of the fast moving and weakly adsorbed component, is predicted. The simulations of the binary permeation show, again, a clear effect of the isotherm model on the mass transport process. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon, Adsorption, Diffusion, Hydrocarbons, Dependence, Equations, Kinetics

Fu, R., Lu, Y., Xie, W. and Zeng, H. (1998), The adsorption and reduction of PT(IV) on activated carbon fibre. *Carbon*, **36** (1-2), 19-23.

Full Text: [C\Carbon36, 19.pdf](C/Carbon36,%2019.pdf)

Abstract: The relationship between the adsorption-reduction capacity of Pt(IV) and the preparation conditions, the surface area of ACF, as well as the effect of the reaction conditions such as the ratio of solid to liquid, the concentration of Pt(IV), reaction temperature and solution pH were studied. The dispersion and structure of the platinum produced were investigated by use of SEM and XRD. (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon, Carbon Fibers, Adsorption, Fibers

Notes: highly cited

? Moreno-Castilla, C., Carrasco-Marín, F., Maldonado-Hódar, F.J. and Rivera-Utrilla, J. (1998), Effects of non-oxidant and oxidant acid treatments on the surface properties of an activated carbon with very low ash content. *Carbon*, **36** (1-2), 145-151.

Full Text: [1998\Carbon36, 145.pdf](1998/Carbon36,%20145.pdf)

Abstract: An activated carbon obtained from olive stones and with very low ash content (0.10%) was treated with either HCl, HF or HNO3. The changes in surface area and porosity resulting from the acid treatments were studied by N-2 and CO2 adsorption at 77 and 273 K, respectively and by mercury porosimetry. The changes in surface chemistry were studied by temperature-programmed desorption and Fourier transformed infrared spectroscopy. The treatments with HCl yielded activated carbons on which some chlorine remained chemisorbed, whereas the HF treatment did not fix any fluorine. Due to this, the HCl treatment had a slight effect on the microporosity of the samples. Moreover, the HF treatment increased the amount of CO-evolving surface groups. The treatment with HNO3 destroyed the pore walls to a large extent, fixing a large amount of oxygen surface groups. The nature and structure of the CO- and CO2-evolving groups will be discussed in detail. (C) 1997 Elsevier Science Ltd All rights reserved.

Keywords: Activated Carbon, Chemical Treatment, Surface Properties, Functional Groups, Nitric-Acid, Adsorption, Oxidation, Complexes, Coal, Gasification, Adsorbents, Chars, Air

Notes: highly cited

? Rodríguez-Reinoso, F. (1998), The role of carbon materials in heterogeneous catalysis. *Carbon*, **36** (3), 159-175.

Full Text: [1998\Carbon36, 159.pdf](1998/Carbon36,%20159.pdf)

Abstract: The increasing importance of carbon materials in catalytic processes is analyzed in terms of the most important characteristics of these materials when acting as catalysts or catalyst supports. Thus, surface area, porosity, chemical inertness and oxygen surface groups affect not only the preparation, but also influence the resistance to sintering and the catalytic activity and selectivity of the catalyst. Several series of catalysts, mainly carbon-supported catalysts, are used to show the possible advantages of carbon as support and the series of variables to be taken into account when selecting a carbon as catalyst support for a given reaction. The role of carbon properties when acting as a catalyst in its own right is also analyzed. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Carbon-Supported Catalysts, Impregnation, Catalytic Properties, Chemical Structure, Functional Groups, Surface Properties, Oxygen-Surface Groups, Supported Iron Catalysts, Fe-Mn Clusters, Platinum Catalysts, Activated Carbon, Monoxide Hydrogenation, Ruthenium Catalysts, CO Hydrogenation, Hydrodesulfurization Catalysts, Thiophene Hydrodesulfurization

Sundaram, N. and Yang, R.T. (1998), Incorporating Henry’s law in the Dubinin isotherm. *Carbon*, **36** (3), 305-306.

Full Text: [C\Carbon36, 305.pdf](C/Carbon36,%20305.pdf)

Stoeckli, F. (1998), Recent developments in Dubinin’s theory. *Carbon*, **36** (4), 363-368.

Full Text: [C\Carbon36, 363.pdf](C/Carbon36,%20363.pdf)

Abstract: Dubinin’s theory, developed in successive stages between 1947 and 1971 and extended to immersion calorimetry in the 1980s, has recently found new applications. It has been shown that water adsorption by microporous carbons, corresponding to type IV and V isotherms, can be described by the Dubinin-Astakhov (D-A) equation. The extension to immersion calorimetry is also valid and provides information on the interaction between water and oxygen-containing surface groups. The D-A equation has also been combined successfully with the theory of Myers and Prausnitz, which leads to a satisfactory description of static and dynamic adsorption of binary mixtures by active carbon beds. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Microporosity, Active Carbons, Water-Vapor, Carbonaceous Adsorbents, Adsorption, Equation, Astakhov

Keywords: Activated Carbon, Adsorption Properties, Gas-Mixtures, Adsorption

Pokonova, Y.V. (1998), Carbon adsorbents for the sorption of arsenic. *Carbon*, **36** (4), 457-459.

Full Text: [C\Carbon36, 457.pdf](C/Carbon36,%20457.pdf)

Keywords: Activated Carbon, Adsorption

Fu, X.L. and Chung, D.D.L. (1998), Submicron-diameter-carbon-filament cement-matrix composites. *Carbon*, **36** (4), 459-462.

Full Text: [C\Carbon36, 459.pdf](C/Carbon36,%20459.pdf)

Keywords: Carbon Composites, Carbon Filaments, Catalytically Grown Carbon, Electrical Properties, Mechanical Properties, Fiber-Reinforced Cement, Filler

Yosida, Y. (1998), Observations of a precursor for carbon nanotubes in the hard deposit obtained in dc arc experiments. *Carbon*, **36** (4), 463-465.

Full Text: [C\Carbon36, 463.pdf](C/Carbon36,%20463.pdf)

Keywords: Carbon Nanotubes, SEM, Growth

Qiu, J.S., Zhou, Y., Wang, L.N. and Tsang, S.C. (1998), Formation of carbon nanotubes and encapsulated nanoparticles from coals with moderate ash contents. *Carbon*, **36** (4), 465-467.

Full Text: [C\Carbon36, 465.pdf](C/Carbon36,%20465.pdf)

Keywords: Carbon Nanotubes, Coal

Bezot, P. and Hesse-Bezot, C. (1998), Fractal structure of carbon black agglomerates. *Carbon*, **36** (4), 467-469.

Full Text: [C\Carbon36, 467.pdf](C/Carbon36,%20467.pdf)

Keywords: Carbon Black, Combustion, Light Scattering, Aggregation, Light-Scattering

Esumi, K., Fujii, T., Hosokawa, T. and Honda, H. (1998), Rheological behavior of carbonaceous gel in organic solvents. *Carbon*, **36** (4), 470-471.

Full Text: [C\Carbon36, 470.pdf](C/Carbon36,%20470.pdf)

Keywords: Carbon Gel, Viscoelasticity

Cabioc’h, T., Jaouen, M. and Girard, J.C. (1998), Thin film of spherical carbon onions onto silver. *Carbon*, **36** (5-6), 499-502.

Full Text: [C\Carbon36, 499.pdf](C/Carbon36,%20499.pdf)

Abstract: We have performed high dose carbon ion implantation into polycrystalline silver substrates at high temperature (500-600°C). The formation of a high density of spherical carbon onions on the nearby silver substrate was characterized by atomic force microscopy experiments and transmission electron microscopy. The influence of the implantation temperature as well as that of silver grain sizes and crystallographic orientations are analysed. (C) 1998 Published by Elsevier Science Ltd. All rights reserved.

Keywords: Fullerene, Atomic Force Microscopy (AFM), Transmission Electron Microscopy (TEM), Microstructure

Lalvani, S.B., Wiltowski, T., Hübner, A., Weston, A. and Mandich, N. (1998), Removal of hexavalent chromium and metal cations by a selective and novel carbon adsorbent. *Carbon*, **36** (7-8), 1219-1226.

Full Text: [C\Carbon36, 1219.pdf](C/Carbon36,%201219.pdf)

Abstract: Carbon produced by the contact are method (whereby graphite electrodes are arced in an inert atmosphere) was employed for the removal of hexavalent and trivalent chromium ions as well as other metal cations from aqueous solutions. It is known that hexavalent chromium is present as an anionic species in the solution. The carbon adsorbent used in this study selectively removed the anions of hexavalent chromium from the solution, whereas, depending upon the solution pH, no or very small uptake of metal cations was observed. On the other hand, commercial activated carbon showed great affinity for cations of lead, zinc, and trivalent chromium but none for the anion of hexavalent chromium. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Soot, Adsorption, Chromium, Lead, Zinc, Ion Selectivity

Sasaki, M., Tamai, H., Yoshida, T. and Yasuda, H. (1998), Dye adsorption on mesoporous activated carbon fiber obtained from pitch containing yttrium complex and tha acid treatment effects. *Carbon*, **36** (7-8), 1247-1248.

Full Text: [C\Carbon36, 1247.pdf](C/Carbon36,%201247.pdf)

Abstract: The adsorption isotherms of various acid, direct, and basic dyes on mesoporous activated carbon fibers (Y-ACF) obtained from pitch containing Y (acac)3 were measured and the influence of their acid treatment was examined. The Y-ACF highly adsorbed dyes with large molecular size, whereas microporous activated carbon fiber scarcely adsorbed these dyes. Electron probe x-ray microanalysis indicated that yttrium oxide in Y-ACF, which was produced from the yttrium complex, was thoroughly eluted by acid treatment of Y-ACF. The adsorption amounts of acid and direct dyes with large molecular size on Y-ACF decreased by acid treatment. On the other hand, the adsorbed amount of basic dye increased by acid treatment. The adsorption characteristics were associated with the electrostatic properties of the activated carbon fibers.

Jia, Y.F., Steele, C.J., Hayward, I.P. and Thomas, K.M. (1998), Mechanism of adsorption of gold and silver species on activated carbons. *Carbon*, **36** (9), 1299-1308.

Full Text: [C\Carbon36, 1299.pdf](C/Carbon36,%201299.pdf)

Abstract: The adsorption characteristics of gold and silver cyanide anionic species on a suite of active carbons derived from coal, coconut shell and polyacrylonitrile have been investigated. The gold and silver cyanide adsorption capacities for both coconut shell and coal derived carbons correlate with total pore volume. Nitric acid treatment of the carbon was detrimental to gold adsorption in spite of the incorporation of oxygen into the carbon through oxidation. The influence of nitrogen Functional groups in the carbon structure on gold and silver adsorption was investigated using carbons with very high nitrogen contents derived from polyacrylonitrile. The addition of ethanol and butanol to the solution had an adverse effect on gold adsorption. Adsorption of silver cyanide ionic species on the active carbon was suppressed in the presence of excess free cyanide ions in solution whereas gold cyanide adsorption was not greatly affected. The results are discussed in terms of the mechanism of adsorption, equilibria in solution and the bonding in metal cyanide complexes adsorbed on the carbon surface. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Porosity, Gold, Aurocyanide Ion-Pairs, Polymeric Adsorbents, Cyanide, Extraction, Models, 1-Pentanol, Au(Cn)2, Ag(Cn)2, Oxygen

D’Silva, A.P. (1998), Adsorption of antioxidants by carbon blacks. *Carbon*, **36** (9), 1317-1325.

Full Text: [C\Carbon36, 1317.pdf](C/Carbon36,%201317.pdf)

Abstract: The adsorption of p-nitrophenol, Methylene blue and antioxidants have been examined on two carbons of high surface area but manufactured from different feedstocks using various methods of activation for developing the pore structure. Black Pearls 2000 is a thermally produced steam activated carbon black, whereas activated char is a wood-based product activated chemically with phosphoric acid followed by steam treatment. Adsorption studies using Methylene blue as solute indicate that in both carbons, around 65% of the total surface is present in pores of less than 2.8 nm radius. Adsorption studies using very large solutes, e.g. antioxidants, indicate that activated char behaves as non-porous towards these large molecular area solutes. There is indication that the antioxidants are present as aggregates in methanol solution and are adsorbed as such on the substrates.

Keywords: Antioxidants, Direct Adsorption, Indirect Adsorption, Aggregation, Micelles, Surface Area, IUPAC Classification, Micropores, Mesopores

? Teng, H.S., Yeh, T.S. and Hsu, L.Y. (1998), Preparation of activated carbon from bituminous coal with phosphoric acid activation. *Carbon*, **36** (9), 1387-1395.

Full Text: [1998\Carbon36, 1387.pdf](1998/Carbon36,%201387.pdf)

Abstract: Activated carbons were prepared from an Australian bituminous coal in this study. The preparation process consisted of phosphoric acid impregnation followed by carbonization in nitrogen at 400-600°C for 1-3 hours. The results reveal that the surface area and pore volume of the resulting carbons increase with the chemical ratio, H3PO4/coal. Within the ranges of carbonization temperature and time, the chemically activated carbon prepared from carbonization at 500°C for 3 hours was found to have maximum surface area and pore volume values. Physical activation with CO2 of the initially H3PO4 activated carbon was examined and the results suggest that the combined activation is suitable for producing high porosity carbons with a high proportion of mesoporosity. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Activation, Carbonization, Adsorption, Surface Properties, Chemical Activation, Coconut Shell, Porosity, CO2

Chen, Y.D. and Yang, R.T. (1998), Surface and mesoporous diffusion with multilayer adsorption. *Carbon*, **36** (10), 1525-1537.

Full Text: [C\Carbon36, 1525.pdf](C/Carbon36,%201525.pdf)

Abstract: The theory by the authors on surface diffusion where multilayer adsorption occurs is reviewed and further discussed. The theory is derived from a kinetic-theory approach for homogeneous surfaces, but readily extendible to heterogeneous surfaces. The assumptions made in the BET theory are used. The theory is capable of predicting the increase and the subsequent decrease in surface diffusivity with surface concentration. The required information for the theory is the equilibrium adsorption isotherm. From the theory, one can understand the fact that when the surface concentration approaches zero, the transport surface diffusivity becomes equal to the corrected surface diffusivity or self-diffusivity, which can be estimated readily from existing theories. On the other hand, when the surface concentration approaches infinity, that is, when surface condensation occurs, the surface transport diffusivity approaches zero. A fair agreement is obtained between the data available in the literature and the theoretical predictions. Finally, the concentration dependence of surface and mesoporous diffusivities is classified into five types. The multilayer surface diffusion theory is used to predict all five types of concentration dependence. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Surface Diffusion, Occupancy Zeolite Catalysts, Concentrated Lattice Gases, Concentration-Dependence, Adsorbed Gases, Monte-Carlo, Activated Carbon, Self-Diffusion, Diffusivities, Particles, Model

Do, D.D. and Wang, K. (1998), A new model for the description of adsorption kinetics in heterogeneous activated carbon. *Carbon*, **36** (10), 1539-1554.

Full Text: [C\Carbon36, 1539.pdf](C/Carbon36,%201539.pdf)

Abstract: A new model for the description of adsorption kinetics in heterogeneous activated carbon is presented in this paper. The activated carbon particle is composed of the fluid phase and the adsorbed phase, the latter of which is heterogeneous. This heterogeneity is assumed to be described by a distribution in the energy of interaction between the two phases. This distribution is obtained from the information of the adsorption equilibria of all species. The kinetics model assumes three processes occurring within the porous particle: (1) the pore volume diffusion, (2) the adsorbed phase diffusion and (3) the finite mass interchange between the molecules in the fluid phase and those in the energy distributed adsorbed phase. The distribution of energy of interaction is accounted for in the last two processes. These three processes are found to have rates that are comparable in magnitude, and depending on the adsorbate, the operating conditions and the mode of operation (adsorption or desorption) one or two of these processes dominate the overall uptake. The model is tested with the experimental data collected in our laboratories using the volumetric isotherm apparatus for equilibria and the differential adsorption bed for kinetics. Seven adsorbates were used, and a wide range of parameters as well as operating conditions were also used to validate the mathematical model. It is found that the model proposed describes well the adsorption as well as desorption kinetics. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Diffusion, Porosity, Reaction Kinetics, Equilibria, Kinetics, Pore-Size Distribution, Energy-Distribution, Particles, Dynamics, Sorption, Dioxide

Lua, A.C. and Guo, J. (1998), Preparation and characterisation of chars from oil palm waste. *Carbon*, **36** (11), 1663-1670.

Full Text: [C\Carbon36, 1663.pdf](C/Carbon36,%201663.pdf)

Abstract: The feasibility of preparing activated carbons from extracted oil palm fibre, an abundant oil palm waste, was studied. Preliminary tests were conducted to investigate the influences of different operating parameters, such as initial material size, inert gas flow rate, heating rate, pyrolysis temperature and hold time, on the properties of the pyrolysed chars. The pyrolysed chars were characterized by a thermogravimetric analyzer for the proximate analyses and the pyrolysis kinetic studies, and by an accelerated surface area and porosimetry system for the determination of their BET and micropore surface areas and pore size distributions. The optimum conditions for pyrolysis were found to be for 0.5-1.0 mm material sizes at a final temperature of 850°C for 3.5-hour hold time, heating rate of 10°C min-1 and a nitrogen flow rate of 150 Nml min-1. For these conditions, chars with a maximum BET surface area of 521 m2 g-1 were obtained. Experimental results showed that it was feasible to prepare chars with high BET surface areas from extracted oil palm fibre. With further activation, the pyrolysed chars would be expected to improve their adsorption capability. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Char, Pyrolysis, Adsorption, Thermal Analysis, Microporosity, Activated Carbons, Pyrolysis, Stones, Steam, Shell, CO2

Namasivayam, C. and Kadirvelu, K. (1999), Uptake of mercury(II) from wastewater by activated carbon from an unwanted agricultural solid by-product: Coirpith. *Carbon*, **37** (1), 79-84.

Full Text: [C\Carbon37, 79.pdf](C/Carbon37,%2079.pdf)

Abstract: Adsorption studies of mercury(II) from aqueous solutions on coirpith carbon were investigated under the varying conditions of agitation time, metal ion concentration, adsorbent dose and pH. Adsorption equilibrium reached in 10, 25, 30 and 40 min for 10, 20, 30 and 40 mgl-1 Hg(II) concentration. Adsorption followed both Langmuir and Freundlich isotherms. The adsorption capacity was 154 mgg-1. The percent removal increased with the increase of pH from 2 to 5 and remained constant up to pH 11.00. Desorption studies were performed with dilute hydrochloric acid and potassium iodide solutions. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Peanut Hull Carbon, Aqueous-Solution, Removal, Adsorption, Water, Activated Carbon, Carbonization, Adsorption, Adsorption Properties

Babić, B.M., Milonjić, S.K., Polovina, M.J. and Kaludierović, B.V. (1999), Point of zero charge and intrinsic equilibrium constants of activated carbon cloth. *Carbon*, **37** (3), 477-481.

Full Text: [C\Carbon37, 477.pdf](C/Carbon37,%20477.pdf)

Abstract: Surface propel-ties of cellulose-based activated carbon cloth were investigated. The point of zero charge was determined by batch equilibrium method. Surface charge densities were obtained from potentiometric titrations. The site-binding model was applied to calculate the intrinsic acidity constants. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbon Cloth, Surface Properties, Oxide-Water Interface, Surface-Ionization, Charcoal Cloth, Aqueous-Solution, Adsorption, Complexation, Acidity, Titration

Ramos, R.L., Ovalle-Turrubiartes, J. and Sanchez-Castillo, M.A. (1999), Adsorption of fluoride from aqueous solution on aluminum-impregnated carbon. *Carbon*, **37** (4), 609-617.

Full Text: [C\Carbon37, 609.pdf](C/Carbon37,%20609.pdf)

Abstract: The adsorption isotherms of fluoride from an aqueous solution on plain and aluminum-impregnated activated carbons were measured in this study. The impregnated carbon was prepared by impregnation with an aluminum nitrate solution at a fixed pH, followed by calcination under nitrogen at temperatures above 300°C. The adsorption of fluoride on impregnated carbon was shown to be dependent upon both the pH of the impregnating solution and the temperature of calcination. Impregnated carbon was shown to have a fluoride adsorption capacity of 3 to 5 times that of plain activated carbon. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Impregnation, Adsorption, Catalyst, Removal

Hu, X., Lei, L., Chu, H.P. and Yue, P.L. (1999), Copper/activated carbon as catalyst for organic wastewater treatment. *Carbon*, **37** (4), 631-637.

Full Text: [C\Carbon37, 631.pdf](C/Carbon37,%20631.pdf)

Abstract: A new heterogeneous copper catalyst was developed using highly porous activated carbon as the catalyst support. The catalyst was designed to promote the oxidation of organic pollutants in dyeing and printing wastewater from the textile industry, which was carried out in a 2 1 high-pressure reactor. The new catalyst enhanced the conversion of organic compounds in dyeing and printing wastewater, shortened the reaction time, and lowered the reaction temperature and the system total pressure. The conditions for preparing the catalyst were experimentally optimized according to their catalytic oxidation efficiency in wastewater treatment. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Impregnation, Adsorption, Thermal Analysis (Tga), Catalytic Properties, Oxidation, Pellets

Tamai, H., Yoshida, T., Sasaki, M. and Yasuda, H. (1999), Dye adsorption on mesoporous activated carbon fiber obtained from pitch containing yttrium complex. *Carbon*, **37** (6), 983-989.

Full Text: [C\Carbon37, 983.pdf](C/Carbon37,%20983.pdf)

Abstract: The adsorption of acid dyes (Acid Blue 9, Acid Blue 74, Acid Orange 10, and Acid Orange 51), direct dyes (Direct Black 19, Direct Yellow 11, and Direct Yellow 50), and basic dyes (Basic Brown 1 and Basic Violet 3) on a highly mesoporous activated carbon fiber (Y-ACF) obtained from pitch containing yttrium acetylacetonate was investigated in terms of size of dye molecules, and pore size and surface charge of the activated carbon fiber. The results were compared with that on a microporous activated carbon fiber (A-20). The high amounts of sterically small size of acid dyes and basic dyes were adsorbed on both Y-ACF and A-20. The amounts of direct dyes, which are large in one or two dimensions of molecular structures, adsorbed on a mesoporous Y-ACF were much higher than those on microporous A-20. The adsorbed amounts of direct dyes decreased with increasing pH in alkaline pH, in which thepotentials of Y-ACF show negative values. From these results, we can suggest that the adsorption of dyes on activated carbon fiber varies greatly by changing pore size and surface charge of activated carbon fiber.

Keywords: Activated carbon, Pitch, Adsorption, Porosity

Park, S.J., Park, B.J. and Ryu, S.K. (1999), Electrochemical treatment on activated carbon fibers for increasing the amount and rate of Cr(VI) adsorption. *Carbon*, **37** (8), 1223-1226.

Full Text: [C\Carbon37, 1223.pdf](C/Carbon37,%201223.pdf)

Abstract: The present study concerns anodic oxidation of activated carbon fibers (ACFs) in order to introduce the surface functional groups onto ACF surfaces. The surface oxides of ACFs were measured using titration and FT-IR spectrometry. As a result, it was observed that the amount of adsorption and the adsorption rate of Cr(VI) increase with increases in the surface oxide groups of ACFs, even though both the specific surface area and the micropore volume do not significantly change as with anodic oxidation treatments on ACFs. (C) 1999 Elsevier Science Ltd, All rights reserved.

Keywords: Activated Carbon, Surface Treatment, Functional Groups, Surface Properties

Yue, Z.R., Jiang, W., Wang, L., Toghiani, H., Gardner, S.D. and Pittman, Jr., C.U. (1999), Adsorption of precious metal ions onto electrochemically oxidized carbon fibers. *Carbon*, **37** (10), 1607-1618.

Full Text: [C\Carbon37, 1607.pdf](C/Carbon37,%201607.pdf)

Abstract: Electrochemically oxidized carbon fibers (ECF) adsorbed a prodigious amount of Ag+ in contrast to oxygen plasma and nitric acid treated carbon fibers. The amount of adsorbed Ag+ reached 3700 µmol/g after 5652 C/g of electrochemical oxidation. This value approaches the 4050 µmol/g of Ag+ which adsorbed onto steam-activated Kenaf-based carbon (with a surface area of 1284 m(2)/g determined by N2/BET) under the same adsorption conditions. ECF oxidized to 9540 C/g adsorbed more than its own weight of Ag+ (12 608 µmol/g). These fibers exhibited a surface area of 115 m2/g (CO2-DR). Two different reactions occurred during Ag+ adsorption. These reactions were ion exchange adsorption between Ag+ and acidic functions (carboxyl) and redox adsorption between Ag+ and reducing functions such as catechol groups on these electrochemically oxidized fibers (ECF). The redox capability was expressed by the reaction electric potential (E) using the Nernst equation. High resolution XPS C 1s spectra of ECFs (level of oxidation 5300 C/g), before and after Ag+ adsorption, showed that the carbon atoms present in phenolic, alcohol or ether groups and those present in carbonyl or quinone groups increased after Ag+ adsorption. X-ray diffraction and X-ray photoelectron spectroscopy (XPS) Ag 3d spectra of the ECF showed that adsorbed Ag+ was reduced to Ag0 after both Ag+ adsorption and subsequent post-heat treatment of the fibers under N2 at 550°C for 30 min. Only about one-third as much Au3+ adsorption occurred versus the extent of electrochemical oxidation as was observed for Ag+. This ratio matches the requirement that three electrons are required to convert Au3+ to Au-0 versus one to convert Ag+ to Ag. High resolution angle resolved XPS (ARXPS) Pd 3d and Pt4+ spectra show that there are two different Pd oxidation states and three different Pt oxidation states present after adsorption of Pd2+ and Pt2+ onto ECF. The peak areas as a function of take off angle showed that substantial amounts of Pd-0 and Pt-0 are present in addition to Pd2+ and Pt2+ and Pt4+ on the outermost surface regions of oxidized fibers. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Carbon Fibers, Electrochemical Treatment, Adsorption, X-Ray Photoelectron Spectroscopy (XPS), Adsorption Properties, Nitric-Acid, Oxygen Plasma, Tetraethylenepentamine, Surfaces, Reduction, Oxidation, Pitch, XPS

Ryu, S.K., Kim, S.Y., Gallego, N. and Edie, D.D. (1999), Physical properties of silver-containing pitch-based activated carbon fibers. *Carbon*, **37** (10), 1619-1625.

Full Text: [C\Carbon37, 1619.pdf](C/Carbon37,%201619.pdf)

Abstract: Silver-containing pitch-based carbon fibers were prepared and activated in steam. SEM and TEM were used to investigate the surface morphology and the behavior of the silver particles in fibers. Physical properties such as density, tensile strength, and electrical resistivity were measured. The SEM photos of fibers containing silver (at initial concentrations of 1000 and 10 000 ppm) were similar. to those of non-activated carbon fibers at high level burn-off. Silver particles accelerate the activation rate. However, the specific surface areas of silver-containing activated carbon fibers were similar to those of non-silver containing activated carbon fibers. The apparent density and the tensile strength of the 10 000 ppm silver-containing carbon fibers were 1.677g/cm3 and 24 kg(f)/mm2, and these decreased to 0.795 g/cm3 and 6 kg(f)/mm2 respectively, at 69% burn-off. The electrical resistivity of isotropic pitch-based carbon fiber was 97 µOmega m. By comparison, as the initial silver content of the fiber was increased to 1000 and 10 000 ppm, the resistivity decreased to 69 and 57 µOmega m, respectively. These resistivities depended on the total pore volume and increased exponentially with increasing specific surface area of fibers. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Activation, BET Surface Area, Mechanical Properties, Electrical Properties, Phenolic Resin, Mesopores, Behavior

Aggarwal, D., Goyal, M. and Bansal, R.C. (1999), Adsorption of chromium by activated carbon from aqueous solution. *Carbon*, **37** (12), 1989-1997.

Full Text: [C\Carbon37, 1989.pdf](C/Carbon37,%201989.pdf)

Abstract: Adsorption isotherms of Cr(III) and Cr(VI) ions on two samples of activated carbon fibres and two samples of granulated activated carbons from aqueous solutions in the concentration range 20-1000 mg/l have been studied. The adsorption isotherms have been determined after modifying the activated carbon surfaces by oxidation with nitric acid, ammonium persulphate, hydrogen peroxide and oxygen gas at 350°C and after degassing at different temperatures. The adsorption of Cr(III) ions increases on oxidation and decreases on degassing. On the other hand, the adsorption of Cr(VI) ions decreases on oxidation and increases on degassing. The increase of Cr(III) and the decrease of Cr(VI) on oxidation and the decrease of Cr(III) and the increase of Cr(VI) on degassing have been attributed to the fact that the oxidation of the carbon surface enhances the amount of acidic carbon-oxygen surface groups while degassing eliminates these surface groups. Thus while the presence of acidic surface groups enhances the adsorption of Gr(III) cations, it suppresses the adsorption of Cr(VI) anions. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbon Fibers, Oxidation, Adsorption, Surface Oxygen Complexes, Surface Characteristics, Polymer Carbons, Behavior, Removal

Toyoda, M. and Inagaki, M. (2000), Heavy oil sorption using exfoliated graphite: New application of exfoliated graphite to protect heavy oil pollution. *Carbon*, **38** (2), 199-210.

Full Text: [C\Carbon38, 199.pdf](C/Carbon38,%20199.pdf)

Abstract: The sorption behaviors of four kinds of heavy oils into exfoliated graphites with different bulk densities were studied. The maximum sorption capacity of an exfoliated graphite with a bulk density of 6 kg/m3 was found to be suprisingly high, 86 g of A-grade heavy oil and 76 g of crude oil per 1 g of exfoliated graphite, respectively, and also its sorption occured very rapidly, i.e. within 2 min. Sorption capacity was found to depend strongly on the bulk density and pore volume of the exfoliated graphite and the time it took to reach maximum sorption, as well as sorption capacity, as an exfoliated graphite depended strongly on the grade of heavy oil. Heavy oils sorbed into the exfoliated graphite could be recovered either by a simple compression or suction filtration with a recovery ratio of 60-80%. Recovered oils showed no difference in molecular weight and hydrocarbon constituent from the original. No increase of the water content in the recovered oils was detected, suggesting preferential sorption of heavy oil into exfoliated graphite. This result indicates clearly that the oils recovered from the exfoliated graphite can be recycled. From the present work, exfoliated graphite with low bulk density is a promising material for the sorption and recovery of spilled heavy oil. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Exfoliated Graphite

Pattanayak, J., Mondal, K., Mathew, S. and Lalvani, S.B. (2000), A parametric evaluation of the removal of As(V) and As(III) by carbon-based adsorbents. *Carbon*, **38** (4), 589-596.

Full Text: [C\Carbon38, 589.pdf](C/Carbon38,%20589.pdf)

Abstract: The As(V) and As(III) removal efficiency of a char-carbon (CC), derived from fly ash in this laboratory, is compared with those of a commercially available Darco activated carbon (DC) and a carbon produced by arcing of graphite rods (AC). The results indicate that CC and AC adsorbents remove almost equal amounts of As(V) at optimum conditions; however, on a percent basis CC removes more As(III) than does AC. In comparison, sample DC was found ineffective for the removal of As(III) and As(V). The present investigation revealed that the adsorption of As(V) onto CC is influenced by pH, initial metal concentration and temperature. Zeta potential measurements were obtained to explain the metal removal behavior of the adsorbents used in this investigation. Since CC shows significant removal efficiency for both As(V) and As(III), there are good prospects fur arsenic fixation on CC in practical applications.

Keywords: Activated Carbon, Adsorption, Arsenite, Water, Oxide, Char, Adsorption Properties

Xiu, G.H. and Li, P. (2000), Prediction of breakthrough curves for adsorption of lead(II) on activated carbon fibers in a fixed bed. *Carbon*, **38** (7), 975-981.

Full Text: [C\Carbon38, 975.pdf](C/Carbon38,%20975.pdf)

Abstract: The breakthrough curves were measured for the adsorption of aqueous Pb(NO3)2 on activated carbon fibers (ACFs) in a fixed-bed adsorber. With the adsorption equilibrium constant and the intraparticle diffusivity determined from separate experiments in a batch tank, the breakthrough curves were predicted by the orthogonal collocation method. By the analysis of the effects of intraparticle and external mass transfer resistances as well as the axial dispersion on the breakthrough curves, the axial dispersion is confirmed to be the main parameter that controls the adsorption dynamics. Based on this analysis, the quasi-lognormal distribution approximation for linear isotherms and the constant pattern profiles solution for nonlinear isotherms were presented to predict the breakthrough curves for ACF fixed beds. In addition, the effluent pH curves were discussed with the changes of experimental conditions. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon Fibers, Adsorption, Modelling, Transport Properties, Removal, Water, Approximation

Hugi-Cleary, D. and Stoeckli, F. (2000), On the use of standard DRK isotherms in Dubinin’s *t*/*F* method. *Carbon*, **38** (9), 1309-1313.

Full Text: [C\Carbon38, 1309.pdf](C/Carbon38,%201309.pdf)

Abstract: It is shown that the adsorption of benzene, carbon tetrachloride, dichloromethane and nitrogen by a typical non-porous carbon black follows the Dubinin-Radushkevich-Kaganer equation. The requirement for temperature invariance is fulfilled, with an average characteristic energy Eo = 10.8 kJ mol-1. This expression is compared with the standard isotherms for benzene and carbon tetrachloride at 293 K proposed by Dubinin and used as a reference in the so-called t/F method, which leads to the non-porous surface area of active carbons. It appears that Dubinin’s isotherm contains inconsistencies, which are compensated for internally. Alternative DRK expressions, applicable to different vapours, are therefore proposed. The present study also shows the limits of Dubinin’s method with respect to comparison plots at higher relative pressures. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Microporosity, Surface Area, Active Carbons, Adsorption, Micropores, Nitrogen

Pelekani, C. and Snoeyink, V.L. (2000), Competitive adsorption between Atrazine and Methylene Blue on activated carbon: The importance of pore size distribution. *Carbon*, **38** (10), 1423-1436.

Full Text: [C\Carbon38, 1423.pdf](C/Carbon38,%201423.pdf)

Abstract: A series of phenolic resin-based microporous activated carbon fibers (ACF) were used to determine how pore size distribution influences the nature of the adsorption competition mechanism between the micropollutant, atrazine, and a compound similar in size, Methylene Blue (MB). Experiments consisted of simultaneous adsorption, dye preloading, and atrazine preloading. Direct competition for adsorption sites is the primary mode when the competing adsorbate can access the same pore size region as the target micropollutant. When only a narrow distribution of primary micropores (pore width <8 Angstrom) is present, simultaneous adsorption and dye preloading greatly impacted atrazine adsorption. Increasing the micropore volume and shifting the pore size distribution into the secondary micropore region (8 Angstrom <pore width <20 Angstrom) reduced the degree of competition. The relative impact of preloading with MB on atrazine adsorption decreased with increasing pore volume and pore size. When atrazine was preloaded, the low: level of atrazine desorption from the smallest pore size adsorbent, which contained mainly primary micropores, provided evidence for strong adsorption/slow desorption in these pores. This is consistent with the enhanced adsorption resulting from overlapping pore wall potentials, contributing to non-ideal competitive adsorption. The displacement of pre-adsorbed atrazine by MB in the other four ACFs is primarily associated with direct competition for sites in the secondary micropore region. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbon Fibers, Adsorption, Microporosity, Natural-Water, GAC, Capacity

Pelekani, C. and Snoeyink, V.L. (2001), A kinetic and equilibrium study of competitive adsorption between Atrazine and Congo Red dye on activated carbon: The importance of pore size distribution. *Carbon*, **39** (1), 25-37.

Full Text: [C\Carbon39, 25.pdf](C/Carbon39,%2025.pdf)

Abstract: A series of phenolic resin-based microporous activated carbon fibers (ACF) with different micropore size distributions were used to assess the role of pore size distribution (PSD) in the mechanism of competitive adsorption between the organic micropollutant, atrazine. and a compound larger in size, Congo red dye (CR). Batch kinetic and equilibrium experiments with the CR/atrazine system consisted of single-solute, simultaneous adsorption, CR preloading followed by atrazine contact, and atrazine preloading followed by CR contact. Based on the previous pore characterization studies and the PSD, two types of pore structures were proposed: telescopic pores and branched pores. With the telescopic pore structure, evidence is presented to support a transition from surface pore blockage to pore constriction (without loss of atrazine capacity) to direct competition for adsorption sites, with increasing average micropore size. With the branched pore structure (micropores branching off from mesopores), direct competition for adsorption sites in a fraction of the large micropores and pore constriction and pore blockage of smaller micropores were found to be important. The kinetics of adsorption was found to be important in determining the impact of simultaneous adsorption, while CR surface coverage and preloading time were the key factors controlling the impact of preloading on atrazine adsorption. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbon Fibers, Adsorption, Microporosity, Fibers, GAC

Gauden, P.A., Terzyk, A.P. and Rychlicki, G. (2001), The new correlation between microporosity of strictly microporous activated carbons and fractal dimension on the basis of the Polanyi-Dubinin theory of adsorption. *Carbon*, **39** (2), 267-278.

Full Text: [C\Carbon39, 267.pdf](C/Carbon39,%20267.pdf)

Abstract: Adsorption on microporous fractal carbons is investigated in terms of their microporous structure. The structure is characterised by the micropore-size distribution (MSD) proposed by Pfeifer and Avnir, and the considerations are limited only to the range of micropores. following the IUPAC classification. Beginning with numerical studies: performed for model solids with different microporosity. a new relationship between the parameters of the Dubinin-Astakhov equation (adsorption energy, E-0, and parameter n(DA)) and the fractal dimension (D) is derived. The obtained results are compared with those published by Jaroniec et al. and Ehrburger-Dolle. The general conclusion is that if adsorption proceeds by a micropore filling mechanism and the pore size distribution function is assumed to be the Pfeifer and Avnir one, the relationship between D and parameters of the Dubinin-Astakhov equation is more complicated than has been presumed up to the present. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Properties, Microporosity, Radushkevich Equation, Characteristic Energy, Isotherm Equation, Size Distribution, Pore-Size, Slit-Like, Surfaces, Systems, Adsorbents, Benzene

Wood, G.O. (2001), Affinity coefficients of the Polanyi/Dubinin adsorption isotherm equations: A review with compilations and correlations. *Carbon*, **39** (3), 343-356.

Full Text: [C\Carbon39, 343.pdf](C/Carbon39,%20343.pdf)

Abstract: A historical review presents the assumptions and approximations made in the Polanyi and Dubinin adsorption theories, which have defined the affinity coefficient beta and proposed parameters to calculate it. A previous compilation of experimental beta [Wood GO. Activated carbon adsorption capacities for vapors. Carbon 1991: 30: 593-599] for gases and vapors on activated carbons has been supplemented to more than double the available database. Experimental affinity coefficients reported and calculated for water vapor have also been compiled. For water vapor at relative humidity >50% on normal industrial (unacidified) activated carbons, 0.1 is a good average value of the affinity coefficient relative to that of benzene. Direct correlations of experimental affinity coefficients (other than for water) with molecular parachor, molar polarizability, and molar volume were successful (beta standard deviations of 0.09, 0.12, and 0.12, respectively). Power functions with exponents less than unity (0.9, 0.75, and 0.9, respectively) provided slightly better fits of predictions to experimental values (standard deviations of 0.08, 0.10, and 0.11, respectively). Any of these correlations can be used. Listed advantages of using molar polarization make it the correlation parameter of preference. Correlation of beta with critical temperature was largely unsuccessful. No obvious effects of adsorbate polarity, adsorbent molecular sieve properties. or form of the Dubinin equations were detected for beta and its correlations. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Affinity Coefficients, BPL Activated Carbon, Gas-Adsorption, Binary Adsorption, Organic-Compounds, Vapor Adsorption, Water-Adsorption, Dubinin-Astakhov, Coadsorption, Equilibria, Capacities

Kononova, O.N., Kholmogorov, A.G., Lukianov, A.N., Kachin, S.V., Pashkov, G.L. and Kononov, Y.S. (2001), Sorption of Zn(II), Cu(II), Fe(III) on carbon adsorbents from manganese sulfate solutions. *Carbon*, **39** (3), 383-387.

Full Text: [C\Carbon39, 383.pdf](C/Carbon39,%20383.pdf)

Abstract: Sorption of Zn2+, Cu2+, Fe3+/Fe2+ on carbon adsorbents under static (batch) and dynamic (columns) conditions from model and industrial MnSO4 solutions has been studied. The industrial solutions were obtained by reducing acidic leaching of manganese and pyrite concentrates. The initial manganese concentration was similar to 35 mmol/l and concentration of Zn2+, Cu2+, Fe3+ ions was similar to 0.2 mmol/l. It was found out that a complete separation of Mn2+ and Me2+ (Fe3+) ions is possible under dynamic conditions. As a result purified MnSO4 solutions are obtained which can be applied in MnO2 electroevolution processes. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbonization, Oxidation, Adsorption, Adsorption Properties

Baçaoui, A., Yaacoubi, A., Dahbi, A., Bennouna, C., Luu, R.P.T., Maldonado-Hodar, F.J., Rivera-Utrilla, J. and Moreno-Castilla, C. (2001), Optimization of conditions for the preparation of activated carbons from olive-waste cakes. *Carbon*, **39** (3), 425-432.

Full Text: [C\Carbon39, 425.pdf](C/Carbon39,%20425.pdf)

Abstract: An experimental design (Doehlert matrix) has been drawn up to optimize the experimental conditions of the preparation of activated carbon from olive-waste cakes. A series of activated carbons have been prepared by physical activation with steam. Adsorption of N2 (77 K), CO2 (273 K) and mercury porosimetry experiments have been carried out to determine the characteristics of all carbons prepared. Adsorption of iodine and Methylene blue was used as a primary indicator of the adsorption capacity of these carbons. The experimental response varied between: 13-27% for the total yield (Y-1), 115-490 mg/g for the adsorption or Methylene blue (Y-2). 741-1495 mg/g for the adsorption of iodine (Y-3), 514-1271 m2/g for the BET surface area (Y-4), 0.225-0.377 cm3/g for the micropore volume (Y-5), 0.217-0.557 cm3/g for the volume of pores with a diameter greater than 3.7 nm (Y-6) and 31.3-132 m2/g for the external surface area (Y-7). The results obtained were exploited using response surface methodology. These responses have been represented and studied in all experimental regions of activation time and activation temperature, the most influential factors in activated carbon preparation. Optimization to obtain activated carbons with textural characteristics suitable to use in water treatment has been carried out. The optimal activated carbon is obtained when using 68 min as activation time and 1095 K as activation temperature. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Activation, Modeling, Porosity, Textures, Moringa-Oleifera, Seed Husks, Adsorption, Pyrolysis

Dobruskin, V.Kh. (2001), Correlation between two-and three-dimensional condensations in cylindrical mesopores of active carbons. *Carbon*, **39** (4), 583-591.

Full Text: [C\Carbon39, 583.pdf](C/Carbon39,%20583.pdf)

Abstract: Adsorption interactions in narrow cylindrical capillaries decay with radii approximately as r-1.1 and this slowly decreasing adsorption potential is responsible for adsorption behavior in the capillary condensation region. Filling of mesopores with concave curvatures is considered to be an evolution of the two-dimensional (2D) condensation, which occurs: on the mesopore walls at the critical condensation pressure. An adsorption isotherm in the individual mesopore exhibits the feature characteristic of condensation: a vertical jump at a pressure approximately corresponding to the critical pressure of a 2D-condensation. Mesopore filling pressures are found proceeding from statistical mechanical theories of adsorption on the planar surface taking into account lateral adsorbate-adsorbate interactions. The model describes the adsorption branch of the hysteresis loop. The underlying reason of the hysteresis loop is discussed. Analysis of adsorption isotherms for benzene and nitrogen shows that the developed model and the classical Kelvin equation lead to close values of mesopore radii. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Modeling, Adsorption, Capillary Condensation, Approximation Approach, Size Distribution, Adsorption, Model, Micropores, Surface

? Lozano-Castelló, D., Lillo-Rodenas, M.A., Cazorla-Amorós, D. and Linares-Solano, A. (2001), Preparation of activated carbons from Spanish anthracite I. Activation by KOH. *Carbon*, **39** (5), 741-749.

Full Text: [2001\Carbon39, 741.pdf](2001/Carbon39,%20741.pdf)

Abstract: In a previous work, the use of a Spanish anthracite for the preparation of activated carbons by chemical activation was analyzed. The results indicated that this raw material is promising for that purpose. In the present paper, that previous work is extended and the effect of different preparation variables on the final porous texture is discussed, such as KOH/anthracite ratio, heating rate, carbonization temperature and carbonization time. Among those different variables studied, the KOH/anthracite ratio seems to be the most important one. In addition, this study introduces an investigation of the nitrogen flow rate, showing that this variable has a very important effect on porosity development. The study confirms that the raw material used is appropriate for the preparation of activated carbons in a single stage pyrolysis process. The proper choice of the preparation conditions allows us to produce microporous activated carbons with a micropore volume up to 1.45 cm3/g and a BET surface area of 3290 m2/g. This work is extended in Par? II with a detailed study using NaOH as activating agent and a different preparation method (physical mixing). (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Anthracite, Activated Carbon, Activation, Adsorption, Microporosity, Phosphoric-Acid Activation, Chemical Activation, Physical Activation, Bituminous Coal, CO2

González-García, C., González-Martín, M.L., Gómez-Serrano, V., Bruque, J.M. and Labajos-Broncano, L. (2001), Analysis of the adsorption isotherms of a non-ionic surfactant from aqueous solution onto activated carbons. *Carbon*, **39** (6), 849-855.

Full Text: [C\Carbon39, 849.pdf](C/Carbon39,%20849.pdf)

Abstract: The adsorption isotherms at 20 degreesC onto four activated carbons of the non-ionic surfactant Triton X-100 from aqueous solution have been studied over a wide concentration range. The adsorption was explained using one or a combination of two Langmuir equations, depending on the equilibrium concentration range studied. A description of the adsorbed layer was constructed on the basis of the information obtained from the isotherms and assuming the model of van Oss et al. for the interfacial interaction between adsorbent and adsorbate. The results indicate that there are at least two kinds of interactions, the first related to a direct interaction between the activated carbon surface and adsorbate molecules, and the second mainly due to the interaction between surfactant molecules at the adsorbent-solution interface leading to the formation of interfacial aggregates. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Interfacial Properties, Thermodynamic Properties, Contact-Angle Measurements, Nonionic Surfactants, Anionic Surfactants, Triton X-100, Free-Energy, Water, Parameters, Mechanism, Removal, Tension

? Abe, I., Fukuhara, T., Maruyama, J., Tatsumoto, H. and Iwasaki, S. (2001), Preparation of carbonaceous adsorbents for removal of chloroform from drinking water. *Carbon*, **39** (7), 1069-1073.

Full Text: [C\Carbon39, 1069.pdf](C/Carbon39,%201069.pdf)

Abstract: Microporous carbons for use as adsorbents in removing chloroform from drinking water were prepared by activating charcoals made from the following natural raw materials: evergreen oak (Q. phillyraeoides), bamboo (P. pubescens), coconut shell (C. nucifera), and Japanese cedar (C. japonica), and from dehydrochlorinated vinylidene film. Chloroform adsorption was found to be enhanced by increase in the specific surface area of the microporous carbon, but suppressed by enlargement of micropore-size. This suppression is due to a decrease in the interaction, governed by London dispersion force, between the chloroform molecules and the pure walls of the microporous carbon. Carbon with iodine adsorption capacity of around 760 mg g-1 demonstrated the greatest chloroform adsorption regardless of the raw material used. In order of chloroform adsorption amount, the materials ranked as follows: vinylidene film>Japanese cedar>coconut shell=evergreen oak> bamboo. The carbon produced by 30 min dehydrochlorination of vinylidene film and that produced by 50 min steam activation of Japanese cedar charcoal demonstrated adsorption capacities several times higher than that or commercial activated carbon. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Activated Carbon, Charcoal, Activation, Adsorption, Adsorption Capacity, Adsorption Properties, Bamboo, Charcoal, Specific Surface Area

? Ismadji, S. and Bhatia, S.K. (2001), Characterization of activated carbons using liquid phase adsorption. *Carbon*, **39** (8), 1237-1250.

Full Text: [2001\Carbon39, 1237.pdf](2001/Carbon39,%201237.pdf)

Abstract: A modification of the Dubinin-Radushkevich pore filling model by incorporation of the repulsive contribution to the pore potential, and of bulk non-ideality, is proposed in this paper for characterization of activated carbon using liquid phase adsorption. For this purpose experiments have been performed using ethyl propionate, ethyl butyrate, and ethyl isovalerate as adsorbates and the microporous-mesoporous activated carbons Filtrasorb 400, Norit ROW 0.8 and Norit ROX 0.8 as adsorbents. The repulsive contribution to the pore potential is incorporated through a Lennard-Jones intermolecular potential model, and the bulk-liquid phase non-ideality through the UNIFAC activity coefficient model. For the characterization of activated carbons, the generalized adsorption isotherm is utilized with a bimodal gamma function as the pore size distribution function. It is found that the model can represent the experimental data very well, and significantly better than when the classical energy-size relationship is used, or when bulk non-ideality is neglected. Excellent agreement between the bimodal gamma pore size distribution and DFT-cum-regularization based pore size distribution is also observed, supporting the validity of the proposed model. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Modeling, Porosity, Pore-Size Distributions, Microporous Carbons, Isotherms, Heterogeneity, Dimensions, Vapors

Nguyen, C. and Do, D.D. (2001), The Dubinin-Radushkevich equation and the underlying microscopic adsorption description. *Carbon*, **39** (9), 1327-1336.

Full Text: [C\Carbon39, 1327.pdf](C/Carbon39,%201327.pdf)

Abstract: The Dubinin-Radushkevich (DR) equation is widely used for description of adsorption in microporous materials, especially those of a carbonaceous origin. The equation has a semi-empirical origin and is based on the assumptions of a change in the potential energy between the gas and adsorbed phases and a characteristic energy of a given solid. This equation yields a macroscopic behaviour of adsorption loading for a given pressure. In this paper, we apply a theory developed in our group to investigate the underlying mechanism of adsorption as an alternative to the macroscopic description using the DR equation. Using this approach, we are able to establish a detailed picture of the adsorption in the whole range of the micropore system. This is different from the DR equation, which provides an overall description of the process. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Microporosity, Pore-Size Distribution, Carbon

? Shim, J.W., Park, S.J. and Ryu, S.K. (2001), Effect of modification with HNO3 and NaOH on metal adsorption by pitch-based activated carbon fibers. *Carbon*, **39** (11), 1635-1642.

Full Text: [2001\Carbon39, 1635.pdf](2001/Carbon39,%201635.pdf)

Abstract: Pitch-based activated carbon fibers (ACFs) were modified with nitric acid and sodium hydroxide. Their physicochemical properties were investigated in terms of N-2 adsorption, mass titration, FTIR and metal adsorption. The specific surface area of the ACFs decreased after oxidation with 1 M nitric acid, but the total acidity increased three times compared to the untreated ACFs, resulting in an improved ion-exchange capacity of the ACFs. The points of zero charge of the ACFs that affect the selectivity for the ionic species changed from pH 6 to pH 4 by 1 M nitric acid and to pH 10 by 1 M sodium hydroxide treatment. Upon oxidation of the ACFs with nitric acid, surface oxide groups were observed in the FTIR spectra by absorption peaks at 1750-1400 cm(-1). The carboxyl groups of ACFs decreased, while the lactone groups increased after the sodium hydroxide treatment. The adsorption capacity of copper and nickel ion is mainly influenced by the lactone groups on the carbon surface pH<pH(zpc), and by the total acidic groups at pH>pH(zpc). (C) 2001 Published by Elsevier Science Ltd.

Keywords: Activated Carbon, Surface Treatment, Adsorption, Infrared Spectroscopy, Functional Groups, Surface Properties, Functional-Groups, Infrared-Spectroscopy, Nitric-Acid, Surface

Yamamoto, O., Nakakoshi, K., Sasamoto, T., Nakagawa, H. and Miura, K. (2001), Adsorption and growth inhibition of bacteria on carbon materials containing zinc oxide. *Carbon*, **39** (11), 1643-1651.

Full Text: [C\Carbon39, 1643.pdf](C/Carbon39,%201643.pdf)

Abstract: An ion-exchange resin with particle size of 0.5 mm was treated for 24 h by either an aqueous solution of [Zn(NH3)4]2+ complex or 29% aqueous ammonia. The resins treated were carbonized for 10 min in nitrogen gas at 500, 700 and 1000 degreesC to prepare carbons with and without ZnO. The adsorption and the growth inhibition of bacteria on their carbon samples were studied. The adsorbed amount of bacteria on samples without ZnO increased with the increase of carbonization temperature and the amount of carbon powder. The adsorbed amount of Staphylococcus aureus was smaller than that of *Escherichia* coli. However, it was found that all bacteria in the suspension were adsorbed onto the samples containing ZnO, irrespective of the carbonization temperature and the amount of carbon powder. The antibacterial activity on the carbon samples containing ZnO increased with the increase of the amount of ZnO in samples and decreased with the increase of carbonization temperature. The antibacterial activity for Staphylococcus aureus was found to be stronger than that for *Escherichia* coli. No activity of the carbon samples without ZnO was observed. The occurrence of antibacterial activity was supposed to be due to the generation of hydrogen peroxide from ZnO in carbon samples. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Resins, Carbonization, Adsorption Properties, Biocompatibility, Antibacterial Activity, Ceramic Powders, Zno

Dastgheib, S.A. and Rockstraw, D.A. (2001), Pecan shell activated carbon: Synthesis, characterization, and application for the removal of copper from aqueous solution. *Carbon*, **39** (12), 1849-1855.

Full Text: [C\Carbon39, 1849.pdf](C/Carbon39,%201849.pdf)

Abstract: Activated carbon with a high adsorption capacity for removal of copper ions from aqueous solution is produced from Air and phosphoric acid are used for the oxidation and the modification or development of oxygen- or phosphorus/oxygen-containing groups on the carbon surface. It was found that the adsorption capacity of the produced carbon is significantly higher than that of the commercial activated carbons that were tested, and comparable to an ion exchange resin designed for copper adsorption. Based on the results obtained from a variety of characterization methods, it has been determined that the surface of the carbon is covered with a considerable concentration of phosphorus, present in the form of various functional groups. It is proposed that the acidic groups detected using the Boehm titration method not only be considered as oxygen-containing acidic groups, but also as oxygen/phosphorus groups. From pH studies, it was observed that adsorption of copper at very low concentrations occurs by ion exchange of 2H(+) from the surface with a Cu2+ ion from solution; while at higher concentrations, other forms of ion-exchange and surface complexation with oxygen- and phosphorus-containing functional group sites can be proposed as well. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Chemical Treatment, Adsorption, Functional Groups, Phosphoric-Acid, Metals, Wood, Nutshells, Cadmium

Bagreev, A., Adib, F. and Bandosz, T.J. (2001), pH of activated carbon surface as an indication of its suitability for H2S removal from moist air streams. *Carbon*, **39** (12), 1897-1905.

Full Text: [C\Carbon39, 1897.pdf](C/Carbon39,%201897.pdf)

Abstract: Samples of activated carbons of different origins were tested as removers of hydrogen sulfide at room temperature. The breakthrough capacity was evaluated using a lab designed test. The surface properties of the carbons were studied using Boehm titration, nitrogen sorption and thermal analysis. The results obtained indicate that the choice of unimpregnated carbon for hydrogen sulfide removal should be based on the parameters describing surface acidity such as pH, number of acidic groups, or weight loss during thermal treatment associated with the presence of acidic functional groups. There are certain threshold ranges of these quantities which, when exceeded, have a dramatic effect on the H2S breakthrough capacity. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbons, Oxidation, Adsorption, Surface Properties, Sewage-Treatment Plants, Hydrogen-Sulfide, Catalytic-Oxidation, Water Regeneration, Adsorption, Mechanism, Gas, Kinetics, Sulfur

Ding, L.P. and Bhatia, S.K. (2001), Application of heterogeneous vacancy solution theory to characterization of microporous solids. *Carbon*, **39** (14), 2215-2229.

Full Text: [C\Carbon39, 2215.pdf](C/Carbon39,%202215.pdf)

Abstract: The vacancy solution theory of adsorption is re-formulated here through the mass-action law, and placed in a convenient framework permitting the development of thermodynamically consistent isotherms. It is shown that both the multisite Langmuir model and the classical vacancy solution theory expression are special cases of the more general approach when the Flory–Huggins activity coefficient model is used, with the former being the thermodynamically consistent result. The improved vacancy solution theory approach is further extended here to heterogeneous adsorbents by considering the pore-width dependent potential along with a pore size distribution. However, application of the model to numerous hydrocarbons as well as other adsorptives on microporous activated carbons shows that the multisite model has difficulty in the presence of a pore size distribution, because pores of different sizes can have different numbers of adsorbed layers and therefore different site occupancies. On the other hand, use of the classical vacancy solution theory expression for the local isotherm leads to good simultaneous fit of the data, while yielding a site diameter of about 0.257 nm, consistent with that expected for the potential well in aromatic rings on carbon pore surfaces. It is argued that the classical approach is successful because the Flory–Huggins term effectively represents adsorbate interactions in disguise. When used together with the ideal adsorbed solution theory the heterogeneous vacancy solution theory successfully predicts binary adsorption equilibria, and is found to perform better than the multisite Langmuir as well as the heterogeneous Langmuir model.

Keywords: Activated Carbon, Adsorption, Modelling, Microporosity

Shawabkeh, R.A., Rockstraw, D.A. and Bhada, R.K. (2002), Copper and strontium adsorption by a novel carbon material manufactured from pecan shells. *Carbon*, **40** (5), 781-786.

Full Text: [C\Carbon40, 781.pdf](C/Carbon40,%20781.pdf)

? Yang, S.B., Hu, H.Q. and Chen, G.H. (2002), Preparation of carbon adsorbents with high surface area and a model for calculating surface area. *Carbon*, **40** (3), 277-284.

Full Text: [2002\Carbon40, 277.pdf](2002/Carbon40,%20277.pdf)

Abstract: Carbon adsorbents (CAs) were made by heat treatment of a mixture of coal char and KOH under the protection of an inert argon flow and the influence of operating conditions on the properties of adsorbents was investigated. Changes in the characteristics of graphitic crystallites during manufacture by X-ray diffraction (XRD) analysis indicated that disappearance of the peak corresponding to 002 faces correlated to high specific surface area. Based on the experimental results, a new model of graphitic crystallites containing hydrogen atoms is proposed to calculate idealized surface area of CAs. With this model, the idealized surface areas of CA can be precisely calculated with the aid of X-ray diffraction. In this way, some experimental problems can be overcome, such as the difficulty to measure specific surface area with N2 adsorption when pore diameters are too small and overestimation when surface areas are too large.

Keywords: Activated Carbon, Activation, Chemical Treatment, X-Ray Diffraction, Surface Areas

Shawabkeh, R.A., Rockstraw, D.A. and Bhada, R.K. (2002), Copper and strontium adsorption by a novel carbon material manufactured from pecan shells. *Carbon*, **40** (5), 781-786.

Full Text: [C\Carbon40, 781.pdf](C/Carbon40,%20781.pdf)

Abstract: A novel carbon material (PS276a) was produced from pecan shells, a waste product of the agricultural industry. Preparation of this material involved the impregnation of the pecan shell feedstock with a phosphoric acid solution. Activation was followed by a water wash and a sodium hydroxide treatment. The carbon produced was characterized by adsorption of N2 and revealed a pore structure with an average pore diameter of 74.8 Angstrom. Equilibrium sorption isotherms prepared for this carbon demonstrate that it has a significantly higher capacity for copper and strontium sorption than that of a commercial material used for comparison. A maximum of 95 mg Cu2+ and 180 mg Sr2+ are adsorbed per gram of this carbon at pH 3.6 and 8.5, respectively. Demonstrated process advantages of this carbon material and preparation technique include low temperature manufacture, in-situ regeneration potential, and adsorbate recovery capability. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, BET Surface Area, Adsorption Properties, Activated Carbon

Wood, G.O. (2002), Review and comparisons of D/R models of equilibrium adsorption of binary mixtures of organic vapors on activated carbons. *Carbon*, **40** (3), 231-239.

Full Text: [C\Carbon40, 231.pdf](C/Carbon40,%20231.pdf)

Abstract: Published models and options for predicting equilibrium adsorption capacities of multicomponent mixtures using single component Dubinin/Radushkevich isotherm equations and parameters were reviewed. They were then tested for abilities to predict total and component capacities reported for 93 binary adsorbed mixtures. The best model for calculating molar distributions was the Ideal Adsorbed Solution Theory (IAST). which balances spreading pressures. Combined with the IAST, total and component capacities were best calculated using either the Lewis or original Bering equation with the Ideal Adsorbed Solution (Raoult’s Law) assumption. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbons, Adsorption, Modelling, Phase Equilibria, Prediction, Equation, Beds

Babić, B.M., Milonjić, S.K., Polovina, M.J., Čupić, S. and Kaludjerović, B.V. (2002), Adsorption of zinc, cadmium and mercury ions from aqueous solutions on an activated carbon cloth. *Carbon*, **40** (7), 1109-1115.

Full Text: [C\Carbon40, 1109.pdf](C/Carbon40,%201109.pdf)

Abstract: The adsorption of zinc, cadmium and mercury ions from aqueous solutions on an activated carbon cloth was studied as a function of their concentrations and solution pH. For that purpose, pertinent adsorption isotherm data was collected at different pH values. The amount of adsorbed zinc and cadmium ions increases while the amount of adsorbed mercury remains constant with an increase in the equilibrium pH of the solution. The adsorption mechanisms of metal ions on activated carbon cloth are discussed, Under the conditions investigated, these primarily involve adsorption of monovalent cations (Zn and Cd) or precipitation of metal hydroxides (Cd and Hg) on the activated carbon cloth tested. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbon Cloth, Adsorption Properties, Heavy-Metals, Zero Charge, Cd, Zn, Adsorbent, Isotherm, Systems, Copper, Single, Point

Dastgheib, S.A. and Rockstraw, D.A. (2002), A model for the adsorption of single metal ion solutes in aqueous solution onto activated carbon produced from pecan shells. *Carbon*, **40** (11), 1843-1851.

Full Text: [C\Carbon40, 1843.pdf](C/Carbon40,%201843.pdf)

Abstract: Adsorption isotherms for activated carbon made from pecan shells have been obtained at 25 degreesC and an approximate pH of 3 for a number of metal ion solutes. It was found that the Slips and Freundlich equations were satisfactory for explaining the experimental data. The correlation of metal ion adsorption with the solute parameters of metal ion electronegativity and first stability constant of the metal hydroxide was investigated. In the case of most of the metal ions studied, higher electronegativities and stability constants corresponded to the higher adsorption levels of metal ions onto the activated carbon. A correlation was developed that predicts the constants of the Freundlich equation from the selected parameters of the metal ions, and thus can predict the adsorption isotherms at constant pH. The developed correlation gives results with acceptable deviations from experimental data. A procedure is proposed for obtaining similar correlations for different conditions (temperature, pH, carbon type and dosage). The ratio of equivalent metal ions adsorbed to protons released is calculated for the studied metal ions over a range of concentrations. In most cases, particularly at low concentrations, this ratio is close to one, confirming that ion exchange of one proton with one equivalent metal ion is the dominant reaction mechanism. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Modeling, Cation Concentration, Copper, Removal, Cadmium, Sorption, Zinc, pH, Cd, Zn

Dastgheib, S.A. and Rockstraw, D.A. (2002), A systematic study and proposed model of the adsorption of binary metal ion solutes in aqueous solution onto activated carbon produced from pecan shells. *Carbon*, **40** (11), 1853-1861.

Full Text: [C\Carbon40, 1853.pdf](C/Carbon40,%201853.pdf)

Abstract: Adsorption isotherms of a number of binary solute systems have been obtained. The adsorption behavior of these cations in the presence of other metal ions that display strong or intermediate affinities for adsorption sites has been systematically investigated. In this investigation the following factors have been considered: (1) metal ion site competition; (2) charge accumulation near the carbon surface; and (3) speciation of the metal ions. Two multicomponent adsorption models are proposed, and the results are compared to two models presented in the literature. The performance of these models is evaluated by an analysis of error. It is found that models with three interaction parameters generally provide a better fit of the data. In most cases, the proposed two-parameter model gives acceptable results. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Modeling, Simultaneous Biosorption, Copper, Sorption, Chromium(VI), Equilibria, Isotherms, Vulgaris, Zinc, Peat

? Li, L., Quinlivan, P.A. and Knappe, D.R.U. (2002), Effects of activated carbon surface chemistry and pore structure on the adsorption of organic contaminants from aqueous solution. *Carbon*, **40** (12), 2085-2100.

Full Text: [2002\Carbon40, 2085.pdf](2002/Carbon40,%202085.pdf)

Abstract: The objective of this research was to develop activated carbon selection criteria that assure the effective removal of trace organic contaminants from aqueous solution and to base the selection criteria on physical and chemical adsorbent characteristics. To systematically evaluate pore structure and surface chemistry effects, a matrix of activated carbon fibers (ACFs) with three activation levels and four surface chemistry levels was prepared and characterized. In addition, three granular activated carbons (GACs) were studied. Two common drinking water contaminants, relatively polar methyl tertiary-butyl ether (MTBE) and relatively nonpolar trichloroethene (TCE), served as adsorbate probes. TCE adsorbed primarily in micropores in the 7-10 Angstrom width range while MTBE adsorbed primarily in micropores in the 8-11 Angstrom width range, These results suggest that effective adsorbents should exhibit a large volume of micropores with widths that are about 1.3 to 1.8 times larger than the kinetic diameter of the target adsorbate. Hydrophobic adsorbents more effectively removed both TCE and MTBE from aqueous solution than hydrophilic adsorbents, a result that was explained by enhanced water adsorption on hydrophilic surfaces. To assure Sufficient adsorbent hydrophobicity, the oxygen and nitrogen contents of an activated carbon should therefore SLIM to no more than about 2 to 3 mmol/g. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Carbon Fibers, Chemical Treatment, Surface Treatment, Adsorption, Adsorption Properties, Microporosity, Competitive Adsorption, Size Distribution, Molecular Simulation, Humic Substances, Natural-Water, 2-Methylisoborneol, Removal, Fibers, Heterogeneity, Parameters

Faur-Brasquet, C., Kadirvelu, K. and Le Cloirec, P. (2002), Removal of metal ions from aqueous solution by adsorption onto activated carbon cloths: Adsorption competition with organic matter. *Carbon*, **40** (13), 2387-2392.

Full Text: [C\Carbon40, 2387.pdf](C/Carbon40,%202387.pdf)

Abstract: Activated carbon cloths are recent adsorbents whose adsorption properties are well known for monocomponent solutions of organics or metal ions. However, to treat wastewaters with these materials, their performance has to be determined in multicomponent solution. This work studies adsorption competition between metal ions (Cu2+, Pb2+) and organic matter (benzoic acid). The first part investigates adsorption equilibrium of monocomponent metal ions solutions and shows the dependence of adsorption capacities on adsorbent porosity and metal ions chemical properties (molecular weight, ionic radius and electronegativity). The influence of pH is also demonstrated. The second part focuses on adsorption competition: (1) between both metal ions (a decrease of adsorption capacities is observed, whose value is related to adsorption kinetics of metal ions); (2) between metal ions and organic matter, in solution or adsorbed onto the activated carbon cloth (a strong influence of pH is shown: when benzoic acid is under benzoate form, in both cases adsorption is increased due to the formation of ligands between adsorbed benzoate ions and metals).

Keywords: Carbon Fibers, Activated Carbons, Adsorption, Adsorption Properties, Heavy-Metals, Waste-Water, Sorption, Surface, Peat, Coirpith, Cadmium, Single, Fibers, Copper

Terzyk, A.P., Gauden, P.A. and Kowalczyk, P. (2002), What kind of pore size distribution is assumed in the Dubinin-Astakhov adsorption isotherm equation? *Carbon*, **40** (15), 2879-2886.

Full Text: [C\Carbon40, 2879.pdf](C/Carbon40,%202879.pdf)

Abstract: Two most sophisticated methods of carbon porosity characterization (high resolution alpha(s)-plot and the procedure proposed by Nguyen and Do, (ND)) were utilized for the assessment of porosity from the series of numerically generated adsorption isotherms. Basing on the Dubinin-Astakhov (DA) adsorption isotherm equation, two series of adsorption isotherms of nitrogen (T=77.5 K) were generated for constant E-o and different n values, and for constant n and different E-o. They were described by the both above-mentioned methods. The types of obtained alpha(s)-plots as well as the pore size distribution curves (PSD) lead to suggestions about the basic features of the DA and the meaning of the parameters of this adsorption isotherm, equation. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Microporosity, Density-Functional Theory, Carbonaceous Materials, Radushkevich Equation, Polanyi Equations, Activated Carbons, Adsorbents, Heterogeneity, Microporosity, Equivalency, Porosity

Tseng, R.L., Wu, F.C. and Juang, R.S. (2003), Liquid-phase adsorption of dyes and phenols using pinewood-based activated carbons. *Carbon*, **41** (3), 487-495.

Full Text: [C\Carbon41, 487.pdf](C/Carbon41,%20487.pdf)

Abstract: Physical properties of activated carbons prepared from pinewood at different activation times (0.5, 1.5, 2.7, and 4.0 h) in steam at 900°C were studied. The adsorption equilibria and kinetics of three dyes and three phenols (phenol, 3-chlorophenol, and *o*-cresol) from aqueous solutions on such carbons were then examined at 30°C. The adsorption isotherms of phenols could be well fitted by the Freundlich equation, and those of dyes were adequately described by the Langmuir–Freundlich equation. The effect of microporosity of the carbons on adsorption capacity was explored. Four simplified kinetic models including pseudo-first-order equation, pseudo-second-order equation, intraparticle diffusion model, and the Elovich equation were selected to follow the adsorption processes. The adsorption of all six adsorbates could be best described by the Elovich equation. The kinetic parameters of this best-fit model were calculated and discussed.

Keywords: Activated Carbon, Activation, BET Surface Area, Adsorption Properties, Microporosity

Ye, X.H., Qi, N., Ding, Y.Q. and LeVan, M.D. (2003), Prediction of adsorption equilibrium using a modified D–R equation: pure organic compounds on BPL carbon. *Carbon*, **41** (4), 681-686.

Full Text: [C\Carbon41, 681.pdf](C/Carbon41,%20681.pdf)

Abstract: A method for predicting adsorption equilibrium using a modified Dubinin–Radushkevich (D–R) equation is presented in this paper. We focus on adsorption of pure organic compounds on BPL-activated carbon. We introduce a new variable *k*v, a volume adjusting coefficient, and simply use *V*b, the constant molar volume of the adsorbate at its normal boiling temperature, instead of *V*m, the temperature-dependent molar volume of the adsorbate at the adsorption temperature. The model parameters in the modified D–R equation for an adsorbate are predicted from *V*b. Overall, the modified D–R equation gives more accurate results than the traditional one.

Keywords: Activated carbon, Adsorption, Modeling, Adsorption properties

Pereira, M.F.R., Soares, S.F., Órfão, J.J.M. and Figueiredo, J.L. (2003), Adsorption of dyes on activated carbons: influence of surface chemical groups. *Carbon*, **41** (4), 811-821.

Full Text: [C\Carbon41, 811.pdf](C/Carbon41,%20811.pdf)

Abstract: The surface chemistry of a commercial activated carbon has been selectively modified, without changing significantly its textural properties, by means of chemical treatments, using HNO3, H2O2, NH3, and thermal treatments under a flow of H2 or N2. The resultant samples were characterized in terms of their surface chemistry and textural properties, and subsequently tested in the removal of different classes of dyes. It was shown that the surface chemistry of the activated carbon plays a key role in dye adsorption performance. The basic sample obtained by thermal treatment under H2 flow at 700°C is the best material for the adsorption of most of the dyes tested. For anionic dyes (reactive, direct and acid) a close relationship between the surface basicity of the adsorbents and dye adsorption was shown, the interaction between the oxygen-free Lewis basic sites and the free electrons of the dye molecule being the main adsorption mechanism. For cationic dyes (basic) the acid oxygen-containing surface groups show a positive effect but thermally treated samples still present good performances, showing the existence of two parallel adsorption mechanisms involving electrostatic and dispersive interactions. The conclusions obtained for each dye individually were confirmed in the colour removal from a real textile process effluent.

Keywords: Activated Carbon, Chemical Treatment, Heat Treatment, Temperature Programmed Desorption, Adsorption Properties

Miguel, G.S., Fowler, G.D. and Sollars, C.J. (2003), A study of the characteristics of activated carbons produced by steam and carbon dioxide activation of waste tyre rubber. *Carbon*, **41** (5), 1009-1016.

Full Text: [C\Carbon41, 1009.pdf](C/Carbon41,%201009.pdf)

Abstract: This paper presents a study into the effect of different activation conditions on the porosity and adsorption characteristics of carbon adsorbents produced from waste tyre rubber. For the purpose of this work, three carbon series were produced using different activation temperatures (between 925 and 1100 °C) and oxidising agents (steam or carbon dioxide). Carbons produced to different degrees of burn off were characterised using gas (nitrogen) and liquid phase (phenol, Methylene blue and Procion Red H-E2B) adsorption. Total micropore volumes and BET surface areas increased almost linearly with the degree of activation to 0.554 ml/g and 1070 m2/g, respectively, while the development of external surface area was particularly rapid at degrees of activation above 50 wt% burn off. Steam was observed to generate a narrower but more extensive microporosity than carbon dioxide. However, carbon dioxide produced carbons of slightly larger external surface areas. Activation at higher temperatures resulted in pores of slightly larger dimensions, although this was only evident in highly activated samples. Porosity characteristics were reflected in the capacity of the carbons to adsorb species of different molecular size from solution. In this respect, steam-activated carbons presented greater capacities for the adsorption of smaller molecular size compounds (phenol), while carbon dioxide-activated carbons adsorbed larger textile dyes more effectively.

Keywords: Activated Carbons, Activation, Adsorption, Adsorption Properties, Porosity

Notes: highly cited

Li, Y.H., Wang, S.G., Luan, Z.K., Ding, J., Xu, C.L. and Wu, D.H. (2003), Adsorption of cadmium(II) from aqueous solution by surface oxidized carbon nanotubes. *Carbon*, **41** (5), 1057-1062.

Full Text: [C\Carbon41, 1057.pdf](C/Carbon41,%201057.pdf)

Abstract: Carbon nanotubes (CNTs) were oxidized with H2O2, KMnO4, and HNO3. Their physicochemical properties were investigated by BET N2 adsorption, laser particle examination, Boehm’s titration, zeta potential measurement and cadmium(II) adsorption. The experimental results suggest that cadmium(II) adsorption capacities for three kinds of oxidized CNTs increase due to the functional groups introduced by oxidation compared with the as-grown CNTs. The cadmium(II) adsorption capacity of the as-grown CNTs is only 1.1 mg g-1, while it reaches 2.6, 5.1 and 11.0 mg g-1 for the H2O2, HNO3 and KMnO4 oxidized CNTs, respectively, at the cadmium(II) equilibrium concentration of 4 mg 1-1. Adsorption of cadmium(II) by CNTs was strongly pH-dependent and the increase of adsorption capacities for HNO3 and KMnO4 oxidized CNTs is more obvious than that of the as-grown and H2O2 oxidized CNTs at lower pH regions. The experiments of CNT dosage effect on the cadmium(II) adsorption show that the adsorption capacity for KMnO4 oxidized CNTs has a sharper increase at the CNT dosage from 0.03 to 0.08 g per 100 ml than the as-grown, H2O2 and HNO3 oxidized CNTs and its removal efficiency almost reaches 100% at CNT dosage of 0.08 g per 100 ml. Analysis revealed that the KMnO4 oxidized CNTs hosted manganese residuals, and these surely contributed to cadmium sorption to a yet-undefined extent. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Carbon Nanotubes, Oxidation, Adsorption, Functional Groups, Activated Carbon, Metal Adsorption, Removal, Mercury, Cd(II), Shell, Cloth, Water, Lead

Ranganathan, K. (2003), Adsorption of Hg(II) ions from aqueous chloride solutions using powdered activated carbons. *Carbon*, **41** (5), 1087-1092.

Full Text: [C\Carbon41, 1087.pdf](C/Carbon41,%201087.pdf)

Abstract: Activated carbons were developed from Casurina equisetifolia leaves, by chemically treating with sulfuric acid (1: 1) or zinc chloride (25%), at low (425degreesC) and high (825degreesC) temperatures. The resulting powdered activated carbons were applied for removing mercuric ions from aqueous solution at different agitation times and mercuric ion concentrations. The equilibrium data fitted well the Langmuir adsorption isotherm. The Langmuir adsorption capacities were 12.3 and 20.3 mg g-1 for low temperature carbons and 43.9 and 38.5 mg g-1 for high temperature carbons impregnated with H2SO4, and ZnCl2, respectively. Studies of the effects of carbon dosage, NaCl concentrations and solution pH values were carried out for the more effective, high temperature carbons. Increasing NaCl concentration resulted in a significant decrease in the adsorption efficiency. Adsorption was high from solutions with low and neutral pH values and lower for solutions with alkaline pH values for the high temperature carbons. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Activation, Adsorption, Waste-Water, Mercury Removal

Lodewyckx, P. and Verhoeven, L. (2003), Using the modified Wheeler–Jonas equation to describe the adsorption of inorganic molecules: Chlorine. *Carbon*, **41** (6), 1215-1219.

Full Text: [C\Carbon41, 1215.pdf](C/Carbon41,%201215.pdf)

Abstract: Very little has been published on the subject of chlorine gas adsorption on activated carbon. In this work we studied breakthrough of chlorine on canisters filled with both impregnated and non-impregnated activated carbons. The results show that the Wheeler–Jonas equation, normally used for the physisorption of organic vapours, is also applicable to the adsorption of chlorine. Hence it can be used to extrapolate laboratory results to real life situations. It can also help to establish the nature of the chlorine adsorption process. The available data do not permit a conclusive statement on the exact reaction mechanism but it appears that moisture, micropore volume and surface complexes all have an impact on this process. Apparently neither the Cu–Cr complexes, nor the TEDA, of the impregnated carbon have a significant influence on the adsorption behaviour.

Keywords: Activated Carbon, Impregnation, Adsorption, Chemisorption, Modeling

Chen, J.P., Wu, S.N. and Chong, K.H. (2003), Surface modification of a granular activated carbon by citric acid for enhancement of copper adsorption. *Carbon*, **41** (10), 1979-1986.

Full Text: [C\Carbon41, 1979.pdf](C/Carbon41,%201979.pdf)

Abstract: In this study. citric acid was used to modify a commercially available activated carbon to improve copper ion adsorption from aqueous solutions. The carbon was modified with 1.0 M citric acid, followed by an optional step of reaction with 1.0 M sodium hydroxide. It was found that the surface modification reduced the specific surface area by 34% and point of zero charge (pH(pzc)) of the carbon by 0.5 units. Equilibrium results showed that citric acid modification increased the adsorption capacity to 14.92 mg Cu/g, which was 140% higher than the unmodified carbon. Higher initial solution pH resulted in higher copper adsorption. The chemical surface modification adversely affected the copper adsorption rate. Adsorption kinetic mechanisms were investigated with an intraparticle diffusion model. It was found that the modification did not change both external diffusion and intraparticle diffusion. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Adsorption, Adsorption Capacity, Adsorption Kinetic, Adsorption Properties, Adsorption Rate, Aqueous, Aqueous Solutions, Capacity, Carbon, Chemical Treatment, Surface Treatment, Copper, Diffusion, Elsevier, Equilibrium, External Diffusion, Granular Activated Carbon, Heavy-Metals, Intraparticle Diffusion, Ions, Kinetic, Mechanisms, Model, pH, Removal, Sodium, Solutions, Sorption, Surface Area, Surface Modification

Li, Y.H., Ding, J., Luan, Z.K., Di, Z.C., Y.F. Zhu, Xu, C.L., Wu, D.H. and Wei, B.Q. (2003), Competitive adsorption of Pb2+, Cu2+ and Cd2+ ions from aqueous solutions by multiwalled carbon nanotubes. *Carbon*, **41** (14), 2787-2792.

Full Text: [C\Carbon41, 2787.pdf](C/Carbon41,%202787.pdf)

Abstract: The individual and competitive adsorption capacities of Pb2+, Cu2+ and Cd2+ by nitric acid treated multiwalled carbon nanotubes (CNTs) were studied. The maximum sorption capacities calculated by applying the Langmuir equation to single ion adsorption isotherms were 97.08 mg/g for Pb2+, 24.49 mg/g for Cu2+ and 10.86 mg/g for Cd2+ at an equilibrium concentration of 10 mg/l. The competitive adsorption studies showed that the affinity order of three metal ions adsorbed by CNTs is Pb2+>Cu2+>Cd2+. The Langmuir adsorption model can represent experimental data of Pb2+ and Cu2+ well, but does not provide a good fit for Cd2+ adsorption data. The effects of solution pH, ionic strength and CNT dosage on the competitive adsorption of Pb2+, Cu2+ and Cd2+ ions were investigated. The comparison of CNTs with other adsorbents suggests that CNTs have great potential applications in environmental protection regardless of their higher cost at present.

Keywords: Carbon Nanotubes, Oxidation, Adsorption, Functional Groups

Kumar, A., Kumar, S. and Kumar, S. (2003), Adsorption of resorcinol and catechol on granular activated carbon: Equilibrium and kinetics. *Carbon*, **41** (15), 3015-3025.

Full Text: [C\Carbon41, 3015.pdf](C/Carbon41,%203015.pdf)

Abstract: Investigations were conducted in the batch mode for studying the adsorption behavior of resorcinol and catechol on granular activated carbon from a basic salt medium (BSM) at pH≈7.1 and temperature≈30 °C. The isotherm data were correlated with six isotherm models, namely Langmuir, Freundlich, Redlich–Peterson, Radke–Prausnitz, Toth, and Fritz–Schlunder’s using a nonlinear regression technique. It is observed that the catechol isotherm data may be represented by Redlich–Peterson, Radke–Prausnitz, Toth, and Fritz–Schlunder models with similar accuracy (max. dev. 12%). And the resorcinol data may be represented by Freundlich, Redlich–Peterson, Radke–Prausnitz, and Fritz–Schlunder models equally well (max. dev. 15%). Freudlich being a simple model is recommended for resorcinol. At the conditions investigated in this study, catechol is adsorbed to a greater extent than resorcinol. This is due to the compound’s solubility and position of the –OH group on the benzene aromatic ring. The kinetics of adsorption have been found to be diffusion controlled and the value of effective particle diffusion coefficients is of the order of 10-13 m2/s. Three distinct phases of kinetics––rapid, medium, and slow––have been observed. These results should be useful for the design of adsorbers for removing these pollutants.

Keywords: Activated carbon, Adsorption, modeling, Adsorption properties

? Lua, A.C. and Yang, T. (2004), Properties of pistachio-nut-shell activated carbons subjected to vacuum pyrolysis conditions. *Carbon*, **42** (1), 224-226

Full Text: [2004\Carbon42, 224.pdf](2004/Carbon42,%20224.pdf)

Keywords: Activated Carbon, Adsorption, Atmospheric Pyrolysis, Porosity, Pyrolysis, Surface Area

Yenisoy-Karakaş, S., Aygün, A., Güneş, M. and Tahtasakal, E. (2004), Physical and chemical characteristics of polymer-based spherical activated carbon and its ability to adsorb organics. *Carbon*, **42** (3), 477-484.

Full Text: [C\Carbon42, 477.pdf](C/Carbon42,%20477.pdf)

Abstract: The characterization of a polymeric spherical activated carbon (PAC) was performed by comparing its adsorption, porosity, functional groups and some of the physical properties with a commercial spherical activated carbon (CAC). The PAC was about 4 times superior to the CAC with respect to the mechanical strength. The micropore volume of the PAC was about 5% smaller than that of the CAC. The maximum Methylene blue adsorption values of the PAC and the CAC were 32 and 14 mg g−1, respectively, which indicated low mesopore volumes as consistent with the values of BJH volume. This resulted in the low butane working capacity values for both activated carbons. Adsorption parameters for the Langmuir and the Freundlich isotherm models were determined for all organic substances tested. Both isotherms were suitable models to analyze the equilibrium data for the removal of all organics. However, the Langmuir model fitted better than the Freundlich model and the adsorption capacities of the PAC were somewhat higher than those of the CAC. The chemical properties of the activated carbons, the pH of solutions and the substituents on absorbates have an effect on adsorption of the organics tested.

Keywords: Activated Carbon, Adsorption, Adsorption Properties, Porosity, Functional Groups, Mechanical Properties

Kadirvelu, K., Kavipriya, M., Karthika, C., Vennilamani, N. and Pattabhi, S. (2004), Mercury(II) adsorption by activated carbon made from sago waste. *Carbon*, **42** (4), 745-752.

Full Text: [C\Carbon42, 745.pdf](C/Carbon42,%20745.pdf)

Abstract: The preparation of activated carbon (AC) from sago industry waste is a promising way to produce a useful adsorbent for Hg(II) removal, as well as dispose of sago industry waste. The AC was prepared using sago industry waste with H2SO4 and (NH4)2S2O8 and physico-chemical properties of AC were investigated. Adsorptive removal of mercury(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, particle size and pH to assess the kinetic and equilibrium parameters. Adsorption equilibrium was obtained in 105 min for 20 mg l-1 and 120 min for 30, 40, and 50 mg l-1 Hg(II) concentrations. The Langmuir and Freundlich equilibrium isotherm models were found to provide an excellent fitting of the adsorption data, with r2 0.9999 and 0.9839, respectively. The adsorption capacity of Hg(II) (Qo) obtained from the Langmuir equilibrium isotherm model was found to be 55.6 mg g-1 at pH 5.0 for the particle size range of 125–250 μm. The percent removal increased with an increase in pH from 2 to 10. This adsorbent was found to be effective and economically attractive.

Keywords: Activated Carbon, Activation, Adsorption, Adsorption Properties

? Arenillas, A., Pevida, C., Rubiera, F., Palacios, J.M., Navarrete, R., Denoyel, R., Rouquerol, J. and Pis, J.J. (2004), Surface characterisation of synthetic coal chars made from model compounds. *Carbon*, **42** (7), 1345-1350.

Full Text: [2004\Carbon42, 1345.pdf](2004/Carbon42,%201345.pdf)

Abstract: Knowledge of surface properties is essential for understanding the reaction mechanisms involved in several coal conversion processes. However, due to the complexity and heterogeneity of coal this is rather difficult and the use of known model compounds could be a valuable tool. Single model compounds have been widely used, but they give a quite simplified picture. In this work a mixture of model compounds in a phenol-formaldehyde matrix was cured in order to create cross-linked structures. The obtained synthetic coal was pyrolysed in a fixed bed reactor, under helium atmosphere. The surface composition of the chars was evaluated by XPS, adsorption gravimetry of water vapour, temperature-programmed desorption and potentiometric titration. Texture was characterised by N2 and CO2 adsorption isotherms at 77 and 273 K, respectively, and immersion calorimetry in benzene. The results obtained from the different techniques were contrasted in order to give an overview of the surface properties (chemical and physical) of the samples studied. Chars obtained under the same operating conditions from a high volatile bituminous coal were used as a reference. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Carbon Precursor, Carbonization, Mixing, Texture, Chemical Structure, Mass Titration, Zero Charge, Adsorption, Pyrolysis, Point, XPS

? Maciá-Agullć, J.A., Moore, B.C., Cazorla-Amorós, D. and Linares-Solano, A. (2004), Activation of coal tar pitch carbon fibres: Physical activation vs. chemical activation. *Carbon*, **42** (7), 1367-1370.

Full Text: [2004\Carbon42, 1367.pdf](2004/Carbon42,%201367.pdf)

Abstract: Activated carbon fibres (ACF) are obtained mainly by physical activation with steam or carbon dioxide. Additionally, there are many papers dealing with chemical activation of carbon fibres, or a polymeric raw material, with several chemical agents like for example, phosphoric acid, zinc chloride, aluminium chloride,... Nevertheless, although it is well known that hydroxides are good activating agents, there are few papers about the activation of carbon fibres with KOH or NaOH. In the present work, ACF with high surface area are obtained by chemical activation with KOH and NaOH. Both chemical agents present different behaviour; thus, NaOH developed the highest value of porosity and KOH developed samples with narrower micropore size distribution. In order to compare the results with those obtained by physical activation, some ACF have been prepared using CO2 activation. The main conclusion of this work is that by using chemical activation it is possible to obtain similar, or even higher, porosity (similar to1 ml/g, similar to3000 m(2)/g) than by physical activation. However, chemical activation presents two important advantages: (1) a much higher yield (27-47% for chemical activation and 6% physical activation for similar to2500 m(2)/g activated carbon fibres) and (2) the surface of the fibres prepared by chemical activation is less damaged than by physical activation. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Coal Tar Pitch, Activation, Adsorption, Carbon Yield, Porosity, Microstructure, NaOH, KOH

Macías-García, A., Valenzuela-Calahorro, C., Espinosa-Mansilla, A., Bernalte-García, A. and Gómez-Serrano, V. (2004), Adsorption of Pb2+ in aqueous solution by SO2-treated activated carbon. *Carbon*, **42** (8-9), 1755-1764.

Full Text: [C\Carbon42, 1755.pdf](C/Carbon42,%201755.pdf)

Abstract: The adsorption of Pb2+ in aqueous solution by SO2-treated activated carbon was investigated from both kinetic and equilibrium standpoints. A commercial activated carbon (C-S) was used. It was treated at 30 degreesC in SO2 (C-SO2-N2-30), at 30 degreesC in two successive steps: first in SO2 and then in H2S (C-SO2-H2S-N2-30), and from room temperature to 900 degreesC in SO2 (C-SO2-900). The samples were characterized by N2 adsorption at -196 degreesC and by helium and mercury density measurements. The adsorption process of Pb2+ was studied using Pb2+ solutions at pH 5.4 and 2.0 and at 25 and 45 degreesC. The amount of sulfur introduced in C S is much larger for C-SO2-H2S-N2-30 and C-SO2-900 than for C-SO2-N2-30. For C-SO2-H2S-N2-30 and C-SO2-900, also, the loss of surface area and porosity is greater than for C-SO2-N2-30. The introduction of sulfur in C-S significantly slows down the adsorption rate of Pb2+ but markedly enhances the extent to which it occurs, except at pH 2.0. The removal of sulfur from C-SO2-H2S-N2-30 and C-SO2-900 noticeably favors the kinetics and also the adsorption of metallic ion. The process may be then as fast as for C-S. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Properties, Cadmium, Columns, Kinetics, Lead Ions, Mercury, Regeneration, Removal, Shell, Surface Treatment, Water

Ko, K.R., Ryu, S.K. and Park, S.J. (2004), Effect of ozone treatment on Cr(VI) and Cu(II) adsorption behaviors of activated carbon fibers. *Carbon*, **42** (8-9), 1864-1867.

Full Text: [C\Carbon42, 1864.pdf](C/Carbon42,%201864.pdf)

Ho, Y.S. (2004), Selection of optimum sorption isotherm. *Carbon*, **42** (10), 2115-2116.

Full Text: [C\Carbon42, 2115.pdf](C/Carbon42,%202115.pdf); [C\Carbon-Ho.pdf](C/Carbon-Ho.pdf)

Keywords: Adsorption, Modeling, Adsorption Properties, Phase Equilibria, Adsorption

Mohan, D., Singh, K.P., Sinha, S. and Gosh, D. (2004), Removal of pyridine from aqueous solution using low cost activated carbons derived from agricultural waste materials. *Carbon*, **42** (10), 2409-2421.

Full Text: [C\Carbon42, 2409.pdf](C/Carbon42,%202409.pdf)

Abstract: The purpose of this study is to suggest an efficient process, which does not require a big investment for the removal of pyridine from wastewater. Activated carbons developed from agricultural waste materials were characterized and utilized for the removal of pyridine from wastewater. Systematic studies on pyridine adsorption equilibrium and kinetics by low cost activated carbons were carried out. Adsorption studies were carried out at different temperatures, particle size, pH and adsorbent doses. Both Langmuir and Freundlich models fitted the adsorption data quite reasonably. The results indicate that the Langmuir adsorption isotherm model fits the data better as compared to the Freundlich adsorption isotherm model. Various mechanisms were established for pyridine adsorption on developed adsorbents. Further, the data are better correlated with non-linear form as compared to the linear one. The kinetic studies were conducted to delineate the effect of temperature, initial adsorbate concentration, particle size of the adsorbent and solid to liquid ratio. The adsorption of pyridine follows the first order rate kinetics. On the basis of these studies, various parameters such as effective diffusion coefficient, activation energy and entropy of activation were evaluated to establish the mechanisms. It is concluded that the adsorption occurs through a particle diffusion mechanism at temperatures 10 and 25 °C while at 40 °C it occurs through film diffusion mechanism. Similarly at concentrations 25 and 50 mg/l the adsorption is particle diffusion controlled while at ≤ 50 mg/l it is film diffusion controlled.

Keywords: Activated Carbon, Activated Carbons, Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Isotherm Model, Agricultural, Agricultural Waste, Aqueous Solution, BET Surface Area, Biodegradation, Blast-Furnace Waste, Concentration, Concentrations, Cost, Derivatives, Diffusion, Diffusion Coefficient, Effective, Effective Diffusion Coefficient, Energy, Entropy, Equilibria, Equilibrium, Film, Film Diffusion, First Order, Freundlich, Freundlich Adsorption Isotherm, Immobilized Pimelobacter sp, Isotherm, Isotherm Model, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Adsorption, Langmuir Adsorption Isotherm, Linear, Low, Materials, Mechanism, Mechanisms, Model, Models, Non-Linear, Nonlinear, Order, Parameters, Particle, Particle Diffusion, Particle Size, pH, Process, Pyridine Adsorption, Removal, Rundle Spent Shale, Single-Component, Sorption, Temperature, Temperatures, Waste, Wastewater, Water

? Mohan, D., Singh, K.P., Sinha, S. and Gosh, D. (2004), Removal of pyridine from aqueous solution using low cost activated carbons derived from agricultural waste materials. *Carbon*, **42** (12-13), 2409-2421.

Full Text: [2004\Carbon42, 2409.pdf](2004/Carbon42,%202409.pdf)

Abstract: The purpose of this study is to suggest an efficient process, which does not require a big investment for the removal of pyridine from wastewater. Activated carbons developed from agricultural waste materials were characterized and utilized for the removal of pyridine from wastewater. Systematic studies on pyridine adsorption equilibrium and kinetics by low cost activated carbons were carried out, Adsorption studies were carried out at different temperatures, particle size, pH and adsorbent doses. Both Langmuir and Freundlich models fitted the adsorption data quite reasonably. The results indicate that the Langmuir adsorption isotherm model fits the data better as compared to the Freundlich adsorption isotherm model. Various mechanisms were established for pyridine adsorption on developed adsorbents. Further, the data are better correlated with non-linear form as compared to the linear one. The kinetic studies were conducted to delineate the effect of temperature, initial adsorbate concentration, particle size of the adsorbent and solid to liquid ratio. The adsorption of pyridine follows the first order rate kinetics. On the basis of these studies, various parameters such as effective diffusion coefficient, activation energy and entropy of activation were evaluated to establish the mechanisms. It is concluded that the adsorption occurs through a particle diffusion mechanism at temperatures 10 and 25 degreesC while at 40 degreesC it occurs through film diffusion mechanism. Similarly at concentrations 25 and 50 mg/l the adsorption is particle diffusion controlled while at less than or equal to 50 mg/l it is film diffusion controlled. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Isotherm Model, Agricultural, Aqueous Solution, Bet Surface Area, Biodegradation, Blast-Furnace Waste, Concentration, Concentrations, Cost, Derivatives, Diffusion, Diffusion Coefficient, Effective Diffusion Coefficient, Energy, Entropy, Equilibria, Equilibrium, Film, Film Diffusion, Freundlich, Immobilized Pimelobacter sp, Isotherm, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Low, Materials, Mechanism, Mechanisms, Model, Models, Parameters, Particle, Particle Diffusion, Particle Size, pH, Process, Pyridine Adsorption, Removal, Rundle Spent Shale, Single-Component, Sorption, Temperature, Waste, Wastewater, Water

Mohan, D., Singh, K.P., Sinha, S. and Gosh, D. (2004), Removal of pyridine from aqueous solution using low cost activated carbons derived from agricultural waste materials. *Carbon*, **42** (14), 2409-2421.

Full Text: [C\Carbon42, 2409.pdf](C/Carbon42,%202409.pdf)

Abstract: The purpose of this study is to suggest an efficient process, which does not require a big investment for the removal of pyridine from wastewater. Activated carbons developed from agricultural waste materials were characterized and utilized for the removal of pyridine from wastewater. Systematic studies on pyridine adsorption equilibrium and kinetics by low cost activated carbons were carried out. Adsorption studies were carried out at different temperatures, particle size, pH and adsorbent doses. Both Langmuir and Freundlich models fitted the adsorption data quite reasonably. The results indicate that the Langmuir adsorption isotherm model fits the data better as compared to the Freundlich adsorption isotherm model. Various mechanisms were established for pyridine adsorption on developed adsorbents. Further, the data are better correlated with non-linear form as compared to the linear one. The kinetic studies were conducted to delineate the effect of temperature, initial adsorbate concentration, particle size of the adsorbent and solid to liquid ratio. The adsorption of pyridine follows the first order rate kinetics. On the basis of these studies, various parameters such as effective diffusion coefficient, activation energy and entropy of activation were evaluated to establish the mechanisms. It is concluded that the adsorption occurs through a particle diffusion mechanism at temperatures 10 and 25 °C while at 40 °C it occurs through film diffusion mechanism. Similarly at concentrations 25 and 50 mg/l the adsorption is particle diffusion controlled while at≤50 mg/l it is film diffusion controlled.

Keywords: Activated Carbon, Activation, Adsorption, BET Surface Area, Pyridine Adsorption

Mui, E.L.K., Ko, D.C.K. and McKay, G. (2004), Production of active carbons from waste tyres: A review. *Carbon*, **42** (14), 2789-2805.

Full Text: [C\Carbon42, 2789.pdf](C/Carbon42,%202789.pdf)

Abstract: A review of the production of activated carbons from waste tyres is presented. The effects of various process parameters, particularly, temperature and heating rate, on the pyrolysis stage are reviewed. The influence of activating conditions, physical and chemical, nature of the activation chemicals, on the active carbon properties are discussed. Under certain process conditions several active carbons with BET surface areas over 1000 m2/g have been produced with extensive micropore volumes, over 40% of the total pore volume.

A review is carried out of the reaction kinetic modeling applied to the pyrolysis of tyres and the chemical activation of tyres. The models cover one step and two step pyrolysis models, plus more recent models which are based on the actual chemical components such as natural rubber. SBR and other additives. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbons, Activation, Pyrolysis, Modeling, Reaction Kinetics, Styrene-Butadiene Rubber, Scrap Tyre Pyrolysis, Natural-Gas Storage, Vacuum Pyrolysis, Thermal-Decomposition, Automotive Tires, CO2 Activation, Spanish Coals, Bed Reactor, Oil

Das, D., Gaur, V. and Verma, N. (2004), Removal of volatile organic compound by activated carbon fiber. *Carbon*, **42** (14), 2949-2962.

Full Text: [C\Carbon42, 2949.pdf](C/Carbon42,%202949.pdf)

Abstract: Experiments were carried out to study adsorption/desorption of volatile organic compound (VOC) on the activated carbon fiber (ACF) under dynamic conditions. The primary objective was to experimentally demonstrate the suitability of ACF in effectively adsorbing VOCs from inert gaseous stream under varying operating conditions, and compare its performance vis-à-vis that of the other commercially available adsorbents, such as granular activated carbon (GAC), silica gel, and zeolites. The adsorption experiments were carried out in a fixed tubular packed bed reactor under various operating conditions including temperature (35–100 °C), gas concentration (2000–10,000 ppm), gas flow rate (0.2–1.0 slpm) and weight of the adsorbent (2–10 g). A mathematical model was developed to predict the VOC breakthrough characteristics on ACF. The model incorporated the effects of the gas-particle film mass transfer resistance, adsorbent pore diffusion and the adsorption/desorption rates within the pore. The experimental data and the corresponding model simulated results were compared and found to be in good agreement. The ACF repeatedly showed a good regeneration capability following desorption by DC electrical heating.

Keywords: Activated Carbon, Carbon Fibers, Adsorption, Modeling, Diffusion

? Kukovecz, Á., Kanyó, T., Kónya, Z. and Kiricsi, I. (2005), Long-time low-impact ball milling of multi-wall carbon nanotubes. *Carbon*, **43** (5), 994-1000.

Full Text: [2005\Carbon43, 994.pdf](2005/Carbon43,%20994.pdf)

Abstract: A systematic study on the morphological changes experienced by multi-wall carbon nanotubes during long-time ball milling in a vibrating mill was performed. Samples were collected in the time interval 0-200 h and analyzed with TEM and N2 adsorption. The change of the mean nanotube length with time could be approximated with a second-order exponential decay function. The length distribution function changed from the original log-normal to normal after 140 h of milling. Specific surface area, surface fractal dimension, the dimension of the capillary condensation and the pore size distribution (PSD) curve were calculated from the N2 adsorption isotherms. These morphological descriptors all experienced characteristic changes after similar to 40 h of milling: the specific surface area decreased, the fractal dimension increased and the maximum of the PSD curve shifted downwards by similar to 0.5 nm. Results indicate that ball milling of carbon nanotubes is a rather complex process and that it can cause several morphological changes to samples besides the well-known cutting effect. (c) 2004 Elsevier Ltd. All rights reserved.

Keywords: Carbon Nanotubes, Grinding, Adsorption, Electron Microscopy, Fracture, Surface Fractal Dimension, Adsorption-Isotherms, N2 Adsorption, Pore-Size, Morphology, Solids, Silica

? Mohan, D., Singh, K.P., Sinha, S. and Gosh, D. (2005), Removal of pyridine derivatives from aqueous solution by activated carbons developed from agricultural waste materials. *Carbon*, **43** (8), 1680-1693.

Full Text: [2005\Carbon43, 1680.pdf](2005/Carbon43,%201680.pdf)

Abstract: The paper investigates the ability of activated carbons developed from coconut shell to adsorb α-picoline, β-picoline, and γ-picolin from aqueous solution. The developed carbons are designated as SAC (activated carbon derived from coconut shells with out any treatment) and ATSAC (activated carbon derived from acid treated coconut shells). The carbons were, characterized and utilized for the sorption of α-picoline, β-picoline, and γ-picoline at different temperatures, particle size, pH and solid to liquid ratio. All the studies were performed by batch method to determine various equilibrium and kinetic parameters. The Langmuir and Freundlich isotherm models were applied and the Langmuir model was found to best report the equilibrium isotherm data. The adsorption of α-, β-, and γ-picoline followed the pseudo-second order rate kinetics. On the basis of kinetic studies, various rate and thermodynamic parameters such as effective diffusion coefficients, activation energy and activation entropy were evaluated. It was concluded that in majority of cases, the adsorption is controlled by particle diffusion at temperatures 10° and 25 °C while at 40 °C it is controlled by film diffusion mechanism. Similarly at concentrations 25 and 50 mg/l the adsorption was governed by particle diffusion in most of the cases while at >50 mg/l it was film diffusion controlled. The overall capacity of ATSAC was higher than SAC. The sorption capacity of γ-picoline was found more followed by β-picoline and α-picoline.

Keywords: Acid, Activated Carbon, Activation, Activation Energy, Adsorption, Adsorption, Agricultural, Alpha-Picoline, And Delta-Picoline Adsorption, Aqueous Solution, Bet Surface Area, Beta-Picoline, Biodegradation, Cadmium, Capacity, Carbon, Coconut Shell, Concentrations, Diffusion, Energy, Entropy, Equilibrium, Equilibrium Isotherm, Film, Film Diffusion, Fly-Ash, Freundlich, Freundlich Isotherm, Immobilized Pimelobacter sp, Isotherm, Isotherm Models, Kinetic, Kinetic Parameters, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Materials, Mechanism, Model, Models, Montmorillonite, Paper, Parameters, Particle, Particle Diffusion, Particle Size, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Quinoline, Rundle Spent Shale, Sorption, Sorption Capacity, Thermodynamic, Thermodynamic Parameters, Treatment, Waste

? Sadezky, A., Muckenhuber, H., Grothe, H., Niessner, R. and Pöschl, U. (2005), Raman micro spectroscopy of soot and related carbonaceous materials: Spectral analysis and structural information. *Carbon*, **43** (8), 1731-1742.

Full Text: [2005\Carbon43, 1731.pdf](2005/Carbon43,%201731.pdf)

Abstract: Experimental conditions and mathematical fitting procedures for the collection and analysis of Raman spectra of soot and related carbonaceous materials have been investigated and optimised with a Raman microscope system operated at three different laser excitation wavelengths (514, 633, and 780 nm). Several band combinations for spectral analysis have been tested, and a combination of four Lorentzian-shaped bands (G, D1, D2, D4) at about 1580, 1350, 1620, and 1200 cm-1, respectively, with a Gaussian-shaped band (W) at similar to 1500 cm-1 was best suited for the first-order spectra. The second-order spectra were best fitted with Lorentzian-shaped bands at about 2450, 2700, 2900, and 3100 cm-1. Spectral parameters (band positions, full widths at half maximum, and intensity ratios) are reported for several types of industrial carbon black (Degussa Printex, Cabot Monarch), diesel soot (particulate matter from modern heavy duty vehicle and passenger car engine exhaust, NIST SRM1650), spark-discharge soot (Palas GfG100), and graphite. Several parameters, in particular the width of the D1 band at similar to 1350 cm-1, provide structural information and allow to discriminate the sample materials, but the characterisation and distinction of different types of soot is limited by the experimental reproducibility of the spectra and the statistical uncertainties of curve fitting. The results are discussed and compared with X-ray diffraction measurements and earlier Raman spectroscopic studies of comparable materials, where different measurement and fitting procedures had been applied. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Soot, Graphitic Carbon, Raman Spectroscopy, Microstructure, Amorphous-Carbon, Particulate Matter, Aerosol-Particles, Diamond Films, Scattering, Graphite, Adsorption, 1st-Order, Black, Model

? Kikuchi, Y., Qian, Q.R., Machida, M. and Tatsumoto, H. (2006), Effect of ZnO loading to activated carbon on Pb(II) adsorption from aqueous solution. *Carbon*, **44** (2), 195-202.

Full Text: [2006\Carbon44, 195.pdf](2006/Carbon44,%20195.pdf)

Abstract: The effect of zinc oxide loading to granular activated carbon on Pb(II) adsorption from aqueous solution was studied in comparison with zinc oxide particles and oxidized activated carbon. Cu(II), Cd(II) and nitrobenzene were used as reference adsorbates to investigate the adsorption. The BET surface area and point of zero charge (pHPZC) in the aqueous solution were measured for the adsorbents. The adsorption isotherms were examined to characterize the adsorption of heavy metals and organic molecules. The heavy metal adsorption was improved by both the zinc oxide loading and the oxidation of activated carbon. In contrast, the adsorption of nitrobenzene was considerably reduced by the oxidation, and slightly decreased by the zinc oxide loading. The zinc oxide loading to the activated carbon was found to be effectively used for the Pb(II) adsorption whereas only a part of surface functional groups was used for the zinc oxide particles and the oxidized activated carbon. From the experimental results, the surface functional groups responsible for the Pb(II) adsorption on the zinc oxide loaded activated carbon were considered to be hydroxyl groups that formed on the oxide, while those on the oxidized activated carbon were considered to be carboxylic groups.

Keywords: Activated carbon, Impregnation, Adsorption, Adsorption properties

? Garnier, C., Görner, T., Villiéras, F., De Donato, P., Polakovič, M., Bersillon, J.L. and Michot, L.J. (2007), Activated carbon surface heterogeneity seen by parallel probing by inverse liquid chromatography at the solid/liquid interface and by gas adsorption analysis at the solid/gas interface. *Carbon*, **45** (2), 240-247.

Full Text: [2007\Carbon45, 240.pdf](2007/Carbon45,%20240.pdf)

Abstract: The energetic surface heterogeneity of four different activated carbons was assessed by the parallel probing at the solid/liquid and solid/gas interfaces. At the solid/liquid interface a method of inverse liquid chromatography, frontal analysis by characteristic point was applied using phenylalanine in water solution as a probe molecule. At the solid/gas interface, argon was used as a probe in the low pressure quasi equilibrium volumetry method. The treatment of the adsorption isotherms by the derivative isotherm summation procedure revealed similar adsorption energy distributions for both argon and phenylalanine. Such an agreement between both methods suggests that, at the solid/liquid interface and on the solid/gas interface, the adsorption was mainly controlled by geometric parameters and no specific interaction was observed and physisorbed water did not played a significant role in adsorption process on three from four studied carbons. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Clay-Minerals, Argon, Coals, Phase

? Mugisidi, D., Ranaldo, A., Soedarsono, J.W. and Hikam, M. (2007), Modification of activated carbon using sodium acetate and its regeneration using sodium hydroxide for the adsorption of copper from aqueous solution. *Carbon*, **45** (5), 1081-1084.

Full Text: [2007\Carbon45, 1081.pdf](2007/Carbon45,%201081.pdf)

Abstract: Activated carbon from coconut shell was modified with sodium acetate at concentrations of 10% and 15%, and used in a fixed-bed column to study the adsorption of copper ions. Synthetic wastewater containing 258 mg/l of Cu was passed through plain activated carbon and modified activated carbon. Plain activated carbon was able to adsorb 20 mg of Cu, and activated carbon modified by treatment with 10% sodium acetate adsorbed 33 mg of Cu. The highest adsorption capacity was found for the activated carbon modified by treatment with 15% sodium acetate, which adsorbed 45 mg of Cu; i.e. 2.2 times as much as the plain activated carbon. After regeneration with 0.71 M NaOH. the activated carbon modified by treatment with 15% sodium acetate was able to adsorb 60 mg of Cu; i.e. three times as much as the plain activated carbon. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Chromium, Removal, Zinc

? Boehm, H.P. and Stumpp, E. (2007), Citation errors concerning the first report on exfoliated graphite. *Carbon*, **45** (7), 1381-1383.

Full Text: [2007\Carbon45, 1381.pdf](2007/Carbon45,%201381.pdf)

Keywords: Citation, Errors, First, Graphite

? Mestre, A.S., Pires, J., Nogueira, J.M.F. and Carvalho, A.P. (2007), Activated carbons for the adsorption of ibuprofen. *Carbon*, **45** (10), 1979-1988.

Full Text: [2007\Carbon45, 1979.pdf](2007/Carbon45,%201979.pdf)

Abstract: Powdered activated carbons prepared from cork waste were studied for the ibuprofen removal from liquid phase. Two carbons were used: CAC obtained by chemical activation with K2CO3, and CPAC prepared by a two-step method, chemical activation with K2CO3 followed by steam activation. The ash content analysis showed that, for this raw material, the previous acid treatment can be omitted. The textural properties of the samples, evaluated by low temperature NZ adsorption, show that the main difference is related with the volume of the larger micropores (supermicropores), which is more developed for CPAC. The surface chemistry characterization, made by the determination of the point of zero charge (PZC) and Boehm’s titration, show that the second activation step led to an activated carbon with less acidic groups, associated with the absence of the strongest acidic groups. Kinetic and equilibrium adsorption data show that the process obeys to the pseudo-second order kinetic equation and Langmuir adsorption model. Between 25 and 40 C no significant influence of the temperature on ibuprofen adsorption was observed. Results indicate that the removal efficiency is higher than 90% between pH 2 and 4 and decreases as pH values increase to a value of 11. The results show that both samples are suitable for ibuprofen removal, although CPAC has advantages, namely, high initial adsorption rate, high adsorption capacity and high removal efficiency, in some cases 100%, for a large range of pH. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Acid, Acid Treatment, Acid-Treatment, Activated Carbon, Activated Carbons, Activation, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Model, Adsorption Rate, Analysis, Aqueous-Solution, Ash, Ash Content, Bisphenol-A, Capacity, Carbon, Characterization, Charge, Chemical, Chemical Activation, Chemistry, Content Analysis, Cork, Cork Waste, Determination, Drinking-Water Treatment, Efficiency, Equilibrium, Equilibrium Adsorption, Groups, Ibuprofen, Initial Adsorption Rate, Kinetic, Koh, Langmuir, Langmuir Adsorption, Liquid Phase, Low, Low Temperature, Low-Temperature, Made, Method, Micropores, Model, Order, pH, pH Values, Pharmaceuticals, Process, Properties, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second Order, Pseudo-Second-Order, PZC, Range, Rate, Removal, Removal Efficiency, Semiempirical Methods, Sorption, Steam Activation, Surface, Surface Chemistry, Temperature, Textural Properties, Titration, Treatment, Value, Waste, Zero Charge

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Full Text: [2008\Carbon46, 778.pdf](2008/Carbon46,%20778.pdf)

Abstract: Three activated carbons in the form of grains, fibers and pellets were oxidized with ammonium peroxidisulfate. The oxidized and non-oxidized activated carbons were characterized by: N-2 adsorption at 77 K, temperature programmed desorption up to 1273 K, and potentiometric titrations in the temperature range between 288 and 31 8 K. The point of zero charge (PZC) of the oxidized activated carbons decreased with increasing temperature and this decrease was in the same direction as the change in 1/2pK(w), the neutral point of water. The non-oxidized activated carbons behaved in a similar manner, but the PZC decreased by more than the corresponding change in 1/2pK(w). Variation of surface charge of the three oxidized activated carbons was fitted to a single second-order function with respect to pH and temperature. However, a single equation could not be found for the three non-oxidized activated carbons. Standard thermodynamic functions at the PZC were obtained from potentiometric curves. Acidity constant distributions were obtained and showed an increase in the number of acidic groups when the temperature increased. The number of carboxylic and phenolic groups obtained from these distributions was compared with that obtained from the deconvolution of temperature programmed desorption spectra. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbons, Adsorbents, Adsorption, Aqueous-Solutions, Cadmium(II), Charge, Deconvolution, Desorption, Fibers, Function, Functions, Mellitic Acid, Oxides, Paracetamol, pH, Rights, Rutile, Surface-Chemistry, Temperature, Thermodynamic, Thermodynamics, Water

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Full Text: [2009\Carbon47, 1043.pdf](2009/Carbon47,%201043.pdf)

Abstract: A mesoporous carbon material, CMK-1 was successfully functionalized with carboxymethylated polyethyleneimine (CMPEI) by a simple adsorption method. The physicochemical properties of the polymer-carbon composite (denoted as CMPEI/CMK-1) were investigated by X-ray diffraction, N-2 adsorption-desorption and X-ray photoelectron spectroscopy (XPS). The adsorption behaviors of Cu(II) ion on the CMK-1 and CMPEI/CMK-1 materials were examined under the batch-type experimental conditions. The CMPEI/CMK-1 material showed a typical Langmuir isotherm with a 10-fold increase in adsorption capacity, compared to that of CMK-1. In the case of 0.02 mM Cu(II) solution, the copper ions were completely removed by utilizing the CMPEI/CMK-1 material both at pH values of 3 and 5. The CMPEI/CMK-1 material also exhibited a remarkably high distribution coefficient value (K-d = 2.75🞨105). The results from XPS depth profiles before and after the copper-ion adsorption indicated that the CMPEI and the adsorbed Cu(II) ions were uniformly distributed within the CMK-1 particles. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Aqueous-Solution, Complexation, Molecular-Sieves, Nanoporous Carbon, Nickel(II) Ion, Polyethyleneimine, Removal, Silica, Surface-Chemistry, Ultrafiltration

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Full Text: [2009\Carbon47, 1614.pdf](2009/Carbon47,%201614.pdf)

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Full Text: [2009\Carbon47, 2014.pdf](2009/Carbon47,%202014.pdf)

Abstract: in an effort to enhance mercury (Hg) removal from the aqueous solution, activated carbon (AC) was modified by a combined treatment of nitric acid and thionyl chloride, followed by the reaction with ethylenediamine, to introduce N, S-, and Cl-containing functional groups. The modified activated carbon (MAC) was characterized by SEM-EDS, FT-IR, XPS, elemental analyzer, and potentiometry. Kinetics and equilibrium isotherms of Hg sorption by MAC were determined in batch experiments. Characterization indicated that additions of the organic-inorganic ligands onto AC surface by treatment were effective, likely through the acyl chloride-carbon reactions. Potentiometric titration showed that the modifications introduced more negative surface charges favoring cation sorption. Kinetics and isotherm studies demonstrated that the Hg sorption by MAC was faster (<30 min) and higher (>200%) than that by AC, suggesting a high affinity of MAC for Hg ions. The sorption by MAC occurred in a wider pH range (4-10 vs. 5-7), and low ionic strength appeared to enhance Hg sorption. The sorption isotherms were best described by Freundlich model, and enhanced Hg sorption by MAC was primarily accomplished by the coordinations of ligand atoms (O, N and S) with Hg ions through the mechanisms of surface complexation, reduction, and ion exchange. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Selective Adsorption, Waste-Water, Ionic-Strength, Surface, Functionalization, Chloride, Sorption, Hg(II), XPS, Adsorbents

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Full Text: [2010\Carbon48, 60.pdf](2010/Carbon48,%2060.pdf)

Abstract: To enhance As(V) removal, an activated carbon fiber (ACF) based adsorbent was fabricated by impregnation of nano-sized magnetite to the surface of ACF with chitosan as the coating support, The AsM adsorption capacity of the modified ACF (MACF) was approximately eight times of that of the raw ACF (RACF). Even at AsM concentrations lower than 10 μg L-1, the MACF exhibited a considerably high adsorption capacity to As(V), whereas the RACF was ineffective even at an AsM concentration ten times higher to 10 μg L-1. The MACF was able to reduce AsM concentration below its maximum contaminant level regulated by the US EPA for drinking water in a wide pH range without formation of the more poisonous As(III). Kinetic experiments indicated that the diffusion of AsM within the pores of the MACF was more rapid than that of the RACF and that the surface reaction was the dominant step in the adsorption of AsM onto the MACE Compared with the RACF, the MACF had a wider applicable pH range from 2 to 8 for the AsM uptake. Besides enhanced AsM uptake, the MACF maintained its high adsorption capability to organic contaminants, such as phenol and humic acid. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: ACF, Activated Carbon, Activated Carbon Fiber, Adsorbent, Adsorbents, Adsorption, Adsorption Capability, Adsorption Capacity, Arsenic, Arsenic Removal, As(III), As(V), As(V) Removal, Capacity, Carbon, Chitosan, Coating, Concentration, Contaminant, Contaminants, Diffusion, Drinking Water, Evaluation, Experiments, Humic Acid, Impregnation, Iron, Kinetic, Kinetics, L1, Magnetite, Maximum Contaminant Level, Mechanism, Model, Modified, Organic, pH, Phenol, Removal, Rights, Sorption, Support, Surface, Surface Reaction, Uptake, US, Water

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Full Text: [2010\Carbon48, 333.pdf](2010/Carbon48,%20333.pdf)

Abstract: Charcoals adsorbents that contain dispersed aluminum and iron oxides have been synthesized by impregnating wood with salt solutions followed by carbonization at 500ºC, 650ºC or 900ºC. The adsorbents were characterized and their performance for fluoride removal from aqueous solution was evaluated. Aluminum and iron oxides were well dispersed into the porous charcoals. The carbons were amorphous and highly porous. XRD of the adsorbents showed crystalline iron oxide but did not show any form of crystalline aluminum oxides. All the adsorbents showed acidic surface properties. The efficiency of defluoridation was found to depend on the carbonization temperature, the pH of point of zero charge (pHPZC), and the co-existing ions. Substrates prepared at 650ºC with aluminum and iron oxides exhibited the best efficiency with a fluoride sorption capacity of 13.64 mg g-1. More than 92% removal of fluoride was achieved within 24h from a 10 mg L-1 solution at neutral pH. Fluoride adsorption kinetic was well fitted by a pseudo-second order model. The amounts of residual Al and Fe in treated solution were pH dependant. At neutral pH, the amounts of dissolved Al and Fe were found to be 0.67 and 1.8 mg L-1, respectively (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Activated Alumina, Adsorbents, Adsorption, Adsorption Kinetic, Aluminum, Aluminum Oxide, Aqueous Solution, Aqueous-Solution, Capacity, Carbon, Carbonization, Characterization, Charge, Defluoridation, Dissolved, Drinking Water, Efficiency, Fluoride, Fluoride Removal, Ions, Iron, Iron Oxide, Iron Oxides, Iron-Oxide, Kinetic, Kinetics, L1, Mixed-Oxide, Model, Oxide, Oxides, Performance, pH, pHPZC, Point of Zero Charge, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Pyrolysis, Removal, Rights, Salt, Solution, Solutions, Sorption, Sorption Capacity, Surface, Surface Properties, Temperature, Waste-Water, Water, Wood, XRD

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Full Text: [2010\Carbon48, 972.pdf](2010/Carbon48,%20972.pdf)

Abstract: Clofibric acid adsorption from the aqueous phase was studied using cork-based activated carbons (CAC: chemically activated with K2CO3; CPAC: physical activation of sample CAC with steam). CPAC outperformed the uptake of water treatment commercial carbons. Results highlight the importance of PH in clofibric acid adsorption: the highest removals were obtained for pH 2.0 and decrease for higher pHs. The sigmoidal adsorption isotherms obtained were fitted to the Dubinin-Astakhov equation. The characteristic adsorption energy revealed that CAC has the highest affinity for the solute, in accordance with its narrow micropore size distribution. The molecular and electronic structure showed that the solvation energy of the undissociated and dissociated forms of clofibric acid is the key factor to explain the isotherm shape and the dependence of the pH. For pH 3.6 the dissociated form is dominant and the uptake significantly decreases, showing that the solvent shields the interaction of the dissociated specie (higher solvation energy) with the carbon surface. The results show that once the solvation energies of the undissociated and dissociated forms of clofibric acid are known, a complete characterization of an activated carbon allows one to predict with confidence its behavior for the adsorption of this compound from the aqueous phase. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbents, Adsorption, Adsorption Isotherms, Aquatic Environment, Aqueous Phase, Aqueous-Solutions, Behavior, Carbon, Characterization, Confidence, Distribution, Drinking-Water, Energy, Forms, Hydrolysis Rate Constants, Ibuprofen, Interaction, Isotherm, Isotherms, pH, Pharmaceutical Residues, Physical, Physical Activation, Removal, Rights, Size, Solution, Structure, Surface, Surface-Chemistry, Treatment, Uptake, Waste, Water, Water Treatment

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Full Text: [2010\Carbon48, 2106.pdf](2010/Carbon48,%202106.pdf)

Abstract: Cyclam-functionalized polyglycidyl methacrylate, grafted on carbon fibres (CF-PGMA-Cy) was prepared by atom transfer radical polymerization using aryl diazonium salt initiators. These adsorption maximum capacity of CF-PGMA-Cy fibres for Cu(II) was found to be 28.6 mg/g at pH 5.2 and the adsorption kinetics fitted to the pseudo-second order model. Cyclic voltammetry of the (CF-PGMA-Cy)-supported copper ions indicated true electrochemical stripping of Cu(II) with detection of as low as 2 pmol of adsorbed Cu-0. CF-PGMA-Cy fibres are thus efficient and reusable adsorbents that hold promises for the design of electrochemical sensors of metal ions. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbons, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous-Solution, Atom Transfer Radical Polymerization, Capacity, Carbon, Cations, Chemistry, Copper, Cu(II), Design, Fiber, Grafted, Heavy-Metal Ions, In Situ, Ions, Kinetics, Metal, Metal Ions, Model, pH, Polymerization, Preconcentration, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Reduction, Removal, Rights, Salt, Stripping, Surfaces, Voltammetry

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Full Text: [2010\Carbon48, 3330.pdf](2010/Carbon48,%203330.pdf)

Abstract: Tubular structured ordered mesoporous carbon CMK-5 was investigated for the adsorption of the industrial dyes reactive blue 19, acid red 57 and fuchsin basic in aqueous solutions at room temperature. It was found that CMK-5 exhibits an ultrahigh adsorption rate and superior adsorption capacities for these dyes. Its maximum adsorption capacities for reactive blue 19, acid red 57 and fuchsin basic were 733, 1131 and 1403 mg g-1, respectively, and significantly greater than other literature reported results on porous carbons. Following adsorption of reactive blue 19, CMK-5 carbon could be regenerated by either ethanol extraction or thermal annealing at 600 degrees C, reaching similar to 51% and similar to 77%, respectively of the adsorption capacity of the original carbon. For comparison, ordered mesoporous carbon CMK-3 (rod structure), polymer based disordered mesoporous carbon, and steam and CO2 activated commercial coconut carbons were investigated for the adsorption of reactive blue 19. The fast adsorption rate of CMK-5 carbon is due to its unique properties of tubular mesostructure, bimodal mesopore system and high surface area. In the case of requiring emergency removal of large amount of dyes in aqueous solution, CMK-5 would be an ideal choice. (C) 2010 Published by Elsevier Ltd.

Keywords: Activated Carbon, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Characteristics, Adsorption Rate, Aqueous Solution, Aqueous Solutions, Basic Dye, Capacity, Carbon, Choice, CMK-3, CO2, Comparison, Congo-Red, Dyes, Emergency, Ethanol, Extraction, Fly-Ash, Leaf Powder, Literature, Low-Cost Adsorbents, Mesopore, Mesoporous, Mesoporous Carbon, Ordered Mesoporous Carbon, Polymer, Reactive Blue 19, Reactive Dyes, Removal, Removal of Dyes, Room Temperature, Solution, Solutions, Sorbent, Structure, Surface, Surface Area, Temperature, Textile Effluent, Waste-Water

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Full Text: [1990\Carcinogenesis11, 1271.pdf](1990/Carcinogenesis11,%201271.pdf)

Abstract: Considerable recent attention has focused on the quantitative analysis of enzyme-altered foci in rodent hepatocarcinogenesis experiments. These foci are believed to represent clones of premalignant cells. A method is presented for the quantitative analysis of these foci that takes into account both the total number of focal transections observed in each liver cross-section and the size distribution of these transections. The method, which has a natural interpretation within the framework of a two-mutation model for carcinogenesis, yields estimates of rates of initiation and of growth rates of enzyme-altered foci as functions of dose of the agent under consideration. Definitions of initiation and promotion potencies are proposed. The method is illustrated by application to an experiment in which rats were administered N-nitrosomorpholine at various concentrations in their drinking water.

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Full Text: [1992\Carcinogenesis13, 1941.pdf](1992/Carcinogenesis13,%201941.pdf)

Abstract: Manganese superoxide dismutase (Mn-SOD) is strongly expressed in human ovarian cancer, and the serum level of the enzyme is a useful marker for the diagnosis and monitoring of human ovarian cancer. In the present study we found that Mn-SOD was highly expressed in primary and transplanted ovarian cancers in rats induced by 7, 12-dimethylbenz[a]anthracene (DMBA), as judged by enzyme-linked immunosorbent assay as well as by Northern blot analysis. The serum levels of Mn-SOD in the tumor-bearing rats were also higher than those in control rats. The antibody strongly reacted with rat ovarian carcinoma tissues. These data suggest that DMBA-induced ovarian cancer in rats is a good experimental model for human ovarian cancer, and that Mn-SOD is also a good marker for disease in the animal model.

Keywords: Necrosis-Factor, Monoclonal-Antibody, Mn-Sod, Nucleotide, Carcinoma, Induction, Resistant, Invivo, Cells

Boesen, J.J.B., Dieteren, N., Bal, E., Lohman, P.H.M. and Simons, J.W.I.M. (1992), A possible factor in genetic instability of cancer cells: Stress-induced secreted proteins lead to decrease in replication fidelity. *Carcinogenesis*, **13** (12), 2407-2413.

Full Text: [1992\Carcinogenesis13, 2407.pdf](1992/Carcinogenesis13,%202407.pdf)

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Full Text: [1994\Carcinogenesis15, 2421.pdf](1994/Carcinogenesis15,%202421.pdf)

Abstract: We have previously shown that trivalent chromium can bind to purified DNA and form lesions capable of obstructing DNA replication in vitro. Trivalent chromium is not, however, carcinogenic to humans. Rather, it is the end product of the intracellular reduction of hexavalent chromium, which is carcinogenic. The process of chromium reduction yields several reactive intermediates which may also interact with DNA, perhaps producing different lesions than those generated when trivalent chromium binds DNA. The present study was undertaken to determine whether the treatment of DNA with hexavalent chromium in the presence of ascorbate (the intracellular reductant responsible for most in vivo chromium reduction), would also generate DNA lesions capable of obstructing replication. Using increasing chromium concentrations and a constant ascorbate:chromium ratio of 0.5:1 to generate biologically relevant adduct levels, a DNA polymerase arrest assay revealed that polymerase arresting lesions were formed and were indistinguishable from those generated by trivalent chromium, in that the most prominent arrests sites were one base upstream of guanine residues on the template strand. Measurement of the amount of chromium bound to template DNA in relation to the number of arrests demonstrated that only a subset (18.5%) of the chromium adducts were capable of causing polymerase arrest. Arrest assays performed with increasing ratios of ascorbate to chromium showed that high ratios (greater than or equal to 5:1) resulted in decreased polymerase arrests. DNA interstrand crosslinks in the arrest assay template were detected by renaturing agarose gel electrophoresis, and were shown to decrease markedly with increasing ascorbate to chromium ratios, whereas chromium binding levels remained unchanged. These results strongly implicate DNA interstrand crosslinks as the polymerase arresting lesion. The present study confirms and extends our previous study with trivalent chromium, and suggests that while the initial chemical nature of the DNA lesions formed by either trivalent chromium or reductive intermediates of hexavalent chromium may differ, their effect on DNA replication is the same.

Keywords: Lead Chromate Particles, Cultured-Mammalian-Cells, Protein Cross-Linking, Hexavalent Chromium, Principal Reductant, Calcium Chromate, Nucleic-Acids, Ascorbic-Acid, Rat Lung, Glutathione

? Zhitkovich, A., Voitkun, V. and Costa, M. (1995), Glutathione and free amino acids form stable complexes with DNA following exposure of intact mammalian cells to chromate. *Carcinogenesis*, **16** (4), 907-913.

Full Text: [1995\Carcinogenesis16, 907.pdf](1995/Carcinogenesis16,%20907.pdf)

Abstract: Exposure of cells to carcinogenic Cr(VI) compounds results in the formation of several types of DNA lesions such as strand breaks, DNA-protein crosslinks and uncharacterized DNA-Cr adducts. Hexavalent chromium compounds are positive in most bacterial and eukaryotic mutagenic systems, although the nature of DNA modifications underlying the chromium-induced mutagenesis is not known. Hexavalent chromate(VI) is very active in cellular systems because it is actively transported into cells, but intracellularly it is ultimately reduced to Cr(III). Here we show that exposure of Chinese hamster ovary (CHO) cells to potassium chromate(VI) leads to the formation of stable complexes between DNA and amino acids or glutathione. Cysteine, glutamic acid and histidine were the major amino acids crosslinked to DNA in chromate-treated cells. Incubation of purified DNA in the presence of EDTA dissociated SDS stable amino acid-DNA complexes, which indicates that these DNA adducts are most likely to represent ternary coordination complexes mediated by Cr(III) rather than covalent linkage between amino acids/glutathione and DNA. The amino acids that were found complexed with DNA purified from chromate-exposed cells did not orginate from previously crosslinked proteins during DNA isolation, but represented authentic reactions of free amino acids and glutathione with chromium and DNA in cells. Ternary complexes of glutathione or amino acids with Cr(III) and DNA were estimated to account for as much as 50% of DNA-bound chromium following exposure to less than or equal to 25 mu M chromate.

Keywords: Protein Cross-Links, Chromium(III) Complexes, Anchorage Independence, Hydrogen-Peroxide, Calcium Chromate, Binding-Sites, Invitro, Damage, Genotoxicity, Nucleotides

Stoner, G.D., Adams, C., Kresty, L.A., Amin, S.G., Desai, D., Hecht, S.S., Murphy, S.E. and Morse, M.A. (1998), Inhibition of N’-nitrosonornicotine-induced esophageal tumorigenesis by 3-phenylpropyl isothiocyanate. *Carcinogenesis*, **19** (12), 2139-2143.

Full Text: [C\Carcinogenesis19, 2139.pdf](C/Carcinogenesis19,%202139.pdf)

Abstract: The ability of dietary isothiocyanates to inhibit the esophageal metabolism of N’-nitrosonornicotine (NNN) was examined in F344 rats. Following feeding of benzyl isothiocyanate (BITC), phenethyl isothiocyanate (PEITC), 3-phenylpropyl isothiocyanate (PPITC), 4-phenylbutyl isothiocyanate (PBITC) or 6-phenylhexyl isothiocyanate for 2 weeks, rats were killed and the esophagi were incubated in vitro with [5-3H]NNN. While dietary BITC, PEITC and PBITC all decreased NNN metabolism, dietary PPITC had the greatest effect, yielding inhibition ranging from 55 to 91% of the control production of various NNN metabolites. To determine the chemopreventive efficacy of PPITC on NNN-induced esophageal tumorigenesis, rats were fed AIN-76A diets containing 0, 1.0 or 2.5 micromol/g PPITC and were given untreated drinking water or drinking water containing 5 p.p.m. NNN. After 87 weeks, the experiment was terminated and the esophageal tumors were counted. Rats that were given untreated drinking water developed no tumors. Rats that were given 5 p.p.m. NNN and unadulterated AIN-76A diet had an esophageal tumor incidence of 71% and a multiplicity of 1.57 tumors/animal. The two dietary concentrations of PPITC reduced the incidence and multiplicity of NNN-induced esophageal tumors by >95%. These results demonstrate the remarkable chemopreventive efficacy of PPITC in the NNN-induced esophageal tumor model.

Sekijima, M., Tsutsumi, T., Yoshida, T., Harada, T., Tashiro, F., Chen, G., Yu, S.Z. and Ueno, Y. (1999), Enhancement of glutathione S-transferase placental-form positive liver cell foci development by microcystin-LR in aflatoxin B-1-initiated rats. *Carcinogenesis*, **20** (1) 161-165.

Full Text: [C\Carcinogenesis20, 161.pdf](C/Carcinogenesis20,%20161.pdf)

Abstract: The objective of this study was to elucidate whether microcystin-LR (MC-LR), a hepatotoxic blue-green algal toxin in drinking water, is carcinogenic or possesses the ability to modulate aflatoxin B-1 (AFB(1))-induced hepatocarcinogenicity, In a medium-term liver bioassay, male Fischer 344 rats were given a single i.p. injection of diethylnitrosamine (DEN, 200 mg/kg) followed by an i.p. injection of MC-LR for 6 weeks after 2 weeks of DEN treatment. To study the synergism between AFB1 and M-CLR, DEN-treated rats were given an i.p. injection of AFB(1) (0.5 mg/kg) dissolved in dimethyl sulfoxide (DMSO) followed by MC-LR at 2 weeks after the treatment. In a separate experiment, the rats were first given AFB1 (0.5 mg/kg) and 2 weeks later an i.p. injection of 1 or 10 µg/kg of MC-LR twice a week for 6 weeks. Most rats were subjected to a two-thirds partial hepatectomy (PH) at week 3 and were killed under anesthesia at week 8. Liver sections were analyzed for glutathione S-transferase placental form (GST-P) expression, and subjected to histopathological examination for phenotypic alteration of hepatocellular foci. In rats that did not receive DEN, MC-LR did not cause a significant increase in the numbers of GST-p-positive foci, whereas AFB1 induced a slight increase in GST-p-positive foci development. In rats given DEN, MC-LR enhanced the expression of GST-p-positive foci, as did AFB1 but no synergism was observed. Histopathological analysis revealed that the area of eosinophilic foci, a biomarker for preneoplastic liver lesion, markedly increased because of MC-LR, In rats given AFB1 as an initiator, treatment with MC-LR resulted in a synergistic increase in the development of GST-p-positive foci. These results suggest that the hepatocarcinogenicities of MC-LR and AFB1 can be predicted in experimental animals with a medium-term bioassay. Furthermore, tumor promoting activity of MC-LR was demonstrated in rats treated with AFB1.

Keywords: Immunoassay, Cancer, Water

Wu, A.H., Wan, P., Hankin, J., Tseng, C.C., Yu, M.C. and Pike, M.C. (2002), Adolescent and adult soy intake and risk of breast cancer in Asian-Americans. *Carcinogenesis*, **23** (9), 1491-1496.

Full Text: [C\Carcinogenesis23, 1491.pdf](C/Carcinogenesis23,%201491.pdf)

Abstract: The association between soyfood intake and breast cancer risk is controversial. Most of the epidemiologic studies published on this topic in the 1990s were not designed to specifically address this question. We conducted a population-based, case-control study of breast cancer among Chinese, Japanese and Filipino women in Los Angeles County to further investigate the role of soy. Our primary objective was to quantify breast cancer risks associated with intake of soy during adolescence and adult life among Asian-American women. During 1995-1998, we successfully interviewed 501 breast cancer patients and 594 control subjects. Intake of soy among Asian-Americans is still relatively high; the median intake was 12 mg isoflavones/day, approximately one-third of that reported in a recent study in Shanghai, China. The risk of breast cancer was significantly inversely associated with soy intake during adolescence and adult life. After adjusting for age, specific Asian ethnicity, education, migration history and menstrual and reproductive factors, women who reported soy intake at least once per week during adolescence showed a statistically significantly reduced risk of breast cancer. There was also a significant trend of decreasing risk with increasing soy intake during adult life. When we considered soy intake during both adolescence and adult life, subjects who were high-soy consumers during both time periods showed the lowest risk (OR=0.53, 95% CI=0.36-0.78) compared with those who were low consumers during both time periods. Risk of breast cancer was intermediate among subjects who were high-soy consumers during adolescence and low-soy consumers during adult life (OR=0.77, 95% CI=0.51-1.10). Based on a relatively small number of subjects, the risk did not appear to differ between those who were low consumers during adolescence and high consumers during adult life. Results remained similar after adjustment for other potential confounders including other dietary and non-dietary risk factors for breast cancer. These results show that high soy intake in childhood in Asian-Americans is associated with reduced breast cancer risk. Risk may be further reduced by intake as an adult.

Keywords: Estrogen-Receptor-Beta, Multiethnic Cohort, Menopausal Status, Mammary-Cancer, Los-Angeles, Genistein, Women, Diet, Premenopausal, Exposure

? Fahey, J.W., Stephenson, K.K., Dinkova-Kostova, A.T., Egner, P.A., Kensler, T.W. and Talalay, P. (2005), Chlorophyll, chlorophyllin and related tetrapyrroles are significant inducers of mammalian phase 2 cytoprotective genes. *Carcinogenesis*, **26** (7), 1247-1255.

Full Text: [2005\Carcinogenesis26, 1247.pdf](2005/Carcinogenesis26,%201247.pdf)

Abstract: Plant chlorophylls and carotenoids are highly colored, conjugated polyenes that play central roles in photosynthesis. Other porphyrins (tetrapyrroles), such as cytochromes, which are structurally related to chlorophyll, participate in redox reactions in many living systems. An unexpected new property of tetrapyrroles, including tetramethyl coproporphyrin III, tetrabenzoporphine, copper chlorin e4 ethyl ester, and of carotenoids including zeaxanthin and alpha-cryptoxanthin is their ability to induce mammalian phase 2 proteins that protect cells against oxidants and electrophiles. The capacity of these compounds to induce the phase 2 response depends upon their ability or that of their metabolites to react with thiol groups, a property shared with all other classes of phase 2 inducers, which show few other structural similarities. Pseudo second-order rate constants of these inducers are correlated with their potency in inducing the phase 2 enzyme NAD(P)H: quinone oxidoreductase 1 (NQO1) in murine hepatoma cells. One of the most potent inducers was isolated from chlorophyllin, a semisynthetic water-soluble chlorophyll derivative. Although chlorophyll itself is low in inducer potency, it may nevertheless account for some of the disease-protective effects attributed to diets rich in green vegetables because it occurs in much higher concentrations in those plants than the widely studied ‘phytochemicals’.

Keywords: Performance Liquid-Chromatography, Antioxidant Response Element, Quinone Reductase, Sulfhydryl-Groups, Enzymes, Induction, Cancer, Identification, Carotenoids, Protect

? Ugolini, D., Puntoni, R., Perera, F.P., Schulte, P.A. and Bonassi, S. (2007), A bibliometric analysis of scientific production in cancer molecular epidemiology. *Carcinogenesis*, **28** (8), 1774-1779.

Full Text: [2007\Carcinogenesis28, 1774.pdf](2007/Carcinogenesis28,%201774.pdf)

Abstract: Objectives: The main purpose of this research was to compare the scientific production in the field of cancer molecular epidemiology among countries and to evaluate the publication trend between 1995 and 2004. Methods: A bibliometric study was carried out searching the PUBMED database with a combined search strategy based on the keywords listed in the medical subject headings and a free text search. Only articles from a representative subset of 92 journals—accounting for 80% of papers identified—were selected for the analysis, and the resulting 13 240 abstracts were manually checked according to a list of basic inclusion criteria. The study evaluated the number of publications and the impact factor (mean and sum), absolute and normalized by country population and gross domestic product. Results: A total of 3842 citations were finally selected for the analysis. Thirty-seven percent came from the European Union (UK, Germany, Italy, France and Sweden ranking at the top), 31.6% from USA and 9.7% from Japan. The highest mean impact factor was reported for Canada (6.3), USA (5.9), Finland (5.8) and UK (5.2). Finland, Sweden and Israel had the best ratio between scientific production and available resources. ‘Genetic polymorphism, glutathione transferase, breast neoplasm, risk factors, case–control studies and polymerase chain reaction’ were the most used keywords in each of the subgroups evaluated, although inclusion criteria may have privileged studies dealing with exogenous carcinogens. Conclusion: Cancer molecular epidemiology is an expanding area attracting an increasing interest. The identification of an operative definition is a necessary condition to give to this discipline a unique scientific identity.

# Title: Cardiology

Full Journal Title: Cardiology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? [Anon]. (2010), Apparent non-cited overlap between two published articles by the same group of authors. *Cardiology*, **117** (3), 197.

Full Text: [2010\Cardiology117, 197.pdf](2010/Cardiology117,%20197.pdf)

# Title: Cardiovascular Diabetology

Full Journal Title: Cardiovascular Diabetology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liu, Y., Yang, Y.M., Zhu, J., Tan, H.Q., Liang, Y. and Li, J.D. (2011), Prognostic significance of hemoglobin A1c level in patients hospitalized with coronary artery disease. A systematic review and meta-analysis. *Cardiovascular Diabetology*, **10**, Article Number: 98.

Full Text: 2011\Car Dia10, 98.pdf

Abstract: Background: The prognostic value of hemoglobin A1c (HbA1c) in coronary artery disease (CAD) remains controversial. Herein, we conducted a systematic review to quantify the association between elevated HbA1c levels and all-cause mortality among patients hospitalized with CAD. Methods: A systematic search of electronic databases (PubMed, EMBASE, OVID, Web of Science, The Cochrane Library) for studies published from 1970 to May 2011 was performed. Cohort, case-control studies, and randomized controlled trials that examined the effect of HbA1c on all-cause mortality were included. Results: Twenty studies met final inclusion criteria (total n = 13, 224). From the pooled analyses, elevated HbA1c level was significantly associated with increased short-term (OR 2.32, 95% CI, 1.61 to 3.35) and long-term (OR 1.54, 95% CI, 1.23 to 1.94) mortality risk. Subgroup analyses suggested elevated HbA1c level predicted higher mortality risk in patients without diabetes (OR 1.84, 95% CI, 1.51 to 2.24). In contrast, in patients with diabetes, elevated HbA1c level was not associated with increased risk of mortality (OR 0.95, 95% CI, 0.70 to 1.28). In a risk-adjusted sensitivity analyses, elevated HbA1c was also associated with a significantly high risk of adjusted mortality in patients without diabetes (adjusted OR 1.49, 95% CI, 1.24 to 1.79), but had a borderline effect in patients with diabetes (adjusted OR 1.05, 95% CI, 1.00 to 1.11). Conclusions: Our findings demonstrate that elevated HbA1c level is an independent risk factor for mortality in CAD patients without diabetes, but not in patients with established diabetes. Prospective studies should further investigate whether glycemic control might improve outcomes in CAD patients without previously diagnosed diabetes.

Keywords: Acute Coronary Syndrome, Acute Myocardial-Infarction, Admission Glucose, Adverse Cardiac Events, Association, Bypass Surgery, Cardiovascular-Disease, Case-Control, Case-Control Studies, Cochrane, Control, Coronary Artery Disease, Databases, Diabetes, Diabetes-Mellitus, Disease, Embase, Glycated Hemoglobin, Glycosylated Hemoglobin, Hemoglobin A1c, Long-Term Mortality, Meta Analysis, Meta-Analysis, Methods, Mortality, Nondiabetic Patients, Outcomes, Patients, Prospective, Prospective Studies, Pubmed, Randomized Controlled Trials, Review, Risk, Risk Factor, Science, Sensitivity, Systematic, Systematic Review, Web Of Science

# Title: Cardiovascular Research

Full Journal Title: [Cardiovascular Research](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=00086363)

ISO Abbreviated Title: Cardiovasc. Res.

JCR Abbreviated Title: Cardiovasc Res

ISSN: 0008-6363

Issues/Year: 12

Journal Country/Territory: England

Language: English

Publisher: Elsevier Science BV

Publisher Address: Po Box 211, 1000 Ae Amsterdam, Netherlands

Subject Categories:

Cardiac & Cardiovascular Systems: Impact Factor

Opthof, T. (1997), Sense and nonsense about the impact factor. *Cardiovascular Research*, **33** (1), 1-7.

Full Text: [C\Car Res33, 1.pdf](C/Car%20Res33,%201.pdf)

Abstract: The impact factor is based on citations of papers published by a scientific journal. It has been published since 1961 by the Institute for Scientific Information. It may be regarded as an estimate of the citation rate of a journal’s papers, and the higher its value, the higher the scientific esteem of the journal. Although the impact factor was originally meant for comparison of journals, it is also used for assessment of the quality of individual papers, scientists and departments. For the latter a scientific basis is lacking, as we will demonstrate in this contribution.

Keywords: Impact Factor, Quality Assessment, Citation Analysis

? Opthof, T. and Coronel, R. (2000), The most frequently cited papers of *Cardiovascular Research* (1967-1998): ‘The Millennium Minutes’. *Cardiovascular Research*, **45** (1), 3-5.

Full Text: [2000\Car Res45, 3.pdf](2000/Car%20Res45,%203.pdf)

Keywords: Papers, Research

Coates, R., Sturgeon, B., Bohannan, J. and Pasini, E. (2002), Language and publication in *Cardiovascular Research* articles. *Cardiovascular Research*, **53** (1), 279-285.

Full Text: [C\Car Res53, 279.pdf](C/Car%20Res53,%20279.pdf)

Abstract: Background: The acceptance rate of non-mother English tongue authors is generally a lot lower than for native English tongue authors. Obviously the scientific quality of an article is the principal reason for publication. However, is editorial rejection *purely* on scientific grounds? English mother tongue writers publish *more* than non mother-tongue writers—so are editors discriminating linguistically? We therefore decided to survey language errors in manuscripts submitted for publication to *Cardiovascular Research* (CVR). Method: We surveyed language errors in 120 medical articles which had been submitted for publication in 1999 and 2000. The language ‘error’ categories were divided into three principal groups: grammatical, structural and lexical which were then further sub-divided into key areas. The articles were corrected without any knowledge of the author’s nationality or the corrections made by other language researchers. After an initial correction, a sample of the papers were cross-checked to verify reliability. Results: The control groups of US and UK authors had an almost identical acceptance rate and overall ‘error’ rate indicating that the language categories were objective categories also for the other nationalities. Although there was not a direct relationship between the acceptance rate and the amount of language errors, there was a clear indication that badly written articles correlated with a high rejection rate. The US/UK acceptance rate of 30.4% was higher than for all the other countries. The lowest acceptance rate of 9% (Italian) also had the highest error rate. Discussion: Many factors could influence the rejection of an article. However, we found clear indications that carelessly written articles could often have either a direct or subliminal influence on whether a paper was accepted or rejected. On equal scientific merit, a badly written article will have less chance of being accepted. This is even if the editor involved in rejecting a paper does not necessarily identify language problems as a motive for rejection. A more detailed look at the types and categories of language errors is needed. Furthermore we suggest the introduction of standardised guidelines in scientific writing. 2002 Elsevier Science B.V. All rights reserved.

# Title: Caries Research

Full Journal Title: Caries Research

ISO Abbreviated Title: Caries Res.

JCR Abbreviated Title: Caries Res

ISSN: 0008-6568

Issues/Year: 6

Journal Country/Territory: Switzerland

Language: English

Publisher: Karger

Publisher Address: Allschwilerstrasse 10, CH-4009 Basel, Switzerland

Subject Categories:

Dentistry, Oral Surgery & Medicine: Impact Factor 1.667, / (2001)

? Kato, K., Nakagaki, H., Robinson, C. and Weatherell, J.A. (1990), Distribution of fluoride across cementum, dentine and alveolar bone in rats. *Caries Research*, **24** (2), 117-120.

Abstract: This study was undertaken to determine the fluoride distribution in cementum and neighboring hard tissues of the rat after different levels of fluoride administration via the drinking water. Specimens of cementum with underlying dentine and adjacent bone were removed from the distal roots of the first lower molars. The fluoride distribution in each specimen was determined in samples removed sequentially using an abrasive microsampling technique. Fluoride concentrations were highest at or near the surface and decreased towards the interior of cementum, dentine and alveolar bone in both control and experimental groups. With increasing fluoride intake, concentrations increased throughout the tissue. The distribution patterns of fluoride in cementum of contralateral teeth from the same animal were similar. Fluoride concentrations in cementum were higher than those of dentine and alveolar bone.

? Vlachou, A., Drummond, B.K. and Curzon, M.E.J. (1992), Fluoride concentrations of infant foods and drinks in the united-kingdom. *Caries Research*, **26** (1), 29-32.

Abstract: Fluoride analyses of baby foods were carried out using a microdiffusion technique, which was found to be reproducible and accurate with less than 8% error. Analysis of 113 baby foods and drinks showed a wide range of fluoride concentrations: 0.01-0.31 mg F/kg for baby milk products; 0.04-0.72 mg F/kg for meat products; 0.04-0.70 mg F/kg for cereals; 0.03-0.48 mg F/kg for vegetable products; 0.03-0.07 mg F/kg for fruits; 0.02-0.28 mg F/kg for desserts, and 0.01-0.51 mg F/l for baby drinks. None of the baby foods and drinks contained fluoride of a sufficiently high concentration to be of concern or likely to contribute to enamel mottling, when used in the normal way.

Keywords: Fluoride, Infant Foods, Inorganic Fluoride, Dental Fluorosis, Dietary-Intake, Prevalence, States

? Kondo, K., Nakagaki, H., Kato, K., Narita, N., Ito, T., Kanayama, T. and Robinson, C. (1995), Fluoride distribution of rat molar cementum in relation to age and fluoride levels in the drinking water. *Caries Research*, **29** (3), 218-222.

Abstract: The present study was undertaken to determine the fluoride distribution profile in rat molar cementum with age in relation to fluoride in drinking water. Fifty-four female Wistar rats were used for the experiment. Before the experiment 6 rats were killed under chloroform anesthesia at 4 weeks of age as controls. The remaining 48 rats were divided into two groups: a control group given distilled water and the other group given water containing 100 ppm fluoride ad libitum. Six rats from each group were killed at the ages of 6, 12, 24, and 48 weeks. The fluoride distribution in the molar cementum was analyzed from the surface to the cementodentinal junction by abrasive microsampling. The fluoride concentrations in molar cementum from control rats on distilled water remained relatively constant until 24 weeks. A small increase then occurred between 24 and 48 weeks. The fluoride concentration in cementum from rats drinking water containing 100 ppm fluoride increased markedly with age, both in outer and inner regions of the molar cementum for all rats. On the other hand, the fluoride concentration in the cementum of older rats drinking water with 100 ppm fluoride was significantly higher in the outer than in the inner region of the cementum. It was concluded that the fluoride distribution in rat molar cementum may increase throughout life in relation to the fluoride level in the drinking water.

Rugg-Gunn, A.J., Al-Mohammadi, S.M. and Butler, T.J. (1997), Effects of fluoride level in drinking water, nutritional status, and socio-economic status on the prevalence of developmental defects of dental enamel in permanent teeth in Saudi 14-year-old boys. *Caries Research*, **31** (4), 259-267

Full Text: [C\Car Res31, 259.pdf](C/Car%20Res31,%20259.pdf)

Abstract: Fourteen-year-old boys from three regions of Saudi Arabia were surveyed in 1992/3. These regions were Jeddah (which receives desalinated water containing 0.22 mgF/l), Riyadh (receiving water containing 0.78 mgF/l) and Qassim (2.66 mgF/l). For each of these urban communities an adjacent rural community was selected; these received water with 0.25, 0.80, and 2.71 mg/l, respectively. Subjects from the urban communities were classified into high, medium and low socio-economic status based on area of residence, income and education level of parents. Nutritional status was calculated from height and age using WHO methods and expressed as height for age percentage of the median of the reference population (HAM); children with HAM scores of less than 95% were classed as malnourished. The developmental defects of enamel index was recorded on the buccal surface of all permanent teeth, by one examiner. Colour photographs of anterior teeth were read ‘blind’ to investigate examiner bias between regions-there was no bias. A total of 1, 539 children were examined who had been continuously resident in that community. Overall, 83% of subjects had one or more enamel defects with a mean number of teeth affected per person of 9.6. Diffuse defects were the most common. Multivariate analyses revealed that all three variables-region, nutritional status, socio-economic status-were statistically significantly related to the prevalence of defects and the number of teeth affected: prevalence was highest in the region with the highest water fluoride concentration, in rural areas and in malnourished subjects. Maxillary incisor teeth were the most affected teeth in all regions. The findings have implications for those in public health who determine optimum fluoride levels in drinking water in Saudi Arabia and beyond.

Ito, T., Nakagaki, H., Kato, K., Kondo, K., Isogai, A., Adachi, K., Negoro, M., Huang, A.B., Nguyen, T.T. and Robinson, C. (1997), The cessation of fluoridated water administration and the fluoride distribution profiles in rat molar cementum. *Caries Research*, **31** (5), 390-396.

Full Text: [C\Car Res31, 390.pdf](C/Car%20Res31,%20390.pdf)

Abstract: The aim of this work was to obtain further information about the origin of fluoride profiles in cementum. Fluoride was administered to rats at varying doses (0.50, 100 ppm F in drinking water) and for different durations (4, 13 and 25 weeks). Fluoride distribution across the full thickness of molar cementum in rats was measured by means of an abrasive micro-sampling technique. The average fluoride concentrations in cementum increased significantly with increasing dose and duration of fluoride administration. The relative reduction of the average fluoride concentrations after cessation of fluoride administration was 94.2-36.5% at 50 ppm F and 62.2-49.2% at 100 ppm F in the outer layers (1-60 microns) and 91.5-24.1% at 50 ppm F and 74.1-7.6% at 100 ppm F in the middle (61-120 microns) layers of the cementum, respectively. The reduction rates were more closely related to the time intervals following cessation rather than fluoride concentrations in drinking water or specificity within the cementum. Two factors which may influence this are new cementum formation after withdrawal of fluoride and some fluoride release from cementum surfaces when the fluoride supply stopped. It was concluded that the cessation of fluoride administration reduced the fluoride concentration on the outer layers of cementum differing from bone where reduction occurs across the entire thickness.

# Title: Casopís Lékařů Českých

Full Journal Title: [Casopis Lekaru Ceskych](http://www.clsjep.cz/nts/casop/lekari/lekari.asp)

ISO Abbreviated Title: Cas. Lek. Cesk.

JCR Abbreviated Title: Cas Lek Cesk

ISSN: 0008-7335

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Špála, M. (1994), Impact factor - Good servant, but a bad master [Impakt faktor - Dobrý sluha, ale špatný pán]. *Casopis Lekaru Ceskych*, **145** (1), 69-78.

Full Text: Cas Lek Ces145, 69.pdf

Abstract: Our paper presents an overview on the role of impact factor (IF) in the valuation of the scientific activity. With maximal objectivity based on published articles the perspectives are outlined and the role of specialized medical journals like Journal of Czech Physicians is shown. When IF is used for evaluation, the full English term should be first considered “journal impact factor”. It expresses the bibliometric features of the given journal, without possibility to transfer this assessment to individual articles or even authors. IF determined on the basis of information from citation indexes represents for an article presented in the journal the probability to be cited. It appears to be evident that this valuable parameter can lead in hands of inexperienced or irresponsible evaluator to incorrect and erroneous conclusions or to be misused. It is useful neither for evaluation of publication or scientific activity of an individual nor for the comparison of journals in different scientific disciplines. Owing to the relation of IF to the probability of an article to be cited, IF reflects the features (quality) of an article which brought the citation. IF is therefore determined also by the activity of scientific editors and referees. IF becomes part of everything what is related to the publication of scientific results and therefore it becomes object of journalogy. It is the source of meritorious intentions of the editorial board of Journal of Czech Physicians to deal with this phenomenon.

Keywords: Bibliometric Indicators, Citation Registers, E. Garfield, Evaluation of Publication Activity, Evaluation of the Research, Impact Factor

? Drbalek, J. (2000), Trends in publishing of Czech and Slovak medical literature. *Casopís Lékařů Českých*, **139** (18), 570-571.

Abstract: Czech and Slovak medical literature (articles in journals and proceedings, book reviews, monographs) is registered in the Bibliographia medica cechoslovaca basis generated by the National Medical Library, Prague. Quantitative trends in the publishing of this literature in the period 1978-1999 are outlined.

Keywords: Book Reviews, Journals, Literature, Medical, Medical Literature, Publishing, Reviews, Trends

# Title: Catalysis Communications

Full Journal Title: [Catalysis Communications](http://www.sciencedirect.com/science/journal/15667367)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kumar, K.V., Porkodi, K. and Rocha, F. (2008), Langmuir-Hinshelwood kinetics - A theoretical study. *Catalysis Communications*, **9** (1), 82-84.

Full Text: [2008\Cat Com9, 82.pdf](2008/Cat%20Com9,%2082.pdf)

Abstract: The present study reports that it is impossible and inappropriate to approximate the Langmuir-Hinshelwood kinetics to zero order kinetics. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Ag+ Doped TiO2, Aqueous-Solution, Blue, Heterogeneous Catalysis, Kinetics, Langmuir-Hinshelwood Kinetics, Methyl-Red-Dye, Nanoparticles, Oxalic-Acid, Photocatalytic Degradation, Theory, Zero Order Kinetics

# Title: Catalysis Letters

Full Journal Title: [Catalysis Letters](http://www.ingentaconnect.com/content/klu/catl)

ISO Abbreviated Title: Catal. Lett.

JCR Abbreviated Title: Catal Lett

ISSN: 1011-372X

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Journal Country/Territory: Netherlands

Language: English

Publisher: Baltzer Sci Publ BV

Publisher Address: PO Box 221, 1400 AE Bussum, Netherlands

Subject Categories:

Chemistry, Physical: Impact Factor 1.762, 30/91 (2000)

? Xu, X.P. and Goodman, D.W. (1994), The effect of particle-size on nitric-oxide decomposition and reaction with carbon-monoxide on palladium catalysts. *Catalysis Letters*, **24** (1-2), 31-35.

Full Text: [2004\Cat Let24, 31.pdf](2004/Cat%20Let24,%2031.pdf)

Abstract: The effect of palladium particle size on its catalytic activity was investigated by the decomposition of chemisorbed nitric oxide and the reaction of nitric oxide with carbon monoxide in flow conditions. Palladium particles (30-500 angstrom) were prepared on silica thin films (100 angstrom) which were supported on a Mo(110) surface. The reactivity of the supported palladium varied with the metal particle size. On large palladium particles, nitric oxide (NO) reacts to form nitrous oxide (N2O), dinitrogen (N2) and atomic oxygen during temperature-programmed reaction, whereas on small particles (< 50 angstrom), nitrous oxide is not formed. Similarly, reactions of NO with CO on large particles, in flow conditions produce N2O, N2 and CO2, whereas N2O is not produced on small particles. In addition, more extensive NO decomposition is observed on the smaller particles.

Keywords: NO Decomposition, CO, Palladium Particles, MO(110), Adsorption, Desorption, Pd(111)

McCarthy, T.J., Marques, C.M.P., Treviño, H. and Sachtler, W.M.H. (1997), Suppressed hydrogen chemisorption of zeolite encaged metal clusters: Discrimination between theoretical-models on the basis of Ru/NaY. *Catalysis Letters*, **43** (1), 11-18.

Full Text: [C\Cat Let43, 11.pdf](C/Cat%20Let43,%2011.pdf)

Abstract: The effects of thermal treatment and zeolite proton concentration on the chemical state and metal particle size of zeolite Y supported ruthenium (3.0 wt%) have been investigated using H2-TPR, H2-TPD, TPMS, FTIR, TEM and EXAFS. Heating in Ar of the precursor after ion exchange, [Ru (NH3)6]3+/NaY, up to 400℃leads to nearly 100% autoreduction of the ruthenium, as evidenced by H2-TPR and TPMS. Heating in O2 results in the formation of volatile ruthenium oxides. After autoreduction, the Ru clusters are extremely small, their coordination numbers, derived from EXAFS, are 0.6 for Ru/HY and 0.8 for Ru/NaY. Subsequent treatment at 500℃ in flowing H2 induces Ru agglomeration to particles which are about the size of the zeolite Y supercages, as indicated by TEM and EXAFS. The Ru-Ru distances are contracted compared to bulk Ru metal. Washing of autoreduced Ru/NaY with NaOH, thus removing the protons formed during autoreduction, results in Ru agglomeration to large particles (60-100 Angstrom). Comparison of the hydrogen adsorption of Ru clusters with similar sizes of 10-15 Angstrom reveals a marked interaction of the Ru clusters with zeolite protons. Increasing the H+/Ru ratio from 3 for Ru/NaY to 10 for Ru/HY, results ina suppression of hydrogen chemisorption per Ru atom by 75%. The conclusion that formation of metal-proton adducts affects the electronic structure of the Ru clusters, thus being one of the main causes of the lowering of the heat of hydrogen chemisorption, is supported by FTIR data of adsorbed CO. The most pronounced C-O vibration band in Ru/HY is located at 2099 cm-1; this band is absent in Ru/NaY. Significant blue-shifting of the IR bands is in conformity with electron-deficiency of the Ru clusters in Ru/HY. The results confirm that adsorptive properties of zeolite encaged metal clusters can be “tuned” by other ions sharing the same cavities.

Lilach, Y., Danziger, I.M. and Asscher, M. (2001), Second order isothermal desorption kinetics. *Catalysis Letters*, **76** (1-2), 35-39.

Full Text: [C\Cat Let76, 35.pdf](C/Cat%20Let76,%2035.pdf)

Abstract: A new method is presented to analyze recombinative desorption from surfaces in an isothermal mode. The activation energy for desorption obtained this way is accurate as long as it is coverage independent. Second order recombinative desorption experiments of N-15(2) and D-2 from Ru(001) were used to demonstrate this method. The activation energies were E-a(N2) = 48±2 kcal/mol and E-a(D-2) = 22±1 kcal/mol for coverages below 0.1 and 0.2 of saturation coverage, respectively. Studying N/Ru(001) provides evidence for bulk nitrogen atoms that slowly diffuse to the surface leading to isotope scrambling.

Keywords: Isothermal Desorption, Second Order Kinetics, Recombinative Desorption, Thermal-Desorption, Dissociative Chemisorption, Ru(001), Nitrogen, N2, Temperature, Adsorption, Surface

# Title: Catalysis Reviews-Science and Engineering

Full Journal Title: [Catalysis Reviews-Science and Engineering](http://www.informaworld.com/smpp/title~content=t713597232~db=all)

ISO Abbreviated Title: Catal. Rev.-Sci. Eng.

JCR Abbreviated Title: Catal Rev-Sci Eng

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bard, Y. and Lapidus, L. (1969), Kinetics analysis by digital parameter estimation. *Catalysis Reviews-Science and Engineering*, **2** (1), 67-112.

Full Text: [1960-80\Cat Rev-Sci Eng2, 67.pdf](1960-80/Cat%20Rev-Sci%20Eng2,%2067.pdf)

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Full Text: [1960-80\Cat Rev-Sci Eng4, 221.pdf](1960-80/Cat%20Rev-Sci%20Eng4,%20221.pdf)

Abstract: Electrocatalysis may be defined as the relative ability of different substances, when used as electrode surfaces under the same conditions, to accelerate the rate of a given electrochemical process.

? Verykios, X.E., Stein, F.P. and Coughlin, R.W. (1980), Oxidation of ethylene over silver: Adsorption, kinetics, catalyst. *Catalysis Reviews-Science and Engineering*, **22** (2), 197-234.

Full Text: [1960-80\Cat Rev-Sci Eng22, 197.pdf](1960-80/Cat%20Rev-Sci%20Eng22,%20197.pdf)

Abstract: Selective oxidation of ethylene to ethylene oxide over supported silver catalysts is not only one of the very few uses of that element as n catalyst of industrial importance, it also has been the basis for the manufacture of an important chemical intermediate that underlies the large glycol industry as well as the manufacture of a varied array of solvents and related chemical materials, The chemical reactions offer a classical example of selectivity for partial oxidation to ethylene oxide versus complete combustion to carbon dioxide and water.

# Title: Catalysis Today

Full Journal Title: [Catalysis Today](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5226&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=da6c0a1604ee971b7f98aaaf313a828d)

ISO Abbreviated Title: Catal. Today

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ISSN: 0920-5861

Issues/Year: 21

Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Science BV

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

Subject Categories:

Chemistry, Applied Chemistry: Impact Factor 1.993, 5/55 (2000); Impact Factor 2.146, / (2002)

Physical: Impact Factor 2.146, / (2002)

Engineering, Chemical: Impact Factor 1.732, 3/110 (1999); Impact Factor 1.933, 3/117 (2000); Impact Factor 2.333, 4/123 (2001); Impact Factor 2.146, 5/126 (2002)

Notes: highly cited

? Cavani, F., Trifirò, F. and Vaccari, A. (1991), Hydrotalcite-type anionic clays: preparation, properties and applications. *Catalysis Today*, **11** (2), 173-301.

Full Text: [1991\Cat Tod11, 173.pdf](1991/Cat%20Tod11,%20173.pdf)

Keywords: Italy, Science

? Hu, Z.H. and Vansant, E.F. (1993), Adsorption of phenol and chlorophenols from aqueous-solution by modified Elutrilithes. *Catalysis Today*, **17** (1-2), 41-51.

Full Text: [1993\Cat Tod17, 41.pdf](1993/Cat%20Tod17,%2041.pdf)

Abstract: Modified elutrilithes were prepared by treating natural sample with calcium chloride or zinc chloride. Natural and treated products (Ca-Elut and Zn-Elut) were examined for their adsorptive properties towards phenol and several of its chlorinated congeners. The modified elutrilithes show, in contrary to the natural forms, a high adsorption capacity and high affinity for these organic compounds. The adsorption of the phenols from aqueous solution can be related to their hydrophobicities. Indeed the adsorption capacities and affinities can be related to the number of chlorine atoms on the phenol structure, phenol < chlorophenol < dichlorophenol < trichlorophenol. Hence, the adsorption capacity was not limited by the molecular size of the adsorbate. For the Zn-Elut adsorbent, the adsorption of phenols increases with increasing the pH of the aqueous solution. Maximal adsorption was observed at a pH close to the pK(a) of the adsorbate, and decreases sharply at larger pH values. The temperature, however, has a small influence on the phenols adsorption on Zn-Elut. In general, the adsorption of phenols increases with decreasing temperature. The strong bond between the phenols and the modified elutrilithes causes the high affinity (type-I adsorption isotherm according to the Langmuir model, indicating.a homogeneity of the adsorption sites on modified elutrilithes). Furthermore, the adsorption-desorption experiments demonstrated that the 3,5-dichlorophenol adsorption on Zn-Elut was a irreversible process. Between the two modified elutrilithes investigated, Zn-Elut exhibited larger adsorption capacities for phenols and was superior to modified clay materials.

Keywords: Adsorption, Adsorption Isotherm, Calcium, Capacity, Chloride, Chlorine, Clay, Hydrophobic Compounds, Isotherm, Materials, Model, Natural, Organic, Organic Compounds, pH, pH Values, Phenol, Polychlorinated Biphenyl, Products, Properties, Sediments, Sites, Soils, Sorption, Structure, Suspended-Solids, Temperature, Zinc

Vigneron, S., Deprelle, P. and Hermia, J. (1996), Comparison of precious metals and base metal oxides for catalytic deep oxidation of volatile organic compounds from coating plants: Test results on an industrial pilot scale incinerator. *Catalysis Today*, **27** (1-2), 229-236.

Full Text: [C\Cat Tod27, 229.pdf](C/Cat%20Tod27,%20229.pdf)

Abstract: For the coating application case, base metal oxides catalysts (Cu/Cr, Cu/W or Cu/Mn) are not more resistant to poisoning than PGM catalysts, the best results being obtained for a Pt/Pd (1: 5) catalyst formulation. Furthermore, the cleaning of aged PGM catalyst is easy and efficient whereas their degree of compactiveness is very high.

Keywords: Volatile Organic Compounds, Oxidation, Industrial Pilot Scale Incinerator, Metal Oxides

Notes: highly cited

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Full Text: [1997\Cat Tod37, 153.pdf](1997/Cat%20Tod37,%20153.pdf)

Abstract: The adsorption properties and reactivities of gold are summarized in terms of their size dependency from bulk to fine particles, clusters and atoms. The catalytic performances of gold markedly depend on dispersion, supports, and preparation methods. When gold is deposited on select metal oxides as hemispherical ultra-fine particles with diameters smaller than 5 nn, it exhibits surprisingly high activities and/or selectivities in the combustion of CO and saturated hydrocarbons, the oxidation-decomposition of amines and organic halogenated compounds, the partial oxidation of hydrocarbons, the hydrogenation of carbon oxides, unsaturated carbonyl compounds, alkynes and alkadienes, and the reduction of nitrogen oxides. The unique catalytic nature of supported gold can be explained by assuming that the gold-metal oxide perimeter interface acts as a site for activating at least one of the reactants, for example, oxygen. Some examples and future prospects in applications are also briefly described.

Keywords: Adsorption, Adsorption Properties, Applications, Carbon, Carbon-Monoxide Oxidation, Catalysis, Combustion, Dispersion, Electron Spectroscopic Characterization, Gold Catalysts, Hydrogen-Production, Hydrogenation, Loaded Tungsten-Oxide, Metal, Nitrogen, Organic-Compounds, Oxide Composite Catalysts, Oxygen-Adsorption, Particles, Performance-Characteristics, Preparation, Temperature Co Oxidation

Blaser, H.U., Jalett, H.P., Müller, M. and Studer, M. (1997), Enantioselective hydrogenation of α-ketoesters using cinchona modified platinum catalysts and related systems: A review. *Catalysis Today*, **37** (4), 441-463.

Full Text: [C\Cat Tod37, 441.pdf](C/Cat%20Tod37,%20441.pdf)

Abstract: The state of the art for the heterogeneous enantioselective hydrogenation of α-ketoesters using cinchona modified Pt catalysts and related systems is reviewed. The effect of the following elements of the catalytic system are well known: *Catalyst.* Supported Pt catalysts with relatively low dispersion (particle diameter >2 nm) are preferred for the hydrogenation of α-ketoacid derivatives, Pd catalysts for functionalized olefins. Most support materials are suitable. *Substrate.* The reacting function is preferentially a ketone or a C=C bond, a carbonyl group in a-position is necessary for good optical yields. *Modifier.* The minimal requirements for an efficient modifier for the hydrogenation of α-ketoesters is the presence of a basic nitrogen atom close to one or more stereogenic centers and connected to an extended aromatic system (preferentially quinolyl or naphthyl). The presence of an alcohol or ether in β-position to the basic nitrogen often gives better enantioselectivities. *Solvent.* Solvents with adielectric constant between 2 and 10 give best selectivities for a-ketoesters with best e.e.’s in acetic acid. For the hydrogenation of substrates with a free acid function aqueous polar solvents are preferred. The highest optical yields for the different substrate types: 95% e.e. for α-ketoesters, 85% for a-ketoacids and 70% for α,)-unsaturated acids. Practical problems for the use of the catalytic system are low e.e.’s at the start of the reaction, the instability of the modifier and some side reactions as well as the purity of the ethyl pyruvate. Mechanistic investigations have established interactions between substrate and modifier in solution and adsorption of the ethyl pyruvate and cinchonidine on the catalyst. The dependence of rate and e.e. on catalyst, cinchonidine, ethyl pyruvate and hydrogen concentration has been established for ethyl pyruvate hydrogenation using Pt/Al2O3-cinchona. A Langmuir-Hinshelwood scheme is well suited for explaining the observed kinetic results. Based on the kinetic results, the effect of modifier and substrate structure, and molecular modeling studies, the following mechanistic model has been developed: On the unmodified catalyst, the a-ketoester and hydrogen are reversibly adsorbed and the addition of the first hydrogen atom is rate determining. A modified active site is formed by adsorption of one cinchona molecule. It is postulated that a protonated adsorbed modifier interacts with the α-ketoester and forms a stabilized half hydrogenated intermediate. The rate determining step for the preferred enantiomer is the addition of the second hydrogen. The rate acceleration and the enantiodiscrimination is therefore due to the preferential stabilization of one of the two diastereomeric intermediates. Alternative mechanisms are discussed but considered to be less satisfying.

Keywords: α-Ketoester Hydrogenation, Heterogenous Enantioselective Hydrogenation, Platinum-Cinchona Catalyst, Kinetics, Review

Notes: highly cited

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Full Text: [1998\Cat Tod46, 233.pdf](1998/Cat%20Tod46,%20233.pdf)

Abstract: The aim of this paper is to review the catalytic reactions for the removal of NO and, more particularly, to discuss the reduction of NO in the presence of NH3, CO, H-2 or hydrocarbons as well as the decomposition of NO. The nature of the different active species, their formation due to dispersion and their interaction with different supports as well as the corresponding correlations with catalytic performance are also discussed. Another goal of this review is to explain the mechanism and kinetics of these reactions on different surfaces as well as the catalyst stability. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: Removal of No, Decomposition of No, Mechanism and Kinetics, Ion-Exchanged ZSM-5, Vanadia-Titania Catalysts, Nitric-Oxide Reduction, Noble-Metal Catalysts, Temperature-Programmed Desorption, Supported Rhodium Catalysts, Amorphous Chromia Catalysts, Diffuse-Reflectance FTIR, X-Ray-Absorption, Y-Type Zeolites

Notes: highly cited

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Full Text: [1999\Cat Tod50, 285.pdf](1999/Cat%20Tod50,%20285.pdf)

Abstract: In the present paper the use of CeO2-based materials in the automotive three-way catalysts (TWCs) is considered. The multiple roles of CeO2 as a TWC promoter and in particular the oxygen storage/release capacity (OSC) are critically discussed. Attention is focused on the advanced OSC materials containing ZrO2, which are employed in the last generation of catalytic automotive converters. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Three-Way Catalysts, CeO2, ZrO2, Oxygen Storage Capacity (OSC), CeO2-ZrO2 Solid-Solutions, Oxygen Storage Capacity, Metastable Tetragonal ZrO2, Ce0.5Zr0.5O2 Mixed-Oxide, Alumina-Supported Ceria, Gel Derived Zirconia, Thermal-Stability, ZrO2-CeO2 System, Redox Behavior, Noble-Metals

Notes: highly cited

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Full Text: [1999\Cat Tod51, 113.pdf](1999/Cat%20Tod51,%20113.pdf)

Abstract: Three new kinds of Ni-based amorphous alloy catalysts, Raney type Ni-P(R-Ni-P), Ni-Co-B, and Ni-B(P)/SiO2, have been prepared by modification of either the rapid quenching method or chemical reduction. Their amorphous structures have been determined by XRD, EXAFS, and DSC. Their catalytic activities and selectivities have been measured during the hydrogenation of various organic compounds, which demonstrate the great improvement on the catalytic properties in comparison with the corresponding amorphous alloy catalysts prepared by the rapid quenching method or chemical reduction previously reported. These new amorphous catalysts also exhibit superior catalytic properties over the traditional catalysts, such as Raney Ni, Ni/SiO2, and Pd/C, making them possible to be used in real industrial catalysis, The relationship between the catalytic properties and the structural properties has been discussed according to various characterizations, including ICP, WS, EXAFS, XRD, TPD, TPR, hydrogen adsorption, LR, SEM, and TEM, etc. The higher hydrogenation activity of R-Ni-P than the Ni-P amorphous catalyst obtained by rapid quenching is mainly ascribed to the increase of the surface area due to the skeleton structure; the higher activity of Ni-Co-B than the Ni-B amorphous catalyst demonstrates a promoting effect of the additive metal(s); while the higher thermal stability of supported Ni-P(B) than the corresponding unsupported catalysts can be explained by considering the stabilizing effect of the silica support on the amorphous structure. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Hydrogenation, Skeletal Ni-P Amorphous Catalyst, Ni-Co-B Amorphous Catalyst, Supported Ni-P(B) Amorphous Catalyst, Formaldehyde Electro-Oxidation, Ray Photoelectron-Spectroscopy, Ni-B Alloys, Selective Hydrogenation, Metal-Alloys, Surface Characteristics, Structural Modification, Chemical-Reduction, Metastable States, Carbon-Monoxide

Notes: highly cited

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Full Text: [1999\Cat Tod53, 115.pdf](1999/Cat%20Tod53,%20115.pdf)

Abstract: Photocatalysis is based on the double aptitude of the photocatalyst (essentially titania) to simultaneously adsorb both reactants and to absorb efficient photons. The basic fundamental principles are described as well as the influence of the main parameters governing the kinetics (mass of catalyst, wavelength, initial concentration, temperature and radiant flux). Besides the selective mild oxidation of organics performed in gas or liquid organic phase, W-irradiated titania becomes a total oxidation catalyst once in water because of the photogeneration of OH. radicals by neutralization of OH- surface groups by positive photo-holes. A large variety of organics could be totally degraded and mineralized into CO2 and harmless inorganic anions, Any attempt of improving titania’s photoactivity by noble metal deposition or ion-doping was detrimental. In parallel, heavy toxic metal ions (Hg2+, Ag+, noble metals) can be removed from water by photodeposition on titania. Several water-detoxification photocatalytic devices have already been commercialized. Solar platforms are working with large-scale pilot photoreactors, in which are degraded pollutants with quantum yields comparable to those determined in the laboratory with artificial light. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: CO2, Cyanide, Degradation, Kinetics, Metal Ions, Metal Support Interaction, Oxidation, Photocatalysis, Photodegradation, Removal, Semiconductor Powders, Suspensions, TiO2 Particles, Titania, Water, Water-Treatment

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Full Text: [2000\Cat Tod55, 79.pdf](2000/Cat%20Tod55,%2079.pdf)

Abstract: Technologies for the nitrate removal from drinking water and waste water will be required in the near future and the catalytic nitrate reduction is one of the most promising ones. To establish a technical-scale nitrate reduction a further improvement of the catalyst is necessary and new concepts should be introduced in the process. It is shown, that palladium-tin and palladium-indium catalysts can be much more suited for an efficient nitrate reduction than palladium-copper catalysts. Furthermore, two new innovative concepts are presented - the use of in situ buffering formic acid as reductant instead of hydrogen and the application of PVAL-encapsulated catalysts with superior diffusional properties - which may contribute to solve selectivity problems. (C)2000 Elsevier Science B.V. All rights reserved.

Keywords: Catalyst, Cu Bimetallic Catalysts, Drinking Water, Drinking-Water, Encapsulation, Formic Acid, Formic-Acid, Hydrogenation Catalysts, Jet Cutting Method, Microscopic Catalysts, Nitrate Reduction, Nitrate Removal, Nitrite Removal, Palladium-Indium, Palladium-Tin, Selective Removal, Viscous Polymer-Solutions

Notes: highly cited

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Full Text: [2002\Cat Tod74, 157.pdf](2002/Cat%20Tod74,%20157.pdf)

Abstract: The use of room temperature ionic liquids as either solvents or catalysts has been the subject of considerable recent attention because of the prospects for “green” catalysis. This paper presents a review of the potential applications of these unique liquid materials in industrial catalysis. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Ionic Liquids, Catalysis, Synthesis, Temperature Molten-Salts, Diels-Alder Reactions, Friedel-Crafts Reactions, Nickel-Complexes, Asymmetric Hydrogenation, Allylation Reactions, Aromatic-Compounds, Coupling Reactions, Organic-Solvents, Carbon-Dioxide

Zhao, H., Xu, S.H., Zhong, J.B. and Bao, X.H. (2004), Kinetic study on the photo-catalytic degradation of pyridine in TiO2 suspension systems. *Catalysis Today*, **93-95**, 857-861.

Full Text: [C\Cat Tod93-95, 857.pdf](C/Cat%20Tod93-95,%20857.pdf)

Abstract: It has been generally agreed that pyridine can be effectively mineralized in aerated TiO2 slurries using near-UV irradiation. The knowledge on the kinetics of the system possesses both practical and theoretical values. The present study, on the base of Langmuir–Hinshewood mechanism, illustrates a pseudo first-order kinetic model of the degradation with the limiting rate constant of 3.004 mgl−1min−1 and equilibrium adsorption constant 2.763×10−2 l mg−1, respectively. The degradation efficiency in alkali is a little higher than that in acid with a minimum at about pH=5, which is explained by the formation of acid-pyridine in acidic surrounding together with the amphoteric nature of the TiO2 surface. The promotion of H2O2 on the photo-degradation lies in its supplying proper amount of .OH radicals for the inducement stage before surface redox reactions.

Keywords: TiO2, Pyridine, Kinetics, Photo-Degradation

? Szpyrkowicz, L., Radaelli, M. and Daniele, S. (2005), Electrocatalysis of chlorine evolution on different materials and its influence on the performance of an electrochemical reactor for indirect oxidation of pollutants. *Catalysis Today*, **100** (3-4), 425-429.

Full Text: [2005\Cat Tod100, 425.pdf](2005/Cat%20Tod100,%20425.pdf)

Abstract: Two different Ti/Pt-Ir materials (commercial and home made) and Ti/PdO + Co3O4 were investigated for their electrocatalytic properties versus Cl2 evolution reaction. The materials were used in a batch electrochemical reactor to treat biologically recalcitrant di-azo compound. An electrochemically driven oxidation, mediated by a Cl2/Cl- couple, proved efficient for destruction of this complex organic molecule, causing cleavage of the conjugated double bonds and destruction of unsatured bonds. Both Ti/Pt-Ir materials performed well; lower kinetics obtained with the Ti/PdO + Co3O4 anode was caused by adsorption of the model compound, evidenced in preliminary voltammetric measurements. The dye oxidation reaction followed the second order kinetics with partial orders in the model compound and (time varying) chlorine concentrations equal to one. Specific energy consumption of 3.12 kWh m-3 proved the process more economic than the homogeneous phase oxidation. (c) 2004 Elsevier B.V. All rights reserved.

Keywords: Electrocatalysis, Chlorine Evolution, Indirect Electro-Oxidation, Ectrochemical Reactor, Anode Material, Kinetics of Indirect Oxidation, Metal-Oxide Electrodes, Anodic-Oxidation

? Wang, Y., Qu, J.H., Liu, H.J. and Hu, C.Z. (2007), Adsorption and reduction of nitrate in water on hydrotalcite-supported Pd-Cu catalyst. *Catalysis Today*, **126** (3-4), 476-482.

Full Text: [2007\Cat Tod126, 476.pdf](2007/Cat%20Tod126,%20476.pdf)

Abstract: The hydrotalcite-supported Pd-Cu catalysts were successfully prepared by the impregnation or coprecipitation method, and their adsorption and catalytic reduction activity for nitrate in water were evaluated. The catalysts were characterized by X-ray diffraction (XRD) and surface area (BET) analysis. The results demonstrated that hydrotalcite-supported Pd-Cu catalysts could significantly adsorb nitrate ions, and then, effectively catalytically reduce them. The excellent adsorption ability for nitrate resulted from the regenerated layer structure of calcined hydrotalcite catalyst in nitrate aqueous solution. Nitrate was forced into the interlayer space and adsorbed on the external surface. The adsorption kinetics and the adsorption isotherm could be well described by pseudo-second-order model and the Langmuir model, respectively. The comparison of catalytic reduction with the adsorption for nitrate indicated that catalytic hydrogenation activity for nitrate increased with increasing adsorption capacity; nitrate reduction on hydrotalcite-supported Pd-Cu catalysts was a consecutive and dynamic adsorption and catalytic hydrogenation process. In addition, the catalyst obtained by coprecipitation method, with intact regeneration of hydrotalcite structure and a high dispersion of active metals, hold higher adsorption and catalytic activity than that prepared by co-impregnation method. (c) 2007 Elsevier B.V. All rights reseved.

Keywords: Activity, Adsorption, Adsorption Ability, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, Analysis, Aqueous Solution, BET, Calcined, Calcined Hydrotalcite, Capacity, Catalyst, Catalysts, Catalytic, Catalytic Activity, Catalytic Hydrogenation, Comparison, Coprecipitation, Denitrification, Dispersion, Drinking-Water, Dynamic, Dynamic Adsorption, Groundwater, Hydrogenation, Hydrotalcite, Impregnation, Interlayer, Isotherm, Kinetics, Langmuir, Langmuir Model, Layered Double Hydroxide, Metals, Method, Mg-Al, Model, Nitrate, Nitrate Reduction, Palladium, Pd-Cu, Process, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Reduction, Regeneration, Removal, Sorption, Structure, Surface, Surface Area, Water, X-Ray, X-Ray Diffraction, XRD

? Lin, K.S., Chowdhury, S., Yeh, H.P., Hong, W.T. and Yeh, C.T. (2011), Preparation and characterization of CuO/ZnO-Al2O3 catalyst washcoats with CeO2 sols for autothermal reforming of methanol in a microreactor. *Catalysis Today*, **164** (1), 251-256.

Full Text: [2011\Cat Tod164, 251.pdf](2011/Cat%20Tod164,%20251.pdf)

Abstract: Porous alumina support CuO/ZnO mixed with CeO(2) sols washcoat catalysts have been synthesized and characterized for the autothermal reforming of methanol in the present study. Experimentally, the BET N(2) adsorption for as-synthesized catalysts and catalyst mixtures with three different CeO(2) sols washcoats were 26, 31, 43, and 62 m(2) g(-1), respectively. In addition, porosity of the catalyst is decreased significantly after certain amount of higher loading of the binder as confirmed using FE-SEM and BET measurements. The intensities of XRD and XPS data indicate that catalyst content copper species strongly interact with CeO(2) to from Cu-O-Ce. The EPR spectrum may reveal that Cu species may be mainly interacted with Ceria. The EXAFS data reveals that the Cu species have a Cu-O bonding with a bond distance of 1.99 +/- 0.02 angstrom and coordination number is 3.24. Moreover, a hydrogen production rate of 2.16 L h(-1) was obtained and the corresponding methanol conversion was 95% at 240 degrees C using the CuO/ZnO with 2 wt.% CeO(2) sol washcoat catalysts. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alumina, Bonding, Catalysts, Ceria Sol, Characterization, Copper, Cu, Exafs, Fuel Cell, Fuel Processor, Hydrogen-Production, Microchannel, Microchannel Reactor, Preparation, Purification, Reforming, Selective Co Oxidation, Steam, System, Washcoat, Xanes, EXAFS, XPS, XRD

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Full Journal Title: Catena

ISO Abbreviated Title: Catena

JCR Abbreviated Title: Catena

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

Notes: highly cited

? Poesen, J., Nachtergaele, J., Verstraeten, G. and Valentin, C. (2003), Gully erosion and environmental change: Importance and research needs. *Catena*, **50** (2-4), 91-133.

Full Text: [2003\Catena50, 91.pdf](2003/Catena50,%2091.pdf)

Abstract: Assessing the impacts of climatic and, in particular, land use changes on rates of soil erosion by water is the objective of many national and international research projects. However, over the last decades, most research dealing with soil erosion by water has concentrated on sheet (interrill) and rill erosion processes operating at the (runoff) plot scale. Relatively few studies have been conducted on gully erosion operating at larger spatial scales.

Recent studies indicate that (1) gully erosion represents an important sediment source in a range of environments and (2) gullies are effective links for transferring runoff and sediment from uplands to valley bottoms and permanent channels where they aggravate off site effects of water erosion. In other words, once gullies develop, they increase the connectivity in the landscape. Many cases of damage (sediment and chemical) to watercourses and properties by runoff from agricultural land relate to (ephemeral) gullying. Consequently, there is a need for monitoring, experimental and modelling studies of gully erosion as a basis for predicting the effects of environmental change (climatic and land use changes) on gully erosion rates.

In this respect, various research questions can be identified. The most important ones are:

(1) What is the contribution of gully erosion to overall soil loss and sediment production at various temporal and spatial scales and under different climatic and land use conditions?

(2) What are appropriate measuring techniques for monitoring and experimental studies of the initiation and development of various gully types at various temporal and spatial scales?

(3) Can we identify critical thresholds for the initiation, development and infilling of gullies in different environments in terms of flow hydraulics, rain, topography, soils and land use?

(4) How does gully erosion interact with hydrological processes as well as with other soil degradation processes?

(5) What are appropriate models of gully erosion, capable of predicting (a) erosion rates at various temporal and spatial scales and (b) the impact of gully development on hydrology, sediment yield and landscape evolution?

(6) What are efficient gully prevention and gully control measures? What can be learned from failures and successes of gully erosion control programmes?

These questions need to be answered first if we want to improve our insights into the impacts of environmental change on gully erosion. This paper highlights some of these issues by reviewing recent examples taken from various environments. (C) 2003 Elsevier Science B.V. All rights reserved.

Keywords: Gully Erosion, Climate Change, Land Use Change, Sediment Yield, Techniques, Thresholds, Flow Hydraulies, Rainfall, Topography, Soils, Infiltration, Drainage, Models, Erosion Control, Connectivity, Concentrated-Flow Erosion, Digital Elevation Models, Extreme Rainfall Events, Loess-Derived Soils, Water Erosion, Mediterranean Environments, Threshold Conditions, Ephemeral Gullies, Southeast Spain, Cultivated Catchments

# Title: Catheterization and Cardiovascular Interventions

Full Journal Title: Catheterization and Cardiovascular Interventions

ISO Abbreviated Title: Catheter. Cardiovasc. Interv.

JCR Abbreviated Title: Catheter Cardio Inte

ISSN: 1522-1946

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Wiley-Liss

Publisher Address: Div John Wiley & Sons Inc, 605 Third Ave, New York, NY 10158-0012

Subject Categories:

Cardiac & Cardiovascular Systems: Impact Factor

? Patel, H.T., Cao, Q.L., Rhodes, J. and Hijazi, Z.M. (1999), Long-term outcome of transcatheter coil closure of small to large patent ductus arteriosus. *Catheterization and Cardiovascular Interventions*, **47** (4), 457-461.

Full Text: [1999\Cat Car Int47, 457.pdf](1999/Cat%20Car%20Int47,%20457.pdf)

Abstract: Coil closure of patent ductus arteriosus (PDA) has become an accepted alternative to surgical closure in most pediatric cardiac centers, However, little is known about the mid- to long-term outcome of this procedure, Therefore, we evaluated the immediate, short-, and long-term outcome of transcatheter coil closure (TCC) of PDA using single or multiple Gianturco coils or the Gianturco-Grifka Vascular Occlusive Device (GGVOD). One hundred forty-nine patients underwent an attempt at TCC of their PDAs at a median age of 2.4 years (2 weeks to 55 years) and median weight of 13.5 kg (2.3-87 kg). There were 33 patients < 1 year of age. The median PDA minimal diameter was 2 mm (0.4-7 mm) with 26 patients whose PDA minimal diameter was > 4 mm. A 4 Fr catheter was used for coil deployment in 136 patients, a 3 Fr in 4, and an 8 Fr in 4 patients who received the GGVOD, A single coil was used in 77 patients and multiple coils (2-6) were used in 66 patients, One hundred forty-six patients had successful closure (142 had immediate complete closure and 4 had residual shunt), 3 patients failed the initial attempt (2 underwent surgical ligation and 1 had a successful second attempt a year later), Of the four patients with residual shunt, three underwent a second procedure with implantation of 1-3 coils resulting in complete closure in all and one patient had spontaneous resolution of the residual shunt. Complications were encountered in nine patients: six had coil migration with successful retrieval in four; two had left pulmonary artery stenosis (2.4 kg and 6.3 kg infants), and one patient had loss of femoral arterial pulse. The median fluoroscopy time was 16 min (2-152 min). One hundred forty-two patients had the procedure as an outpatient, five patients stayed greater than 24 hr, and two of these patients were in hospital for 1 month for noncardiac reasons, At a median follow-up interval of 3.0 years (1 month to 5.1 years), there were no episodes of delayed coil migration, delayed recanalization, thromboembolic episodes, or bacterial endocarditis. Lung perfusion scans performed at a median follow-up interval of 1.6 years in 31 patients who received multiple coils revealed 45%±5% blood flow to the left lung. Long-term follow-up of coil closure of PDA indicates that the technique is safe and effective for most patients with PDA up to a diameter of 7 mm, Cathet. Cardiovasc. Intervent. 47: 457-461, 1999. (C) 1999 Wiley-Liss, Inc.

Keywords: Coil, Catheter Intervention, Transcatheter Closure, Multiple Gianturco Coils, Percutaneous Closure, Follow-Up, Occlusion, Delivery, Device, Single, Embolization, Immediate, Children

? Abdel-Latif, A., Mukherjee, D., Mesgarzadeh, P. and Ziada, K.M. (2010), Drug-eluting stents in patients with end-stage renal disease: Meta-analysis and systematic review of the literature. *Catheterization and Cardiovascular Interventions*, **76** (7), 942-948.

Full Text: [2010\Cat Car Int76, 942.pdf](2010/Cat%20Car%20Int76,%20942.pdf)

Abstract: Objective: The study sought to examine the total weight of evidence regarding the use of drug eluting (DES) and bare metal stents (BMS) in patients with end stage renal disease (ESRD). Background: The potential superiority of DES over BMS in reducing target lesion or vessel revascularization (TLR or TVR) in patients with ESRD on dialysis has not been established. Small studies comparing DES to BMS in this population have yielded inconclusive results mainly due to the small sample size. Methods: We searched MEDLINE, EMBASE, Science Citation Index, CINAHL, and the Cochrane CENTRAL database of controlled clinical trials (December 2009) for controlled trials comparing DES to BMS in ESRD patients. We conducted a fixed-effects meta-analysis across seven eligible studies (n = 869 patients). Results: Compared with BMS-treated patients, DES-treated patients had significantly lower TLR/TVR (OR 0.55 CI: 0.39-0.79) and major adverse cardiac events (MACE) (OR 0.54; CI: 0.40-0.73). The absolute risk reduction (ARR) with DES in TLR/TVR was -0.09 (CI: -0.14 to -0.04; NNT 11) and in MACE was -0.13 (CI: -0.19 to -0.07; NNT 8). A trend towards lower incidence of all cause mortality was also noted with DES (OR 0.68; CI: 0.45-1.01). No significant differences were noted between both groups in the relative or absolute risk of myocardial infarction. Conclusion: The use of DES in patients with ESRD is safe and yields significant reduction in the risk of TLR/TVR and MACE. Larger randomized studies are needed to confirm the results of this meta-analysis and establish the appropriate stent choice in this high risk population. (C) 2010 Wiley-Liss, Inc.

Keywords: Angiographic Outcomes, Artery-Bypass-Surgery, Bare Metal Stents, Bare Metal Stents, Chronic Kidney-Disease, Citation, Clinical-Outcomes, Database, Dialysis Patients, Drug Eluting Stents, Embase, End-Stage Renal Disease, Hemodialysis, Literature, Long-Term Survival, Medline, Meta-Analysis, Mortality, Myocardial Infarction, Myocardial-Infarction, Percutaneous Coronary Intervention, Population, Randomized Controlled-Trials, Reduction, Sample Size, Science, Science Citation Index, Stage, Trend, Weight

? Dasari, T.W., Hennebry, T.A., Hanna, E.B. and Saucedo, J.F. (2011), Drug eluting versus bare metal stents in cardiac allograft vasculopathy: A systematic review of literature. *Catheterization and Cardiovascular Interventions*, **77** (7), 962-969.

Full Text: 2011\Cat Car Int77, 962.pdf

Abstract: Background: Cardiac allograft vasculopathy (CAV) is a distinct pathological condition characterized by diffuse and progressive arteriopathy and it is an important determinant of long-term graft survival. Definitive CAV treatment is retransplantation but palliation with stenting might temporarily alleviate it. The benefit of drug eluting stents (DES) over bare metal stents (BMS) in the treatment of such lesions is debatable. We therefore sought to do a literature search to review the available evidence comparing DES to BMS. Methods: We conducted Pub Med, EMBASE, Cochrane database review, Web of Science search of studies comparing DES with BMS in CAV. Available studies were retrospective in nature with either direct comparison groups (n = 5) or historical controls (n = 1). The main outcomes analyzed were in stent restenosis (ISR) during follow-up and clinical outcomes. Results: A total of 312 patients from six studies were included in the review (1995-2007). Most commonly used DES were sirolimus eluting stent. DES appeared to reduce the long-term risk of ISR compared with BMS. Three of the five studies showed a statistically significant reduction in ISR at 12 months while the one study assessing ISR at 6 months showed no significant difference. Clinical endpoints such as death and major adverse cardiac events were not statistically different. Conclusion: DES appear to reduce the incidence of ISR in CAV as compared with BMS. Prospective randomized clinical trials are needed to determine the clinical benefit of DES beyond a reduction in ISR. (C) 2011 Wiley-Liss, Inc.

Keywords: Angioplasty, Bare Metal Stents, Cardiac Allograft Vasculopathy, Clinical Trials, Cochrane, Coronary-Artery-Disease, Drug, Drug Eluting Stents, EMBASE, Endpoints, Experience, Follow-Up, Heart-Transplant Recipients, Implantation, Interventions, Literature, Methods, Outcomes, PCI, Percutaneous Coronary Intervention, Pub Med, Randomized Clinical Trials, Rejection, Review, Risk, Science, Simvastatin, Sirolimus, Survival, Systematic, Systematic Review, Treatment, Web of Science

# Title: CDS Review

Full Journal Title: CDS Review

ISO Abbreviated Title: CDS Rev.

JCR Abbreviated Title: CDS Rev

ISSN: 0091-1666

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Flanders, R.A. (1995), Preventive dentistry in Illinois. *CDS Review*, **88** (9), 22-24.

Abstract: Success in preventive dentistry requires much more than community water fluoridation, dental sealants, fluoride supplements and dental health education. The scope of preventive dentistry should include oral cancer prevention, orofacial injury control, craniofacial anomalies, malocclusion, and the early detection of systemic disease with oral manifestations. The Division of Dental Health has developed preventive programs to address a majority of these health problems. The State of Illinois can be considered in the forefront of preventive dentistry. It has more than 85% of its population served by optimally fluoridated drinking water, 75,000 children participating in fluoride mouthrinse programs, established dental sealant programs and mouthguard programs, and the availability of innovative programs that address a wide variety of oral health concerns. These programs and others being conducted by the Illinois State Dental Society and in private dental offices are providing a significant improvement in the oral health status for all residents of Illinois.

# Title: Celestial Mechanics

Full Journal Title: Celestial Mechanics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0008-8714

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bond, V.R. (1982), Error propagation in the numerical solutions of the differential equations of orbital mechanics. *Celestial Mechanics*, **27** (1), 65-77.

Full Text: [1982\Cel Mec27, 65.pdf](1982/Cel%20Mec27,%2065.pdf)

Abstract. The relationship between the eigenvalues of the Iinearized differential equations of orbital mechanics and the stability characteristics of numerical methods is presented. It is shown that the Cowell, Encke, and Encke formulation with an independent variable related to the eccentric anomaly all have a real positive eigenvalue when linearized about the initial conditions. The real positive eigenvalue causes an amplification of the error of the solution when used in conjunction with a numerical integration method. In contrast an element formulation has zero eigenvalues and is numerically stable.

# Title: Cell

Full Journal Title: [Cell](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7051&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=546430ff14e2719edd38dd6998596bf9)

ISO Abbreviated Title: Cell

JCR Abbreviated Title: Cell

ISSN: 0092-8674

Issues/Year: 26

Journal Country/Territory: United States

Language: English

Publisher: Cell Press

Publisher Address: 1050 Massachusettes Ave, Circulation Dept, Cambridge, MA 02138

Subject Categories:

Biochemistry & Molecular Biology: Impact Factor 32.440, 2/310 (2000); Impact Factor 29.219, 2/308 (2001)

Cell Biology: Impact Factor 29.219, 1/147 (2001)

? Knutson, J.C. and Poland, A. (1982), Response of murine epidermis to 2,3,7,8-tetrachlorodibenzo-para-dioxin: Interaction of the AH and hr loci. *Cell*, **30** (1), 225-234.

Full Text: [C\Cell30, 225.pdf](C/Cell30,%20225.pdf)

Abstract: 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (TCDD) and related halogenated aromatic hydrocarbons produce epidermal hyperplasia, hyperkeratosis and sebaceous gland metaplasia in the skin of mice bearing the recessive mutation (*hr/hr*) hairless. This response is mediated through the cytosol receptor protein: the structure-activity relationship for receptor binding corresponds to that for production of the skin lesion, and these histopathological changes segregate with the genetic polymorphism at the *Ah* locus, the locus determining the cytosol receptor. In HRS/J mice, an inbred strain segregating for the *hr* locus, both hairless (*hr/hr*) and haired (*hr/* +) mice possess the high-affinity cytosol receptor and respond to TCDD with the induction of epidermal aryl hydrocarbon hydroxylase activity, a receptor-mediated biochemical response; however, only *hr/hr* mice develop the proliferative/metaplastic skin response. We propose a genetic model for the interaction of the *Ah* and *hr* loci, to account for the differential response to TCDD observed in the skin of HRS/*J hr/hr* and *hr/* + mice.

Notes: highly cited

? Yoshida, H., Matsui, T., Yamamoto, A., Okada, T. and Mori, K. (2001), XBP1 mRNA is induced by ATF6 and spliced by IRE1 in response to ER stress to produce a highly active transcription factor. *Cell*, **107** (7), 881-891.

Full Text: [2001\Cell107, 881.pdf](2001/Cell107,%20881.pdf)

Abstract: In yeast, the transmembrane protein kinase/endoribonuclease Ire1p activated by endoplasmic reticulum stress cleaves HAC1 mRNA, leading to production of the transcription factor Hac1p that activates the unfolded protein response (UPR). In mammals, no Hac1p counterpart has yet been discovered despite the presence of Ire1p homologs in the endoplasmic reticulum. Instead, the transcription factor ATF6 specific to the mammalian UPR is regulated by intramembrane proteolysis. Here, we identified the transcription factor XBP1, a target of ATF6, as a mammalian substrate of such an unconventional mRNA splicing system and showed that only the spliced form of XBP1 can activate the UPR efficiently. Our results reveal features of the UPR conserved during evolution and clarify the relationship between IRE1- and ATF6-dependent pathways.

# Title: Cell Biophysics

Full Journal Title: Cell Biophysics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Balla, M.I, Gandini, E. and Nicolini, C. (1989), Can bibliometric indicators assess science and technology? *Cell Biophysics*, **14** (1), 99-116.

# Title: Cell Cycle

Full Journal Title: Cell Cycle

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bartek, J. (2010), In their own words: Interviews with *Cell Cycle* Dr. Jiri Bartek on his highly cited paper published in *Cell Cycle*. *Cell Cycle*, **9** (11), 2063-2064

Full Text: Cell Cycle9, 2063.pdf

Keywords: Anticancer Barrier, ATM, Cancer, Checkpoint, DNA-Damage Response, Oncogene-Induced Senescence, Tumorigenesis

? Slack, F. (2009), An interview with Dr. Frank Slack on his highly cited paper published in Cell Cycle let-7 microRNA reduces tumor growth. *Cell Cycle*, **8** (12), 1823.

? Viglietto, G. (2009), Giuseppe Viglietto on his highly cited paper. *Cell Cycle*, **8** (18), 2869-2870.

# Title: Cell Death and Differentiation

Full Journal Title: Cell Death and Differentiation

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Garfield, E. and Melino, G. (1997), The growth of the cell death field: An analysis from the ISI Science citation index. *Cell Death and Differentiation*, **4** (5), 352-361.

Full Text: [1997\Cel Dea Dif4, 352.pdf](1997/Cel%20Dea%20Dif4,%20352.pdf)

Keywords: Activation, AIDS, Analysis, Antigen, Apoptosis, Caenorhabditis-Elegans, Citation, Death, Endonuclease, Field, Growth, Index, Induction, ISI, Lineages, Nematode, Thymocytes

? Garfield, E. and Melino, G. (1998), The growth of the cell death field: an analysis from the ISI Science Citation Index (vol 4, pg 352, 1997). *Cell Death and Differentiation*, **5** (1), 127.

Full Text: [1998\Cel Dea Dif5, 127.pdf](1998/Cel%20Dea%20Dif5,%20127.pdf)

Keywords: Analysis, Citation, Death, Field, Growth, ISI, Science Citation Index

# Title: Cell Growth & Differentiation

Title: Cell Growth & Differentiation: the Molecular Biology Journal of the American Association for Cancer Research

Full Journal Title: Cell Growth & Differentiation

ISO Abbreviated Title: Cell Growth Differ.

JCR Abbreviated Title: Cell Growth Differ

ISSN: 1044-9523

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Amer Assoc Cancer Research

Publisher Address: PO Box 11806, Birmingham, AL 35202

Subject Categories:

Biochemistry & Molecular Biology: Impact Factor 5.235, 49/310 (2000); Impact Factor 3.677, / (2001)

Cell Biology: Impact Factor 3.677, / (2001)

Mandal, M. and Kumar, R. (1996), BCL-2 expression regulates sodium butyrate-induced apoptosis inhuman MCF-7 breast cancer cells. *Cell Growth & Differentiation*, **7** (3), 311-318.

Abstract: Sodium butyrate (butyrate) is a potent growth inhibitor and differentiating agent for many cell types, including breast cancer cells. Programmed cell death, or apoptosis, is a physiological mechanism of cell death that is dependent on both preexisting proteins and De Novo protein synthesis. In the studies presented here, we investigated the role of apoptosis in the growth regulation of human MCF-7 breast cancer cells by sodium butyrate. We report that butyrate treatment of breast cancer MCF-7 cells causes a nonreversible growth inhibition by inducing apoptosis in a time-and dose-dependent manner. Treatment of MCF-7 cells for as little as 12 h with butyrate caused a 5.6-fold induction in apoptotic cell death, which continued to increase up to 27-fold by 48 h treatment. The butyrate-induced apoptosis in MCF-7 cells was closely linked with the down-regulation of expression of Bcl-2 mRNA and Bcl-2 protein, a gene product known to be involved in the regulation of apoptosis in mammalian cells. The observed relationship between the downregulation of Bcl-2 and induction of apoptosis was not causal because stable overexpression of Bcl-2 resulted in protection of MCF-7 cells from the cytotoxic morphological changes and growth-inhibitory effects of butyrate (15% growth inhibition compared to 60% growth inhibition in the parental cells). In addition, Bcl-2-overexpressing MCF-I cells exhibited a significant suppression in butyrate-induced stimulation of apoptosis (5-fold increase in apoptosis compared to 27-fold in parental MCF-7 cells). These findings demonstrate that the levels of Bcl-2 expression regulate the butyrate-induced apoptosis in breast cancer cells and that butyrate may potentially be useful in sensitizing the breast cancer cells to chemotherapy-induced apoptosis.

Keywords: Growth-Regulation, Anticancer Drugs, Carcinoma Cells, Death, Gene, Protein, Lymphoma, Derivatives, Modulation, Stress

# Title: Cell Stem Cell

Full Journal Title: Cell Stem Cell

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Levine, A.D. (2008), Identifying under- and overperforming countries in research related to human embryonic stem cells. *Cell Stem Cell*, **2**, 521-524.

Full Text: [2008\Cel Ste Cel2, 521.pdf](2008/Cel%20Ste%20Cel2,%20521.pdf)

? Bubela, T., Strotmann, A., Adams, R. and Morrison, S. (2010), Commercialization and collaboration: Competing policies in publicly funded stem cell research? *Cell Stem Cell*, **7** (1), 25-30.

Full Text: [2010\Cel Ste Cel7, 25.pdf](2010/Cel%20Ste%20Cel7,%2025.pdf)

Abstract: Advances in bibliometrics present new methods for analyzing emerging collaborative innovation models. These methods are illustrated by the Canadian Stem Cell Network, which fosters high-profile multidisciplinary, collaborative, international research. However, patenting negatively impacts collaboration patterns in published research. Policies directed at collaboration and commercialization may be in conflict, depending on the degree to which one activity is emphasized over the other.

Keywords: Bibliometrics, Patents, Research

# Title: Cell Transplantation

Full Journal Title: Cell Transplantation

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Agrawal, A., Gurusamy, K., Powis, S., Gray, D.W., Fuller, B. and Davidson, B.R. (2008), A meta-analysis of the impact of the two-layer method of preservation on human pancreatic islet transplantation. *Cell Transplantation*, **17** (12), 1315-1322.

Abstract: There are conflicting reports about the effectiveness of perfluorocarbons used in the two-layer method (TLM) of pancreas preservation for human islet transplantation. The mechanism of action is unclear and the optimal role of this method uncertain. The study design was a meta-analysis of the evidence that TLM improves islet isolation outcomes. PUBMED, CENTRAL, EMBASE, Science Citation Index. and BIOSIS were searched electronically in January 2008. After selecting the relevant human trials for meta-analysis data relating to donor variables, study design, primary and secondary islet isolation Outcomes were extracted. Electronic searches identified eight unique citations, describing I I human Studies that were eligible for the meta-analysis. When comparing TLM with preservation in University of Wisconsin (UW) Solution, there was a statistically significant higher islet yield [WMD 711.55, 95% confidence interval (CI) 140.03-1283.07] in the TLM group. The proportion of transplantable preparations obtained was not significantly different (OR 1.30, 95% CI 0.89-1.88) between the two groups. The rate of successful islet isolations for marginal organs was higher in the TLM group (OR 6.69, 95% CI 1.80-24.87). Improved oxygenation and preservation of cellular bioengertics is thought to be the main underlying mechanism, although no single mechanism has yet been confirmed. There is currently no clear evidence that the TLM is beneficial in human islet transplantation. It may improve the preservation of marginal organs.

Keywords: Apoptosis, Canine Pancreas, Citation, Citations, Clinical-Trials, Cold-Storage Method, Injury, Islet Transplantation, Meta-Analysis, Mitochondrial Pathway, of-Wisconsin Solution, Organ Preservation, Outcomes, Oxygenation, Pancreas, Perfluorocarbon, Perfluorocarbon, Transplantation, Two-Layer Method

# Title: Cellular and Molecular Life Sciences

Full Journal Title: [Cellular and Molecular Life Sciences](http://www.springerlink.com/content/101193/?p=ec724ef230964425a5c3bb2e697dd5a2&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1420-682X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Deuel, H. and Hostettler, F. (1950), Hundert jahre ionenaustausch. *Cellular and Molecular Life Sciences*, **6** (12), 445-456.

Full Text: [-1959\Cel Mol Lif Sci6, 445.pdf](-1959/Cel%20Mol%20Lif%20Sci6,%20445.pdf)

# Title: Cellulose

Full Journal Title: [Cellulose](http://www.kluweronline.com/issn/0969-0239/)

ISO Abbreviated Title: Cellulose

JCR Abbreviated Title: Cellulose

ISSN: 0969-0239

Issues/Year: 4

Journal Country/Territory: Netherlands

Language: English

Publisher: Kluwer Academic Publ

Publisher Address: Spuiboulevard 50, PO Box 17, 3300 AA Dordrecht, Netherlands

Subject Categories:

Materials Science, Paper & Wood: Impact Factor 0.705,

Materials Science, Textiles: Impact Factor 0.705,

Polymer Science: Impact Factor 0.705, 32/69 (2000)

Inglesby, M.K. and Zeronian, S.H. (1996), The accessibility of cellulose as determined by dye adsorption. *Cellulose*, **3** (3), 165-181.

Abstract: The accessibility of cotton cellulose was determined after it had been mercerized both in the slack and tension states, Mercerized samples were either dried or retained in the undried state before dyeing to determine their accessibilities by the adsorption of Direct Blue 1. Samples were characterized also by techniques such as moisture adsorption, water retention value (WRV) and X-ray analysis. It appeared that the crystallinity of cotton mercerized under tension was slightly increased during dyeing. Dye adsorption increased in the order nonmercerized <tension-mercerized <slack-mercerized. Products mercerized and not dried adsorbed more dye than counterparts given the same swelling treatment but dried after mercerization. The presence of dye in a sample mercerized and undried before dyeing did not affect its crystallinity. From both the dye adsorption and WRV data it was concluded that structural collapse of the fibre is greater for the slack-mercerized product than its tension-mercerized counterpart after it is dried. It was also concluded from dye adsorption and water adsorption data that about 34% of the internal surface of cotton and mercerized cotton, available for water adsorption, is inaccessible to Direct Blue 1.

Newman, R.H. (1997), Crystalline forms of cellulose in the silver tree fern *Cyathea dealbata*. *Cellulose*, **4** (4), 269-279.

Full Text: [C\Cellulose4, 269.pdf](C/Cellulose4,%20269.pdf)

Abstract: Solid-state C-13 NMR spectroscopy was used to characterize fibrous material cut from the midrib of a fern frond. Signals associated with cellulose crystallites were separated from those associated with the lignin-hemicellulosic matrix by exploiting differences in proton rotating-frame relaxation time constants. Heights of signals at 90.2 and 88.5 ppm, assigned to C-4 in cellulose I-alpha and I-beta, indicated similar proportions of the two crystalline forms. This observation conflicts with a suggestion that plant celluloses can be grouped into the two categories of 1(alpha)-rich and 1(beta)-rich.

Keywords: Nuclear Magnetic Resonance, Cellulose I-Alpha, Cellulose I-Beta, Fern, Nuclear-Magnetic-Resonance, State C-13 NMR, Native Celluloses, Cell-Walls, Wood, Transformation, Spectroscopy, Resolution, Components, Hardwoods

Saliba, R., Gauthier, H., Gauthier, R. and Petit-Ramel, M. (2002), The use of amidoximated cellulose for the removal of metal ions and dyes from waste waters. *Cellulose*, **9** (2), 183-191.

Full Text: [C\Cellulose9, 183.pdf](C/Cellulose9,%20183.pdf)

Abstract: The adsorption of metal ions such as Cu(II), Cr(III), Cd(II) and Ni(II) and dyes such as Acid Blue 25, Calmagite and Eriochrome Blue Black B is performed onto amidoximated cellulose (Am-Cell). Different ways are possible for the adsorption of these pollutants onto Am-Cell: adsorption of each pollutant alone on the support, or cumulative adsorption of both metal ions and dyes on the same support. In the last case, the pollutants may be adsorbed simultaneously from a unique solution, or successively from two different solutions, whatever the order. Am-Cell loaded or not with metal ions shows a high capacity for dye adsorption. Ternary complexes involving metal/dye/amidoxime are formed. The observed stoichiometries are 1/1/1 with Cu(II), Cr(III) and Cd(II) ions and 1/1/2 with Ni(II) ion. A quasi-total and specific desorption of either metal ions (by treatment with ethylenediaminetetracetic salt) or of dyes (by heating in aqueous solution) is possible from these ternary complexes. Concerning the dyes, many successive adsorption/desorption cycles are possible without a noticeable change in the adsorption capacity.

Keywords: Amidoxime, Cellulose, Depollution, Dyes, Heavy Metals, Sorption, Color Removal, Activated Carbon, Aqueous-Solutions, Reactive Dye, Fly-Ash, Adsorption, Sorption, Wastewaters, Chitin

? Liu, R.G., Yu, H. and Huang, Y. (2005), Structure and morphology of cellulose in wheat straw. *Cellulose*, **12** (1), 25-34.

Full Text: [2005\Cellulose12, 25.pdf](2005/Cellulose12,%2025.pdf)

Abstract: The structure and morphology of cellulose extracted from wheat were studied. It was found that the extraction process is effective and hemicelluloses and lignin can be extracted completely. Cellulose in wheat straw was identified as cellulose I allomorph with low crystallinity and the crystallinity of cellulose from different parts of the wheat straw has;little difference. There was no metastable cellulose Ialpha crystalline modification found in wheat straw; only the more stable cellulose I-beta crystalline modification existed. Cellulose chains in the epidermis of wheat straw were observed with their orientation along the growth direction of wheat straw, while those in parenchyma were observed with almost no preferred orientation. There are two kinds of morphologies on the surface of wheat straw. One is the fiber structure with fibrils of about 5 mum diameter, and the other is the fiber structure with serration morphology at the edge of the fiber, with which the fibers are connected together. The diameter of the latter one is about 10 mum. The vascular bundles consist of circular rings while spiral structure cellulose backbones covered with thin cellulose film were also observed.

Keywords: Cellulose, Crystallinity, Ftir, Orientation, Morphology, Wheat Straw, Native Cellulose, Electron-Diffraction, High-Temperatures, Nanocomposite Materials, Mechanical-Properties, Fiber Composites, Cell-Walls, C-13 NMR, Whiskers, Behavior

? Boufi, S. and Belgacem, M.N. (2006), Modified cellulose fibres for adsorption of dissolved organic solutes. *Cellulose*, **13** (1), 81-94.

Full Text: [2006\Cellulose13, 81.pdf](2006/Cellulose13,%2081.pdf)

Abstract: Cellulose fibres were grafted with aliphatic anhydrides having C6, C8, C12 and C16 chain length using a heterogeneous solvent exchange acylation procedure. The ensuing materials were fully characterised by FTIR, solid state C-13-NMR, Wide-angle X-ray scattering and contact angle measurements. These techniques showed that the chemical coupling has indeed occurred. The prepared modified fibres appeared to be efficient to trap different organic molecules dissolved in water. Recycling tests revealed that the saturated substrates could be regenerated tens of times without loosing their capacity of absorption of organic contaminants.

Keywords: Acylation, Adsorption, Modified Cellulose Fibres, Organic Solutes, Regeneration, Aqueous-Solution, Metal-Ions, Graft-Copolymers, Derivatives, Removal, Sorption, Acid, Esters

? Mao, Y.H., Guan, Y., Zheng, Q.K., Feng, X.N. and Wang, X.X. (2011), Adsorption thermodynamic and kinetic of disperse dye on cotton fiber modified with tolylene diisocyanate derivative. *Cellulose*, **18** (2), 271-279.

Full Text: [2011\Cellulose18, 271.pdf](2011/Cellulose18,%20271.pdf)

Abstract: Adsorption thermodynamic and kinetic study of disperse dye on cotton fiber modified with tolylene diisocyanate derivative was carried out under the condition of pH value 6.0±A 0.2, initial dye concentration 0.01-3.0 g/L and liquor ratio 2,000:1. The result showed the equilibrium adsorption isotherm of disperse dye on modified cotton fiber was Langmuir-Nernst mixed Model and the saturated adsorption capacity of the turning point was 7.1429 mg/g. The calculation of the thermodynamic parameters indicated that the Van der Waals’ forces played a major role between the disperse dye and the modified cotton fiber, and the adsorption of disperse dye on the modified cotton fiber was exothermic process. Compared with the diffusion coefficient and the activation energy of disperse dye on various fibers, the disperse dye diffusion in modified cotton fiber was more difficult than that in original cotton. Meanwhile, it was found that the adsorption kinetics of disperse dye on modified cotton fiber was well agreed with a pseudo second-order kinetic model.

Keywords: Adsorption, Adsorption Isotherm, Bridge Compound, Cellulose, Disperse Dye, Dye, Dyeability, Equilibrium, Kinetic, Kinetic Model, Kinetics, Linked Chitosan Beads, Modified Cotton Fabric, Part 1, pH, Reactive Dye, Sodium Benzoylthioglycollate, Thermodynamic

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Materials Science, Paper & Wood: Impact Factor

? Aoyama, M., Seki, K., Honma, S. and Kasai, A. (1993), Adsorption of heavy-metal ions by hardwood barks. *Cellulose Chemistry and Technology*, **27** (1), 39-46.

Abstract: Forty five species of hardwood barks were examined to evaluate their abilities to remove toxic heavy ions from aqueous solution. The barks considerably varied in the adsorption ability to each metal ion. Of the barks tested, high adsorption abilities for Cd2+, Cu2+ and Zn2+ were found in Fraxinus mandshutica var. japonica, Magnolia kobus var. borealis, Magnolia obovata, Morus bombycis, Populus maximowiczii, Populus sieboldii, Styrax japonica and tree species of walnut family (Juglandaceae). However, most of the barks were inefficient in removing of Ag+, Co2+, Mn2+ and Ni2+. Batch experiments using Cd(NO3)2 solutions and Populus maximowiczii bark indicated that the adsorption of heavy metal ion by bark adsorbent was markedly affected by the pH of solution and the initial concentration of heavy metal ion in the solution. Almost quantitative removal of Cd2+ from 1 mM Cd(NO3)2 solution was achieved by a column packed with Populus maximowiczii bark. Before the column broke through, the packing had retained 10.7 - 20.4 mg Cd2+ g adsorbent.

Keywords: Adsorbent, Adsorption, Bark, Binding, Heavy Metal, Heavy-Metal, Metal, Peanut Skins, pH, Removal, Uranium

? Zhan, H.Y. and Chen, J.X. (1994), Study on the mechanism of aspen explosion high-yield pulping. *Cellulose Chemistry and Technology*, **28** (3), 329-338.

Abstract: The mechanism of aspen explosion high yield pulping has been studied. In this study, chemical analysis, SEM-EDXA, GPC, IR, NMR and X-ray diffraction have been used to know the changes of fiber main components, sulfonation of lignin, topochemistry of delignification, functional groups of lignin, molecular weight and its distribution, as well as crystallinity of cellulose during explosion pulping.

Lebek, J. and Wardas, W. (1996), Adsorption of some textile dyes on post-vanillin lignin during its precipitation. *Cellulose Chemistry and Technology*, **30**, 213-221.

Abstract: The here investigated adsorption of some textile dyes on post-vanillin lignin (lignin V) was examined during precipitation of the lignin, Under these conditions, not only the investigated cationic dyes adsorbed, but also the reactive ones, of anionic character. The cationic dyes adsorbed in all cases better than the reactive ones. Depending on the type of dye and equilibrium concentration, the obtained excessive adsorption reached values even up to 1.4 g per 1 g of lignin V, what made adsorb even up to 99.6% of the amount introduced to a sample dye.

The determined adsorption isotherms were described with Langmuir’ and Freundlich’s equations with a close to 100% probability. Both in the case of the reactive dyes, which is obvious because of their anionic character and in the case of the cationic ones, the investigated adsorption process was of physical type.

? Kokorevics, A., Gravitis, J., Chirkova, E., Bikovens, O. and Druz, N. (1999), Sorption of chromium(III) and copper(II) ions on biodamaged wood and lignin. *Cellulose Chemistry and Technology*, **33** (3-4), 251-266.

Abstract: Sorption capacity was evaluated by batch experiments: approximately equal sorption capacities of Cu(II) and Cr(III) ions were observed for wood (1.8-3.2 mg, g and 1.5-3.2 mg, g, respectively) as well as for white and brown rot damaged wood (5.6-6.4 mg, g; 4.7-5.6 mg, g), while a higher Cu(II) ions sorption capacity, as compared to the Cr(III) ions sorption, was detected for wood digested by grub (3.0 mg, g, 1.0 mg, g), hydrolysis lignin (1.7 mg, g, 1.0 mg, g), and its modification - amino-lignin (26.4 mg, g, 11.5 mg, g). Based on water vapour sorption isothermals, it was established that metal ions sorption increased with the increase in the concentration of hydrophilic centres and decreased with the energy constant detected by the BET equation. Therefore, the material surface, chemical activity - the level of lignification of the accessible surface played an important role in the process of heavy metal sorption. The sorption of Cu(II) ions on rot damaged wood and aminolignin was also studied by a column experiment.

Keywords: Aminolignin, Binding, Biodamaged Wood, Chromium(III) Ions, Copper(II) Ions, Heavy Metal, Heavy-Metal, Heavy-Metal Ions, Lignin, Lignin Hydrolysis, Metal, Metal Ions, Metal Sorption, Modification, Preservatives, Sorption, Wood

? Suteu, D., Bilba, D. and Cristian, G. (1999), Removal of brilliant red HE-3B reactive dye using ion exchange celluloses. *Cellulose Chemistry and Technology*, **33** (5-6), 397-403.

Abstract: The ability of ion exchange celluloses to remove reactive dyes from aqueous solutions was investigated. The thermodynamic sorption of the Brilliant Red HE-3B reactive dye on ion exchange celluloses was studied using Langmuir isothermals equations at different temperatures. Other adsorption parameters studied were: initial dye concentration pH of the solution treatment time, temperature and type of celluloses. The results show that ion exchange celluloses exhibit better capacity for the reactive dye than some types of ion exchange resin do.

Keywords: Dye Reactive, Cellulose, Ion Exchange, Concentration, Adsorption and Removal

? Bjorkman, A. (2001), Lignin sulfonation: A different approach. *Cellulose Chemistry and Technology*, **35** (1-2), 113-133.

Abstract: The research on sulfite pulping has been characterized by the attempts to explain its chemistry. The. different approach presented is incited by perceptions about the (still) unsolved problem of the ultrastructural features of lignin in wood. A simple kinetic model has been chosen to describe the reaction order of lignin as “concentration” (weight) in the dissolution kinetics, the cooking liquor being used in substantial excess. Three states of lignin were used: in wood as sawdust (W), in milled. wood (MW) and as milled wood lignin (MWL). Cooks were performed at pH 1.5, and 6. (measured at room temperature). The lignin was also modified chemically in two ways: alkaline borohydride reduction and diazomethane methylation. The reaction order (with the kinetics used) was found to be about 2, 3, which is the value to be expected for particles of equal size reacting, at the particle surface. The cooks were carried onto completion, defined as the maximum amount of dissolved lignin. Depending on the state of lignin, apart dissolved more or less “immediately”. The kinetic results are presented in dissolution, time and Arrhenius diagrams. Some experiments were made to ensure that counterfeit results were evaded. It was found that lignin is very reactive, that is why the sulfonation chemistry alone does not necessarily determine its dissolution rate. It became evident that the ultrastructure dispersion of lignin in wood is beneficial for its dissolution. For W, the rate was much higher at pH 1.5 than at 6. MW lignin and MWL dissolved (after extraction of the “immediate” lignin) at higher rates than W lignin. For MWL, the rate difference between pH 1.5 and 6 was moderate, compared to W lignin. Borohydride reduction did not affect the lignin dissolution from W, but gave a large decrease of sulfonation rate for MWL. Methylation had also a small rate effect for W, but again a large decrease for MWL.

Keywords: Kinetics, Lignin, Lignin Modification, Sulfonation, Wood Ultrastructure

? Saliba, R., Gauthier, H., Gauthier, R. and Petit-Ramel, M. (2001), Amidoximated cellulose as scavenger for cadmium and nickel cations. *Cellulose Chemistry and Technology*, **35** (5-6), 435-449.

Abstract: The aim of the present work concerns the adsorption of Cd(II) and Ni(II) onto amidoximated cellulose from aqueous solution, as previously studied for other metals. Characterization of this modified cellulose is further performed using TGA, DSC and C-13 NMR. The rate of ions removal increases with pH, initial concentration of metal, contact time and temperature. The maximum adsorption capacities of Cd(II) and Ni(II) are 3.58, and respectively 1.8 mmol, per gram of adsorbent. The formation of 1/1 and 2/1 complexes with Cd(II) and respectively Ni(II) is proved by the adsorption limit values of these metal ions. The adsorbed metals are easily desorbed from the amidoxime cellulose by stirring with an ethylenediaminetetraacetic solution, and recycling of the support is tested in view of its potential use as a cation exchanger.

Keywords: Amidoximated Cellulose, Cadmium and Nickel Cations, TGA, DSC, C-13 NMR, Heavy-Metal Ions, Adsorption, Derivatives, Thermoplasticization, Copper(II), Wood

? Suteu, D., Nacu, A. and Cristian, G. (2001), Removal of methyl violet triphenyl methanic dye using ion exchange celluloses. *Cellulose Chemistry and Technology*, **35** (5-6), 451-457.

Abstract: The ability of ion exchange celluloses (cationites) to remove triphenyl methanic dyes from aqueous solutions was studied. The sorption parameters studied were: initial dye concentration, pH of the solution, contact time and temperature. The process of sorption was appreciated using Langmuir isotherms equations at different temperature, and the characteristic parameters. The results show that ion exchange celluloses exhibit higher capacity for the triphenyl methanic dye from waste waters.

Keywords: Triphenyl Methanic Dyes, Sorption, Cellulose, Isotherm, Parameters, Color, Effluents, Adsorption, Polymer, Waters, Acid

? Dulman, V., Cucu-Man, S. and Popa, V.I. (2002), Sorption of some textile dyes by oak wood sawdust. *Cellulose Chemistry and Technology*, **36** (5-6), 515-525.

Abstract: Adsorption of some textile dyes from aqueous solution by using an industrial waste lignocellulosic product was studied under various conditions. Out of the ten dyes tested, the sorbent shows preference for three: Direct Orange 8, Direct Brown 2 and Basic Blue 86. The parameters characterizing adsorption were determined on the basis of Langmuir and Freundlich isotherms. The following values of adsorption capacity were obtained: for Direct Orange 86.36 mg, g, for Direct Brown 29.3 mg, g and for Basic Blue 8633.47 mg, g. The Basic Blue dye, which is structurally different from the other ones, may be mainly adsorbed by the electrostatic attraction between the positively charged dye molecules and the negatively charged organic functional groups present on the surface of the sorbent

Keywords: Adsorption, Adsorption Isotherms, Dyes, Intraparticle Diffusion, Langmuir, Lignocellulosic, Oak Wood Sawdust, Removal, Sawdust, Waste, Wood

? Namasivayam, C., Yamuna, R.T. and Jayanthi, J. (2003), Removal of Methylene blue from wastewater by adsorption on cellulosic waste, orange peel. *Cellulose Chemistry and Technology*, **37** (3-4), 333-339.

Abstract: The ability of waste orange peel for the adsorptive removal of Methylene blue was investigated at different initial dye concentrations, agitation time, adsorbent dosage and pH. Adsorption equilibrium data obeyed the Freundlich isotherm model. Adsorption kinetics showed first-order rate expression by Lagergren. A maximum removal of 74% of the dye was observed at pH 10.4. Desorption studies showed that the adsorption was mainly due to ion exchange.

Keywords: Adsorbent, Adsorption, Basic-Dyes, Coirpith, Color, Degradation, Dye, Equilibrium, Ions, Methylene Blue, Orange Peel, Peel, pH Effect, Reactive Dyes, Silica, Wastewaters

? Asandei, D., Bulgariu, L. and Bobu, E. (2009), Lead(II) removal from aqueous solutions by adsorption onto chitosan. *Cellulose Chemistry and Technology*, **43** (4-6), 211-216.

Full Text: [2009\Cel Che Tec43, 211.pdf](2009/Cel%20Che%20Tec43,%20211.pdf)

Abstract: The adsorption behaviour of lead(II) ions from aqueous solutions onto chitosan was investigated. Adsorption experiments were performed in a batch system, at room temperature (20±0.5ºC) by changing the various experimental parameters initial solution pH, chitosan dosage, initial lead(II) concentration and contact time. The results have shown that the effectiveness of lead ions removal is mainly dependent on the initial concentration of lead ions to chitosan dosage ratio, which should be optimized by a compromise between the removal yiedl and cost-effectiveness of the process. The adsorption equilibrium data were analyzed by the Freundlich and Langmuir isotherm models, whose application for the mathematical description of lead(II) adsorption on chitosan indicated that the adsorption equilibrium is well-fitted to the Langmuir isotherm.

Keywords: Adsorbents, Adsorption, Adsorption Equilibrium, Application, Aqueous Solutions, Batch, Batch System, Behaviour, Biosorbents, Biosorption, Chitosan, Concentration, Cost Effectiveness, Cost-Effectiveness, Data, Effectiveness, Equilibrium, Experimental, Experiments, Freundlich, Heavy-Metals, Ions, Isotherm, Isotherms, Langmuir, Langmuir Isotherm, Lead, Lead(II), Lead(II), Models, Peat, pH, Removal, Removal Yield, Room Temperature, Solution, Solutions, Sorbents, Sorption, Temperature, Time, Waste-Water

? Suteu, D., Malutan, T. and Bilba, D. (2011), Agricultural waste corn cob as a sorbent for removing reactive dye Orange 16: Equilibrium and kinetic study. *Cellulose Chemistry and Technology*, **45** (5-6), 413-420.

Full Text: [2011\Cel Che Tec45, 413.pdf](2011/Cel%20Che%20Tec45,%20413.pdf)

Abstract: The potential of corn cob, a natural low-cost lignocellulosic material, was investigated for the removal of reactive dye Orange 16 from an aqueous solution. Sorption isotherms were determined at 3 temperatures (5, 18 and 45ºC), in solutions with initial dye concentrations in the 37.05-370.5 mg L-1 range. The equilibrium data were analyzed using Langmuir, Freundlich, Dubinin-Radushkevich and Tempkin isotherm models. The sorption equilibrium process was described well by the Langmuir isotherm model. According to the Langmuir isotherm, the maximum sorption capacity was estimated as 25.25 mg g-1 (18ºC). The values of the mean free energy determined with the Dubinin-Radushkevich equation (9.713 kJ mol-1 at 18ºC, as well as the thermodynamic parameters suggest that the mechanism of reactive dye sorption onto corn cob is a combination of electrostatic interactions and physical sorption. The kinetic data were studied in terms of pseudo-first and pseudo-second order kinetic models.

Keywords: Adsorption, Aqueous Medium, Aqueous-Solutions, Biosorption, Brilliant Red He-3b, Corn Cob, Dubinin-Radushkevich, Equilibrium, Freundlich, Husk, Ions, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Mechanism, Methylene-Blue, Reactive Dye Orange 16, Sorption, Sorption, Thermodynamic

# Title: Cement and Concrete Research

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Construction & Building Technology Materials Science: Impact Factor

Pera, J., Coutaz, L., Ambroise, J. and Chababbet, M. (1997), Use of incinerator bottom ash in concrete. *Cement and Concrete Research*, **27** (1), 1-5.

Full Text: [C\Cem Con Res27, 1.pdf](C/Cem%20Con%20Res27,%201.pdf)

Abstract: The aim of the present work was to show if municipal solid waste incinerator (MSWI) bottom ash could be an alternative aggregate for the production of building concrete presenting a characteristic 28-day compressive strength of 25 MPa.

The aggregates passing the 20-mm sieve and retained on the 4-mm sieve were considered for investigation. They showed lower density, higher water absorption, and lower strength than natural gravel. They could be considered as average quality aggregates for use in concrete.

When directly introduced in concrete, they led to swelling and cracking of specimens, due to the reaction between cement and metallic aluminium. Therefore, a treatment by sodium hydroxide was proposed to avoid such degradation, which made possible the partial replacement (up to 50%) of gravel in concrete without affecting the durability. Copyright (C) 1997 Elsevier Science Ltd.

Keywords: Bottom Ash, Aggregate, Aluminium, Concrete, Strength, Durability

Ranganath, R.V., Bhattacharjee, B. and Krishnamoorthy, S. (1998), Influence of size fraction of bonded ash on its pozzolanic activity. *Cement and Concrete Research*, **28** (5), 749-761.

Full Text: [C\Cem Con Res28, 749.pdf](C/Cem%20Con%20Res28,%20749.pdf)

Abstract: The paper examines the role of different size fractions of ponded ash, characterised in terms of their physical nature and chemical composition, on the lime.-reactivity strength of ash-lime-sand mortars. The paper also presents SEM and MIP characterisation of different size fractions. The results of the investigation show the strong influence of the fine particles on their physical properties and Lime-reactivity strength of mortars. Ponded ash contains both reactive, small particles and non-reactive or poorly reactive large particles, due to which it loses its overall pozzolanicity. Its use as a pozzolan in cement concrete will only be possible if the non-reactive large sized particles are separated from it. The paper concludes that the practice of wet disposal of fly ash adopted mostly in India is detrimental to the pozzolanic activity of the ash. (C) 1998 Elsevier Science Ltd.

Keywords: Fly

Yu, Q.J., Sawayama, K., Sugita, S., Shoya, M. and Isojima, Y. (1999), The reaction between rice husk ash and Ca(OH)2 solution and the nature of its product. *Cement and Concrete Research*, **29** (1), 37-43.

Full Text: [C\Cem Con Res29, 37.pdf](C/Cem%20Con%20Res29,%2037.pdf)

Abstract: In this study it was confirmed that, at temperatures around 40°C and in the presence of water, the amorphous silica contained in rice husk ash (RHA) can react with Ca(OH)2 to form one kind of C-S-H gel (Ca1.5SiO3.5. xH2O). The C-S-H gel looks like flocs in morphology, with a porous structure and large specific surface. The average particle diameter of the reaction product, ranging from 4.8 to 7.9 μm, varies slightly with the condition under which the reaction occurs. When the product is heated, it gradually loses the water that exists in it, but it maintains an amorphous form up to 750°C. Above 780°C it begins to transform to crystalline CaSiO3. One of the main reasons for the improvement of concrete properties upon addition of RHA possibly may be attributed to the formation of more C-S-H gel and less portlandite in concrete due to the reaction occurring between RHA and the Ca2+, OH- ions, or Ca(OH)2 in hydrating cement. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Rice Husk Ash, Ca(OH)2, Reaction, Calcium Silicate Hydrate, Pozzolan

Agyei, N.M., Strydom, C.A. and Potgieter, J.H. (2000), An investigation of phosphate ion adsorption from aqueous solution by fly ash and slag. *Cement and Concrete Research*, **30** (5), 823-826.

Full Text: [C\Cem Con Res30, 823.pdf](C/Cem%20Con%20Res30,%20823.pdf)

Abstract: The removal of phosphate ions from aqueous solution by fly ash and slag has been investigated. The chemical composition of each adsorbent has been determined by XRF and XRD, as well as some important physical characteristics such as BET surface area and mean particle size. The effect of contact time on the rate of PO43-removal has been studied, and slag was found to remove the solute faster than fly ash. The Frumkin isotherm was found to be the most appropriate equation for constructing adsorption isotherms from the experimental adsorption data. The values of the isotherm constants have been obtained. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Fly Ash, Slag, Adsorption, Frumkin Isotherm

Agyei, N.M., Strydom, C.A. and Potgieter, J.H. (2002), The removal of phosphate ions from aqueous solution by fly ash, slag, ordinary Portland cement and related blends. *Cement and Concrete Research*, **32** (12), 1889-1897.

Full Text: [C\Cem Con Res32, 1889.pdf](C/Cem%20Con%20Res32,%201889.pdf)

Abstract: Phosphate ions have been removed from aqueous solution by fly ash, slag, ordinary Portland cement (OPC) and related cement blends. The rate and efficiency of PO43- removal were found to increase in the order: fly ash, slag, OPC, apparently mimicking the order of increasing percent CaO in the adsorbents. Blending OPC with fly ash or slag evidently results in diminished PO43- removal efficiency. Better removal was obtained at higher solute concentration, acidic pH and higher temperature. The effect of particle size and the speed of mixing were found not to be significant. A first-order kinetic model was used to obtain values for overall sorption rate constants and intraparticle diffusion constants. The Frumkin isotherm was found to be the appropriate equation for modelling isotherms from the experimental adsorption data, and values have been obtained for the isotherm constants. A 400-mg/l PO43- (as P) solution was fed at a steady velocity of 2.0 cm/min through a 2.0-cm fixed-bed column (at pH 9.0 and 25 degreesC), and breakthrough curves were constructed to obtain estimated adsorption capacity values of 32, 60, 75, 78 and 83 mg PO43- adsorbent for fly ash, slag, OPC + fly ash, OPC + slag and OPC, respectively. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Fly Ash, Slag, OPC, Adsorption, Phosphate Ions, Frumkin Isotherm, Adsorption

Oğuz, E., Gürses, A. and Canpolat, N. (2003), Removal of phosphate from wastewaters. *Cement and Concrete Research*, **33** (8), 1109-1112.

Full Text: [C\Cem Con Res33, 1109.pdf](C/Cem%20Con%20Res33,%201109.pdf)

Abstract: Gas concrete waste was used to remove phosphate from aqueous solutions in this study. The influence of suspension pH, temperature, mixing rate, and gas concrete dosage on phosphate removal was investigated by conducting a series of batch adsorption experiments. In addition, the yield and mechanisms of phosphate removal were explained on the basis of the results of X-ray spectroscopy, measurements of zeta potential of particles, both values of BET-N-2 specific surface area, and images of scanning electron microscopy (SEM) of the particles before and after adsorption. In this study, phosphate removal in excess of 99% was obtained and it was concluded that wastes of gas concrete are an efficient adsorbent for the removal of phosphate. The removal of phosphate predominantly takes place by precipitation mechanism and the weak physical interactions between the surface of adsorbent and the metallic salts of phosphate. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Concrete, SEM, Adsorption, Waste-Water, Adsorption, Phosphorus, Variables, Tnsac, Slag

Özacar, M. (2003), Phosphate adsorption characteristics of alunite to be used as a cement additive. *Cement and Concrete Research*, **33** (10), 1583-1587.

Full Text: [C\Cem Con Res33, 1583.pdf](C/Cem%20Con%20Res33,%201583.pdf)

Abstract: The adsorption of phosphate from aqueous solution by alunite has been investigated as a function of calcination temperature, particle size, pH, agitation time and initial phosphate concentration. Phosphate adsorption was seen to increase with increasing calcination temperature, decreasing adsorbent particle size and pH. The adsorption isotherm data were fitted to the Langmuir isotherm. The alunite exhibited the highest phosphate uptake capacity at 1073 K calcination temperature, at a particle size of 90-150 mum, at the initial pH of 5.0, at an equilibrium time of 60 min and at the initial phosphate concentration of 20×10-4 mol/l. The adsorption capacity, Q, was 4.697×10-3 mol/g at initial pH 5.0. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Alunite, Calcination, Phosphate Ions, Adsorption, Adsorption Isotherms, Phosphorus Removal, Dyes, Ash, Ore

Feng, Q.G., Yamamichi, H., Shoya, M. and Sugita, S. (2003), Study on the pozzolanic properties of rice husk ash by hydrochloric acid pretreatment. *Cement and Concrete Research*, **34** (3), 521-526.

Full Text: [C\Cem Con Res34, 521.pdf](C/Cem%20Con%20Res34,%20521.pdf)

Abstract: The pozzolanic properties of rice husk ash by hydrochloric acid pretreatment are reported in the paper. Three methods have been used to estimate the pozzolanic activity of rice husk ash. The heat evolution and the hydration heat of cement, the Ca(OH)2 content in the mortar and the pore size distribution of mortar are determined. It is shown that compare with the rice husk ash heated untreated rice husk, the sensitivity of pozzolanic activity of the rice husk ash heated hydrochloric acid pretreatment rice husk to burning conditions is reduced. The pozzolanic activity of rice husk ash by pretreatment is not only stabilized but also enhanced obviously. The kinetics of reaction of rice husk ash with lime is consistent with diffusion control and can be represented by the Jander diffusion equation. A significant increase in the strength of the rice husk ash (pretreated) specimen is observed. The results of heat evolution indicate that the rice husk ash by pretreatment shows the behavior in the increase of hydration of cement. The cement mortar added with the rice husk ash by pretreatment has lower Ca(OH)2 content after 7 days and the pore size distribution of the mortar with the rice husk ash with pretreatment shows a tendency to shift towards the smaller pore size.

Keywords: Rice Husk Ash, Hydrochloric Acid Pretreatment, Pozzolanic Activity, Heat Evolution, Strength

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? Mossop, R.T. (1991), Trivalent chromium, in atherosclerosis and diabetes. *Central African Journal of Medicine*, **37** (11), 369-374.

Abstract: The known effects of trivalent chromium (Cr) in lowering blood levels of low density lipoproteins (LDL), raising high density lipoproteins (HDL) and improving glucose tolerance are summarised. Chromium deficiency cannot easily be established by direct means, but can be inferred by the reversal of symptoms and signs following the administration of trivalent chromium. This evidence can be supported by knowledge or suspicion of a deficiency in the diet, common in those who use highly refined cereal foods. It is considered that the beneficial effects of chromium repletion are now so well established and the trivalent form is so free of toxicity that it should now be used in clinical medicine for the benefit of those with some forms of diabetes and its complications and those suffering from atherosclerosis. of perhaps more importance is the public health aspect, since most chromium is discarded in the cereal refinement process, we now have added evidence for a return to the diets in which complex carbohydrates predominated. In those who refuse or are unable to do this, possibly the addition of chromium to their drinking water may be of value.

? Moran, P., Nhandara, C., Hove, I., Charimari, L., Katito, C., Bradley, M. and Williams, M.A. (1997), Contamination of traditional drinking water sources during a period of extreme drought in the Zvimba communal lands, Zimbabwe [published erratum appears in Cent Afr J Med 1998 Jul; 44 (7) (189]. *Central African Journal of Medicine*, **43** (11), 316-321.

Abstract: OBJECTIVES: Diarrhoeal disease is a significant public health concern in Zimbabwe, particularly for the population living in rural settings. The present study was undertaken to investigate the quality of water in a rural area of Zimbabwe during a period of extreme drought.

DESIGN AND SETTING: A cross sectional survey study design was used. During the month of July, (1995), water samples were collected from various actively used sources in the Zvimba communal lands, Zimbabwe.

MAIN OUTCOME MEASURES: The level of contamination was estimated by use of the membrane filtration technique to detect the presence of *Escherichia coli*.

RESULTS: Mean concentrations of E. coli found in boreholes and piped water were 9.3 and zero colonies per 100 ml, respectively. Using standardized criteria to define suitable drinking water quality, borehole and piped sources were determined to be more likely to provide satisfactory drinking water.

CONCLUSIONS: Water samples collected from semi-protected and unprotected wells, which serve the majority of the population in the study area, were found to be unsatisfactory for drinking (range from two to 1, 960 colonies of E. coli per 100 ml). Included are suggestions on how to efficiently utilize available water.

# Title: Central Asiatic Journal

Full Journal Title: Central Asiatic Journal

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

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? Hahn, R.F. (1993), Garments from top to toe: Eastern turkic texts relating to articles of clothing - edited with translation, notes and glossary - Jarring, G. *Central Asiatic Journal*, **37** (3-4), 335-337

Keywords: Articles

# Title: Central European Journal of Chemistry

Full Journal Title: [Central European Journal of Chemistry](http://www.springerlink.com/content/119964/?p=03347721db1347d799cc62c6a28d807f&pi=0)

ISO Abbreviated Title:

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Language:

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? Bilba, D., Suteu, D. and Malutan, T. (2008), Removal of reactive dye brilliant red HE-3B from aqueous solutions by hydrolyzed polyacrylonitrile fibres: equilibrium and kinetics modelling. *Central European Journal of Chemistry*, **6** (2), 258-266.

Full Text: [2008\Cen Eur J Che6, 258.pdf](2008/Cen%20Eur%20J%20Che6,%20258.pdf)

Abstract: A cheap and efficient fibrous hydrolyzed polyacrylonitrile (HPAN) sorbent was obtained by alkaline hydrolysis of Romanian polyacrylonitrile fibres. Scanning electronic microscopy and infrared spectroscopy were used to characterize the hydrolyzed product and to confirm its functionalization. The adsorptive potential of the proposed sorbent for reactive dye Brilliant Red HE-3B removal from aqueous solutions of pH=2 was examined by the batch technique as a function of dye concentration, temperature solution and contact time. The Freundlich, Langmuir and Dubinin-Radushkevich adsorption models were applied to describe equilibrium sorption data and to determine the corresponding isotherm constants. The thermodynamic parameters ΔG, ΔH and ΔS were also determined; the values obtained show that soRPTIon of reactive dye on HPAN fibres is a spontaneous, endothermic and entropy-driven process. The kinetics of sorption of the reactive dye were analyzed using pseudo-first order and pseudo-second order kinetic models. The kinetic data fitted well to pseudo-second order kinetics, indicating the chemisorption of reactive dye onto the fibrous sorbent. The sorption mechanism of the dye onto hydrolyzed fibres was confirmed by FTIR spectroscopy. The dye-loaded HPAN sorbent can be regenerated by treatment with 0.1M NaOH and the regenerated sorbent may be reused in several adsorption-desorption cycles. The results of this study provided evidence that the HPAN fibres are effective for removing reactive dye Brilliant Red HE-3B from aqueous effluents.

Keywords: Activated-Charcoal, Adsorption, Alkaline-Hydrolysis, Aqueous Solutions, Behaviors, Dye, Endothermic, Equilibrium, Evidence, Freundlich, FTIR, Function, Ions, Isotherm, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Langmuir, Mechanism, Mechanisms, Modelling, Models, Potential, Pseudo-Second Order, Reactive Dye, Removal, Solution, Sorption, Sorption, Spectroscopy, Surface Modification, Temperature, Thermodynamic, Thermodynamic Parameters, Treatment, Water

? Çakicioğlu-Özkan, F. and Polatoğlu, İ. (2009), Kinetics of proton transfer in the zeolitic tuff. *Central European Journal of Chemistry*, **7** (3), 508-511.

Full Text: [2009\Cen Eur J Che7, 508.pdf](2009/Cen%20Eur%20J%20Che7,%20508.pdf)

Abstract: The kinetics of a proton transfer into dilute acid solutions containing natural zeolitic tuff was studied by following the pH evolution of the liquid phase. Four different solutions with tuff contents of 9, 3, 1 and 0.5 (% wt) and three different particle size fractions (< 2000 μm) were studied. The proton concentration of the solution was decreased by increasing the zeolite amount and decreasing the particle size traction. The proton transfer reaction was analyzed with chemical reactions and diffusion model equations. Analysis shows that the adsorption and/or ion exchange are possible mechanisms and are expressed by a second order reaction model.

Keywords: Adsorption, Chemical, Clinoptilolite, Clinoptilolite, Concentration, Diffusion, Diffusion Model, Evolution, Ion Exchange, Ion-Exchange, Kinetics, Liquid, Mechanisms, Model, Natural, Particle Size, pH, Proton Diffusion, Second Order, Second-Order, Size, Solution, Solutions, Zeolite, Zeolite Tuff, Zeolitic Tuff

? Oladoja, N.A., Ololade, I.A., Idiaghe, J.A. and Egbon, E.E. (2009), Equilibrium isotherm analysis of the sorption of congo red by palm kernel coat. *Central European Journal of Chemistry*, **7** (4), 760-768.

Full Text: [2009\Cen Eur J Che7, 760.pdf](2009/Cen%20Eur%20J%20Che7,%20760.pdf)

Abstract: The ability of Palm Kernel Coat (PKC), a waste agricultural product, in the abstraction of Congo Red (CR), an anionic dye, from aqueous solution was studied. The effects of sorbent dose and temperature were studied using batch sorption system. Isotherm experiments were conducted and the data obtained were fitted with different equilibrium isotherm equations namely, Langmuir, Freundlich, Dubinin-Radushkevich (D-R), Temkin, Harkins-Jura and Halsey isotherm equations. The Langmuir isotherm equation gave the best description of the sorption process and the maximum saturated monolayer sorption capacity of the PKC for CR was 79.37 mg g-1. Harkins-Jura isotherm equation gave the poorest description of the sorption process. The linear form of the Langmuir equation was used to analyze the data obtained when the sorbent dosage was optimized by method of continuous variation. The results obtained showed that the equilibrium monolayer sorption capacity, *q*m, of the PKC for CR decreased (79.37-17.07 mg g-1) with an increase in sorbent dosage. The relationship between the dimensionless parameter, K-R, and initial concentration, C-o, showed that the sorption of CR was favored at higher initial dye concentration and PKC dosages than the lower ones. The thermodynamic parameters, such as change in the free energy, the enthalpy and the entropy, were also evaluated. The thermodynamic analysis showed that the sorption is spontaneous and exothermic.

Keywords: Activated Carbons, Adsorption, Agricultural, Analysis, Aqueous Solution, Aqueous-Solution, Basic Dye, Batch, Capacity, Co, Concentration, Congo Red, Cr, Data, Dye, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherm, Exothermic, Experiments, Freundlich, Ions, Isotherm, Isotherm Equations, Langmuir, Langmuir Equation, Langmuir Isotherm, Monolayer, Operations, Palm Kernel Coat, PKC, Removal, Rice-Husk, Sawdust, Solution, Sorbent, Sorbent Dose, Sorption, Sorption Capacity, Sorption Process, Temperature, Thermodynamic, Thermodynamic Parameters, Tree Fern, Waste

? Buhaceanu, R., Sarghie, I., Barsanescu, A., Dulman, V. and Bunia, I. (2009), Silver sorption on acrylic copolymers functionalized with amines. Equilibrium and kinetic studies. *Central European Journal of Chemistry*, **7** (4), 827-835.

Full Text: [2009\Cen Eur J Che7, 827.pdf](2009/Cen%20Eur%20J%20Che7,%20827.pdf)

Abstract: The sorption capacity of three weak base ion exchangers based on acrylic copolymers functionalized with ethylenediamine, triethylenetetramine and N, N- dimethylamino propylamine for Ag(I) ions was evaluated. Adsorption experiments were carried out by batch method. The effect of pH, crosslinking degree of copolymers, amount of sorbent, initial ion concentration, contact time and temperature was studied. The parameters which characterize the retention process were estimated using Langmuir and Freundlich isotherm models, the best fitting being for the first model. Kinetic data were fitted to pseudo-first order, pseudo-second order and intraparticle diffusion models. Experimental data were in good agreement with the pseudo second order.

Keywords: Absorption Spectrometric Determination, Adsorption, Ag(I) Ions, Aqueous-Solutions, Batch, Batch Method, Capacity, Chelating Resin, Chelating Resin, Concentration, Crosslinking, Data, Diffusion, Environmental-Samples, Equilibrium, Equilibrium And Kinetic Study, Ethylenediamine, Experiments, First, Freundlich, Freundlich Isotherm, Intraparticle Diffusion, Ion Exchangers, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Studies, Langmuir, Metal Ions, Model, Models, N, pH, Polypyrrole Film, Preconcentration, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Retention, Second Order, Second-Order, Silica-Gel, Silver, Sorbent, Sorption, Sorption Capacity, Temperature, Trace Amounts, Water Samples

? Samiey, B. and Dargahi, M.R. (2010), Kinetics and thermodynamics of adsorption of Congo red on cellulose. *Central European Journal of Chemistry*, **8** (4), 906-912.

Full Text: [2010\Cen Eur J Che8, 906.pdf](2010/Cen%20Eur%20J%20Che8,%20906.pdf)

Abstract: Thermodynamics and kinetics of adsorption of congo red (CR) on cellulose are studied at 308-328 K. In the used concentration range of CR, interaction of CR with cellulose is exothermic and CR molecules adsorb chemically on cellulose surface. The effects of contact time, temperature and initial concentration of CR on kinetics of its adsorption on cellulose were investigated. The process proceeds according to the pseudo-second-order equation. Initial adsorption rate of adsorption is first-order in CR and the intraparticle diffusion of CR molecules within cellulose is identified as the main rate-limiting step.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solution, Avrami Equation, Cellulose, Congo Red, Diffusion, Dyes, Gamma-Cyclodextrin, Growth Site Impingement, Homogeneous Nucleation, Isothermal Crystallization, Kinetics, Langmuir Isotherm, Macrokinetic Models, Phase-Transition Kinetics, Sorption, Thermodynamics, Water

? Jachuła, J., Kołodyńska, D. and Hubicki, Z. (2011), Sorption of Cu(II) and Ni(II) ions in the presence of the methylglycinediacetic acid by microporous ion exchangers and sorbents from aqueous solutions. *Central European Journal of Chemistry*, **9** (1), 52-65.

Full Text: [2011\Cen Eur J Che9, 52.pdf](2011/Cen%20Eur%20J%20Che9,%2052.pdf)

Abstract: In the presented paper the use of a novel environmentally friendly aminopolycarboxylate chelating agent trisodium salt of methylglycinediacetic acid (MGDA) to inactivate various metal ions by complex formation in microporous anion exchangers and sorbents was tested. MGDA is a new generation of chelator, undergoing biodegradation. The removal of Cu(II) and Ni(II) ions from aqueous solutions in the presence of MGDA on microporous anion exchangers of the Lewatit group with different basicity of functional centres as well as on nitrolite and clinoptilolite was described. The studies were carried out by the dynamic (column) and the static (batch) methods. The influence of several parameters such as the concentration of analyzed metal ions, pH and temperature were studied with respect to sorption equilibrium. The sorption isotherms were obtained and fitted using the Langmuir, Freundlich, Temkin and Dubinin-Radushkevich (D-R) models. Kinetic curves were also fitted using pseudo first order, pseudo second order as well as the intraparticle diffusion model equations to evaluate the most effective one.

Keywords: Activated Carbon, Adsorption, Aqueous Solutions, Batch, Biodegradable Chelating Agents, Biodegradable Chelating-Agents, Biodegradation, Calcium-Montmorillonite, Clinoptilolite, Cobalt Ions, Column, Complex-Forming Agents, Concentration, Cu(II), Diffusion, Diffusion Model, Dynamic, Environmentally Friendly, Equilibrium, First, First Order, Freundlich, Generation, Heavy Metal Ions, Heavy-Metals, Intraparticle Diffusion, Intraparticle Diffusion Model, Ion Exchangers, Ions, Isotherms, Kinetic, Langmuir, Metal, Metal Ions, Methods, Microporous Anion Exchangers, Model, Models, Natural Clinoptilolite, Ni(II), Ni(II) Ions, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Salt, Second Order, Second-Order, Separation, Simultaneous Removal, Solutions, Sorbents, Sorption, Sorption Isotherms, Temperature

? Dancu, A.C., Barabas, R. and Bogya, E.S. (2011), Adsorption of nicotinic acid on the surface of nanosized hydroxyapatite and structurally modified hydroxyapatite. *Central European Journal of Chemistry*, **9** (4), 660-669.

Full Text: [2011\Cen Eur J Che9, 660.pdf](2011/Cen%20Eur%20J%20Che9,%20660.pdf)

Abstract: In the present paper, hydroxyapatite and structurally modified hydroxyapatite were investigated to establish the best material for nicotinic acid adsorption. Structurally modified hydroxyapatite wa prepared by adding sodium silicate in the reaction medium. The influence of silica concentration, presence of small amounts of metal ions, temperature and initial concentrations of nicotinic acid solutions on the adsorption capacity, were studied. Results indicated that structurally modified hydroxyapatite doped with copper adsorbed the highest amount of nicotinic acid. For this material the adsorption capacity was 0.232 mg nicotinic acid / g material, at an initial concentration of 10(-4) M nicotinic acid. For all types of materials, best results were obtained at 15AºC. The amount of nicotinic acid adsorbed increases with the decrease in temperature and with the increase in the initial concentration of nicotinic acid. Adsorption kinetics data were modeled using pseudo-first and pseudo-second order models while the interference due to diffusion was analyzed with intraparticle diffusion model. The results indicate that pseudo-second order model best describes the adsorption kinetics data, indicating the formation of chemical bonding. The materials used in this study were characterized by the following methods: IR, Coulter Counter analyzer, Scanning Electron Microscope and BET.

Keywords: Adsorption, Adsorption Efficiency, Adsorption Kinetics, Behavior, Calcium Hydroxyapatite, Chromatography, Copper, Diffusion, Drug-Delivery, Hydroxyapatite, Ions, Kinetics, Local-Delivery, Niacin, Nicotinic Acid, Release, Silica, Silica Addition, Sorption, Synthetic Hydroxyapatite, Temperature

? Detcheva, A.K., Vassileva, P.S., Georgieva, R.H., Voykova, D.K., Gerganova, T.I. and Ivanova, Y.Y. (2011), Adsorption properties of a nanostructured hybrid material containing aluminium towards some metal ions. *Central European Journal of Chemistry*, **9** (5), 932-940.

Full Text: [2011\Cen Eur J Che9, 932.pdf](2011/Cen%20Eur%20J%20Che9,%20932.pdf)

Abstract: In the present work the adsorption of some transition metal ions from aqueous solutions on a silica-based nanostructured hybrid material modified by aluminium was investigated. The novel organic-inorganic material was synthesized via a sol-gel method through hydrolysis and co-condensation reactions. Its structure was characterized by means of SEM, XRD and FTIR. Based on the data obtained the most probable cross-linking mechanism for the derived xerogel was proposed. The characterization of its texture parameters was carried out by low-temperature adsorption of nitrogen. The adsorption properties of this material with respect to Cu(II), Cr(III) and Pb(II) ions from single-component aqueous solutions and multi-component aqueous solutions containing also Cd(II) and Fe(III) were evaluated. The effect of contact time, acidity of initial solutions and metal ion concentrations was investigated using the batch method. Pseudo-first order, pseudo-second order and intraparticle diffusion models were used to analyze kinetic data. In all cases the adsorption was significantly affected by the pH value. Equilibrium modelling data were fitted to linear Langmuir, Freundlich and Dubinin-Radushkevich models. Best fit was observed for Langmuir model, which showed determination coefficients greater than 0.992 for all ions studied. The maximum adsorption capacities for single- and multi-component adsorption were calculated.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Equilibrium, Agricultural Waste, Aqueous-Solution, Basic Dye, Batch Method, Cd(II), Characterization, Co-Condensation, Cr(III), Cu(II), Diffusion, Equilibrium, Fe(III), Freundlich, FTIR, Functionalized Mesoporous Silica, Kinetic, Langmuir, Mechanism, Modelling, Pb(II), pH, Removal, Removal of Metal Ions, SEM, Silica-Based Nanostructured Hybrid Material, Sol-Gel

# Title: Central European Journal of Medicine

Full Journal Title: Central European Journal of Medicine

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? Elahi, B., Nikfar, S., Derakhshani, S., Vafaie, M. and Abdollahi, M. (2009), Benefit of antibiotic therapy on pouchitis after ileal pouch anal anastomosis: A systematic review and meta-analysis of clinical trials. *Central European Journal of Medicine*, **4** (2), 164-170.

Abstract: The aim of the study was to evaluate and collect current evidence on the effect of antibiotics in pretreatment of pouchitis after restorative ileal pouch anal anastomosis (IPAA). PUBMED, EMBASE, Web of Science, Scopus, and Cochrane Library databases were searched between 1966 and July 2008; and relevant clinical trials extracted, reviewed, and validated according to the study protocol. The outcome of interest was clinical improvement after treatment. Nine randomized, placebo-controlled clinical trials were found relevant and studied but 3 of them with 70 patients were entered into meta-analysis. Pooling of the results from these trials yielded an odds ratio of 15.96 with a 95% CI of 4.20-60.70, indicating a significant OR (p < 0.0001) in treatment group in comparison to the placebo group. In conclusion, the meta-analysis confirms benefit of antibiotics in management of pouchitis after IPAA operation.

Keywords: Antibiotic, Antibiotics, Ciprofloxacin, Clinical Trials, Cochrane, Combination Therapy, Crohns-Disease, Databases, Double-Blind, Ileal Pouch Anal Anastomosis, Inflammatory-Bowel-Disease, Interest, Management, Meta-Analysis, Metronidazole, Outcome, Pouchitis, Probiotics, Protocol, Ratio, Restorative Proctocolectomy, Review, Science, Scopus, Systematic, Systematic Review, Therapy, Treat Refractory Pouchitis, Treatment, Ulcerative-Colitis, Web of Science

# Title: Central European Journal of Public Health

(Cent. Eur. J. Public Health)

Full Journal Title: Central European Journal of Public Health

ISO Abbreviated Title:

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Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Valic, F. and Beritic Stahuljak, D. (1993), Is chrysotile asbestos exposure a significant health risk to the general population? *Cent Eur J Public Health*, **1** (1), 26-30.

Abstract: The main unresolved issues concerning environmental exposure to chrysotile asbestos of the general population are discussed. A review of the results of the measurement of airborne chrysotile fibres in buildings is presented showing that the results have been consistently low with the exception of buildings with damaged friable asbestos-containing material. Quantitative risk assessments are presented indicating that the lifetime risk is small compared to many other environmental risks. Possible adverse health effects of paraoccupational exposures in the case of high domestic airborne asbestos levels cannot be excluded. Both on the basis of electron microscopy analyses of asbestos exposures at locations with heavy traffic, and the very shallow slopes in the exposure-response relationships for increased lung cancer risk, the conclusion is drawn that exposure to airborne asbestos-containing friction materials has not been proven to pose a significant health risk to the general population. Reviewing animal ingestion studies published and all the available epidemiological studies related to asbestos in drinking water, the conclusion is drawn that the carcinogenic risk in the general population is low even in the case of drinking water containing elevated concentrations of chrysotile asbestos.

? Mascher, F. and Marth, E. (1993), Metabolism and effect of nitrates. *Cent Eur J Public Health*, **1** (1), 49-52.

Abstract: The effect of nitrate on the health of mice in a long term study is described. Nitrate was given to the mice in the form of calcium nitrate in drinking water in varying concentrations, and the mice were observed over the course of 18 months. Three groups were formed: 1. control group, 2. group I (100 mg nitrate/l drinking water) and group II (1,000 mg nitrate/l drinking water). The parameters studied were liver function, kidney function, total iron, ammonium, total protein and electrophoresis of the various serum proteins, body weight, and N-glycolyl-neuraminic acid as a tumor marker. Nitrate is broken down via nitrate, hydroxylamine to ammonium and finally to urea. The concentration of urea increased with time and higher concentrations of nitrate load. The exposed mice clearly lost weight and died prematurely. This was true only for the mice in group II. With a load of 100 mg/l drinking water, no change in the physiological parameters could be seen within the time period studied.

? Slosárek, M., Kubín, M. and Jaresová, M. (1993), Water-borne household infections due to Mycobacterium xenopi. *Cent Eur J Public Health*, **1** (2), 78-80.

Abstract: Of 21 M. xenopi excretors recorded in Prague in (1990), 13 suffered from a serious pulmonary disease and the organisms were detected repeatedly in all of them. In 11 flats of these excretors water samples were collected from faucets and showers and M. xenopi was detected in five of them, as well as in five neighbouring flats. In flats of six remaining excretors and 12 adjoining flats, M. xenopi was not found. However, in 14 of 28 examined flats, the clinically insignificant M. gordonae was isolated. Water samples from three water-works, six regional water reservoirs and 10 street hydrants did not harbour mycobacteria. In the authors’ view M. xenopi originating from infected drinking water outlets may cause infections in exposed household dwellers.

? Bencko, V. and Ungváry, G. (1994), Risk assessment of chemicals: A central European perspective. *Cent Eur J Public Health*, **2** (2), 70-72.

Abstract: During the last four decades in all the Central and East European countries it was intended that prevention of the adverse health effects of chemicals in occupational and environmental settings, including the drinking water and food basket of populations, be achieved by determination and compulsory observance of hygienic limit values (MAC, TLV, ADI). The authors have tried to demonstrate some specific features of risk assessment of exposure to chemicals in environmental and occupational settings. Although the approach to risk assessment and management was similar in many respects in the CMEA countries, implementation and hygienic practice was different in the individual countries in terms of many details and effectiveness. Due to long lasting experience with environmental pollution including health impact on humans, such as in the “Dirty Triangle of Europe” and other heavily contaminated areas a considerable knowledge has been gained. The authors recommend to analyse critically and evaluate the knowledge and experience and present it to the international scientific community and international institutions such as UNEP, ILO, IPCS, IRPTC and last but not least, OECD.

? Slosárek, M., Kubín, M. and Pokorný, J. (1994), Water as a possible factor of transmission in mycobacterial infections. *Cent Eur J Public Health*, **2** (2), 103-105.

Abstract: Mycobacterium kansasii and Mycobacterium xenopi are the most frequent species occurring in water in the Czech Republic. In the endemic area of M. kansasii in heavy industry and mining areas of North Moravia various mycobacterial species were detected in more than 20% of different water samples and M. kansasii was found in 1.5 to 1.9% of them, frequently in pit bathrooms and in the drinking water as well. Mycobacterium xenopi was detected in 35 and 50% of water samples collected in households of M. xenopi excretors in North Bohemia and in Prague. A nosocomial occurrence of M. xenopi was recorded in an hospital department in North Bohemia and in a rest home in Prague and all samples of water from the afflicted institutions were positive for M. xenopi. In a coal mine in Moravia a case of cutaneous involvement associated with the presence of M. marinum in mine water was also recorded. The incidence of various mycobacterial species (except of M. kansasii and M. xenopi) in spa and swimming pools in West Bohemia reached 35% positivity. Comprehensive reviews of bacteriological investigations for mycobacteria performed in the entire territory of the Czech Republic have been reported in annual reports since 1985. In the period from 1985 to 1991 a total of 5167 samples of various kinds of water samples were examined and mycobacteria were detected in 8.2 to 47.7% of them.

? Kubálek, I. and Mysák, J. (1995), The prevalence of environmental mycobacteria in drinking water supply systems in Olomouc County, north Moravia, Czech Republic, in the period 1984-1989. *Cent Eur J Public Health*, **3** (1), 39-41.

Abstract: The presence of environmental mycobacteria was studied in drinking water supply systems in Olomouc County, Czech Republic, in order to detect the possible spread of M. kansasii from the neighbouring region in Ostrava County. Drinking water samples from water supply systems of 16 localities were investigated. The samples of running water, and tap swabs or tap scrapings were collected twice a year, in the spring and in the autumn. The most common cultivated and identified species were M. gordonae (20.4%), M. flavescens (13.8%), rapidly growing mycobacteria (5.0%) and then by occasional identification of M. fortuitum, M. terrae, M. scrofulaceum. M. kansasii was not detected. The prevalence rates showed no time trend over the period 1984-1989. We conclude that there is no evidence at present that endemic M. kansasii, isolated repeatedly from neighbouring region, has spread to Olomouc County. Different environmental and nutritional constituents in soil and coal mine dust in the endemic regions seem to be the most probable limiting environmental factor of the endemic occurrence of M. kansasii in its endemic locality in Ostrava and Karviná regions.

? Kubálek, I., Komenda, S. and Mysák, J. (1995), The spring-fall variations in the prevalence of environmental mycobacteria in drinking water supply system. *Cent Eur J Public Health*, **3** (3), 146-148.

Abstract: The fluctuation in the prevalence of environmental mycobacteria in relation to nutritional conditions in nature was repeatedly described in literature. The seasonal difference in potable water supply system has not yet been documented. Potable water samples from water supply systems of 16 localities were analyzed. The samples of running water, and tap swabs or tap scrapings were collected twice a year, in the spring and in the autumn. McNemar’s test was used to analyze the difference of the occurrence of environmental mycobacteria between the vernal and the autumnal samples. A significant change in the presence of environmental mycobacteria in the potable water supply system was observed: the vernal samples yielded more positive results. This finding supports other observations of superficial water. We infer that this effect in potable water supply system may be caused by the change in temperature. Contamination rates were similar with no statistically significant difference between running water samples and that of swabs or scraping. No time trend in the period 1984-1989 in the prevalence of mycobacteria was detected. Direct microscopy showed massive colonisation with environmental mycobacteria of potable water supply system. Public health consequences of these findings should be further evaluated, as colonisation of water pipes can be associated with outbreaks of mycobacterial disease in immunocompromised patients. There has been also an increase in the incidence of mycobacterioses in North Moravian Region in recent years.

? Kniewald, J. and Kniewald, Z. (1995), Environmental impact, healthful food and education in toxicology-trends in Croatia. *Cent Eur J Public Health*, **3** (3), 163-168.

Abstract: Following the informative regional development and environmental impacts in the Republic of Croatia, authors present the problems emphasized in environmental protection and health protection, and present the status of the contamination of food and drinking water in 1993. The level of education in the function of environmental protection in Croatia and its importance are discussed.

? Eder, E., Budiawan, ?? and Schuler, D. (1996), Crotonaldehyde: A carcinogenic and mutagenic air, water and food pollutant. *Cent Eur J Public Health*, **4** (Suppl), 21-22.

Abstract: Crotonaldehyde is mutagenic and carcinogenic and it is ubiquitous in our environment. The data base does, however, not allow an assessment of the carcinogenic risk. We have developed a sensitive 32P-postlabelling technique which allows the detection of specific DNA-adducts in animal tissues as markers for initiation of cancer cells. Adducts were found in several organs of F 344 rats after gavage and persisted to a certain extent. The determination of adduct levels in animal tissues after different exposure or even in human tissues can therefore be considered as an effect monitoring and would certainly improve the risk assessment.

? Livardjani, F., Heimburger, R., Leroy, M., Jaeger, A. and Lugnier, A. (1996), Determination of total mercury in estuary, lake and river sediments. *Cent Eur J Public Health*, **4** (Suppl), 53.

Abstract: In order to improve the quality of the results in sediment analysis, the Community Bureau of Reference (BCR) of the European Communities has developed 3 sediment reference materials (CRM) from estuarine, lake and river origins. Certification of mercury content in these materials was achieved by 3 methods (cold vapor atomic absorption spectrometry, plasma emission spectrometry, neutron activation analysis with radiochemical separation). The values finally certified in the CRM estuarine, lake and river sediments are 1.77±06, 0.67±0.02, 1.03±0.13 mg/kg respectively.

? Riparbelli, C., Ferioli, A., Azimonti, G., Regidore, C., Battipede, G. and Maroni, M. (1996), Impact of pesticides to groundwater resources in an alluvial plain using a geographical information system. *Cent Eur J Public Health*, **4** (1), 21-24.

Abstract: A methodology to evaluate the impact of pesticides to drinking water resources in an agricultural region has been applied in an Italian alluvial plain using a Geographical Information System (GIS). With this technology it is possible to store, process and represent geographical data and update them according to the environmental characteristics. The studied area, covering a surface of 500 km2, is located immediately south of Milan, in the alluvial plain of the Po river. The DRASTIC model (1) has been utilized in order to evaluate the intrinsic vulnerability of aquifers, DRASTIC is a quantitative method proposed by EPA to identify pollution potential especially referred to pesticides in USA. The application of this model, combined with data of land use has provided maps identifying areas at risk for groundwater pollution. Information derived from risk maps is of primary importance in territorial planning such as: selection of areas to be monitored, identification of areas to be protected, correct management of agricultural practices and use of pesticides. These maps should provide an useful instrument for agricultural and territorial management.

? Kliment, V. (1996), Model of multiple exposure to contaminants in monitoring the environmental impact on population health. *Cent Eur J Public Health*, **4** (4), 246-249.

Abstract: The model study is focused on possibilities of comprehensive evaluation of the multiple exposure of humans to selected inorganic contaminants (arsenic, cadmium, lead, zinc) monitored within the subsystems of the monitoring the environmental impact on population health (inhalation and ingestion exposure from air, drinking water and foodstuffs and biological monitoring). The mean daily intake of contaminants of average adults is assessed using the monitoring and literature data. The exposure balance showed that the total intake of individual contaminants studied did not exceed the limit values given by the exposure standards (acceptable daily intake). The highest value of exposure reaching 28% of the limit was reported for cadmium. The prevailing pathway of exposure is ingestion of foodstuffs: more than 95% in all contaminants under study. Information on the intake of contaminants is used as input in a linear multicompartmental model describing their kinetics and retention in the human organism. The results of the model computation are compared with the laboratory data obtained in the biological monitoring of adult urine. The model and monitoring sets of results were found to conform well for cadmium and zinc. For arsenic and lead the model values are roughly one order of magnitude lower than the monitored ones which should be considered as acceptable for the model studies of this type. The model study of contaminant monitoring data processing and evaluation suggests further applications of health risk assessment representing one of the basic outputs of monitoring the environmental impact on population health.

? Rames, J., Chaloupecký, V., Sojková, N. and Bencko, V. (1997), An attempt to demonstrate the increased resistance of selected bacterial strains during repeated exposure to UV radiation at 254 nm. *Cent Eur J Public Health*, **5** (1), 30-31.

Abstract: Evidence was provided that in a repeatedly irradiated bacterial suspension of *Escherichia coli* K12: AB 1157, 1886, 2463, under the described experimental conditions, gradually mutants more resistant to UV radiation survive. Under these circumstances it may happen that selection and an increase of bacterial clones with an increased UV resistance develop, manifested by a reduced effectiveness of UV radiation during repeated irradiation. Although the cumulating damage of DNA in microbes can lead to a reduction of their survival as well as a reduction of their absolute numbers, it can be hardly assumed that during practical use in air conditioning units or during disinfection of drinking water all bacteria will be destroyed. In that case even repeated UV irradiation is not necessarily a reliable disinfection tool.

? Sefcová, H. (1997), The effects of storage time on the growth of bacterial flora in bottled drinking water. *Cent Eur J Public Health*, **5** (1), 32-34.

Abstract: An elevated count of mesophilic and psychrophilic bacteria (103-104 CFU/1 ml) was detected in uncarbonated bottled water stored for a period of 1 year. None of the 120 samples contained faecal coliform bacteria or streptococci. Psychrophilic and mesophilic bacteria counts detected in bottled water within 24 hours of bottling conformed to Czech Republic standard CSN 56 78 59. Counts of the same bacteria detected up to 6 months after bottling were also within the limits set by the above norm.

? Gzyl, J. (1997), Assessment of Polish population exposure to lead and cadmium with special emphasis to the Katowice Province on the basis of metal concentrations in environmental compartments. *Cent Eur J Public Health*, **5** (2), 93-96.

Abstract: Polish data of lead and cadmium concentrations in such environmental compartments as: air, dust, soil, diet and drinking water were presented in the paper. Special emphasis was placed to the Upper Silesian industrial Region, the central part of the Katowice Province, the most polluted area in Poland. An attempt was made to assess human exposure to heavy metals. According to the available data it can be concluded that the WHO tolerable intake (ADI, PTWI) could be exceeded in an extremely disadvantageous situation occurring in the Katowice Province. Furthermore, a critical review of heavy metal standards in soil, dustfall and edible plants, obligatory in Poland, was presented. The author states that there are still some inconsistencies in current regulations in Poland. In order to remove them, an interdisciplinary board consisting of such disciplines representatives as: medicine, toxicology, nutritional science, law and protection of soils used for agricultural purposes should be appointed.

? Kliment, V., Kubínová, R., Kazmarová, H., Havlík, B., Sisma, P., Ruprich, J., Cerná, M. and Kodl, M. (1997), System of monitoring the environmental impact on population health of the Czech Republic. *Cent Eur J Public Health*, **5** (3), 107-116.

Abstract: The data collected in the System of monitoring the environmental impact on population health of the Czech Republic in 1994 and 1995 were obtained routinely and in a stabilized manner in six subsystems: health consequences and risks related to air pollution, drinking water quality, noise, human dietary exposure, human exposure to toxic pollutants from the environment and the monitoring of the health state and evaluation of selected indicators of demographic and health statistics. They represent a useful and comprehensive background for providing objective information on the health status of the Czech population and on pollution of different components of the environment in the Czech Republic to other countries in Europe and worldwide to facilitate their commercial and cultural contacts. The results of the calendar year 1995 show that no critical situation needing urgent countermeasures to be taken appeared in the localities monitored. However, some results are indicative of the necessity to take certain remedial measures to maintain all population exposure burdens as low as reasonably possible from the economical and social points of view. The set of problems was identified as important also in 1994. Generally, the limit values and exposure standards are exceeded only sporadically in some localities while for most contaminants monitored only very low values compared to the admissible limits can be found.

? Chobot, S., Malis, J., Sebáková, H., Pelikán, M., Zatloukal, O., Palicka, P. and Kocurová D. (1997), Endemic incidence of infections caused by Mycobacterium kansasii in the Karviná district in 1968-(1995), (analysis of epidemiological data-review). *Cent Eur J Public Health*, **5** (4), 164-173.

Abstract: The Karviná district (northwestern part of North Moravia and Silesia) is typical by its industrial character, above all mining of black coal which is coked and which led to the devastation of the countryside. The ratio of light industry is low. In a small area (347 km2) there is a population of 824 inhabitants per km2. The population is concentrated in particular in urban agglomerations of the flat block type. Up to 1990 almost 55% of the population was employed in heavy industry. Due to its industrial activities, incl. metallurgical plants and ironworks in nearby Ostrava and Trinec, the district is one of the areas with a heavily contaminated atmosphere in particular with solid aerosol containing toxic metals (the values of solid aerosol varied on average between 100 and 150 micrograms/ml), the elevated values of Nox due to contamination from traffic and polyaromatic hydrocarbons were not negligible either during the investigation period. Since 1968 an endemic incidence of mycobacteria has been recorded which is due to Mycobacterium kansasii. At first only an occasional incidence was involved, since 1973 there has been a more substantial increase with a maximum in 1983 (64 cases) and thus up to (1995), there are 961 cases on records, incl. 787 (81.8%) in men and 174 (18.2%) in women. From the total number of recorded M. kansasii in 937 instances (97.3%) the lungs were affected (777 men, 160 women). The mean annual incidence was 34.3 cases, i.e. 12.03 per 100,000 population (28.1, i.e. 20/100,000 in men, 6.2, i.e. 4.28/100,000 in women). As to age, 78.8% of cases are recorded in the age bracket from 25 to 64 years (in men 81%, in women 68.9%). The highest specific morbidity in men is in the age group from 45-54 years (on average 73.13 per 100,000 per year), in women in the age group from 75 to 84 years (on average 9.75 per 100,000 per year). As to occupation, the ratio of mine employees at the time of contraction of the disease (incl. retired miners) was 52.2%), other workers 14.6%-all stigmatized by an increased dust concentration in other workplaces in heavy industry. As far as the domicile is concerned, the incidence was by far highest in Havírov (more than 56%), followed by Karviná (26.7%). These towns are inhabited mostly by miners. As to the mode of assessment 68.8% cases were diagnosed on account of pulmonary complaints and during dispensarization (stigmatization by dust) and 24.6% cases during preventive radiodiagnostic examinations of miners lungs. It did not prove possible to reveal the source. Interhuman transmission was not proved in any of the patients. The causal agent of the infection is most probably transmitted through water (by the aerogenic route). M. kansasii was isolated from drinking water (560 samples, in 7% M. kansasii was found), as well as in industrial water. In 1971-(1995), a total of 1231 samples of industrial water were examined (scrapings and untreated water). From these M. kansasii was isolated in 43.7% (538 specimens). In soil samples (93) and small mouse-like rodents (187) M. kansasii was not detected. The authors confirm that the development of disease depends in a decisive way on the susceptibility of the individual which in turn depends in particular on exposure to dust with possible lung damage and contamination of the atmosphere. In the district there is a high incidence of recurring acute diseases of the airways in children, incl. allergies affecting the airways. In the towns of Karviná, Havírov, Orlová, Bohumín and Ceský Tesín there is a high ratio of children with reduced immunity. In November 1981 to January 1982 987 first form pupils were examined for postvaccination TB allergy (standard tuberculin and avian tuberculin were used). The reactivity to avian tuberculin was higher than to standard tuberculin (see results). The highest ratio of intense reactions (30%) was recorded in children from Havírov where there is also the highest specific (and simple) incidence in adults.

? Gulis, G., Fitz, O., Wittgruber, J. and Suchanová, G. (1998), Colorectal cancer and environmental pollution. *Cent Eur J Public Health*, **6** (3), 188-191.

Abstract: Monitoring of personal exposure of population from environmental pollution is a very complicated process. There are many different pollutants in environment in very low concentrations and their distribution is non-homogenous. To measure these pollutants is not often feasible or possible due to technical problems. On the other side these can influence the health status of inhabitants by the way of a long time exposition by low doses. In our work we studied an incidence of the cancer of colon and rectum in rural area of Trnava district during the years 1986-1995. These are the most frequent types of cancer in our district-13.4%, incidence rate is 27.5 per 100,000 inhabitants. The standardised incidence ratio (observed/expected cases) were calculated for all villages, including statistical parameters. The population in this small area (1390 km2) is relatively stabile from point of view of migration and nutritional habits. The urban area consisting from five towns was excluded from analysis because the life style and nutritional habits of people living in towns and villages are different. These suppositions enabled to concentrate our attention to the study of environmental factors which can influence development of the colorectal cancer. The SIR’s were correlated with time of public drinking water supply, surface water quality, location of waste dumps, and time of gas heating using as kind of house heating. Positive and statistically significant correlation’s were found between SIR of the colorectal cancer and waste dump location for females and weaker for surface water and SIR for males. Statistically significant elevation of SIR both for males and females were found in one village. Ecological design of study did not allow to study confounders, yet served enough information for preparation of analytical studies and public health decision-making process on local level.

? Sefcová, H. (1998), Hygiene aspects of drinking water ultrafiltration. *Cent Eur J Public Health*, **6** (4), 314-316.

Abstract: Ultrafiltration is highly effective method for removal of bacteria and viruses and does not produce organohalides associated with water treatment by chlorine gas. The aim was to assess the hygiene suitability of the unit for possible use in bottled water production. The ultrafiltration unit was in operation for 220 hours with simulated of varying duration. The running time (220 hours) and shut-down duration (to 5 hours) did not in any way influence the effectiveness of the module (100% filtration of aerobic colony count at 37°C and 22°C).

? Gulis, G. and Kross, B.C. (1999), Drinking water, mortality, and life expectancy: An assessment of the east-west mortality gap in Europe. *Cent Eur J Public Health*, **7** (4), 191-196.

Abstract: The role of the drinking water in public health has been recognised for many years. Recent ecological studies of mortality rates in Slovakia when compared to indicators of environmental pollution have shown surprising results-areas with greater air pollution seem to have lower total mortality rates. This paradox may be explained by a number of other factors, including urban/rural occupational conditions, socio-economic status, access to health care, and perhaps drinking water. Overall population access to safe drinking water is about the same between East and West Europe, but more careful evaluation suggest at least one important difference. About 35.7% of the people in Central and Eastern European countries do not have 100% access to safe drinking water in their rural areas, compared to only 18.7% of the rural populations in Western Europe who do not have full access to safe drinking water. This study examines access to safe drinking water, assesses overall drinking water quality, and utilises an index of drinking water quality to perform correlation with total mortality, selected chronic diseases which have been associated with drinking water contamination, and life expectancy at birth. These methods are applied to data for East-West Europe, Slovakia, and detailed urban-rural comparisons for three areas of Slovakia (Trnava, Banská Bystrica, and Kosice).

? Sixl, W., Sixl, K. and Sixl Voigt, B. (1999), Quality of water: Quality of life. *Cent Eur J Public Health*, **7** (4), 216-220.

Abstract: Especially in developing countries, the problem of adequate drinking water supply is an ever growing one. Public health programmes have been established to improve the population’s health conditions, but these programmes require big financial means for guaranteeing adequate supply of potable water and medical therapy for sick people. Too little emphasis is still put on regular testing of drinking water for microorganisms such as Aeromonas sp. and Vibrio sp. In a spot check analysis in various countries, the importance of Aeromonas sp. is shown-not a single sample complied with international norms and guidelines for drinking water.

# Title: Central European Neurosurgery

Full Journal Title: Central European Neurosurgery

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zieger, M., Schwarz, R., Konig, H.H., Harter, M. and Riedel-Heller, S.G. (2010), Depression and anxiety in patients undergoing herniated disc surgery: Relevant but underresearched: A systematic review. *Central European Neurosurgery*, **71** (1), 26-34.

Abstract: Background: An association between depression and anxiety and musculoskeletal disorders has been consistently reported in the past years. This article provides a systematic overview of the literature on the prevalence rates of depression and anxiety in patients undergoing surgery for a herniated disc. Methods: A systematic literature search was conducted in the following electronic databases: PUBMED, PsycINFO, Web of Science, Cochrane Library and PSYNDEXplus. The identified articles were evaluated for prevalence rates of depression and anxiety, methodological issues, change of depression and anxiety over time, and major findings on the impact of depression and anxiety on patients undergoing disc surgery. Results: Fourteen studies were identified. Prevalence rates for depression and anxiety in patients undergoing disc surgery varied between 21.5% and 49.3% before and between 4.1% and 79.6% after disc surgery. The study designs, the use of assessment instruments and cut-off values varied greatly. Depression and anxiety decreased within the population of disc surgery patients over time. Depression and anxiety were found to have a great impact on the postoperative outcome of surgery, return to work, analgesia abuse, pain experience, and abnormal illness behaviour. Conclusions: Little research has been done to investigate depression and anxiety in patients undergoing surgery for a herniated disc. Evidently disc surgery patients are at higher risk of suffering from depression and anxiety than the general population. The review outlines the importance for clinicians to be more sensitive to psychological concerns in patients undergoing disc surgery. Psychological assessment and assistance from mental health professionals should be considered during the hospital stay and rehabilitation period, depending on local feasibility. Further investigations are necessary to examine whether the implementation of a multidisciplinary in-patient treatment program will improve postoperative outcome in patients undergoing intervertebral disc surgery.

Keywords: Analgesia, Anxiety, Assessment, Cervical Diskectomy, Cochrane, Databases, Depression, Depression And Anxiety, Disc Surgery, Feasibility, Follow-Up, Hospital, Impact, Literature, Low-Back-Pain, Lumbar Diskectomy, Mental Health, Methods, Musculoskeletal, Outcome, Overview, Pain, Prevalence, Psychiatric-Disorders, Psychological, PUBMED, Rehabilitation, Rehabilitation Patients, Research, Return to Work, Review, Risk, Risk-Factors, Scale, Science, Spine, Surgery, Systematic, Systematic Review, Treatment, Web of Science

# Title: Cephalalgia

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

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0333-1024

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Walach, H., Haeusler, W., Lowes, T., Mussbach, D., Schamell, U., Springer, W., Stritzel, G., Gaus, W. and Haag, G. (1997), Classical homeopathic treatment of chronic headaches. *Cephalalgia*, **17** (2), 119-126.

Full Text: [C\Cephalalgia17, 119.pdf](C/Cephalalgia17,%20119.pdf)

Abstract: We conducted a randomized, placebo-controlled, double-blind clinical trial in order to determine the efficacy of classical homeopathic therapy in patients with chronic headaches. After 6 weeks of baseline observation, patients received either the prescribed individualized homeopathic medication or an indistinguishable placebo for 12 weeks. Outcome parameters were headache frequency, duration, and intensity, measured daily by diary. Use of medication for acute headache was also monitored. Of the 98 patients in the sample, 37 were randomized to receive placebo, 61 received individualized homeopathic remedies. Groups were comparable at the beginning of the treatment. The median age was 48.5 years; 76% suffered from migraine, 51% from tension-type headaches, and 94% were previously treated for headache. The median headache frequency was 3 days a week. Headaches were present for 23 years (median). In both groups, patients showed an improvement of one headache day less per month. The use of medication for acute headache was reduced. The headache frequency of 21 patients was reduced by more than 40%. Thirty-nine patients either did not improve or experienced aggravations. There was no significant difference in any parameter between homeopathy and placebo.

Keywords: Homeopathy, Migraine, Placebo, Randomized Controlled Trial, Tension Headache

? Whitmarsh, T.E., Coleston Shields, D.M. and Steiner, T.J. (1997), Double-blind randomized placebo-controlled study of homoeopathic prophylaxis of migraine. *Cephalalgia*, **17** (5), 600-604.

Full Text: [C\Cephalalgia17, 600.pdf](C/Cephalalgia17,%20600.pdf)

Abstract: Homoeopathic remedies for migraine are widely available over the counter, statutorily offered by the national health service in the UK, and apparently popular with patients. Do they work? Sixty-three outpatients with migraine with or without aura by IHS criteria entered a 4-month randomized placebo-controlled, double-blind, parallel-groups trial of individualized homoeopathic prophylaxis, the first month being baseline with all patients on placebo. Three patients (4.8%) dropped out, leaving 30 in each treatment group. There were chance differences in attack frequency and severity between the groups at baseline (attacks were more frequent but less severe in the placebo group). Both groups improved on therapy, bill neither to a great extent on the primary outcome measure of attack frequency (verum: -19%; placebo: -16%). Reduction was mostly in mild attacks on placebo, more in moderate and severe attacks on homoeopathy. Few adverse events were reported. Overall, there was no significant benefit over placebo of homoeopathic treatment. The course of change differed between groups, and suggested that improvement reversed in the last month of treatment on placebo. On this evidence we cannot recommend homoeopathy for migraine prophylaxis, but cannot conclude that it is without effect.

Keywords: Homoeopathy, Migraine, Placebo, Prophylaxis, Randomized Controlled Trial, Homeopatht, Trial

Moseley, I. (2000), How to write and publish a scientific paper, 5th edn. *Cephalalgia*, **20** (2), 141-142.

Full Text: [C\Cephalalgia17, 141.pdf](C/Cephalalgia17,%20141.pdf)

# Title: Cereal Chemistry

Full Journal Title: Cereal Chemistry

ISO Abbreviated Title: Cereal Chem.

JCR Abbreviated Title: Cereal Chem

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Park, S.W., Chung, D.S. and Watson, C.A. (1971), Adsorption kinetics of water vapor by yellow corn. 1. Analysis of kinetic data for sound corn. *Cereal Chemistry*, **48** (1), 14-??.

# Title: CFI-Ceramic Forum International

Full Journal Title: CFI-Ceramic Forum International

ISO Abbreviated Title: CFI-Ceram. Forum Int.

JCR Abbreviated Title: CFI-Ceram Forum Int

ISSN: 0173-9913

Issues/Year: 10

Journal Country/Territory: Germany

Language: English

Publisher: Goller Verlag Gmbh

Publisher Address: Aschmattstrasse 8, D-76532 Baden Baden, Germany

Subject Categories:

Materials Science, Ceramics: Impact Factor 0.090, / (2000)

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# Title: Ceskoslovensky Casopis Pro Fysiku Sekce A

Full Journal Title: Ceskoslovensky Casopis Pro Fysiku Sekce A

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Silverio, M. (1973), Do you know Science Citation Index. *Ceskoslovensky Casopis Pro Fysiku Sekce A*, **23** (2), 209-??.

Keywords: Citation, Science Citation Index

# Title: Challenges and Opportunities in Science and Technology

Ho, Y.S., Wase, D.A.J. and Forster, C.F. (1995), Peat as a biosorbent for the removal of heavy metals from wastewaters. in *Challenges and Opportunities in Science and Technology*, (Edited by Shih, W.C., Chan, S.L.I. and Heng, Y.C.), The First Symposium of the Chinese Institute of Engineers in the UK, Cambridge, UK, 166-169.

# Title: Chaos

Full Journal Title: Chaos

ISO Abbreviated Title: Chaos

JCR Abbreviated Title: Chaos

ISSN: 1054-1500

Issues/Year: 4

Journal Country/Territory: United States

Language: English

Publisher: Amer Inst Physics

Publisher Address: Circulation Fulfillment Div, 500 Sunnyside Blvd, Woodbury, NY 11797-2999

Subject Categories:

Mathematics, Applied Physics, Mathematical: Impact Factor

Ueda, Y., Ohta, H. and Stewart, H.B. (1994), Bifurcations in a system described by a nonlinear differential equation with delay. *Chaos*, **4**, 75-83.

# Title: Ceskoslovensky Casopis Pro Fysiku Sekce A

Full Journal Title: Ceskoslovensky Casopis Pro Fysiku Sekce A

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ismadji, S. and Bhatia, S.K. (2002), Percolation phenomena in micropore adsorption: Influence on single and multicomponent adsorption equilibria. *Characterization of Porous Solids VI*, **144**, 123-130.

Abstract: A novel and simple method for determination of micropore network connectivity of activated carbon using liquid phase adsorption is presented in this paper. The method is applied to three different commercial carbons with eight different liquid phase adsorptives as probes. The effect of the pore network connectivity on the prediction of multicomponent adsorption equilibria was also studied. For this purpose, the Ideal Adsorbed Solution Theory (IAST) was used in conjuction with the modified DR single component isotherm. The results of comparison with experimental data show that incorporation of the connectivity, and consideration of percolation processes associated with the different molecular sizes of the adsorptives in the mixture, can improve the performance of the IAST in predicting multicomponent adsorption equilibria.

Keywords: Activated Carbon, Activated Carbons, Adsorption, Carbon, Comparison, Connectivity, Isotherm, Liquid-Phase Adsorption, Multicomponent, Network Connectivity, Nitrogen Sorption Measurements, Porous Solids, Simulation, Size

# Title: Chemia Analityczna

Full Journal Title: Chemia Analityczna

ISO Abbreviated Title: Chem. Anal.

JCR Abbreviated Title: Chem Anal-Warsaw

ISSN: 0009-2223

Issues/Year: 6

Journal Country/Territory: Poland

Language: Multi-Language

Publisher: Instytut Chemii Fizycznej Pan

Publisher Address: UL Kasprzaka 44/52, 01-224 Warsaw, Poland

Subject Categories:

Chemistry, Analytical: Impact Factor

? Jaroniec, M., Rozylo, J.K. and Jaroniec, J.A. (1981), Association effects in liquid adsorption chromatography with binary eluents. *Chemia Analityczna*, **26** (4), 623-631.

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# Title: Chemia Stosowana

Full Journal Title: Chemia Stosowana

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: KKinetics

?? Kawecka, J., Klesinka-Drwalowa, J. and Lason, A.K.M. (1963), *Chem. Stosowam*, 7, 441. (in Polish).

?? Kawęcka, J., Kłosińska-Drwalowa, J., Korta, A. and Lasoń, M. (1963), *Chemia Stosowana*, 3, 441. (in Polish).

?? Kawęcka, J., Kłosińska-Drwalowa, J., Korta, A. and Lasoń, M. (1961), *Chemia Stosowana*, 3, 441. (in Polish).

# Title: Chemica Scripta

Full Journal Title: Chemica Scripta

ISO Abbreviated Title: Chem. Scripta

JCR Abbreviated Title: Chem Scripta

ISSN: 0004-2056

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Cambridge Univ Press, New York

Publisher Address:

Subject Categories:

: Impact Factor

? Patrykiejew, A., Jaroniec, M. and Marczewski, A.W. (1983), Studies of the temperature-dependence of gas-adsorption data on graphite and boron-nitride in terms of the partially mobile adsorption model. *Chemica Scripta*, **22** (3), 136-145.

# Title: Chemical and Biochemical Engineering Quarterly

Full Journal Title: [Chemical and Biochemical Engineering Quarterly](http://www.fkit.hr/cabeq/pdf/pdf.html)

ISO Abbreviated Title: Chem. Biochem. Eng. Q.

JCR Abbreviated Title: Chem Biochem Eng Q

ISSN: 0352-9568

Issues/Year: 4

Journal Country/Territory: Croatia

Language: English

Publisher: Croatian Soc Chemical Engineering Technology

Publisher Address: Berislaviceva 6, PO Box 123, HR-10000 Zagreb, Croatia

Subject Categories:

Biotechnology & Applied Microbiology: Impact Factor

Engineering, Chemical: Impact Factor 0.438, 61/110 (1999); Impact Factor 0.298, 82/123 (2001)

? Solisio, C., Lodi, A., Converti, A. and DelBorghi, M. (1998), Cadmium, zinc and chromium(III) removal from aqueous solutions by *Zoogloea Ramigera*. *Chemical and Biochemical Engineering Quarterly*, **12** (1), 45-49.

Full Text: 1998\Che Bio Eng Qua12, 45.pdf

Abstract: A strain of *Zoogloea Ramigera* was used in batch tests for Cd, Zn and Cr removal from solutions simulating the composition of industrial wastewaters. Living cells of this microorganism proved to remove metal ions from pure solutions more effectively (91-99%) than inactivated biomass (50% or less), thus confirming the predominant biological nature of this process. The removal yield strongly decreased when these metals were simultaneously present in the solution, probably because of a possible competition phenomenon. The evaluation of the related kinetic parameters would allow to design an accessory section for heavy metals removal in a wastewaters treatment plant.

Keywords: Activated-Sludge Process, Insoluble Metal Removal, Accumulation, Adsorption, Behavior, *Zoogloea Ramigera*, Heavy Metals Removal, Industrial Wastewaters

? Veglio, F., Beolchini, F., Gasbarro, A. and Toro, L. (2000), *Arthrobacter* sp. as a copper biosorbing material: Ionic characterisation of the biomass and its use entrapped in a poly-hema matrix. *Chemical and Biochemical Engineering Quarterly*, **13** (1), 9-14.

Full Text: [1999\Che Bio Eng Qua13, 9.pdf](1999/Che%20Bio%20Eng%20Qua13,%209.pdf)

Abstract: A study of copper sorption abilities of the bacterium Arthrobacter sp. has been reported in this work. Arthrobacter sp. was firstly potentiometrically titrated in order to have a rough characterisation of the functional groups of the cell wall. Carboxylic and aminic groups were evidenced by the titration curve. Active groups for biosorption were observed on the cell wall by performing sorption experiments, using lysozyme treated biomass. Arthrobacter sp. was tested as a copper biosorbing material in a free condition (i.e. suspended in solution) after a lyophilisation treatment. Equilibrium isotherms were similar to the ones obtained with a fresh biomass. The Langmuir model was used for the fitting of experimental points. Arthrobacter sp. was also tested as a biosorbing material in an immobilised condition, trapped in a polymeric matrix of poly-hydroxoethylmethacrylate. The Shrinking Core Model was used for the fitting of the kinetic experimental data. The effective diffusivity of copper inside the polymeric matrix was estimated at 4.07×10-6 cm(2) s-1. The use of an ion selective electrode for the study of copper biosorption by Arthrobacter sp. revealed some limitations.

Keywords: *Arthrobacter* sp., Copper Biosorption, Ion Selective Electrode, Shrinking Core Model, Biosorption, Acrylate, Metals, Cells

? Matošić, M., Mijatović, I. and Hodžić, E. (2000), Nitrate removal from drinking water using ion exchange - Comparison of chloride and bicarbonate form of the resins. *Chemical and Biochemical Engineering Quarterly*, **14** (4), 141-146.

Full Text: [2000\Che Bio Eng Qua14, 141.pdf](2000/Che%20Bio%20Eng%20Qua14,%20141.pdf)

Abstract: Experiments have been carried out to investigate nitrate removal from aqueous solution using two strong base anion exchange resins (IMAC HP-555 and HP-441 from ROHM&HAAS) in chloride and bicarbonate form. Four theoretical adsorption isotherms were used to describe the experimental results. Influence of initial nitrate concentration, sulphate-nitrate ratio and specific flow rate on the performance of resins was determined. Regeneration curves for Various types of regenerants-were generated from experimental data and the distribution coefficients for different initial nitrate concentrations and temperatures were estimated.

Keywords: Biological Denitrification, Drinking Water, Ion Exchange, Nitrate Removal

Kogej, A. and Pavko, A. (2004), Mathematical model of lead biosorption by *Rhizopus nigricans* pellets in a laboratory batch stirred tank. *Chemical and Biochemical Engineering Quarterly*, **18** (1), 29-35.

Full Text: [C\Che Bio Eng Qua18, 29.pdf](C/Che%20Bio%20Eng%20Qua18,%2029.pdf)

Abstract: The aim of this work was to study the Pb2+-ions biosorption rate with the *Rhizopus* *nigricans* biomass in a batch stirred tank and to examine the process characteristics with a simple mathematical model. Self immobilized biomass in the form of 2.5±0.5 mm pellets was used in a laboratory scale vessel of 100 ml working volume. Biomass concentrations from 25 to 200 g of wet mass per liter of biomass suspension were used while the initial lead mass concentrations varied from 20 to 300 mgl-1.

Mathematical model is based on the assumption that the rate of biosorption determines the rate of the process. It combines the differential mass balance equation of the batch reactor and the biosorption rate equation, which is considered as a reversible reaction between metal ions and free binding sites on the biomass. On the basis of lead biosorption rate data and the applied mathematical model, the Langmuir adsorption mechanism was confirmed and the average adsorption rate coefficient *k*ads=3×10-4 l mg-1 min-1 was determined.

Keywords: Biosorption, Lead, Batch Stirred Tank, Mathematical Model, *Rhizopus Nigricans*

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Full Text: [2007\Che Bio Eng Qua21, 219.pdf](2007/Che%20Bio%20Eng%20Qua21,%20219.pdf)

Abstract: Adsorption isotherms of benzaldehyde from aqueous solutions onto granular activated carbon have been determined and studied the effect of dosage of granular activated carbon, contact time, and temperature on adsorption. Optimum conditions for benzaldehyde removal were found adsorbent dose gamma approximate to 4 g 1-1 of solution and equilibrium time t approximate to 4 h. Percent removal of benzaldehyde increases with the increase in adsorbent dose for activated carbon, however, it decreases with increase in benzaldehyde mass concentration. Adsorption capacity of activated carbon for benzaldehyde removal decreases with increase in temperature, the adsorbent showing the exothermic nature of adsorption. The adsorption of benzaldehyde by granular activated carbon followed pseudo-second order kinetics. Diffusion is not the only rate-controlling step. Adsorption equilibrium data were analyzed by Langmuir, Frendlich and Temkin isotherm equation using regression analysis. Temkin found to best represent the data for benzaldehyde adsorption onto granular activated carbon. Value of the change in entropy (Delta S degrees) and heat of adsorption (Delta H degrees) for benzaldehyde adsorption on activated carbon were negative. The high negative value of change in Gibbs free energy (Delta G degrees) indicates the feasible and spontaneous adsorption of benzaldehyde on granular activated carbon.

Keywords: Activated Carbon, Activated Granular Carbon, Adsorbent, Adsorption, Adsorption on Activated Carbon, Analysis, Aqueous Solutions, Benzaldehyde, Capacity, Carbon, Concentration, Contact Time, Diffusion, Dosage, Dyes, Energy, Entropy, Equilibrium, Equilibrium Data, Equilibrium Time, Exothermic, Free Energy, Free-Energy, G, Gibbs Free Energy, Granular, Granular Activated Carbon, Heat of Adsorption, Isotherm, Isotherm Equation, Isotherms, Kinetics, Langmuir, Mass, Mass Concentration, Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Regression, Regression Analysis, Removal, Solutions, Sorption, Spontaneous, T, Temkin Isotherm, Temperature, Thermodynamic, Thermodynamics, Time, Value

? Mužic, M., Sertic-Bionda, K. and Gomzi, Z. (2010), A design of experiments investigation of adsorptive desulfurization of diesel fuel. *Chemical and Biochemical Engineering Quarterly*, **24** (3), 253-264.

Full Text: [2010\Che Bio Eng Qua24, 253.pdf](2010/Che%20Bio%20Eng%20Qua24,%20253.pdf)

Abstract: Adsorptive desulfurization of diesel fuel was investigated applying two Design of Experiments (DOE) methods. The experiments were carried out in a batch adsorption system using Chemviron Carbon SOLCARB (TM) C3 activated carbon as adsorbent. The first DOE method employed was a full factorial with three factors on two levels and five center points, and the second was Box-Behneken design with the same three factors but on three levels. The effects of individual factors and their interactions on sulfur concentration and sorption capacity were determined, and statistical models of the process developed. The first-order models predict the behavior of the system rather well but significant curvature was detected. Subsequently developed second-order models were able to give reasonably well descriptions of the system. The lowest achieved output sulfur concentration was 7.6 mg kg-1 with relatively low sorption capacity of 0.0861 mg g-1

Keywords: Activated Carbon, Adsorbent, Adsorption, Batch, Capacity, Carbon, Catalysts, Deep Desulfurization, Design Of Experiments, Desulfurization, Diesel, Diesel Fuel, Dye, Factorial Design, Hydrodesulfurization, Models, Optimization, Output, Process, Removal, Response-Surface Methodology, Second-Order, Sorption, Sorption Capacity, System, Technology

? Zahoor, M. and Mahramanlioglu, M. (2011), Adsorption of imidacloprid on powdered activated carbon and magnetic activated carbon. *Chemical and Biochemical Engineering Quarterly*, **25** (1), 55-63.

Full Text: [2011\Che Bio Eng Qua25, 55.pdf](2011/Che%20Bio%20Eng%20Qua25,%2055.pdf)

Abstract: The adsorptive characteristics of imidacloprid on magnetic activated carbon (MAC12) in comparison to powdered activated carbon (PAC) were investigated. Adsorption of imidacloprid onto powdered activated carbon and magnetic activated carbon was studied as a function of time, initial imidacloprid concentration, temperature and pH. Pseudo-first-order, pseudo-second-order and intraparticle diffusion models for both carbons were used to describe the kinetic data. The adsorption equilibrium data were analyzed using the Langmuir and Freundlich models. For powdered activated carbon the isotherm was ‘H’ type, and ‘L’ type for magnetic activated carbon. Equilibrium data fits well to the Langmuir model in the studied concentration range of imidacloprid. It was found that both the boundary layer and intraparticle diffusion for both adsorbents play an important role in the adsorption mechanisms of imidacloprid. The adsorption of imidacloprid on PAC and MAC12 followed a pseudo-second-order kinetic model rather than pseudo-first-order model. A decrease in the adsorption of imidacloprid on powdered activated carbon and magnetic activated carbon was observed with the increase in temperature. The pH of the solutions had no effect on the adsorption capacity of the adsorbents.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous-Solution, Bagasse Fly-Ash, Carbon, Composites, Contaminants, Degradation, Environmental Pollution, Equilibrium, Freundlich, Imidacloprid, Isotherm, Kinetic, Kinetic Model, Langmuir, Magnetic, Magnetic Activated Carbon, Pesticides, pH, Powdered Activated Carbon, Removal, Spent Bleaching Earth, Sugar-Industry Waste, Water

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Full Text: [2011\Che Bio Eng Qua25, 105.pdf](2011/Che%20Bio%20Eng%20Qua25,%20105.pdf)

Abstract: The study was carried out to investigate the adsorption kinetics and equilibrium of four heavy metal ions (Cu(2+), Cd(2+), Zn(2+) and Pb(2+)) on two kinds of electric arc furnace slag (EAF slag). The adsorption capacity of the Shougang slag (SG slag) is more than that of the Baoshan slag (BS slag). The metal adsorption on the EAF slag is more akin to the first-order kinetic model. Experimental data confirmed that Freundlich model was better in describing the metal adsorption on SG slag, while Langmuir model was more applicable for BS slag. The adsorption of metal ions increased with the pH value and reached a maximum at a 7 value for the Zn(2+) and Pb(2+) adsorption on SG slag. The decrease of grain size could enhance the adsorption of metal ions. The results established the potential use of EAF slag as costly adsorbents for heavy metal from contaminated wastewaters.

Keywords: Adsorption, Adsorption Kinetics, Biosorption, Blast-Furnace, Cadmium, Clinoptilolite, Copper, EAF Slag, Equilibrium, Grain Size, Heavy Metal, Heavy Metal Ions, Heavy-Metals, Ions, Kinetics, Langmuir Model, Model, Natural Zeolites, PH, PH Value, Removal, Steel Slag, Water

# Title: Chemical Communications

Full Journal Title: [Journal of the Chemical Society](http://www.rsc.org/Publishing/Journals/C3/Article.asp?Type=CurrentIssue)

Full Journal Title: [Chemical Communications](http://www.rsc.org/Publishing/Journals/C3/Article.asp?Type=CurrentIssue)

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JCR Abbreviated Title: Chem Commun

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Publisher: Royal Soc Chemistry

Publisher Address: Thomas Graham House, Science Park, Milton Rd, Cambridge CB4 0WF, Cambs, Eng

Subject Categories:

Chemistry: Impact Factor 3.477, 9/121

Burnett, M.G., Faharty, C., Hardacre, C., Mallon, J.M., Ormerod, R.M. and Saunders, G.C. (1998), Adsorption of metal cations by hydrous aluminium(III) or iron(III) hydroxide precipitates: Enhancement by EDTA and related chelate molecules. *Chemical Communications*, **22**, 2525-2526.

Full Text: [1998\Che Com22, 2525.pdf](1998/Che%20Com22,%202525.pdf)

Abstract: Stoichiometrically equivalent concentrations of ethylenediaminetetraacetate, EDTA, and of related chelating anions increase the adsorption of ca. millimolar concentrations heavy metal aqua-ions on amorphous precipitates of aluminium(III) or iron(III) hydroxide and, although higher concentrations decrease the adsorption, poly-EDTA, a polyelectrolyte containing EDTA functional groups, shows no such decrease.

Keywords: Nickel, Ethylenediaminetetraacetate, Complexes, Cadmium, Zinc

Notes: highly cited

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Full Text: [2003\Che Com17, 2140.pdf](2003/Che%20Com17,%202140.pdf)

Abstract: Very rapid (< 10 min to reach equilibrium) and high-capacity (up to 533 mg g(-1)) immobilization of enzymes within mesoporous silica has been achieved by finely tuning their morphologies.

Keywords: Catalytic Activity, Molecular-Sieves, Cytochrome-C, Adsorption, Proteins

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Full Text: [2011\Che Com47, 1072.pdf](2011/Che%20Com47,%201072.pdf)

Abstract: Biodegradable copolymers with molecule inclusion ability was prepared by introduction of beta-cyclodextrin into poly(aspartic acid) matrices. The ibuprofen loading and dissolution properties of poly(aspartic acid)-beta-cyclodextrin were investigated.

Keywords: Adsorption, Beta-Cyclodextrin, Chitosan, Complex, Dissolution, Drug, Extraction, Loading, Matrix, Membranes, Model, Polyaspartic Acid, Polymer

? Khan, N.A., Jun, J.W., Jeong, J.H. and Jhung, S.H. (2011), Remarkable adsorptive performance of a metal-organic framework, vanadium-benzenedicarboxylate (MIL-47), for benzothiophene. *Chemical Communications*, **47** (4), 1306-1308.

Full Text: [2011\Che Com47, 1306.pdf](2011/Che%20Com47,%201306.pdf)

Abstract: Liquid-phase adsorption of benzothiophene over isotypic MOFs such as MIL-47 and MIL-53(Al, Cr) has shown that a metal ion of a MOF-type material has a dominant role in adsorptive desulfurization and MIL-47 has a remarkable performance.

Keywords: Activated Carbons, Adsorbents, Adsorption, Coordination Polymers, Desulfurization, Dibenzothiophene, Framework, Liquid-Phase Adsorption, Metal, Organosulfur Compounds, Performance, Removal, Role, Selectivity, Terephthalate, Ultrasound, Zeolites

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Full Text: [2011\Che Com-Zhang.pdf](2011/Che%20Com-Zhang.pdf)

Abstract: This communication demonstrates that improperly formulated data analyses can inflate the strength of statistical correlations and result in drawing incorrect conclusions. The widespread misuse of a second-order kinetic model in the recent literature reveals that many chemists are not aware of the dangers of spurious correlation.

# Title: The Chemical-Engineer

Swan, R. (1999), Taking responsibility, taking pride. *The Chemical-Engineering*, **680**, 2.

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Bond G. (1999), Juggling Responsiblities: Ten years after the Responsible Care programme was launched, Gregory Bond describles one company’s view of the importance of environment, health and safety to product development. *The Chemical-Engineering*, **680**, 15-17.

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# Title: Chemical Engineer-London

Full Journal Title: Chemical Engineer-London

ISO Abbreviated Title: Chem. Eng.-London

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ISSN: 0302-0797

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Publisher: Inst Chemical Engineers

Publisher Address: 165-189 Railway Terrace, Davis Bldg, Rugby CV21 3BR, England

Subject Categories:

Engineering, Chemical: Impact Factor 0.010, 108/110 (2000); Impact Factor 0.000, 119/123 (2001)

McKay, G. and Alexander, F. (1977), Kinetics of the removal of basic dye from effluent using silica. Part 1: Batch experiments. *Chemical Engineer-London*, **319**, 243-244.

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# Title: Chemical Engineering

Full Journal Title: Chemical Engineering

ISO Abbreviated Title: Chem. Eng.

JCR Abbreviated Title: Chem Eng-New York

ISSN: 0009-2460

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Chemical Week Associates

Publisher Address: 888 Seventh Ave, 26th FL, New York, NY 10106

Subject Categories:

Engineering, Chemical: Impact Factor110 (1999); Impact Factor 0.132, 108/123 (2001)

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Full Text: [C\Che Eng104, 39.pdf](C/Che%20Eng104,%2039.pdf)

Zwayyed, S.K. and Novak, R.G. (1998), Predicting actual incinerator system capacity. *Chemical Engineering*, **105** (1), 115-122.

# Title: Chemical Engineering Communications

Full Journal Title: [Chemical Engineering Communications](http://www.ingentaconnect.com/content/tandf/gcec); [Chemical Engineering Communications](http://www.informaworld.com/smpp/title~db=all~content=t713454788~tab=issueslist)

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Journal Country/Territory: England

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Subject Categories:

Engineering, Chemical: Impact Factor 0.254, 83/110 (1999); Impact Factor 0.410, 75/123 (2001)

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Full Text: [1960-80\Che Eng Com6, 49.pdf](1960-80/Che%20Eng%20Com6,%2049.pdf)

Abstract: An innovative technique has been developed for determination of external (“film”) and internal (“intraparticle”) mass transport parameters associated with uptake of solutes by porous solids in fixed-bed adsorbers. These parameters are required for predictive modeling of the dynamics of such systems as activated carbon columns and ion exchange beds. Current methods for evaluation of film transfer coefficients and effective intraparticle diffusivities involve correlation procedures and separate batch-reactor measurements of adsorption rates, respectively. These methods frequently introduce and compound significant errors in subsequent predictive modeling Tor full-scale process design. The present work develops a method by which, on the basis of the characteristics of breakthrough curves measured in specially designed micro-columns, more accurate and reliable simultaneous determinations of both film transfer coefficients and effective surface diffusivities can be done. Verification of the procedure is demonstrated by the agreement of predictions generated from a mathematical model, in which mass transfer coefficients determined from the micro-column technique are used, with experimental breakthrough data for larger scale adsorbers.

Jevtitch, M.M. and Bhattacharyya, D.B. (1983), Separation of heavy metal chelates by activated carbon: Effect of surface and species charge. *Chemical Engineering Communications*, **23** (4-6), 191-213.

Full Text: [1983\Che Eng Com23, 191.pdf](1983/Che%20Eng%20Com23,%20191.pdf)

Abstract: An extensive experimental investigation was conducted with activated carbons to establish the adsorption capacities of heavy metals (Cd2+, Ni2+, Cu2+, and Zn2+) in the presence of complexing agents (EDTA, triethylenetetramine (TRIEN), citrate, etc.). Adsorption equilibria are explained by species charges and carbon surface charge characteristics. In the pH range 7.5-8.0, the active sites are positively charged. The adsorption capacities of Cd2+ (and other heavy metals), free ligands, and cadmium-ligands are also a function of feed metal concentration, types of ligands, molar ratio of ligand/metal, and pH. Complete metal-ligand species distributions are calculated by computer solutions of multiple reaction equilibria. For an equilibrium cadmium concentration of 0.1 mM (pH 7.5-8.0), the sequence in adsorption capacity for cadmium chelates is *Q*Cd-EDTA > *Q*Cd-citrate > *Q*Cd-TRIEN > *Q*Cd-tartrate. A relationship between the adsorption capacity, surface charge of activated carbon, and the average species charge for various cadmium ligands systems is presented.

? Olmstead, K.P. and Weber, Jr., W.J. (1991), Interactions between microorganisms and activated carbon in water and waste treatment operations. *Chemical Engineering Communications*, **108** (1), 113-125.

Full Text: [1991\Che Eng Com108, 113.pdf](1991/Che%20Eng%20Com108,%20113.pdf)

Abstract: The encouragement of microbial activity in activated carbon operations used for water and waste treatment has attracted interest as a potential means for enhancing overall system performance. Microorganisms have been found to have both positive and negative effects on adsorption processes; the most common positive effect is increased throughput before regeneration is required, while common negative effects include potential interference with the adsorption of specifically targeted compounds and the possibility of release of pathogenic organisms to progress effluents. There have been a number of reports in the literature, including several by Dr. Tien and his co-workers, which have involved either experimental or numerical modeling studies of phenomena associated with biologically active carbon adsorption systems. This paper reviews progress to date on elucidation of various mechanisms extant in such systems, and suggests areas for future research on the topic.

Keywords: Activated Carbon, Adsorption, Bacterial-Activity, Bilayer Film Model, Biodegradation, Biofilm, Biologically-Active Carbon Adsorption, Bioregeneration, Columns, Degradation, Microorganisms, Substrate, Surfaces, Water and Waste Treatment

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Full Text: [1993\Che Eng Com119, 151.pdf](1993/Che%20Eng%20Com119,%20151.pdf)

Abstract: The kinetics of ozonation of the sulfur dye Methylene Blue in aqueous solution is studied. The experiments have been carried out in a bubble column, using a single nozzle as gas sparger. The influence of the operating variables (initial concentration of Methylene Blue, ozone partial pressure, temperature and pH) on the oxidation process is established. A stoichiometric ratio of 3 moles of ozone consumed per mol of dye reacted is deduced. A reaction scheme based on the direct ozone attack to the dye is suggested, and it agrees with the found stoichiometry. The overall reaction orders and rate constants as a function of pH and temperature are determined following the film theory which is applied to the experimental data. The process develops in the fast pseudo mth order kinetic regime of absorption.

Keywords: Ozonation, Methylene Blue, Dye, Kinetics, Water, Decomposition

? Hashim, M.A., Chu, K.H. and Tsan, P.S. (1997), Modelling of protein adsorption in a fixed-bed: Single and two-solute breakthrough behaviour. *Chemical Engineering Communications*, **161** (1), 45-63.

Full Text: Che Eng Com161, 45

Abstract: Single- and two-solute adsorption breakthrough curves of lysozyme and bovine serum albumin on the cation exchanger SP-Sepharose Fast Flow were studied in this paper. A simplified mathematical model was used to model these data. Input parameters of the model such as equilibrium and kinetic parameters were estimated from single-solute batch experiments. For single-component adsorption in a fixed-bed, the breakthrough behaviour of lysozyme was well modelled. In contrast, significant deviations were observed between the measured and theoretical breakthrough curves of albumin. It was shown that the equilibrium parameters measured from batch experiments failed to account for the behaviour of albumin in the fixed-bed. The bisolute system consisting of the simultaneous adsorption of lysozyme and albumin was also modelled using the same set of parameters derived from single-solute batch experiments. Deviations were observed between the measured and theoretical breakthrough curves for both proteins, indicating that the effects of multicomponent equilibria and kinetics must be taken into consideration in parameter estimation.

Keywords: Protein Modelling, Multicomponent Adsorption, Fixed-Bed Adsorption, S-Sepharose FF, Chromatography

Hu, X. (1999), Multicomponent adsorption equilibrium of gases in zeolite: Effect of pore size distribution. *Chemical Engineering Communications*, **174** (1), 201-214.

Full Text: [1999\Che Eng Com174, 201.pdf](1999/Che%20Eng%20Com174,%20201.pdf)

Abstract: The effect of pore size distribution of zeolite on the multicomponent adsorption equilibrium is studied. All species compete locally for a given pore and this can be described by the extended multicomponent Langmuir isotherm. The size exclusion effect is taken into account in the competition of different species for a given pore so large molecules have less degree of accessing available pores. The pore size is related to the adsorbate-adsorbent interaction energy by the Lennard-Jones potential. The isotherm parameters extracted from single-component data fitting are used to predict multicomponent adsorption equilibrium. When validated with binary experimental data of CO2, H2S and propane in H-mordenite, collected by Talu and Zwiebel (1986), this model provides better results than a previously proposed heterogeneous model based on a uniform energy distribution and a local IAST (Hu and Do, 1995).

Keywords: Adsorption Isotherm, Multicomponent, Pore Size Distribution, Surface Heterogeneity, Zeolite, Mixtures, Model, Heterogeneity, Micropores, Carbons

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Full Text: [2001\Che Eng Com188, 1.pdf](2001/Che%20Eng%20Com188,%201.pdf)

Abstract: The uptake equilibrium and the column dynamics of alanine by “001 x 7” resin, a strongly acidic cation exchange resin, were investigated, The experimental data indicated that the Langmuir equation could describe the equilibrium isotherm. The implicit difference scheme and the optimization technique were applied to compute the model developed for alanine in fixed-bed column. The results of experiments with different superficial velocities and liquid phase solute concentrations showed that interparticle transport was dominated by the slow diffusion of alanine cations through the liquid phase bulk into the surface of the resin particle. However, the resistance of intraparticle diffusion of alanine cations through the macroreticular polymer structure of the resin was small. The experimental results were in good agreement with the theoretical predictions.

Keywords: Adsorption, Amino Acid, Axial Diffusion, Cation Exchanger, Column, Column Dynamics, Fixed Bed, Fixed Bed Column, Fixed-Bed, Fixed-Bed Column, Ldf, Model, Multicomponent

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Full Text: [2002\Che Eng Com189, 1684.pdf](2002/Che%20Eng%20Com189,%201684.pdf)

Abstract: Stangeland’s kinetic model for predicting hydrocracker yields was modified to explicitly account for the mass balance closure in each individual hydrocracking reaction and for the effect of hydrogen partial pressure on the hydrocracking reaction rate. This improved kinetic model has two additional parameters. The model was applied to the modeling of a fixed bed reactor for mild hydrocracking of vacuum gas oils in the framework of the Aspen Plus® process simulator. The kinetic parameters were regressed using the algorithm of Levenberg-Marquardt such that the mass balance in each individual hydrocracking reaction is satisfied. The reactor model assumed gas-liquid equilibrium and was used to quantify the effect upon conversion of the operating variables--liquid hourly spatial velocity, reactor pressure, and hydrogen-to-feed ratio--showing that both the kinetic and reactor models predict the appropriate trends compared to the reference data. The practical implications of explicitly introducing the mass balance closure for each hydrocracking reaction in the kinetic model are discussed.

Sağ, Y., Akcael, B. and Kutsal, T. (2003), Application of multicomponent adsorption models to the biosorption of Cr(VI), Cu(II), and Cd(II) ions on *Rhizopus arrhizus* from ternary metal mixtures. *Chemical Engineering Communications*, **190** (5-8), 797-812.

Full Text: [C\Che Eng Com190, 797.pdf](C/Che%20Eng%20Com190,%20797.pdf)

Abstract: Instantaneous and equilibrium metal uptake performance of *Rhizopus arrhizus* was studied using aqueous solutions containing Cr(VI), Cu(II), and Cd(II) ions in ternary mixtures. Application of the multicomponent Langmuir model to describe the three-metal system revealed its nonideal characteristics, whereby the values of the equilibrium constants and the maximum capacities for the metals differed for each system. For that reason, the ternary biosorption equilibria of Cr(VI), Cu(II), and Cd(II) ions with R. arrhizus were further investigated by using the multicomponent Freundlich model. From the equations of the multicomponent Freundlich model, three-dimensional (3-D) biosorption isotherm surfaces were simulated depicting the equilibrium behavior of the three-metal system

Keywords: Activated-Sludge, Biosorbent, Biosorption, Chromium(VI), Equilibria, Heavy Metal, Heavy-Metals, Microalgae, Multicomponent Freundlichmodel, Wastewater

Chen, J.H., Hsu, Y.C., Yang, H.C. and Hsu, C.H. (2003), Ozonation treatment of 2-nitrophenolic wastewater using a new gas-inducing reactor. *Chemical Engineering Communications*, **190** (11), 1541-1561.

Full Text: [C\Che Eng Com190, 1541.pdf](C/Che%20Eng%20Com190,%201541.pdf)

Abstract: Ozonation is a potential chemical process for the treatment of nitrophenolic wastewater. However, due to the low solubility and utilization rate of ozone, a conventional gas-inducing reactor for ozonation treatment has limited app-lication for treating phenolic wastewater. In this study, 2-nitrophenol wastewater ozonation was conducted in a new gas-inducing reactor that has been investigated in our laboratory over the past few years. The ozonation conducted in this reactor can be operated with a higher ozone utilization rate and lower power consumption than a conventional gas-liquid reactor. The ozone utilization rate increases with increasing pH value and can be maintained at over 95%. Kinetic studies show that a pseudo first-order reaction model derived from a two-film theory can describe the ozonation of 2-nitrophenol. Kinetic study of 2-nitrophenol ozonation shows that there are two stages in 2-nitrophenol ozonation. The observed rate constant in the second stage of 2-nitrophenol ozonation is higher than the first stage. A change in the 2-nitrophenol concentration is responsible for the change in the observed rate constant. Below pH 7, the oxidation rate of 2-nitrophenol increases with increasing pH and increasing ozone inlet concentration. This new gas-inducing reactor can improve the ozone utilization rate. The ozonation of 2-nitrophenol can be effectively conducted in this reactor.

? Al-Jabari, M. (2003), Modeling analytical tests of supercritical fluid extraction from solids with Langmuir kinetics. *Chemical Engineering Communications*, **190** (12), 1620-1640.

Full Text: [C\Che Eng Com190, 1620.pdf](C/Che%20Eng%20Com190,%201620.pdf)

Abstract: A model for the analytical supercritical fluid extraction (SFE) tests from solid samples in which desorption of the solute from the surface of the solid is the rate determining step is presented. The desorption process is described by the Langmuir kinetics. The two stages of the test (static and dynamic) are modeled, where each of the two phases (solid and supercritical fluid) are considered well mixed. The resulting ordinary differential equations are solved analytically for the static stage and numerically for the dynamic stage. Dimensionless curves of concentrations of the two phases and fractional recovery during the two stages of the tests are predicted. These curves are characterized by two dimensionless parameters for the static stage, the equilibrium constant and the fractional initial capacity, in addition to one parameter for the dynamic stage, the desorption coefficient. The model provides a good fit to experimental results for SFE from solids. The trends in the fitted parameters with respect to pressure and temperature are in agreement with theory.

Keywords: Supercritical Fluid, Extraction, Modeling, Analytical Test, Langmuir, Kinetics, Carbon-Dioxide, Mass-Transfer, Simulation, Adsorption, Oil, CO2, Mixtures, Metals, Liquid

Keywords: Gas-Inducing Reactor, 2-Nitrophenol, Ozonation, Cod Removal, Admi Value, Kinetics

Alma, M.H. and Acemioğlu, B. (2004), A kinetic study of sulfuric acid-catalyzed liquefaction of wood into phenol. *Chemical Engineering Communications*, **191** (7), 968-980.

Full Text: [C\Che Eng Com191, 968.pdf](C/Che%20Eng%20Com191,%20968.pdf)

Abstract: The powders of monarch birch wood (Betula maximowiczina Regel) were liquefied into phenol using sulfuric acid as a catalyst at various temperatures and reaction times. Typical kinetic parameters of the degrading reaction of wood in the presence of phenol and the acid were determined using typical kinetic models. In addition, the activation parameters of the liquefaction of wood were determined according to transition-state theory. The results of showed percent liquefied wood that about 100% of the wood could be liquefied into phenol at a temperature of 150degreesC for about 2 h. However, about 68% of phenol was found to react mainly with wood components along with sulfuric acid and phenol itself. The kinetic studies showed that the liquefaction of wood into phenol using sulfuric acid obeyed a bimolecular type second-order reaction and Arrhenius law. The activation energy of the liquefaction was 68.5 kJ mol-1. Furthermore, the findings related with activation enthalpy showed that the liquefaction of wood possessed a primarily endothermic reaction nature.

Keywords: Kinetic, Activation Energy, Liquefaction of Wood, Sulfuric Acid, Rate Constant, Activation Parameters, Carboxymethylated Wood, Products

Açikel, Ü., Kabasakal, E., Tezer, S. and Aksu, Z. (2004), Individual and simultaneous biosorption of chromium(VI) and nickel(II) onto dried activated sludge. *Chemical Engineering Communications*, **191** (12), 1589-1605.

Full Text: [C\Che Eng Com191, 1589.pdf](C/Che%20Eng%20Com191,%201589.pdf)

Abstract: The biosorption of chromium(VI) and nickel(II) ions, both singly and in combination, by dried activated sludge was investigated in a batch system as a function of initial pH and single- and dual-metal ion concentrations. The working pH value for single chromium(VI) and nickel(II) biosorption was determined as 1.0 and 4.5, respectively, due to the selective uptake of biomass. Multi component biosorption studies were performed at these two initial pH values. It was observed that the biosorption kinetics and equilibrium uptakes of chromium(VI) and nickel(II) ions in binary mixtures changed due to the initial biosorption pH and the presence of the other component.

Keywords: Simultaneous Biosorption, Chromium(VI), Nickel(II), Dried Activated Sludge

? Harouna-Oumarou, H.A., Fauduet, H., Porte, C. and Ho, Y.S. (2007), Comparison of kinetic models for the aqueous solid-liquid extraction of *Tilia* sapwood in a continuous stirred tank reactor. *Chemical Engineering Communications*, **194** (4), 537-552.

Full Text: [2007\Che Eng Com194, 537.pdf](2007/Che%20Eng%20Com194,%20537.pdf)

Abstract: The kinetic study of the aqueous extraction of Tilia sapwood was based on temperature, while all the other factors were kept constant. Several models were used and compared to explain the kinetics of the aqueous solid-liquid extraction of Tilia sapwood. For each model, the rate constant, the equilibrium extraction capacity, and the initial extraction rate were evaluated to analyze the suitability of these kinetic models to describe the leaching process for temperatures ranging from 313 to 363 K. The pseudo first-order model could not be applied during the whole of the process. The Elovich model provided a good degree of correlation (from 0.929 to 0.988) and could be applied all along the extraction process. The pseudo second-order model was satisfactorily applied, with coefficients of correlation over 0.998, showing that it perfectly described the process. A physical explanation of these models was finally proposed.

Keywords: Elovich Model, First-Order Model, Kinetics, Leaching, Second-Order Model, Tilia Sapwood, Adsorption, Sorption, Diffusivity, Biosorbent, Equation, Removal, Release, Linden, Carbon, Plants

? Sahu, A.K., Mall, I.D. and Srivastava, V.C. (2008), Studies on the adsorption of furfural from aqueous solution onto low-cost bagasse fly ash. *Chemical Engineering Communications*, **195** (3), 316-335.

Full Text: [2008\Che Eng Com195, 316.pdf](2008/Che%20Eng%20Com195,%20316.pdf)

Abstract: The present study deals with the sorptive removal of furfural from aqueous solution by carbon-rich bagasse fly ash (BFA). Batch studies were performed to evaluate the influence of various experimental parameters, namely, initial pH (pH(0)), adsorbent dose, contact time, initial concentration, and temperature on the removal of furfural. Optimum conditions for furfural removal were found to be pH0 approximate to 5.5, adsorbent dose approximate to 4g/L of solution, and equilibrium time approximate to 4 h. The adsorption followed pseudo-second-order kinetics. The effective diffusion coefficient of furfural is of the order of 10-13m2/s. Equilibrium adsorption data on BFA was analyzed by Freundlich, Langmuir, Dubnin-Radushkevich, Redlich-Peterson, and Temkin isotherm equations using regression and error analysis. The Redlich-Peterson isotherm was found to best represent the data for furfural adsorption onto BFA. Adsorption of furfural on BFA is favorably influenced by a decrease in the temperature of the operation. Values of the change in entropy (Delta S-0) and heat of adsorption (Delta H-0) for furfural adsorption on BFA were negative. The high negative value of change in Gibbs free energy (Delta G(0)) indicates the feasible and spontaneous adsorption of furfural on BFA.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Analysis, Aqueous Solution, Bagasse Fly Ash, Chitosan, Diffusion, Dioxide, Equilibrium, Equilibrium Isotherm Analyses, Fly Ash, Furfural, Green-Dye, India, Isotherm, Isotherms, Kinetics, Langmuir, pH, Pseudo-Second-Order Kinetics, Removal, Sorption, Temperature, Toxicity, USA

? Maiti, S., Purakayastha, S. and Ghosh, B. (2008), Production of low-cost carbon adsorbents from agricultural wastes and their impact on dye adsorption. *Chemical Engineering Communications*, **195** (4), 386-403.

Full Text: [2008\Che Eng Com195, 386.pdf](2008/Che%20Eng%20Com195,%20386.pdf)

Abstract: This study concerns utilizing commonly available agricultural wastes like mustard stalk, jute stalk, sesame stalk, wheat straw, bagasse, and rice husk in a proper and efficient way. As a part of this research, activated carbon has been prepared from these wastes by a two-stage activation process with a carbonization stage up to 325°C as a first stage followed by chemical activation using zinc chloride as an activation agent. The effects of temperature, time, and impregnation ratio on activation have been studied. The batch adsorption technique has been utilized to obtain information for treating effluents from the dye industry. Methylene blue dye has been chosen as the standard. Adsorption data have been modeled using the Freundlich and Langmuir adsorption isotherms and first- and second-order kinetic equations and intraparticle diffusion model. Specific surface area was determined by the Methylene blue spot test. The results indicate that such carbons can be employed as low-cost alternatives to expensive commercial activated carbon in wastewater treatment to remove water-soluble dyes.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbents, Adsorption, Adsorption Isotherms, Agricultural Wastes, Aqueous-Solutions, Carbon, Carbonization, Chemical Activation, Chloride, Diffusion, Dye, Dye Removal From Water, India, Isotherms, Kinetic, Kinetic Equations, Kinetics, Langmuir, Metal-Ions, Methylene Blue, Methylene-Blue, Porosity, Removal, Research, Rice, Shell, Temperature, USA, Wastewater, Wastewater Treatment, Zinc, Zinc-Chloride

? Delgado, J.M.P.Q. (2008), The initial states of water vapor adsorption in piles of granules: A new approach. *Chemical Engineering Communications*, **195** (4), 404-416.

Full Text: [2008\Che Eng Com195, 404.pdf](2008/Che%20Eng%20Com195,%20404.pdf)

Abstract: In this work the wall effect during the initial states of water vapor adsorption was studied for different piles of granules held in a cylindrical container. A new diffusion model was developed for the description of the physical phenomenon whereby water vapor penetrates along the piles of cylindrical pores. The isotherm sorption equation was incorporated as a wall boundary condition of the cylindrical pore. Finally, the differential mass balance equation was solved numerically using a finite-difference method. A second-order central differencing scheme (CDS), in a general nonuniform grid, was adopted. A mathematical expression is proposed for linear sorption isotherm (given as Equation (28) here), and a numerical procedure is presented for the case of nonlinear moisture sorption isotherm. The numerical solutions were tested through the measurement of water vapor mass uptake for different piles of silica gel and breakfast cereals, and the experimental values obtained were in good agreement.

Keywords: Adsorption, Breakfast Cereals, Cd, Diffusion, Grain, Isotherm, Mass Transfer, Measurement, Numerical Method, Silica Gel, Sorption, USA, Vapor Adsorption, Water

? Lata, H., Gupta, R.K. and Garg, V.K. (2008), Removal of basic dye from aqueous solution using chemically modified *Parthenium hysterophorus* Linn. biomass. *Chemical Engineering Communications*, **195** (10), 1185-1199.

Full Text: [2008\Che Eng Com195, 1185.pdf](2008/Che%20Eng%20Com195,%201185.pdf)

Abstract: Removal of malachite green on phosphoric acid treated (PWC) and sulfuric acid treated (SWC) parthenium plant biomass was studied. Batch experiments were conducted to study the effect of different process parameters, i.e., pH, contact time, adsorbent dose, and initial dye concentration for the removal of malachite green dye. Similar experiments were carried out with commercially available activated carbon (AC) to compare the adsorption capacities. Maximum dye was removed from the liquid phase within 90 min after the beginning of every experiment. Higher percentage of dye was removed at lower concentration of dye and higher adsorbent dose. At 250 mg L-1 malachite green concentration, AC had 2.01 and 2.63 times more adsorption capacity than PWC and SWC, respectively. Adsorption kinetic data determined at 22°± 1°C were modeled using the pseudo-first- and pseudo-second-order kinetic equations and intra-particle diffusion models. The pseudo-second-order model best describes adsorption kinetic data. Adsorption follows both Langmuir and Freundlich isotherm models. By considering the experimental results and adsorption models applied in this study, it was concluded that equilibrium data were represented well by the Langmuir isotherm equation. SEMs of the native and exhausted SWC and PWC were recorded to explore the morphology of the adsorbent. The result showed that SWC and PWC can be considered as potential adsorbents for malachite green removal from dilute aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Kinetic, Aqueous Solution, Aqueous Solutions, Basic Dye, Biomass, Capacity, Carbon, Diffusion, Dye, Equilibrium, Experimental, Experiments, Freundlich, Freundlich Isotherm, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Equations, Kinetic Study, Kinetics, Langmuir, Langmuir Isotherm, Malachite Green, Methylene-Blue, Model, Models, Morphology, Parthenium, pH, Phosphoric Acid, Plant, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Sawdust, Solution, Sorption, Sorption Isotherm, Waste-Water, Wood

? Gupta, B., Zareena, B.I. and Rajput, G. (2008), Equilibrium and kinetic studies for the adsorption of Mn(II) and Co(II) from aqueous medium using agar-agar as sorbent. *Chemical Engineering Communications*, **195** (10), 1200-1212.

Full Text: [2008\Che Eng Com195, 1200.pdf](2008/Che%20Eng%20Com195,%201200.pdf)

Abstract: An extensive increase in industrial activities and environmental accidents in recent years have greatly contributed to increasing metal pollution in water resources, thereby causing threats to terrestrial as well as aquatic life. The toxicity of metal pollution is slow and long lasting, as these metal ions are nonbiodegradable. The most appropriate solution for controlling the biogeochemistry of metal contaminants to produce high-quality treated effluents from polluted wastewaters is sorption technique. Agar-agar, a readily available seaweed, was used as sorbent for the removal of Mn(II) and Co(II) from aqueous media. Batch experiments were performed to study adsorption as a function of process parameters: sorption time, initial pH, concentration of sorbate and sorbent. The Freundlich model fitted best with the experimental equilibrium data between the two adsorption isotherm models tested. The kinetic data correlated well with the Lagergren pseudo-second-order kinetic model for the sorption of both Mn(II) and Co(II) using agar-agar. Adsorbed metal ions were quantitatively recovered from the spent adsorbent using 5.0 mol L-1 HCl. The efficiency of agar-agar for decontaminating Mn(II) and Co(II) from electroplating effluent has also been evaluated. The results proved agar-agar to be a favorable adsorbent to remove and recover Mn(II) and Co(II) from waste effluent for further use in diversified industrial applications.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Isotherm Models, Agar-Agar, Aqueous Medium, Biogeochemistry, Biosorption, Cadmium, Co(II), Cobalt(II), Desorption, Efficiency, Electroplating Industrial Effluent, Environmental, Equilibration, Equilibrium, Experimental, Experiments, Freundlich, Freundlich Model, Function, Isotherm, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Lead, Life, Manganese(II), Media, Metal, Metal Ions, Metals, Model, Models, pH, Pollution, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Sargassum sp, Seaweed, Solution, Sorbate, Sorbent, Sorption, Toxicity, Waste, Waste Biomass, Water

? Migahed, M.A. and Al-Sabagh, A.M. (2009), Beneficial role of surfactants as corrosion inhibitors in petroleum industry: A review article. *Chemical Engineering Communications*, **196** (9), 1054-1075.

Full Text: [2009\Che Eng Com196, 1054.pdf](2009/Che%20Eng%20Com196,%201054.pdf)

Abstract: The objective of this review is to outline the beneficial role of surfactants as corrosion inhibitors in the petroleum field. After an introduction and brief notes on fundamentals of surfactants, the article shows the most important corrosion problems in the oil industry and the effective role of surfactants to solve these problems. The reported mechanisms of corrosion inhibition by surfactants are also considered. Key results are extracted from publications covering the past 50 years.

Keywords: Corrosion Inhibitors, Critical Micelle Concentration, Petroleum Fields, Pipelines, Self-Assembly Molecules, Surfactants, Sulfuric-Acid-Solution, Carbon-Steel, Nonionic Surfactants, Hydrochloric-Acid, Mild-Steel, Amine Surfactants, Chloride Solution, Iron Corrosion, Lauryl Amide, Oil-Fields

? Boussahel, R., Irinislimane, H., Harik, D. and Moussaoui, K.M. (2009), Adsorption, kinetics, and equilibrium studies on removal of 4,4-DDT from aqueous solutions using low-cost adsorbents. *Chemical Engineering Communications*, **196** (12), 1547-1558.

Full Text: [2009\Che Eng Com196, 1547.pdf](2009/Che%20Eng%20Com196,%201547.pdf)

Abstract: The removal of a chlorinated pesticide (4,4-DDT) from aqueous solutions by a batch adsorption technique using different low-cost adsorbents was investigated. Two adsorbents, wood sawdust (A) and cork wastes (B), were used to determine adsorption efficiency. The influence of the adsorbent particle size and the organic matter of water (humic acids) on the removal process was studied. The obtained results were compared to those obtained with a commercial powdered activated carbon (PAC, F400, Chemviron) (C). Kinetic studies were performed to understand the mechanistic steps of the adsorption process. The rate of the adsorption kinetics of 4,4-DDT on the low-cost adsorbents was found best fitted with a pseudo-second-order kinetic model. This is in contrast to the rate of the adsorption kinetics of the PAC F400, which was best fitted with the Lagergren model. The application of the Morris-Weber equation showed that the adsorption process of 4,4-DDT on these adsorbents was complex. Both the adsorption on the surface and the intraparticle diffusion were the rate-controlling mechanisms. Langmuir and Freundlich adsorption isotherms were applicable to the adsorption process and their constants were evaluated. The adsorption capacity (*q*m) calculated from the Langmuir isotherm (69.44mg center dot g-1, 19.08mg center dot g-1, and 163.90mg center dot g-1, respectively, for A, B, and C) showed that the process is highly particle size dependent, that the organic matter influenced the adsorption process negatively, and that wood sawdust is the most effective adsorbent for the removal of 4,4-DDT from aqueous solutions. The adsorbents studied exhibited a possible application in water decontamination, as well as in treatment of industrial and agricultural waste waters.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Agricultural, Agricultural Waste, Application, Aqueous Solutions, Batch, Batch Adsorption, Capacity, Carbon, Chlorophenols, Cork, Cork Processing Wastewaters, DDT, Decontamination, Diffusion, Dye Adsorption, Efficiency, Equilibrium, Freundlich, Humic Acids, Intraparticle Diffusion, Isotherm, Isotherms, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Lagergren Model, Langmuir, Langmuir Isotherm, Low Cost, Low Cost Adsorbents, Low-Cost Adsorbents, Mechanisms, Model, Morris-Weber Equation, Organic, Organic Matter, PAC, Parameters, Part I, Particle Size, Pesticide, Pesticides, Powdered Activated Carbon, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Sawdust, Size, Solutions, Sorption, Surface, Treatment, Waste, Waste Waters, Water, Waters, Wood, Wood Sawdust

? Royer, B., Lima, E.C., Cardoso, N.F., Calvete, T. and Bruns, R.E. (2010), Statistical design of experiments for optimization of batch adsorption conditions for removal of Reactive Red 194 textile dye from aqueous effluents. *Chemical Engineering Communications*, **197** (5), 775-790.

Full Text: [2010\Che Eng Com197, 775.pdf](2010/Che%20Eng%20Com197,%20775.pdf)

Abstract: Factorial and central composite design experiments were performed to maximize the percentage removal of hydrolyzed reactive red 194 (HRR) from a simulated textile effluent by using Brazilian pine fruit wastes. Solution pH, initial dye concentration, contact time, and adsorbent mass levels were systematically varied for both untreated and acid-treated wastes. Biosorbent dosage of 9.0gL-1, pH of 2.0, and at least 7-8h contact time resulted in 98% dye removal for the acid-treated wastes and 88% for the untreated wastes. Adsorption isotherms were determined for both materials at the optimized conditions, and the equilibrium data was better fitted to the Sips isotherm model.

Keywords: Adsorption, Adsorption Isotherms, Araucaria-Angustifolia Wastes, Biosorbent, Biosorption, Brazilian Pine Fruit Wastes, Composite, Cu(II), Dye, Dye Removal, Effluent, Equilibrium, Evaluate, Factorial Design, Isotherm, Isotherms, Methylene-Blue Biosorption, Model, Optimization, Pecan Nutshell, pH, Removal, Response Surface Design, Shell, Simulated Textile Effluent, Solution pH, Sorption Capacity, Yellow Passion-Fruit

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Full Text: [2010\Che Eng Com197, 1435.pdf](2010/Che%20Eng%20Com197,%201435.pdf)

Abstract: Honey tree and peepul leaves showed tremendous potential in sorbing methylene blue (MB) from aqueous solution, with qmax values of 417 and 402mg g-1, respectively. But other tested biomass had considerably lower *q*max (mgg-1): mango leaves (301), guava leaves (295), black gram husk (278), coir fibers (273), neem leaves (265), Indian elm leaves (264), Indian rosewood leaves (253), bermuda grass clippings (247), banyan leaves (239), groundnut husk (206), citrus leaves (204), tea leaves (203), banana peels (184), wheat straw (171), sugarcane baggasse (154), rice husk (126), teak leaves (120), and teak sawdust (96). MB sorption by honey tree leaves attained equilibrium within 20-30min, but a slightly slower attainment of equilibrium of MB sorption was noticed in the case of peepul leaves. Both the pseudo-first-order and the pseudo-second-order rate equations suitably fitted to the time course data of MB sorption by honey tree and peepul leaves. However, the latter fitted better because its estimated values of equilibrium MB sorption (qE) were closer to the experimental values. MB sorption by honey tree and peepul leaves was adversely affected by the presence of divalent cations. Nevertheless, both honey tree and peepul leaves efficiently sorbed MB from solution in the presence of the monovalent cation Na+.

Keywords: Algae, Aqueous Solution, Aqueous-Solution, Biomass, Biosorption, Biosorption, Black Gram Husk, Cation, Course, Data, Divalent Cations, Dye Removal, Equilibrium, Experimental, Fibers, Kinetics, Low-Cost Adsorbents, MB, Methylene Blue, Na+, Neem Leaves, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rice, Rice Husk, Rice-Husk, Sawdust, Solution, Sorption, Sorption Capacity, Sorption Isotherm, Straw, Sugarcane, Waste Plant Material, Water

? Sekrane, F., Bouberka, Z., Benabbou, A.K., Rabiller-Baudry, M. and Derriche, Z. (2011), Adsorption of toluene on bentonites modified by dodecyltrimethylammonium bromide. *Chemical Engineering Communications*, **198** (9), 1093-1110.

Full Text: [2011\Che Eng Com198, 1093.pdf](2011/Che%20Eng%20Com198,%201093.pdf)

Abstract: The adsorption of toluene was studied by using various types of adsorbents (Na+- and Al3+-bentonite) modified by dodecyltrimethylammonium bromide (DTAB). The characterization of these new sorbing matrices by XRD and IR indicates that DTAB tallow interacted with bentonite and increased the interlayer spacing of the clay with double-layered formation. Adsorption of toluene on modified bentonites was characterized by linear isotherms with no limitation of adsorption within the concentration range studied, thus indicating a mechanism of adsorption due to partition. Adsorption was fast and favored by a slightly acid medium. Pseudo-first-order, pseudo-second-order, the Elovich equation, and intra-particle diffusion models were used to fit the experimental data. The adsorption kinetic of toluene was described by the pseudo-first order onto DTAB-Na-bent, and pseudo-second order onto DTAB-Al-bent. The intra-particle diffusion process was identified as the main mechanism controlling the rate of toluene adsorption. Thermodynamic parameters such as standard free energy change (G0), the standard enthalpy change (H0), and the standard entropy (S0) were also evaluated. The variation of adsorption energy versus the types of adsorbent suggested a physical adsorption mechanism.

Keywords: Acid Dye, Adsorption, Aqueous-Solutions, Benzene, Characterization, Clays, Dodecyltrimethylammonium Bromide, Isotherms, Kinetic, Mechanism, Modified, Modified Bentonite, Montmorillonite, Organic Contaminants, Organobentonite, Organophilic-Bentonite, Phenol, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Toluene

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Full Journal Title: [Chemical Engineering Journal](http://www.sciencedirect.com/science?_ob=PublicationURL&_cdi=5228&_pubType=J&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=0dc2f93fee6a8b46feaec74815015fbb)

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McKay, G. (1983), The adsorption of dyestuffs from aqueous solution using activated carbon: Analytical solution for batch adsorption based on external mass transfer and pore diffusion. *Chemical Engineering Journal*, **27** (3), 187-196.

Full Text: [C\Che Eng J27, 187.pdf](C/Che%20Eng%20J27,%20187.pdf)

Abstract: A two-step resistance model has been developed for the adsorption of dyes on carbon. The model is based on external mass transfer and pore diffusion and an analytical solution is possible based on the assumption of a pseudo-irreversible isotherm. The diffusion coefficient and external mass transfer for Telon Blue are 8.0×10-7 cm2 s-1 and 4.0×103 cm s-1 respectively and for Deorlene Yellow are 1.0×10-7 cm2 s-1 and 2.0×10-3 cm s-1 respectively. The model enables the performance of an agitated batch adsorber to be predicted. A single diffusivity and external mass transfer coefficient is sufficient, for each dye-carbon system, to predict the concentration decay curve when the initial dye concentration is varied and also when the ratio of the carbon mass to the solution volume is varied.

Tsezos, M., Baird, M.H.I. and Shemilt, L.W. (1986), The kinetics of radium biosorption. *Chemical Engineering Journal*, **33** (2), B35-B41.

Full Text: [C\Che Eng J33, B35.pdf](C/Che%20Eng%20J33,%20B35.pdf)

Abstract: The intrinsic rate of radium adsorptive uptake by two types of waste inactive microbial biomass was examined. The effects of solution initial radium concentration, pH and ionic composition on the observed rate were also investigated. The results show that radicum uptake rates are reasonably rapid, with equilibrium attained after less than 2 min up to about 5 min, depending on the particular biosorption system and experimental conditions studied. The uptake of radium from industrial process wastewater is also rapid.

Byerley J.J., Scharer, J.M. and Charles, A.M. (1987), Uranium(VI) biosorption from process solutions. *Chemical Engineering Journal*, **36** (6), B49-B59.

Full Text: [C\Che Eng J36, B49.pdf](C/Che%20Eng%20J36,%20B49.pdf)

Abstract: Uranium(VI) biosorption from process liquor by Streptomyces levoris, Rhizopus arrhizus, mixed culture (activated sludge), Sacharomyces cerevisiae and Chlorella vulgaris was studied. The process liquor was derived from biological leaching of pyritic uranium ores. The sorption experiments included both dynamic and equilibrium studies.

A Langmuir-type isotherm adequately described the sorption equilibrium data. At pH 5 and 20 °C, the maximum equilibrium sorption capacities ranged from 146 mg UVI g−1 (dry weight) biomass (mixed culture) to 240 mg UVI g−1 (dry weight) biomass (Rhizopus arrhizus). At lower pH values, the sorption capacities declined substantially. Thermal inactivation had only a marginal effect on the sorption equilibrium. Increasing the sorption temperature from 4 °C to 35 °C, however, enhanced biosorption by 40% – 90% for both inactivated and viable cells.

The sulphate concentration and the metal ion contaminants (Ni, Zn, Cu, Co, Fe, Mn) adversely affected the biosorption of UVI. Of the metal ions tested, the ferric ion competed most effectively with the UO22+ ion for sorption sites. It appeared that the ferric ion was preferentially sorbed by the biomass and increased FeIII concentration at lower pH values was the primary reason for the decline of UVI biosorption from process solutions saturated with respect to ferric hydroxide.

Mutlu, M., Sağ, Y. and Kutsal, T. (1997), The adsorption of copper(II) by *Z. Ramigera* immobilized on Ca-alginate in packed bed columns: A dynamic approach by stimulus-response technique and evaluation of adsorption data by moment analysis. *Chemical Engineering Journal*, **65** (1), 81-86.

Full Text: [1997\Che Eng J65, 81.pdf](1997/Che%20Eng%20J65,%2081.pdf)

Abstract: In this study, Cu-II adsorption by *Z. Ramigera* immobilized on Ca-alginate was investigated in a packed bed column test circuit using a stimulus-response technique. The mathematical model was described and solved using “parameter estimation by cybernetic moment technique”, and the adsorption rate constant of Cu-II ions on *Z. Ramigera* immobilized on Ca-alginate was calculated. The Peclet numbers, which reflect the column flow characteristics in the cases of no diffusion and/or no adsorption, were calculated. The diffusional effects inside the pores of biomass immobilized on Ca-alginate matrices were investigated. The moment technique was used far evaluation of stimulus-response data of heavy metal-biosorbent interactions, to determine the process parameters.

Keywords: Cu-II Adsorption, Immobilized *Z-Ramigera*, Ca-Alginate Matrix, Stimulus-Response Analysis, Moment Technique

? White, D.A. and Rãutiu, R. (1997), The sorption of anionic species on hydrous tin dioxide. *Chemical Engineering Journal*, **66** (2), 85-89.

Full Text: [1997\Che Eng J66, 85.pdf](1997/Che%20Eng%20J66,%2085.pdf)

Abstract: This paper describes the anion exchange properties of hydrous tin dioxide and of a composite silica-tin dioxide. The anions studied were fluoride, iodide, iodate and antimonate. Some isotherm data have been obtained and have been correlated with the Langmuir isotherm in which the coefficient in the denominator is negative. Generally speaking the uptake of anions drops as the pH of the contacting solution rises. The balance of evidence would seem to indicate that the process is classical ion exchange. The extent of the pH range over which this occurs is surprising and contradicts classical notions of hydrous oxide ion exchange theory. (C) 1997 Elsevier Science S.A.

Keywords: Anions, Binary Metal-Oxides, Cation-Exchange, Composite, Fluoride, Hydrous Tin Dioxide, Ion Exchange, Langmuir, Langmuir Isotherm, Oxide Ion-Exchanger, pH, Sorption, Thermal-Stability

Nassar, M.M. and Magdy, Y.H. (1997), Removal of different basic dyes from aqueous solutions by adsorption on palm-fruit bunch particles. *Chemical Engineering Journal*, **66** (3), 223-226.

Full Text: [C\Che Eng J66, 223.pdf](C/Che%20Eng%20J66,%20223.pdf)

Abstract: The adsorption of three basic dyes (basic yellow, basic red and basic blue) from an aqueous solution on palm-fruit bunch particles has been studied. The equilibrium isotherm for each dye-adsorbent system was determined. The experimental results have been fitted with Langmuir, Freundlich and Redlich-Peterson isotherms. The maximum adsorption capacities of the palm-fruit bunch particles were found to be 327 mgyellow dye per gram of adsorbent, 180 mgred dye per gram of adsorbent and 92 mgblue dye per gram of adsorbent. A comparative cost study, based on the adsorption capacity alone, has shown that the costs of the adsorbent required are 1.9%, 4.4% and 7.1%, respectively, compared with the case of commercial activated carbon granules. (C) 1997 Elsevier Science S.A.

Keywords: Textile Effluents, Color Removal, Palm-Fruit Bunch, Basic Dyes, Absorption Isotherms, Comparative Cost

Schubert, A. (1998), The profile of the Chemical Engineering Journal and Biochemical Engineering Journal as reflected in its publications, references and citations, 1983-1996. *Chemical Engineering Journal*, **69** (3), 151-156.

Full Text: [1998\Che Eng J69, 151.pdf](1998/Che%20Eng%20J69,%20151.pdf)

Abstract: Scientometric techniques have been used to help outline the profile of the Chemical Engineering Journal and Biochemical Engineering Journal during the 1983-1996 period. (C) 1998 Elsevier Science S.A. All rights reserved.

Keywords: Chemical Engineering Journal, Biochemical Engineering Journal, Scientometric Techniques, Science

Notes: highly cited

Ho, Y.S. and McKay, G. (1998), Sorption of dye from aqueous solution by peat. *Chemical Engineering Journal*, **70** (2), 115-124.

Full Text: [C\Che Eng J70, 115.pdf](C/Che%20Eng%20J70,%20115.pdf)

Abstract: The sorption of two dyes, namely, Basic Blue 69 and Acid Blue 25 onto peat has been studied in terms of pseudo-second order and first order mechanisms for chemical sorption as well as an intraparticle diffusion mechanism process. The batch sorption process, based on the assumption of a pseudo-second order mechanism, has been developed to predict the rate constant of sorption, the equilibrium capacity and initial sorption rate with the effect of agitation, initial dye concentration and temperature. An activation energy of sorption has also been evaluated with the pseudo-second order rate constants. A comparison of the equilibrium sorption capacity evaluated has been made from pseudo-second order model and Langmuir isotherm. (C) 1998 Elsevier Science S.A. All rights reserved.

Keywords: Activation, Activation Energy, Adsorption, Agitation, Aqueous Solution, Basic-Dyes, Batch, Capacity, Comparison, Diffusion, Dye, Dyes, Effluent, Equilibrium, First, First Order, Fly-Ash, Intraparticle Diffusion, Intraparticle Mass-Transport, Ions, Isotherm, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Mechanisms, Model, Peat, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Mechanism, Pseudo-Second Order Model, Pseudo-Second-Order, Rate Constant, Rate Constants, Removal, Rights, Solution, Sorption, Sorption Capacity, Sorption Process, Temperature, Water

Wolborska, A. (1999), External film control of the fixed bed adsorption. *Chemical Engineering Journal*, **73** (2), 85-92.

Full Text: [C\Che Eng J73, 85.pdf](C/Che%20Eng%20J73,%2085.pdf)

Abstract: When the process of adsorption on the fixed bed of activated carbon is used to minimize the content of pollutants in a stream, e.g. in the technology of water treatment and renovation, the shape of the initial segment of the break-through curve of the so-called low concentration region is important. Usually, it is assumed that in this region the mass transfer is dominated by external film diffusion. The paper presents a theoretical analysis and experimental verification of this assumption. It was concluded that in the low concentration range, the process was determined by equilibrium parameters of the adsorption system and external mass transfer characterized by the intraparticle diffusion coefficient. Results of experimental investigations of phenol, p-nitrophenol and benzoic acid adsorption from aqueous solutions on a fixed bed of activated carbon AG-5 are presented. (C) 1999 Elsevier Science S.A. All rights reserved.

Keywords: Fixed Bed Adsorption, Mass Transfer In Adsorption, Break-Through Curve, Activated Carbon, Period of The Bed Protection

Rutherford, S.W. and Do, D.D. (1999), Permeation time lag with multilayer adsorption and surface diffusion. *Chemical Engineering Journal*, **74** (3), 155-160.

Full Text: [C\Che Eng J74, 155.pdf](C/Che%20Eng%20J74,%20155.pdf)

Abstract: Analysis of the permeation of adsorbed molecules through a carbon pellet has been undertaken in order to investigate the dependence of the adsorbed phase mobility upon the concentration of the adsorbed phase. The dependence is shown to be described well by the model proposed by Chen and Yang [Y. Chen, R.T. Yang, Carbon 36 (10) (1998) 1525] which can apply to adsorbed phase concentrations greater than that at saturation but still within the BET limits. The time lag for permeation is also shown to provide a useful and reliable means for investigating the adsorbed phase diffusion process. (C) 1999 Elsevier Science S.A. All rights reserved.

Keywords: Mesoporous Media, Condensable Vapors, Permeability, Peat, Dye, Kinetics, Sorption Intraparticle Mass-Transport, Fly-Ash, Basic-Dyes, Removal, Adsorption, Batch, Effluent, Kinetics, Water, Ions

Sutikno, T. (1999), Analytical model for chemisorption of cyanogen chloride on impregnated carbon. *Chemical Engineering Journal*, **75** (3), 207-212.

Full Text: [C\Che Eng J75, 207.pdf](C/Che%20Eng%20J75,%20207.pdf)

Abstract: An analytical model has been derived for chemisorption of cyanogen chloride in ASC carbon. This model, derived from the mass balance differential equation, uses simplified rate expressions for both the external diffusion and the reaction each with a decay function. Agreements between the calculated and experimental breakthroughs of cyanogen chloride are reasonably good. However, the selected values for transfer coefficients and rate constants require additional data for further verifications of the rate controlling steps assumed in the model. (C) 1999 Elsevier Science S.A. All rights reserved.

Rutherford, S.W. and Do, D.D. (2001), Adsorption dynamics measured by permeation and batch adsorption methods. *Chemical Engineering Journal*, **76** (1), 23-31.

Full Text: [C\Che Eng J76, 23.pdf](C/Che%20Eng%20J76,%2023.pdf)

Abstract: We have measured the adsorption equilibrium and kinetics of carbon dioxide on a commercially available activated carbon by two methods; permeation and batch adsorption. The two methods are compared and found to yield consistent results. All experiments are performed at low pressure (<5 torr) and in this range the isotherm was found to be reversible and non-linear Because of the observed non-linearity, the batch adsorption experiments were conducted differentially in order to obtain the adsorbed phase diffusivity at local conditions. The diffusion process was described by gas phase diffusion, adsorption and adsorbed phase diffusion which was modelled using the Darken relation. Results of adsorption equilibria and kinetics will be discussed in detail in this investigation. (C) 2000 Elsevier Science S.A. All rights reserved.

Keywords: Adsorption Dynamics, Permeation Adsorption, Batch Adsorption, Surface-Diffusion, Time-Lag, Carbon

Lan, Q.D., Bassi, A.S., Zhu, J.X. and Margaritis, A. (2001), A modified Langmuir model for the prediction of the effects of ionic strength on the equilibrium characteristics of protein adsorption onto ion exchange/affinity adsorbents. *Chemical Engineering Journal*, **81** (1-3), 179-186.

Full Text: [C\Che Eng J81, 179.pdf](C/Che%20Eng%20J81,%20179.pdf)

Abstract: An empirical model modified from the Langmuir isotherm model to account for the effects of ionic strength on the equilibrium characteristics of protein adsorption onto ion exchange/affinity adsorbents has been proposed and tested against experimental and literature data. The equilibrium isotherms for BSA adsorption onto a polystyrenic anion exchanger, Diaion HPA25, were established for five different NaCl concentrations at 25 degreesC, pH 7.0. The apparent Langmuir parameters in the new model (qm’, and Kd’), which replace the Langmuir parameters (qm and Kd) in the original Langmuir model, were determined by non-linear curve fitting. The proposed model has been shown to be applicable to various protein/adsorbent systems. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Ion Exchange, Protein Adsorption, Ionic Strength, Langmuir Isotherm, Modeling, Chromatography, Affinity, Gels

Elizalde-Gonzälez, M.P., Mattusch, J., Einicke, W.D. and Wennrich, R. (2001), Sorption on natural solids for arsenic removal. *Chemical Engineering Journal*, **81** (1-3), 187-195.

Full Text: [C\Che Eng J81, 187.pdf](C/Che%20Eng%20J81,%20187.pdf)

Abstract: Steady state experiments were conducted on arsenic sorption from aqueous solutions by natural solids to test the feasibility of these materials to act as concentrator for arsenic removal from groundwater and drinking water. The solids considered were natural zeolites, volcanic stone, and the cactaceous powder CACMM. The arsenic species studied were As(III), As(V), dimethylarsinic acid (DMA) and phenylarsonic acid (PHA). The arsenic removed was determined from the data obtained by measuring the concentration diminution of the arsenic species in the liquid phase at equilibrium before and after the adsorption experiment by means of ICP-AES for the total concentration of arsenic and IC-ICP-MS to determine the arsenic species. The latter method allowed the detection of As(V) additionally formed as a result of the oxidation of As(III) on some of the zeolites. The sorption of the arsenic species onto zeolites was studied on both non-activated and activated zeolites, as well as on zeolites hydrogenated or modified with iron, and with respect to varying pH. The kinetics and the ability to desorb and readsorb the arsenic species were investigated for selected zeolites. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Natural Solids, Arsenic, Sorption, Zeolites, Adsorption, Water, Adsorbent, Ion

McKay, G. (2001), Solution to the homogeneous surface diffusion model for batch adsorption systems using orthogonal collocation. *Chemical Engineering Journal*, **81** (1-3), 213-221.

Full Text: [C\Che Eng J81, 213.pdf](C/Che%20Eng%20J81,%20213.pdf)

Abstract: A solution to the homogeneous surface diffusion model has been developed and incorporated into a batch adsorption model based on external boundary layer mass transport and homogeneous diffusion. The model has been extensively tested using three experimental adsorption systems, namely phenol on carbon, basic yellow dye on carbon and basic blue dye on silica. The effect of initial solute concentration and adsorbent mass has been studied in 23 batch experiments, which have been modelled using the collocation solution method to solve the homogeneous surface diffusion equation. The theoretical concentration decay curves show a high degree of correlation with experimental data. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Surface Diffusion Model, Collocation, Adsorption, Phenol, Dyes, Silica, Activated Carbon, Granular Activated Carbon, Countercurrent-Flow, Finite Bath, Kinetics, Particles, Rates

Hamadi, N.K., Chen, X.D., Farid, M.M. and Lu, M.G.Q. (2001), Adsorption kinetics for the removal of chromium(VI) from aqueous solution by adsorbents derived from used tyres and sawdust. *Chemical Engineering Journal*, **81** (5), 95-105.

Full Text: [C\Che Eng J81, 95.pdf](C/Che%20Eng%20J81,%2095.pdf)

Abstract: The batch removal of hexavalent chromium (Cr(VI)) from wastewater under different experimental conditions using economic adsorbents was investigated in this study. These adsorbents were produced from the pyrolysis and activation of the waste tyres (TAC) and from the pyrolysis of sawdust (SPC). The performance of these adsorbents against commercial activated carbon F400 (CAC) has also been carried out. The removal was favoured at low pH, with maximum removal at pH = 2 for all types of carbon. The effects of concentration, temperature and particle size have been reported. All sorbents were found to efficiently remove Cr(VI) from solution.

The batch sorption kinetics have been tested for a first-order reversible reaction, a first-order and second-order reaction. The rate constants of adsorption for all these kinetic models have been calculated. The applicability of the Langmuir isotherm for the present system has been tested at different temperatures. The thermodynamic parameters (AGO, K,) obtained indicate the endothermic nature of Cr(Vl) adsorption on TAC, SPC and CAC. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Used Tyres, Sawdust, Pyrolysis, Activation, Adsorption Kinetics, Langmuir Isotherm, Hexavalent Chromium, Thermodynamic Parameters, Activated Carbon, Pyrolysis, Sorption, Product, Tires

? Lan, Q.D., Bassi, A.S., Zhu, J.X. and Margaritis, A. (2001), A modified Langmuir model for the prediction of the effects of ionic strength on the equilibrium characteristics of protein adsorption onto ion exchange/affinity adsorbents. *Chemical Engineering Journal*, **81** (1-3), 179-186.

Full Text: [2001\Che Eng J81, 179.pdf](2001/Che%20Eng%20J81,%20179.pdf)

Abstract: An empirical model modified from the Langmuir isotherm model to account for the effects of ionic strength on the equilibrium characteristics of protein adsorption onto ion exchange/affinity adsorbents has been proposed and tested against experimental and literature data. The equilibrium isotherms for BSA adsorption onto a polystyrenic anion exchanger, Diaion HPA25, were established for five different NaCl concentrations at 25 degreesC, pH 7.0. The apparent Langmuir parameters in the new model (q(m)(‘), and K-d(‘)), which replace the Langmuir parameters (q(m) and K-d) in the original Langmuir model, were determined by non-linear curve fitting. The proposed model has been shown to be applicable to various protein/adsorbent systems. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Affinity, BSA, Chromatography, Equilibrium, Gels, Ion, Ion Exchange, Ionic Strength, Isotherm, Isotherms, Langmuir Isotherm, Model, Modeling, Parameters, pH, Prediction, Protein, Protein Adsorption

Yang, X.Y. and Al-Duri, B. (2001), Application of branched pore diffusion model in the adsorption of reactive dyes on activated carbon. *Chemical Engineering Journal*, **83** (1), 15-23.

Full Text: [C\Che Eng J83, 15.pdf](C/Che%20Eng%20J83,%2015.pdf)

Abstract: In this work, the branched pore diffusion model (BPDM) was applied to the single component adsorption of three reactive dyes on activated carbon in a batch stirred vessel. Results are in terms of theoretical concentration decay curves, characterised by the non-linear combination of four mass transfer parameters namely the external mass transfer coefficient kf, the solid diffusivity Ds, the micropore rate coefficient kb and the fraction micropores f. An ‘improved’ solution technique was presented where an optimising subroutine was employed to select ‘best’ combination of the mass transfer parameters. Compared to the existing methods, this yielded more accurate results over a longer period of adsorption and shorter computational time. Also, equilibrium was accurately described by the Fritz-Schlunder isotherm. Results showed that, over a wide range of system conditions, a single kf, kb and f value described each dye/carbon system; while Ds increased with the initial solution concentration, C0. Furthermore, Ds was mathematically related to the surface loading qs. This paper provides an in-sight into the relation between the sorbent surface, the solute properties and the adsorptive characterictics. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Branched Pore Diffusion Model, Fritz-Schlunder Isotherm, Kinetics, Mass Transfer Parameters, Numerical Solution, Surface-Diffusion, Phase Adsorption, Mass-Transfer, Coefficients

Kerkhof, P.J.A.M., Geboers, M.A.M. and Ptasinski, K.J. (2001), On the isothermal binary mass transport in a single pore. *Chemical Engineering Journal*, **83** (2), 107-121.

Full Text: [C\Che Eng J83, 107.pdf](C/Che%20Eng%20J83,%20107.pdf)

Abstract: For the transport in an inert pore the local species momentum balance is reconsidered. This leads to a Maxwell-Stefan type equation for a component rr in which the gradient in chemical potential, the interspecies friction and the cr-cr shear stress form the momentum balance. From the set of equations the component axial velocity profiles can be derived, and so we call this model the velocity profile model (VPM-1), in which I stands for the fact that we only consider here the flow in one direction. For binary systems the set of equations is solved, and pore-integrated velocities are derived. This is done both for liquids with a no-slip boundary condition and for gases with Maxwell-slip boundary condition. The pore-averaged velocities can be expressed in the same form as the binary friction model. The use of the difference in pore-averaged velocities instead of the pore-averaged differences requires a correction function, which is derived for both fluid types. For liquids the component-wall friction factors are equal to those in the binary friction model, for gases a slightly different form is obtained. Comparison of predictions for liquid ultrafiltration and gas transport through porous plugs shows in general very small differences between the present model and the BFM, and good agreement with experimental data. The VPM-1 predicts a second flow reversal point of (near-)equal mass isobaric diffusion of gases at different pressures, and a reversal with temperature, From the model follows a new expression for the velocity difference. Velocity profiles for various situations are explored such as liquid ultrafiltration and diffusion, counterdiffusion of gases and for the Stefan-tube. In the latter we find that for a zero average flux of inert gas there is a core of inert gas moving in the direction of the water vapor, and a reverse flow in the area near the wall. The model can be extended to more-dimensional flow problems such as in adsorption and heterogeneous catalysis. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Multicomponent Diffusion, Dusty Gas Model, Maxwell-Stefan, Binary Friction Model, Baroeffect, Porous Media, Gas-Mixture, Diffusion, Flow

Walker, G.M. and Weatherley, L.R. (2001), Adsorption of dyes from aqueous solution: The effect of adsorbent pore size distribution and dye aggregation. *Chemical Engineering Journal*, **83** (3), 201-206.

Full Text: [C\Che Eng J 83, 201.pdf](C/Che%20Eng%20J%2083,%20201.pdf)

Abstract: The removal of acid dyes, Tectilon Blue 4R, -Tectilon Red 2B and Tectilon Orange 3G, from single component solution by adsorption on activated carbon and bone char has been investigated in isotherm experiments. Results from these experiments were successfully modelled using Langmuir and Freundlich isotherm analyses. Nitrogen adsorption analysis was also undertaken and indicated that the activated carbon had a much higher specific surface than the bone char. Calculations involving the pore size distribution data indicate that only 14% of the total specific surface of the activated carbon is available for adsorption due to the high molecular area and aggregation of the dye. The equilibrium data indicate that dye aggregation takes place in the solid phase of both adsorbents with higher solid phase aggregation numbers found using the bone char, which is indicative of multilayer adsorption. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Carbon Adsorbents, Dye Aggregation, Isotherm Analysis, Pore Structure

Chen, B., Hui, C.W. and McKay, G. (2001), Film-pore diffusion modeling and contact time optimization for the adsorption of dyestuffs on pith. *Chemical Engineering Journal*, **84** (2), 77-94.

Full Text: [C\Che Eng J84, 77.pdf](C/Che%20Eng%20J84,%2077.pdf)

Abstract: The sorption of four dyestuffs, namely, Acid Blue 25 (AB25), Acid Red 114 (AR114), Basic Blue 69 (BB69) and Basic Red 22 (BR22) onto bagasse pith has been studied using an agitated batch sorber system. The equilibrium isotherms were determined and kinetic runs were performed over a range of concentrations for each dye and masses of pith. A film-pore diffusion mass transfer model has been developed based on a single effective diffusion coefficient for each system. Error analysis of the experimental and theoretical data indicated relatively large errors at low initial dyestuff concentrations.

In this paper, a contact time optimization methodology of a two-stage batch adsorber system taking minimum contact time as the objective function has been developed. The initial concentration of the second stage and adsorbent weight have been designated as variables. Contact time optimization of a two-stage batch adsorber system has been demonstrated at two different conditions/cases for the adsorption of dyes on pith. The optimization solutions show that there is a significant difference for minimum contact time at different process conditions. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Modeling and Optimization, Film-Pore Diffusion, Dyes, Pith, External Mass-Transfer, Ion-Exchange Kinetics, Shrinking-Core Model, Activated Carbon, Surface-Diffusion, Binary Adsorption, Dye Adsorption, Resin, Rates, Gold

Notes: highly cited

Hamadi, N.K., Chen, X.D., Farid, M.M. and Lu, M.G.Q. (2001), Adsorption kinetics for the removal of chromium(VI) from aqueous solution by adsorbents derived from used tyres and sawdust. *Chemical Engineering Journal*, **84** (2), 95-105.

Full Text: [2001\Che Eng J84, 95.pdf](2001/Che%20Eng%20J84,%2095.pdf)

Abstract: The batch removal of hexavalent chromium (Cr(VI)) from wastewater under different experimental conditions using economic adsorbents was investigated in this study. These adsorbents were produced from the pyrolysis and activation of the waste tyres (TAC) and from the pyrolysis of sawdust (SPC). The performance of these adsorbents against commercial activated carbon F400 (CAC) has also been carried out. The removal was favoured at low pH, with maximum removal at pH = 2 for all types of carbon. The effects of concentration, temperature and particle size have been reported. All sorbents were found to efficiently remove Cr(VI) from solution.

The batch sorption kinetics have been tested for a first-order reversible reaction, a first-order and second-order reaction. The rate constants of adsorption for all these kinetic models have been calculated. The applicability of the Langmuir isotherm for the present system has been tested at different temperatures. The thermodynamic parameters (AGO, K,) obtained indicate the endothermic nature of Cr(Vl) adsorption on TAC, SPC and CAC. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Used Tyres, Sawdust, Pyrolysis, Activation, Adsorption Kinetics, Langmuir Isotherm, Hexavalent Chromium, Thermodynamic Parameters, Activated Carbon, Pyrolysis, Sorption, Product, Tires

Walker, G.M. and Weatherley, L.R. (2001), COD removal from textile industry effluent: Pilot plant studies. *Chemical Engineering Journal*, **84** (2), 125-131.

Full Text: [C\Che Eng J84, 125.pdf](C/Che%20Eng%20J84,%20125.pdf)

Abstract: This work involved the treatment of industrial waste water from a nylon carpet printing plant. As dyeing of nylon is particularly difficult, acid dyes, fixing agents, thickeners, finishing agents, are required for successful colouration and cause major problems with the plant’s effluent disposal in terms of chemical oxygen demand (COD). Granular activated carbon (GAC) Filtrasorb 400 was used to treat a simulated process plant effluent containing all the pollutants. Equilibrium isotherm experiments were established and experimental data obtained showed good empirical correlation with Langmuir isotherm theory. Column experimental data, in terms of COD were correlated using the bed depth service time (BDST) model. Solid phase loading in the columns were found to approach that in equilibrium studies indicating an efficient use of adsorbent. The results from the BDST model were then used to design a pilot adsorption rig at the plant. The performance of the pilot plant column were accurately predicted by scale-up from the bench scale columns. (C) 2001 Elsevier Science BN. All rights reserved.

Keywords: Adsorption, Pilot Plant, Activated Carbon, Textile Process Effluent, Bed Depth Service Time Model, Granular Activated Carbon, Waste-Water, Fixed-Beds, Adsorption, Systems, Reuse, Dyes

Kandah, M. (2001), Zinc adsorption from aqueous solutions using disposal sheep manure waste (SMW). *Chemical Engineering Journal*, **84** (3), 543-549.

Full Text: [C\Che Eng J84, 543.pdf](C/Che%20Eng%20J84,%20543.pdf)

Abstract: Available and disposal low price adsorbent (i.e. sheep manure waste (SMW)) was used for adsorption studies of Zn2+ from aqueous solutions. The adsorption experiments were performed under various conditions such as different adsorbent particle size (0.064-1.0 mm), Zn2+ initial concentration (20-150 ppm), shaking time (1-300 min), pH (1-6), and adsorbent concentration (2-30 g/l).

About 10 g/l of SMW (0.064 mm in diameter) was found to be enough to remove 93.3% of 100 ppm Zn2+ from 50 ml aqueous solution after 1 h. The optimum pH value was found to be at 4.

The kinetic curves show very clearly the selectivity of the SMW for Zn2+. The uptake obeys both the Freundlich and Langmuir isotherms. The applicability of Lagergren kinetic model has also been investigated.

Activated carbon was also prepared by heating a grinded SMW at (105-800 degreesC) and the adsorption capacity is investigated. About 10 g/l of activated (heated to 600 degreesC) SMW was enough to remove 98.8% of 100 ppm Zn2+ from 50 ml aqueous solution after 5 h. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Sheep Manure Waste (SNW), Aqueous Solution, Adsorption, Heavy Metal

Pentchev, I., Paev, K. and Seikova, I. (2002), Dynamics of non-isothermal adsorption in packed bed of biporous zeolites. *Chemical Engineering Journal*, **85** (2-3), 245-257.

Full Text: [C\Che Eng J85, 245.pdf](C/Che%20Eng%20J85,%20245.pdf)

Abstract: Adsorption dynamics were investigated in a laboratory scale fixed bed column, functioning under three different non- isothermal conditions: adiabatic, near adiabatic and non- adiabatic. Axial and radial temperature profiles were registered, as well as a corresponding breakthrough curves at the column exit. Experimentally it has been demonstrated that the thermal effect of adsorption leads to deformation of the temperature profiles along the column. This directly affects the total amount adsorbed in the bed and breakthrough at the exit, an effect which is different for the different non- isothermal conditions. A two-dimensional mathematical model for description of non-isothermal adsorption was developed, including the effects of the radial temperature gradients. A biporous structure of the adsorbent particles is assumed and the heat effect on the equilibrium is taken into account. Good agreement is shown between experimental and theoretical results, when the mathematical model accounts for the radial thermal conduction and thermal flow through the wall. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Adiabatic Adsorption, Adsorption, Analytic Solution, Behavior, Bidisperse Adsorbent, Breakthrough, Breakthrough Curves, Column, Diffusion, Fixed Bed, Fixed Bed Column, Fixed-Bed, Fixed-Beds, Gas Adsorption, Gas-Adsorption, Heat Of Adsorption, Model, Non-Isothermal, Nonlinear Adsorption, Numerical Solution, Packed Bed, Transfer-Coefficients, Two-Dimensional Model

Nourbakhsh, M.N., Kiliçarslan, S., Ilhan, S. and Ozdag, H. (2002), Biosorption of Cr6+, Pb2+ and Cu2+ ions in industrial waste water on *Bacillus* sp. *Chemical Engineering Journal*, **85** (2-3), 351-355.

Full Text: [C\Che Eng J85, 351.pdf](C/Che%20Eng%20J85,%20351.pdf)

Abstract: Biosorption of each of the ions Cr6+, Pb2+ and Cu2+ on *Bacillus* sp. in a batch stirred system was investigated and optimum conditions were determined. Then, the multi-metal ions, containing different concentrations of Cr6+, Pb2+ and Cu2+ ions together were prepared and partial competitive adsorptions of these mixtures were investigated at 27°C and for the pH values of 4.0 and 7.0 that are the most frequently seen conditions in industrial waste waters. Parameters such as co-adsorption of metals to microorganism, combination, concentration and adsorption sequence affect the partial competitive adsorption. In conclusion, in the metal ions mixture, lead biosorption increases widely while chromium and copper biosorptions decrease in comparison with the biosorption of only one kind of metal ion. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Heavy Metal Contamination, Heavy Metal Biosorption, *Bacillus* sp., Partial Competitive Biosorption, Waste Water, Biosorption, Heavy Metals

Li, Z., Li, X.B., Xi, H.X. and Hua, B. (2002), Effects of ultrasound on adsorption equilibrium of phenol on polymeric adsorption resin. *Chemical Engineering Journal*, **86** (3), 375-379.

Full Text: [C\Che Eng J86, 375.pdf](C/Che%20Eng%20J86,%20375.pdf)

Abstract: Adsorption equilibrium experiments of phenol on NKA II resin were separately conducted in the presence and absence of ultrasound at ambient temperature. The isotherm of phenol on the polymer adsorbent in the presence of an ultrasonic field is reported. Results indicate that the adsorption of phenol determined in the presence of ultrasound is less than that in the absence of ultrasound. In addition, experimental results also show that the use of ultrasound in the adsorption system of the phenol aqueous solution+NKA II resin could cause a rise in temperature of the system. The effect of ultrasound on the isotherm of phenol on the NKA II resin is due both to the thermal and non-thermal effects of the ultrasonic field, and the role of the latter is much greater than that of the former. The addition of surfactant substance, ethanol or ethyl acetate, to the adsorption system of the phenol aqueous solution+the NKAII resin in the existence of the ultrasonic field would cause the equilibrium adsorbed amounts of phenol to decrease.

Keywords: Ultrasound, Adsorption, Isotherm, Polymeric Resin, Phenol

McKay, G. (2002), Dioxin characterisation, formation and minimisation during municipal solid waste (MSW) incineration: Review. *Chemical Engineering Journal*, **86** (3), 343-368.

Full Text: [C\Che Eng J86, 343.pdf](C/Che%20Eng%20J86,%20343.pdf)

Abstract: The present review discusses the current views on methods to minimise dioxins, namely polychlorinated dibenzodioxins (PCDDs) and dibenzofurans (PCDFs), formation in MSW incineration systems. The structure of this group of compounds is discussed initially and then the toxic equivalence scale is presented for the most common isomers and congeners in the dioxin family. The current status on dioxin limits imposed in various countries and by various organisations is presented. A detailed analysis of the theories leading to dioxin formation in MSW incineration is given, since, this has been one of the most controversial areas of dioxin chemistry for the past 20 years.

Three dioxin formation theories were considered possible for a long time; (i) from PCDD/PCDFs originally present in the furnace feedstock; (II) from precursor compounds (foundation formatting molecules which could react rapidly with other groups in the system to form dioxins) in the MSW feed; (iii) from de novo synthesis of smaller, relatively innocuous chemical molecules combining together to form the dioxins. Methods (II) and (iii) are based on heterogeneously catalysed reactions. Some researchers are considering possible homogeneous thermal reaction formation of dioxin.

This review demonstrates that with the advanced modern MSW combustion systems, option (i) is a most unlikely route and also methods (II) and (iii) are quite feasible. Based on thermodynamic and kinetic data in the literature, the rate and extent of the formation of dioxins and their precursors by certain mechanisms can definitely be contributing to routes (II) and (iii). Since even the most advanced MSW combustion systems do not produce complete combustion, predominantly because of inadequate feed preparation and turbulence, some de novo synthesis of precursors can also take place.

These ‘de novo precursors’ could be carried through the combustion unit adsorbed or absorbed on particulate material such as soot and dust, but also these precursors could be formed during the cooling process by heterogeneous catalytic reactions and go on to form dioxins. The maximum rate of formation of PCDD/PCDFs from both sources lies in the temperature range 300–400 °C. This knowledge of formation rates and mechanisms provides the basis of designing combustion systems. A two stage approach is adopted; firstly, system design to achieve complete combustion and minimise formation; secondly, end-of-pipe treatment systems to remove dioxins.

In the first case, combustion temperature should be above 1000 °C, combustion residence time should be greater than 1 s, combustion chamber turbulence should be represented by a Reynolds number greater than 50,000, good MSW feed preparation and controlled feed rate are also critical. In the second category, very rapid gas cooling from 400 to 250 °C should be achieved, semi-dry lime scrubbing and bag filtration coupled with activated carbon injection adsorption as end-of-pipe treatments can all play a role in prevention or minimisation of dioxins in the final flue gas emission to the atmosphere.

Keywords: Municipal Solid Waste Incineration, Polychlorinated Dibenzodioxins, Polychlorinated Dibenzofurans

Rostami, Kh. and Joodaki, R.M. (2002), Some studies of cadmium adsorption using *Aspergillus niger*, *Penicillium austurianum*, employing an airlift fermenter. *Chemical Engineering Journal*, **89** (1-3), 239-252.

Full Text: [C\Che Eng J89, 239.pdf](C/Che%20Eng%20J89,%20239.pdf)

Abstract: *Aspergillus niger* and *Penicillium austurianum* were produced on a rotary shaker washed, dried, and sieved. The 1 g of each biomass were introduced into tiny columns and Erlenmeyer flasks of 50 ml volume, to study the effect of agitation, cadmium in solution concentration and a wide range of pH. The samples were analyzed using atomic absorption spectroscopy (Shimadsu AA67) at 228.8 nm. The adsorption data of *A. niger* were fitted to Langmuir and Freundlich models and *R*2 higher than 0.97 and 0.98 obtained. In a different set of experiments the effects of cadmium concentration in solution, temperature, aeration velocity and mixed culture of 1: 1 and 3: 1 ratio employing a glass made airlift fermenter were investigated. The results show that the operation temperature of 22±1 °C and pH 4 and 5 are suitable for biosorption, using active fungi. It was also found that 2 vvm aeration is reasonably sound to produce biomass and biosorption using *A. niger* in the airlift reactor.

Keywords: Heavy Metal, Cadmium Removal, Fungi

Georgiou, A. and Kupiec, K. (2003), Nonlinear driving force approximation for intraparticle mass transfer in adsorption processes: Nonlinear isotherm systems with macropore diffusion control. *Chemical Engineering Journal*, **92** (1-3), 185-191.

Full Text: [C\Che Eng J92, 185.pdf](C/Che%20Eng%20J92,%20185.pdf)

Abstract: A generalized nonlinear driving force (NLDF) approximation of intraparticle mass transfer rate for nonlinear isotherm systems with macropore diffusion control is presented. The obtained expression is compared with the solutions of the Fickian diffusion and adsorption model and excellent accuracy over the entire time (fractional uptake) domain and for all values of the Freundlich exponent (adopted as the isotherm nonlinearity measure) is demonstrated. The high accuracy of the model is further demonstrated by comparison with experimental data. The presented methodology for the derivation of driving force approximations is shown to be a useful alternative to the methodology based on intraparticle concentration profile approximations.

Keywords: Nonlinear Driving Force, Fickian Diffusion, Macropore Diffusion Control, Kinetics, Freundlich Isotherm

Yang, X.Y., Otto, S.R. and Al-Duri, B. (2003), Concentration-dependent surface diffusivity model (CDSDM): Numerical development and application. *Chemical Engineering Journal*, **94** (3), 199-209.

Full Text: [C\Che Eng J94, 199.pdf](C/Che%20Eng%20J94,%20199.pdf)

Abstract: In this paper. the film-solid diffusion model (FSDM) combined with a concentration-dependent surface diffusivity D-s = D-0 exp {k(q/q(sat))} was presented to describe the kinetics of adsorption of reactive dye from aqueous solution onto activated carbon in a batch reactor. A finite-difference scheme was employed to solve the partial differential equations which govern the entire adsorption process in the batch reactor and the resulting kinetic data was presented in terms of the concentration decay curve. It was found that, for the investigated adsorption system, one set of mass transfer parameters was adequate to describe the adsorption rate at different initial solute concentrations. Compared with the constant surface diffusivity model (CSDM), the concentration-dependent surface diffusivity model (CDSDM) yielded a steeper solid-phase concentration profile due to the concentration dependence of D-s. Parametric sensitivity analysis was also carried out in order to facilitate understanding of the effect of each parameter on the shape of the concentration decay curve. (C) 2003 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Concentration-Dependent Surface Diffusivity Model, Kinetics, Mass Transfer, Numerical Solution, Finite Difference, Liquid-Phase Adsorption, Activated Carbon Adsorption, Aqueous-Phase, Pores, Dyes

Martin, M.J., Artola, A., Balaguer, M.D. and Rigola, M. (2002), Activated carbons developed from surplus sewage sludge for the removal of dyes from dilute aqueous solutions. *Chemical Engineering Journal*, **94** (3), 231-239.

Full Text: [C\Che Eng J94, 231.pdf](C/Che%20Eng%20J94,%20231.pdf)

Abstract: Surplus biological sludge from wastewater treatment plants was pyrolysed at 700 °C in the presence of H2SO4. Sludge-based (SB) activated carbon (AC) was mainly mesoporous in nature, with a surface area of 253 m2/g and an average pore diameter of 2.3 nm. Chemviron GW, an AC commercial reference, was mainly microporous with a surface area of 1026 m2/g and an average diameter of 1.8 nm. SB AC outperformed the commercial product in the removal of three anionic dyes in solution (CI Acid Brown 283, CI Direct Red 89 and CI Direct Black 168). Chemviron GW performed best for Basic Red 46, which may be related to the relatively small steric size of the dye molecules compared with the size of micropores, and to the greater surface area of the commercial AC. For equilibrium pH values between 5 and 9, the adsorption capacity of SB AC for dyes was significantly modified due to the presence of ionisable surface functional groups while that of Chemviron GW, with a more hydrophobic surface, remained unaltered.

Keywords: Sewage Sludge, Pyrolysis, Adsorption, Carbon Adsorbent, Pore Structure, Surface Charge, pHZPC

Xiu, G.H., Li, P. and Rodrigues, A.E. (2003), Adsorption-enhanced steam-methane reforming with intraparticle-diffusion limitations. *Chemical Engineering Journal*, **95** (1-3), 83-93.

Full Text: [C\Che Eng J95, 83.pdf](C/Che%20Eng%20J95,%2083.pdf)

Abstract: The adsorption-enhanced reaction (AER) process is theoretically analyzed for hydrogen production by steam-methane reforming (SMR). It uses a fixed-bed packed column of an admixture of a SMR catalyst and an adsorbent for selective removal of CO2 from the reaction zone. A mathematical model taking into account multicomponent (six species) mass balances, overall mass balance, Ergun relation for pressure drop, energy balance for bed-volume element including the heat-transfer to the column wall, and nonlinear adsorption equilibrium isotherm coupled with three main reactions was derived to describe AER process with the intraparticle-diffusion limitations. The numerical solution of the model equations for this process was obtained by using the method of orthogonal collocation. The validity of the model prediction was checked by comparing the simulated results with experimental data from literature. The mechanism of the adsorption-enhanced SMR is studied by analysis of the profiles of the bed concentrations, temperature, velocity, pressure, and reaction and adsorption rates. The intraparticle-diffusion limitations on the adsorption-enhanced SMR are evaluated by the effectiveness factors. The effect of the operating conditions (reaction temperature, pressure and length of adsorptive reactor) on the hydrogen purity, hydrogen productivity and methane conversion is studied by numerical simulation; a high purity of hydrogen product gas (90–98%) with methane as the prime impurity and traces of CO2 (below 400 ppm) and CO (below 30 ppm) can be produced directly from the adsorptive reactor under conditions of 450–490 °C and 222.9–891.4 kPa.

Keywords: Adsorption, Mass-Transfer, Mathematical Modeling, Reaction Engineering, Adsorption-Enhanced Reaction (AER) Process, Effectiveness Factor

Jena, P.R., De, S. and Basu, J.K. (2003), A generalized shrinking core model applied to batch adsorption. *Chemical Engineering Journal*, **95** (1-3), 143-154.

Full Text: [C\Che Eng J95, 143.pdf](C/Che%20Eng%20J95,%20143.pdf)

Abstract: A two resistance mass transfer model for batch adsorption process has been developed which includes a film mass transfer coefficient and an internal effective diffusivity that controls the internal mass transport process based on the pore diffusion mechanism. This model is based on shrinking core formulation for catalytic reaction. The model proposed here is more generalized, can accommodate wide range of initial adsorbate concentration in feed and the nature of the isotherm. The model is solved numerically and optimized using nonlinear parameter estimation technique in order to match with the experimental kinetic data available in the literature [AIChE J. 39 (1993) 2027; AIChE J. 30 (1984) 692; Adsorp. Sci. Technol. 4 (1987) 58]. In this procedure the process parameters, i.e. the external mass transfer coefficient and internal effective diffusivity are determined for a particular system. Using the estimated parameters, a parametric study has been carried out to observe the effects of initial adsorbate concentration, particle size of adsorbent, mass of adsorbent, etc. on the system kinetics.

Keywords: Adsorption, Mass Transfer Coefficient, Pore Diffusion, Internal Diffusivity, Shrinking Core Model

Atun, G. and Hisarli, G. (2003), Adsorption of carminic acid, a dye onto glass powder. *Chemical Engineering Journal*, **95** (1-3), 241-249.

Full Text: [C\Che Eng J95, 241.pdf](C/Che%20Eng%20J95,%20241.pdf)

Abstract: The adsorption of carminic acid (CA) on glass powder (GP) has been studied polarographically. The adsorption is a two-stage process comprising a fast initial phase and a slower second phase. The rate constant for the first phase increased slightly with increasing dye concentration while the rate constant for the second phase remained almost constant. This indicated the presence of two diffusional processes. In the first phase, CA molecules are adsorbed at the outer sites of the glass particles in a fast process that dominates the initial kinetics of adsorption. In the second phase, dye molecules slowly diffuse inward and adsorb to the inner sites of the glass particles. The rate of adsorption increases with increasing temperature. The thermodynamic parameters for activated state have been evaluated using the Arrhenius and Eyring equations. The equilibrium isotherms have been analyzed using the Freundlich and Langmuir equations. The parameters of the isotherms show that the adsorption process is favorable.

Keywords: Carminic Acid, Glass Powder, Adsorption Kinetics, Freundlich Isotherm, Langmuir Isotherm

Liu, H.L., Chen, B.Y., Lan, Y.W. and Cheng, Y.C. (2004), Biosorption of Zn(II) and Cu(II) by the indigenous *Thiobacillus thiooxidans*. *Chemical Engineering Journal*, **97** (2-3), 195-201.

Full Text: [C\Che Eng J97, 195.pdf](C/Che%20Eng%20J97,%20195.pdf)

Abstract: Biosorption of each of the heavy metals, Zn(II) and Cu(II), and of the binary mixture of these two metal ions by the indigenous *Thiobacillus thiooxidans* was investigated in this study. Equilibrium concentration (*q*m) and dissociation constant (*K*d) were calculated by fitting the experimental data with the Langmuir isotherms. The effects of pH, pretreatment of biomass, and temperature on the amount of metal uptake by this organism were also determined. Typically, the adsorption capacity increases with increasing pH in the ranges of 2.0–6.0 and 4.0–5.0 for Zn(II) and Cu(II), respectively. Chemical pretreatment of the biomass with 0.075 M NaOH has positive effects on its capacity for metal biosorption. Higher temperature yields higher biosorption capacity for both metals. The indigenous *T. thiooxidans* is in favor of Zn(II) uptake in the binary mixture. Biosorption of Cu(II) is inhibited by the existence of Zn(II). The total amount of metal adsorbed in the binary mixture decreases in comparison with biosorption of only one kind of metal ion.

Keywords: Biosorption, Heavy Metal, *Thiobacillus Thiooxidans*, Equilibrium Concentration, Dissociation Constant, Langmuir Isotherms, Pretreatment

Chu, K.H. (2004), Improved fixed bed models for metal biosorption. *Chemical Engineering Journal*, **97** (2-3), 233-239.

Full Text: [C\Che Eng J97, 233.pdf](C/Che%20Eng%20J97,%20233.pdf)

Abstract: This paper describes the application of two new mathematical models, derived from an existing model with two adjustable parameters, to simulate the breakthrough curves of metal biosorption in fixed bed columns. No new adjustable parameters are introduced into the modified models. The models offer a fast and accurate alternative to the conventional mass balance-based models which are much more complicated mathematically. The major characteristic of this empirical modeling approach is that it requires experimental breakthrough data for model calibration. Modeling results suggest that the new models are capable of describing symmetric and asymmetric experimental breakthrough curves selected from the biosorption literature. Compared to the original model, the modified models show significant improvements for modeling breakthrough curves obtained with columns packed with native biomass but yield only small improvements on deviations from breakthrough data obtained with a column packed with immobilized biomass.

Keywords: Adsorption, Biosorption, Breakthrough Curve, Heavy Metals, Packed Bed

Hashim, M.A. and Chu, K.H. (2004), Biosorption of cadmium by brown, green, and red seaweeds. *Chemical Engineering Journal*, **97** (2-3), 249-255.

Full Text: [C\Che Eng J97, 249.pdf](C/Che%20Eng%20J97,%20249.pdf)

Abstract: Seven species of brown, green, and red seaweeds were examined for their abilities to sequester cadmium ions from aqueous solution. Although all the seaweed types investigated were capable of binding appreciable amounts of cadmium, considerable variability in their biosorption performance was observed. Maximum cadmium uptake capacities at pH 5 ranged from the highest value of 0.74 mmol/g for the brown seaweed *Sargassum baccularia* to the lowest value of 0.16 mmol/g for the red seaweed *Gracilaria salicornia*, representing a 363% difference. In general, brown seaweeds were found to exhibit the best overall cadmium ion removal. Additional experiments were conducted to evaluate the biosorption characteristics of the brown seaweed *S. baccularia*. The equilibrium uptakes of cadmium were similar within the pH 3–5 range but decreased significantly when the solution pH was reduced to pH 2. The presence of background cations such as sodium, potassium, and magnesium and anions such as chloride, nitrate, sulphate, and acetate up to a concentration of 3.24 mmol/l was found to have no significant effect on the equilibrium uptake of cadmium. However, the biosorbent uptake of cadmium was markedly inhibited in the presence of calcium ions at 3.24 mmol/l. Kinetic studies revealed that cadmium uptake was fast with 90% or more of the uptake occurring within 30–40 min of contact time.

Keywords: Adsorption, Algae, Biosorption, Heavy Metals, Seaweeds

Ghorai, S. and Pant, K.K. (2004), Investigations on the column performance of fluoride adsorption by activated alumina in a fixed-bed. *Chemical Engineering Journal*, **98** (1-2), 165-173.

Full Text: [C\Che Eng J98, 165.pdf](C/Che%20Eng%20J98,%20165.pdf)

Abstract: In the present study, removal of fluoride ions using activated alumina (AA) was investigated in batch and continuous operations. The fluoride removal performance was investigated as a function of the fluoride concentration, flow rate, amount of adsorbent dose and pH. Sorption data have been correlated with Langmuir and Freundlich isotherms. pH was shown to be a decisive parameter on fluoride removal. Percentage fluoride removal as a function of time and uptake capacity related to flow volume were determined by evaluating the breakthrough curves.

Data confirmed that early saturation and lower fluoride removal was observed at higher flow rate and at higher concentration. There was a marginal decrease in the uptake capacity after each regeneration cycle. A one-dimensional model for isothermal, axially dispersed fixed-bed adsorption has been numerically solved and compared with the experimental results. Predicted simulation results based on the assumption of pore-diffusion rate-control conditions matches with the experimental data in the initial zone of the breakthrough curve, but deviated marginally in the final tailing zone.

Keywords: Fluoride, Activated Alumina, Regeneration, Drinking Water, Breakthrough, Modeling

Kim, S. and Kim, Y.K. (2004), Apparent desorption kinetics of phenol in organic solvents from spent activated carbon saturated with phenol. *Chemical Engineering Journal*, **98** (3), 237-243.

Full Text: [C\Che Eng J98, 237.pdf](C/Che%20Eng%20J98,%20237.pdf)

Abstract: This paper presents the result of an experimental work designed to develop a desorption kinetic model of phenol from activated carbon (AC) by acetone, *N*, *N*-dimethylformamide (DMF), and methanol. The kinetic model assumed that a driving force for desorption might be accounted for by the difference between the equilibrium concentration of phenol in solvents corresponding to its adsorbed amount on AC and the bulk phenol concentration in solvents at a time. The equilibrium concentration of phenol in solvents was estimated from a non-linear relationship with its adsorbed amount on AC at a time. Apparent desorption rate constants were described as a function of temperature by Arrhenius relationship. Desorption rate of phenol increased with desorption temperature of solvents. The desorption rates attained by acetone and DMF were close each other but greater than those by methanol. Theoretical kinetic results duplicated experimental data quite well, supporting the practicality of the proposed kinetic model. Acetone and DMF were found to be more efficient for desorbing phenol from AC than methanol.

Keywords: Spent Activated Carbon, Phenol, Acetone, DMF, Methanol, Desorption Kinetic Model

Lee, V.K.C. and McKay, G. (2004), Comparison of solutions for the homogeneous surface diffusion model applied to adsorption systems. *Chemical Engineering Journal*, **98** (3), 255-264.

Full Text: [C\Che Eng J98, 255.pdf](C/Che%20Eng%20J98,%20255.pdf)

Abstract: Three solutions to the film surface diffusion mass transport model are discussed. The solutions are based on the homogenous surface diffusion model (HSDM) and are compared using three different adsorption systems. The mass transport solutions include a Crank–Nicholson implicit finite difference method, a semi-analytical solution method and a Cartesian collocation method. The three solutions are compared for accuracy, stability, convergence and computation CPU time.

The experimental systems used two adsorbents, activated carbon, a mainly microporous material, and sorbsil silica, a mainly macroporous material. Two categories of adsorbates were selected for the study, phenol, a relatively small organic molecule, which does not ionise, and basic dyes, larger organic structures, which exist as ionisable salts. A range of initial adsorbate concentrations were studied. The range of material types and experimental conditions selected should be sufficient to test and compare the three models under a variety of conditions.

Keywords: Adsorption Systems, MMW model, WAMM model, Cartesian Collocation Model

Ozdemir, G., Ceyhan, N., Ozturk, T., Akirmak, F. and Cosar, T. (2004), Biosorption of chromium(VI), cadmium(II) and copper(II) by *Pantoea* sp. TEM18. *Chemical Engineering Journal*, **98** (3), 249-253.

Full Text: [C\Che Eng J98, 249.pdf](C/Che%20Eng%20J98,%20249.pdf)

Abstract: Microorganisms and microbial products can be highly efficient bioaccumulators of soluble and particulate forms of metals, especially from dilute external solutions, and microbe-related technologies may provide an alternative or adjunct to conventional techniques of metal removal/recovery. In this work, among microorganisms isolated from wastewater treatment of a petrochemical industry, a gram-negative bacterium *Pantoea* sp. TEM18 exhibited the greatest copper tolerance. It was able to survive in the medium containing copper at concentrations as high as 180 mg/l. The biosorption properties of bacterial biomass for cadmium and the effects of environmental factors (i.e. pH, metal concentration contact time) on the chromium, cadmium and copper biosorption were explored. Optimum adsorption pH values of chromium(VI), cadmium(II) and copper(II) were determined as 3.0, 6.0 and 5.0, respectively. Experimental results also showed the influence of initial metal concentration on the metal uptake for dried biomass. Both the Freundlich and Langmuir adsorption models were suitable for describing the short-term biosorption of chromium(VI), cadmium(II) and copper(II) by *Pantoea* sp. TEM18.

Keywords: Waste Water Treatment, *Pantoea* sp., Biosorption, Chromium, Cadmium, Copper

Jaafari, K., Ruiz, T., Elmaleh, S., Coma, J. and Benkhouja, K. (2004), Simulation of a fixed bed adsorber packed with protonated cross-linked chitosan gel beads to remove nitrate from contaminated water. *Chemical Engineering Journal*, **99** (2), 153-160.

Full Text: [C\Che Eng J99, 153.pdf](C/Che%20Eng%20J99,%20153.pdf)

Abstract: Nitrate, contained in surface or groundwater, can be removed by sorption on protonated cross-linked chitosan gel beads. The sorption capacity is large enough to meet the standard of drinkable water. The isothermal equilibrium curves are straight lines which were established for a contaminated groundwater. The sorption kinetics is not limited by pore diffusion and is well modelled by a phenomenological equation. The experimental partition coefficient and overall mass transfer coefficient were used for simulating a plug flow fixed bed adsorber. The trend of the breakthrough curve was not affected by sinusoidal variations of the superficial velocity, which shows that the design can be carried out considering a conventional step injection. The breakthrough curve is more sensitive to the packing length than to the column diameter.

Keywords: Nitrate,Cross-Linked Chitosan,Groundwater,Plug Flow Reactor

? Supaka, N., Juntongjin, K., Damronglerd, S., Delia, M.L. and Strehaiano, P. (2004), Microbial decolorization of reactive azo dyes in a sequential anaerobic-aerobic system. *Chemical Engineering Journal*, **99** (2), 169-176.

Full Text: [2004\Che Eng J99, 169.pdf](2004/Che%20Eng%20J99,%20169.pdf)

Abstract: A sequential anaerobic-aerobic treatment process based on mixed culture of bacteria isolated from textile dye effluent-contaminated soil was used to degrade reactive azo dyes Remazol Brilliant Orange 3R. Remazol Black B and Remazol Brilliant Violet 5R. Treating synthetic dye wastewater with the combination anaerobic and aerobic process showed that the majority of colors were removed by the anaerobic process, on the other hand the majority of chemical oxygen demand (COD) was removed in the subsequent aerobic process. Samples from combined anaerobic-aerobic system at the beginning of anaerobic process, after anaerobic process and after subsequent aerobic process were analyzed by high performance liquid chromatography (HPLC). The results suggested that under anaerobic conditions, the azo dyes were reduced and the aromatic amines were generated by the bacterial biomass. After re-aeration of the synthetic dye wastewater, these amines were further degraded by the same isolates. Thus, total degradation of reactive azo dyes was achieved by using an anaerobic-aerobic treatment. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Reactive Azo Dyes, Mixed Culture, Anaerobic-Aerobic Treatment, Aromatic Amines, Waste-Water, Textile Effluent, Biodegradation, Degradation, Reduction, Consortium

Khraisheh, M.A.M., Al-Degs, Y.S. and Mcminn, W.A.M. (2004), Remediation of wastewater containing heavy metals using raw and modified diatomite. *Chemical Engineering Journal*, **99** (2), 177-184.

Full Text: [C\Che Eng J99, 177.pdf](C/Che%20Eng%20J99,%20177.pdf)

Abstract: Diatomite and manganese oxide modified-diatomite (Mn-diatomite) were tested for heavy metal removal from wastewater. Impregnating the diatomite surface with 0.38g g-1 of manganese oxide gave a 2.4-fold increase in the adsorbent surface area. Equilibrium studies demonstrated that diatomite has a higher removal capacity for Pb2+, Cu2+ and Cd2+ from water than untreated diatomite. Furthermore, the adsorption capacity of Mn-diatomite increased by decreasing the quantity of manganese oxides deposited on the surface. Electronic microscopy was carried out to study the effect of heterogeneity, modification and diatomite frustule type on adsorption. Both centric and pennate types of diatomite were present. The scanning micrographs also indicated the birnessite structure of manganese oxides, which is characterised by a platy-like-crystal structure. Adsorption kinetics confirmed the effectiveness of the manganese chemical treatment, which also significantly improved the diatomite filtration properties. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Diatomite, Filtration, Heavy Metals, Manganese Oxides, Hydrous Manganese-Dioxide, Activated Carbon, Surface-Chemistry, Aqueous-Solutions, Ion-Exchange, Removal, Adsorption, Sorption, Copper, Oxide

Ozdemir, G., Ceyhan, N., Ozturk, T., Akirmak, F. and Cosar, T. (2004), Biosorption of chromium(VI), cadmium(II) and copper(II) by *Pantoea* sp. TEM18. *Chemical Engineering Journal*, **102** (3), 249-253.

Full Text: [C\Che Eng J102, 249.pdf](C/Che%20Eng%20J102,%20249.pdf)

Abstract: Microorganisms and microbial products can be highly efficient bioaccumulators of soluble and particulate forms of metals, especially from dilute external solutions, and microbe-related technologies may provide an alternative or adjunct to conventional techniques of metal removal/recovery. In this work, among microorganisms isolated from wastewater treatment of a petrochemical industry, a gram-negative bacterium *Pantoea* sp. TEM18 exhibited the greatest copper tolerance. It was able to survive in the medium containing copper at concentrations as high as 180 mg/l. The biosorption properties of bacterial biomass for cadmium and the effects of environmental factors (i.e. pH, metal concentration contact time) on the chromium, cadmium and copper biosorption were explored. Optimum adsorption pH values of chromium(VI), cadmium(II) and copper(II) were determined as 3.0, 6.0 and 5.0, respectively. Experimental results also showed the influence of initial metal concentration on the metal uptake for dried biomass. Both the Freundlich and Langmuir adsorption models were suitable for describing the short-term biosorption of chromium(VI), cadmium(II) and copper(II) by *Pantoea* sp. TEM18.

Keywords: Waste Water Treatment, *Pantoea* sp., Biosorption, Chromium, Cadmium, Copper

Jena, P.R., Basu, J.K. and De, S. (2004), A generalized shrinking core model for multicomponent batch adsorption processes. *Chemical Engineering Journal*, **102** (3), 267-275.

Full Text: [C\Che Eng J102, 267.pdf](C/Che%20Eng%20J102,%20267.pdf)

Abstract: A two resistance mass transfer model for multi component batch adsorption process has been developed including an external film mass transfer coefficient and an internal effective diffusivity that controls the internal mass transport process. The model is based on the shrinking core formulation. The developed model is more generalized, can accommodate wide range of initial adsorbate concentration in feed and the nature of the isotherm. The model is tested for two binary systems reported in the literature [Chem. Eng. Sci. 36 (1981) 731]. The model equations are solved numerically and optimized using nonlinear parameter estimation technique in order to match with the experimental kinetic data [Chem. Eng. Sci. 36 (1981) 731]. In this procedure, the process parameters, i.e. the external mass transfer coefficient and internal effective diffusivity are determined for a particular system. Using the estimated parameters, a parametric study has been carried out to observe the effects of initial adsorbate concentration, particle size of adsorbent, mass of adsorbent, etc. on the system kinetics.

Keywords: Adsorption, Mass Transfer Coefficient, Effective Diffusivity, Shrinking Core Model, Modeling, Optimization

Wu, Z., Joo, H., Ahn, I.S., Haam, S., Kim, J.H. and Lee, K. (2004), Organic dye adsorption on mesoporous hybrid gels. *Chemical Engineering Journal*, **102** (3), 277-282.

Full Text: [C\Che Eng J102, 277.pdf](C/Che%20Eng%20J102,%20277.pdf)

Abstract: Adsorption of two organic dyes (alizarin red S and phenol red) on mesoporous silica and hybrid gels is investigated. The mesoporous gels are derived from tetraethoxysilane (TEOS), methyltriethoxysilane (MTES), vinyltriethoxysilane (VTES), propyltriethoxysilane (PTES), and phenyltriethoxysilane (PhTES). The experimental results demonstrate that the adsorption capacity of the hybrid gels is much higher than that of the pure silica gel and increases as the gel surface becomes more hydrophobic. This suggests that the organic dye adsorption is governed mainly by the hydrophobic interaction between the organic dyes and the gel surface. Langmuir and Toth isotherm models are also tested against the experimental isotherm data.

Keywords: Adsorption, Organic Dye, Mesoporous, Hybrid Gel, Adsorption Isotherm, Hydrophobic Interaction

Singh, A., Pant, K.K. and Nigam, K.D.P. (2004), Catalytic wet oxidation of phenol in a trickle bed reactor. *Chemical Engineering Journal*, **103** (1-3), 51-57.

Full Text: [C\Che Eng J103, 51.pdf](C/Che%20Eng%20J103,%2051.pdf)

Abstract: Catalytic liquid phase oxidation of aqueous phenol was studied in a pilot plant trickle bed reactor using a copper oxide catalyst supported on alumina. Catalysts were prepared by impregnating CuO on alumina extrudates and on computer designed shape (CDS) alumina pellets. Phenol oxidation was carried out in a 2.54 cm diameter reactor with a catalyst bed length of 60 cm and in the pressure range of 1-15 atm and temperature range of 373-403 K Compared to alumina extrudates higher phenol conversion was achieved over CDS pellets under identical conditions. Phenol oxidation reaction was strongly affected by the temperature and pressure, however, pressure had less effect. Hydrodynamics of the reactor had strong influence on phenol oxidation reaction. A one dimensional axial dispersion model was proposed to simulate the experimental results. The model satisfactorily explains the experimental results with a deviation of ±15%. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Trickle Bed Reactor, Oxidation, Phenol, Catalyst, Modeling, Liquid-Phase Oxidation, Air Oxidation, Aqueous-Solutions, Performance, Removal, Water

Choy, K.K.H., Porter, J.F. and McKay, G. (2004), Intraparticle diffusion in single and multicomponent acid dye adsorption from wastewater onto carbon. *Chemical Engineering Journal*, **103** (1-3), 133-145.

Full Text: [C\Che Eng J103, 133.pdf](C/Che%20Eng%20J103,%20133.pdf)

Abstract: The adsorption of three acid dyes onto activated carbon has been studied. Three single, three binary and one ternary systems have been investigated and both equilibrium and kinetic studies have been determined. The equilibrium capacities based on the Langmuir analysis are 0.253, 0.125 and 0.219 mmol g-1 carbon for Acid Blue 80, Acid Red 114 and Acid Yellow 117, respectively. The batch adsorber rate data for the seven systems have been analysed based on an intraparticle diffusion rate parameter derived from the plots of dye adsorbed versus the square root of time. The data indicate the adsorption mechanism is predominantly intraparticle diffusion. The multicomponent system rate parameters have been correlated with the single component rate parameters by the use of the Langmuir equilibrium parameters.

Keywords: Diffusion Modeling, Adsorption, Activated Carbon, Acid Dyes, Multicomponent

? Al-Ghouti, M.A., Khraisheh, M.A.M. and Tutuji, M. (2004), Flow injection potentiometric stripping analysis for study of adsorption of heavy metal ions onto modified diatomite. *Chemical Engineering Journal*, **104** (1-3), 83-91.

Full Text: [2004\Che Eng J104, 83.pdf](2004/Che%20Eng%20J104,%2083.pdf)

Abstract: Computerised flow injection coupled with potentiometric stripping analysis (FlPSA) was employed for examination of the adsorption behaviour of Pb(II), Cd(II) and Zn(II) ions onto diatomite modified with manganese oxides. Signal optimisation was undertaken with respect to flow rate, deposition time, deposition potential, oxidising agent concentration, thickness of mercury film, solution pH and metal ion concentration. Examination of the column adsorption characteristics was facilitated by introduction of an adsorption microcolumn, as a complementary component of the flow injection system. The resulting breakthrough curves were employed to calculate parameters including adsorption capacity and adsorption rate constant, taking into consideration initial ion concentration, flow rate, mass and particle size of adsorbent, and column internal diameter. Adsorption capacities, determined using the Thomas mathematical model, showed that manganese modified Jordanian diatomite had an efficiency towards the removal of heavy metal ions from aqueous solutions; Cd(II) > Zn(ll) - Pb(II). The relative adsorption rates of the ions followed the order: Pb(ll) > Zn(ll) - Cd(ll). (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Rate, Analysis, Bed, Biosorption, Cadmium, Capacity, Cd(II), Concentration, Copper, Deposition, Diatomite, Efficiency, Film, Flow, Flow Injection, Heavy Metal, Heavy Metal Ions, Heavy Metals, Injection, Ion, Kinetics, Manganese, Manganese Oxides, Mathematical Model, Mercury, Model, Models, Oxides, Parameters, Particle, Particle Size, Pb(II), pH, Potentiometric, Rate Constant, Removal, Stripping Analysis, System, Water

Ferraz, A.I., Tavares, T. and Teixeira, J.A. (2004), Cr(III) removal and recovery from *Saccharomyces cerevisiae*. *Chemical Engineering Journal*, **105** (1-2), 11-20.

Full Text: [C\Che Eng J105, 11.pdf](C/Che%20Eng%20J105,%2011.pdf)

Abstract: Heavy metal recovery from biosorbents is of major importance in the assessment of competitiveness of biosorption processes. Several desorption agents (H2SO4, HNO3, HCl, CH3COOH and EDTA) were tested for the selection of the optimal elution conditions for Cr(III) recovery from *Saccharomyces cerevisiae* cells.

Sorption time was optimised as it plays an important role in the sorption–desorption process, being shown that a 30 min sorption period is the best option to ensure metal removal from solution and good recovery from biosorbent. The optimal contact time with desorption agents was also studied, as long exposures to these ones may cause cell damage, affecting biosorbent metal uptake capacity in subsequent sorption cycles.

Each eluant was analysed in terms of its desorption capacity and its effect on the biomass metal uptake capacity in multiple sorption–desorption cycles. Considering the effectiveness of chromium desorption from loaded biomass, it was possible to conclude that H2SO4 (pH ≈ 1) was the most effective eluant tested, accomplishing the highest Cr(III) recovery from *S. cerevisiae* in three consecutive sorption/desorption cycles.

Regarding the damage caused by acid treatment on *S. cerevisiae* cells, assessed by the reduction on metal uptake capacity after elution, it was possible to observe that sulphuric acid was the most harmful eluant causing long term negative effects in metal uptake. By the time the experiments were interrupted (nearly 26 h of continuous cycles) biomass uptake capacity was reduced to about 77% of the value reached before acid treatment.

Keywords: Biosorption, Desorption, Heavy Metals, *Saccharomyces Cerevisiae*

Choy, K.K.H., Porter, J.F., Hui, C.W. and McKay, G. (2004), Process design and feasibility study for small scale MSW gasification. *Chemical Engineering Journal*, **105** (1-2), 31-41.

Full Text: [C\Che Eng J105, 31.pdf](C/Che%20Eng%20J105,%2031.pdf)

Abstract: A process design study has been carried out to assess the feasibility of installing a small-scale municipal solid waste (MSW) gasifier on a university campus. The objective was to gasify all the non-recyclable MSW produced on campus and then combust the gaseous product to produce energy and electricity for the campus. Five energy generation combination scenarios were studied at two different mass gasification rates. The scenarios involved hot water (based on site demand), electricity (only, less the demand for hot water) and excess hot water for export (with electricity, with no electricity). Due to the high capital cost of generating electricity from a 10 tonnes per day MSW gasifier, the optimum rate of return on capital investment is 14.8%. On a heat basis only a return of 23.4% is achievable. However, this optimum solution is based on being able to export 60% of the hot water off campus. If an additional 10 tonnes per day MSW is imported onto campus the optimum rate of return increases to 36.1% but over 75 % hot water has to be exported. Alternatively, with 400 kW of electricity generation a rate of return of 32.5% can be achieved at this higher mass throughput. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: MSW Gasification, Municipal Solid Waste, Process Design, Economic Evaluation, Municipal Solid-Waste, Incineration, Combustion

Ravikumar, K., Pakshirajan, K., Swaminathan, T. and Balu, K. (2005), Optimization of batch process parameters using response surface methodology for dye removal by a novel adsorbent. *Chemical Engineering Journal*, **105** (3), 131-138.

Full Text: [2005\Che Eng J105, 131.pdf](2005/Che%20Eng%20J105,%20131.pdf)

Abstract: Adsorption of Astrazone Blue FRR (Basic Blue 69) and Teflon Blue ANL (Acid Blue 125) was investigated using a hybrid adsorbent that was prepared by pyrolysing a mixture of carbon and fly ash 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 studied and optimized using response surface methodology. The optimum pH, temperature, particle size and time were found to be 12.8, 27.75 °C, 0.0555 mm, 230 min, respectively for basic blue and those for acid blue 25 were 1.5, 27.5 °C, 0.0565 mm and 245 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

Acemioğlu, B. (2005), Batch kinetic study of sorption of Methylene blue by perlite. *Chemical Engineering Journal*, **106** (1), 73-81.

Full Text: [2005\Che Eng J106, 73.pdf](2005/Che%20Eng%20J106,%2073.pdf)

Abstract: Batch sorption kinetics of Methylene blue by perlite have been studied in terms of pseudo-first-order, pseudo-second-order and intra-particle diffusion models. The results showed that sorption process was best described by the pseudo-second-order model. The correlation coefficients, r2, obtained from pseudo-second-order model were higher than 0.98 under all the experiment conditions. The effects of agitation speed, initial dye concentration and solution temperature on kinetic parameters (sorption rate constant, initial sorption rate, equilibrium sorption capacity, etc.) are discussed. While the values of sorption rate constants (k2) and initial sorption rates (h) increased with increasing agitation speeds and solution temperatures, it was seen that the values of k2 decreased and the values of h increased with increased initial dye concentration. The values of equilibrium sorption capacity from pseudo-second order (q2) were in the best agreement with experimental data (qe) in each experimental condition. Moreover, the activation energy (Ea) of sorption calculated using the pseudo-second-order rate constants was found to be 10.31 kJ/mol from an Arrhenius plot. The value of Ea indicated that sorption was controlled by an intra-particle diffusion mechanism as well as by pseudo-second-order kinetics.

Keywords: Kinetics, Perlite, Methylene Blue, Sorption Activation Energy, Aqueous-Solution, Fly-Ash, Copper(II) Removal, Congo Red, Adsorption, Water, Wollastonite, Equilibrium, Effluents, Lead(II)

Vijayaraghavan, K., Jegan, J., Palanivelu, K. and Velan, M. (2005), Batch and column removal of copper from aqueous solution using a brown marine alga *Turbinaria ornata*. *Chemical Engineering Journal*, **106** (2), 177-184.

Full Text: [2005\Che Eng J106, 177.pdf](2005/Che%20Eng%20J106,%20177.pdf)

Abstract: *Turbinaria ornata*, a brown marine alga, was tested for its ability to remove copper(II) from aqueous solution. Batch equilibrium tests at different pH conditions showed that at pH 6, a maximum copper uptake of 147.06 mg/g was observed according to the Langmuir model. A solution of 0.1 M HCl performed well in eluting copper from copper-loaded biomass and caused no damage to the biosorbent. The ability of *T. ornata* to biosorb copper in a packed column was investigated, as well. The experiments were conducted to study the effect of important design parameters such as bed height and flow rate. The copper uptake remained relatively constant at approximately 68 mg/g irrespective of the bed height, whereas the uptake decreased as the flow rate increased. The bed depth service time model and the Thomas model were used to analyze the experimental data and the model parameters were evaluated. In regeneration experiments, a loss of sorption performance was observed during seven cycles of sorption–desorption indicated by a shortened breakthrough time and a broadened mass transfer zone. The life-factor for *T. ornata* in terms of critical bed length was found to be 0.603 cm/cycle. The elutant, 0.1 M HCl, provided elution efficiencies greater than 98.8% in all the seven cycles. The pH profiles during both sorption and desorption process were also reported.

Keywords: Biosorption, Copper, Packed Bed, Regeneration, *Turbinaria Ornata*

? Choy, K.K.H., Barford, J.P. and McKay, G. (2005), Production of activated carbon from bamboo scaffolding waste-process design, evaluation and sensitivity analysis. *Chemical Engineering Journal*, **109** (1-3), 147-165.

Full Text: [2005\Che Eng J109, 147.pdf](2005/Che%20Eng%20J109,%20147.pdf)

Abstract: A feasibility study has been carried out on the preliminary process design of the production of activated carbon from the bamboo scaffolding waste based on 30 tonnes of bamboo waste per day throughput. A comparison of the process economics of the stand-alone bamboo carbonization plant with a plant that is integrated into another major processing facility has been studied. The preliminary process design was based on various literature sources and an economic evaluation, in which the total capital investment (M), the production cost, the return on investment (ROI), the cash flow and the internal rate of return (IRR) of the stand-alone plant and integrated plant were estimated. The TO of the stand-alone plant and integrated plant are HK$ 7,430,000 and HK$ 6,430,000, respectively. Net present values of two plants at various discount factors have been determined and the IRR have been estimated as 13.0 and 20.1% for the stand-alone plant and integrated plant, respectively. Sensitivity analysis reveals that the cash flow of the project would be increased or decreased up to 40, 65 and 120% by varying production factors of cost of chemical activation agent, production capacity and selling price of activated carbon, respectively, in the extent of +/- 25%. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Bamboo Scaffolding Waste, Activated Carbon, Process Design, Economic Evaluation,Temperature, Adsorption, Removal

? Özer, A., Akkaya, G. and Turabik, M. (2005), The biosorption of Acid Red 337 and Acid Blue 324 on *Enteromorpha prolifera*: The application of nonlinear regression analysis to dye biosorption. *Chemical Engineering Journal*, **112** (1-3), 181-190.

Full Text: [2005\Che Eng J112, 181.pdf](2005/Che%20Eng%20J112,%20181.pdf)

Abstract: The biosorption of Acid Red 337 and Acid Blue 324 from aqueous solution on *Enteromorpha prolifera* was investigated in a batch system. Optimum initial pH and temperature values for AB 324 and AR 337 dyes were found as 3.0 and 2.0, 25 and 30 °C, respectively and the optimum dye uptake amounts per unit mass were obtained at 0.5 g/l biosorbent concentration for both dyes. The Langmuir, Freundlich and Redlich–Peterson adsorption models were applied to experimental equilibrium data and the isotherm constants were calculated using Polymath 4.1 software. The monolayer covarage capacities of *E. prolifera* for AB 324 and AR 337 were obtained as 160.6 and 210.9 mg/g, respectively. It was observed that the biosorption data fitted well to Redlich–Peterson model than the other models. The external diffusion and intraparticle diffusion models were also applied to biosorption data of AR 337 and AB 324 and it was found that both the surface adsorption as well as intraparticle diffusion contribute to the actual adsorption process. The constants obtained from the pseudo-second order kinetic model at different temperatures were evaluated and the activation energies for the biosorption of AB 324 and AR 337 were found to be −31.5 and −19.87 kJ/mol, respectively. Thermodynamic parameters such as enthalpy, entropy and Gibb’s free energy changes were also calculated and it was concluded that the biosorption of these acidic dyes on *E. prolifera* was exothermic in nature.

Keywords: Biosorption, Isotherm, Nonlinear Regression, Pseudo-Second Order Kinetics, Weber–Morris Model

? Wu, Z., Joo, H. and Lee, K. (2005), Kinetics and thermodynamics of the organic dye adsorption on the mesoporous hybrid xerogel. *Chemical Engineering Journal*, **112** (1-3), 227-236.

Full Text: [2005\Che Eng J112, 227.pdf](2005/Che%20Eng%20J112,%20227.pdf)

Abstract: We investigate the kinetics and thermodynamics of brilliant blue FCF (BBF) adsorption on a mesoporous hybrid xerogel derived from tetraethoxysilane (TEOS) and propyltriethoxysilane (PTES) with cetyltrimethylammonium bromide (CTAB) as a templating agent. We study the effect of initial BBF concentration, temperature, pH, and ionic strength on the adsorption of BBF from aqueous solution. Kinetic studies show that the kinetic data are well described by the pseudo second-order kinetic model. Initial adsorption rate increases with the increase in initial BBF concentration and temperature. The internal diffusion appears to be the rate-limiting step for the adsorption process. The equilibrium adsorption amount increases with the increase in initial BBF concentration, temperature, solution acidity, and ionic strength. The thermodynamic analysis indicates that the adsorption is spontaneous and endothermic. Electrostatic attraction and hydrophobic interaction are suggested to be the dominant interactions between dye and the xerogel surface.

Keywords: Brilliant Blue FCF, Mesoporous Hybrid Xerogel, Adsorption Kinetics, Adsorption Thermodynamics

? Sheha, R.R. and Someda, H.H. (2005), Removal of some chelators from aqueous solutions using polymeric ingredients. *Chemical Engineering Journal*, **114** (1-3), 105-113.

Full Text: [2005\Che Eng J114, 105.pdf](2005/Che%20Eng%20J114,%20105.pdf)

Abstract: This work tries to throw a light on the removal of thenoyl trifluoroacetone (TTA) and ethylene diamine tetraacetic acid (EDTA) extractants that extensively used in many nuclear facilities. Using Amberlite XAD resins, equilibrium studies were performed to identify the adsorption of these chelatos from aqueous solutions under various experimental conditions. The applied resins exhibit high retention ability for the studied chelators with a maximum adsorption capacity of 23.9 and 38.0 mg g−1 for sorption of TTA and EDTA on Amberlite XAD4 and 18.6 and 21.2 mg g−1 for their adsorption on Amberlite XAD7. Factors affecting the resin retention ability, such as pH value of aqueous solution and presence of cosolvent have been studied. The kinetics of adsorption behavior, in the applied system, indicate the process to be controlled by more than one diffusion mechanism. Therefore, two diffusion models were utilized to understand and verify the mechanism of adsorption processes; they are the film mass transfer model and the intraparticle diffusion model. The first model, based on film resistance, gave a successful depiction for adsorption of TTA onto Amberlite XAD4 and XAD7. The second one displayed an acceptable prediction for sorption of EDTA onto Amberlite XAD4.

Keywords: TTA, EDTA, Removal, Amberlite XAD, Diffusion Model

? Baláž, P., Aláčová, A. and Briančin, J. (2005), Sensitivity of Freundlich equation constant 1/*n* for zinc sorption on changes induced in calcite by mechanical activation. *Chemical Engineering Journal*, **114** (1-3), 115-121.

Full Text: [2005\Che Eng J114, 115.pdf](2005/Che%20Eng%20J114,%20115.pdf)

Abstract: This work presents an attempt to modify the properties of calcite by mechanical activation in order to enhance its capacity for heavy metal removal. The equilibrium isotherms of zinc adsorption onto the mineral show the data correlate well with Freundlich model. Experiments with temperature changes in sorption tests proved that chemisorption plays the main role in zinc sorption on calcite. The solid-state properties of calcite (surface area, particle size, particle morphology and crystallinity) has been modified by mechanical activation (high-energy milling) and the structure sensitivity parameter, *S*A/*X* (*S*A: specific surface area and *X*: crystallinity) has been used for the characterization of mechanically activated calcite. The good linear correlation (*R* = 0.92) between Freundlich parameter 1/*n* and log(*S*A/*X*) has been found. The experimental results proved that the mechanically activated calcite is an effective sorbent for Zn removal from water solutions.

Keywords: Zinc, Adsorption, Freundlich, Calcite, Mechanical Activation

? Rozada, F., Otero, M., Parra, J.B., Morán, A. and García, A.I. (2005), Producing adsorbents from sewage sludge and discarded tyres: Characterization and utilization for the removal of pollutants from water. *Chemical Engineering Journal*, **114** (1-3), 161-169.

Full Text: [2005\Che Eng J114, 161.pdf](2005/Che%20Eng%20J114,%20161.pdf)

Abstract: Adsorbent materials have been produced from sewage sludge and discarded tyres. Their physical structures and chemical surfaces differ according to their origin and production process. However, all the activated carbons show a good development of their mesopore structure. The adsorption equilibriums of Methylene blue and sandolan brilliant red N-BG 125 (an industrial dye) onto the activated carbons generated have been analysed and described in terms of Freundlich isotherm. The best adsorption results were those corresponding to sandolan brilliant red onto the adsorbent obtained from sludge chemically activated with ZnCl2. The effect of temperature on the dyes adsorption was addressed and the thermodynamic parameters (ΔH, ΔS and ΔG) were determined for each of the studied systems. It was found that the process was endothermic and spontaneous in all cases.

Keywords: Adsorbents, Characterization, Liquid-phase Adsorption, Sewage Sludge, Tyres, Thermodynamics

? Lee, K.T., Mohamed, A.R., Bhatia, S. and Chu, K.H. (2005), Removal of sulfur dioxide by fly ash/CaO/CaSO4 sorbents. *Chemical Engineering Journal*, **114** (1-3), 171-177.

Full Text: [2005\Che Eng J114, 171.pdf](2005/Che%20Eng%20J114,%20171.pdf)

Abstract: This study presents findings from an experimental investigation of the influences of several factors on the desulfurization activity of sorbents synthesized from coal fly ash, CaO, and CaSO4. Specifically, the effects of specific surface area (16.1–133.3 m2/g), reaction temperature (60–300 °C), feed concentration of SO2 (500–2500 ppm), and feed concentration of NO (0–750 ppm) were elucidated using a fixed bed reactor. In general, the sorbent desulfurization activity increased with increasing specific surface area, reaction temperature, and NO concentration but with decreasing SO2 concentration. The physical and chemical properties of sorbent before and after SO2 capture were characterized through scanning electron microscopy, X-ray diffraction, and Fourier transform infrared analyses.

Keywords: Desulfurization, Fixed Bed Reactor, Flue Gas, Fly Ash, Sorbent, Sulfur Dioxide

? Kuusisto, J., Mikkola, J.P., Casal, P.P., Karhu, H., Väyrynen, J. and Salmi, T. (2005), Kinetics of the catalytic hydrogenation of d-fructose over a CuO-ZnO catalyst. *Chemical Engineering Journal*, **115** (1-2), 93-102.

Full Text: [2005\Che Eng J115, 93.pdf](2005/Che%20Eng%20J115,%2093.pdf)

Abstract: Kinetics of d-fructose hydrogenation over a copper catalyst (61 wt% CuO and 39 wt% ZnO) in aqueous solutions was studied. The hydrogenation experiments were carried out batchwise in a three-phase laboratory-scale reactor (300 ml, Parr Co.), operating at 35–65 bar and between 90 and 130 °C. The main hydrogenation products were mannitol and its epimer, sorbitol. Also, a minor isomerization of fructose to glucose was observed.

In the operating regime studied, the reaction rate showed a second order dependency with respect to the hydrogen pressure. Mannitol selectivity at the experimental range varied from 60 to 68%. The selectivity values improved slightly, as the hydrogen pressure increased or the reaction temperature decreased. The effect of catalyst loading and catalyst deactivation during consecutive hydrogenation batches was also studied. Catalyst characterization studies (nitrogen adsorption BET, XPS, SEM and particle size analysis) were carried out for a better understanding of the catalyst deactivation and reduction processes.

The fitting of the experimental data to the kinetic model was carried out by Modest software using a combined Simplex–Levenberg–Marquardt method. The proposed kinetic model was able to predict the experimental concentrations of fructose and mannitol as well as the by-products sorbitol and glucose with a better than 95% degree of explanation.

Keywords: Catalytic Hydrogenation, D-Fructose, D-Mannitol

? Mohanty, K., Das, D. and Biswas, M.N. (2005), Adsorption of phenol from aqueous solutions using activated carbons prepared from *Tectona grandis* sawdust by ZnCl2 activation. *Chemical Engineering Journal*, **115** (1-2), 121-131.

Full Text: [2005\Che Eng J115, 121.pdf](2005/Che%20Eng%20J115,%20121.pdf)

Abstract: Activated carbons prepared from Tectona grandis sawdust, a timber industry waste, have been examined for the removal of phenol from aqueous solutions. The activated carbon was prepared by zinc chloride activation under four different activation atmospheres, to develop carbons with well-developed porosity. Experiments were carried out at different chemical ratios (activating agent/precursor). Effects of carbonization temperature and time are the important variables, which had significant effect on the pore structure of carbon. Developed activated carbon was characterized by SEM analysis. Pore volume and surface area were estimated by Hg porosimetry and BET surface area analyses. The carbons showed surface area and micropore volumes of around 585 m2/g and 0.442 cm3/g, respectively. The activated carbon developed showed substantial capability to adsorb phenol from aqueous solutions. The kinetic data were fitted to the models of Lagergren, pseudo-second-order and intraparticle diffusion, and followed closely the pseudo-second-order chemisorption model. The Freundlich and Langmuir isotherm models were well fitted. The solution pH markedly affected the sorption process. The maximum uptake of phenol was found to be 2.82 mg/g at pH 3.5.

Keywords: Wastewater Treatment, Activated Carbon, Tectona Grandis Sawdust, Surface Area, Chemical Activation, Phenol Removal

? Zhao, N.Q., Wei, N., Li, J.J., Qiao, Z.J., Cui, J. and He, F. (2005), Surface properties of chemically modified activated carbons for adsorption rate of Cr(VI). *Chemical Engineering Journal*, **115** (1-2), 133-138.

Full Text: [2005\Che Eng J115, 133.pdf](2005/Che%20Eng%20J115,%20133.pdf)

Abstract: The commercially available activated carbon (AC) was oxidized with different oxidizing agents such as HNO3, H2O2 and Fe(NO3)3 and then followed by heat treatment at different temperatures in order to introduce more surface oxygen complexes. The effects of the oxidizing agent treatment on the surface chemical nature were characterized by ultimate Boehm titration and X-ray photoelectron spectrometer (XPS). The application of the chemically modified ACs in wastewater containing Cr(VI) was tested. Effects of surface oxygen groups of AC on Cr(VI) adsorption were investigated. The results showed that the adsorption of Cr(VI) ion was more effective for the chemically treated ACs. The extent of adsorption and reduction of ACs to Cr(VI) depends on the adsorption time, the pH value and the quality of AC in the Cr(VI) solution.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Properties, Adsorption Rate, Agents, Aqueous-Solution, Carbon, Cations, Chemical, Chromium, Complexes, Cr(VI), Functional-Groups, H2O2, Heat Treatment, Heat-Treatment, HnO3, Ion, Metals, Organic-Compounds, Oxidizing, Oxygen, pH, Properties, Quality, Reduction, Removal, Surface Oxygen Groups, Surface Properties, Titration, Treatment, Wastewater, Wastewaters, X-Ray Photoelectron Spectroscopy, XPS

? Tunali, S., Çabuk, A. and Akar, T. (2006), Removal of lead and copper ions from aqueous solutions by bacterial strain isolated from soil. *Chemical Engineering Journal*, **115** (3), 203-211.

Full Text: [2006\Che Eng J115, 203.pdf](2006/Che%20Eng%20J115,%20203.pdf)

Abstract: Biosorption of Pb(II) and Cu(II) ions from aqueous solutions has been studied in a batch system by using a bacterial strain isolated from metal polluted soil. The bacterial strain was identified as *Bacillus* sp. The optimum conditions of biosorption were determined by investigating the initial pH, contact time and the initial concentrations of metal ions at constant temperature (25°C). The maximum biosorption of the metal ions was observed at pH 3.0±0.1 for Pb(II) and pH 5.0±0.1 for Cu(II) ions. Biosorption equilibrium times for Pb(II) and Cu(II) ions were observed in 15 and 30 min, respectively. The maximum biosorption capacities of Pb(II) and Cu(II) ions on *Bacillus* sp. were determined to be 92.27±1.17 mg g−1 at 250 mg l−1 concentration and 16.25±1.64 mg g−1 at 200 mg l−1 concentration, respectively. The experimental adsorption data were fitted to Langmuir isotherm model. Competition of metal ions during biosorption was investigated in binary metal solutions. The interactions between metal ions and functional groups on the cell wall surface of the biomass were confirmed by FTIR, SEM and EDAX analysis. The results indicated that bacterial isolate *Bacillus* sp. is a suitable biosorbent for the removal of Pb(II) and Cu(II) ions from aqueous solutions.

Keywords: *Bacillus sp*., Biosorption, Competitive Biosorption, Cu(II), Langmuir Isotherm, Pb(II)

? Şayan, E. (2006), Ultrasound-assisted preparation of activated carbon from alkaline impregnated hazelnut shell: An optimization study on removal of Cu2+ from aqueous solution. *Chemical Engineering Journal*, **115** (3), 213-218.

Full Text: [2006\Che Eng J115, 213.pdf](2006/Che%20Eng%20J115,%20213.pdf)

Abstract: In recent years, the use of new technologies based on non-conventional energies such as ultrasound gains increasing importance. Ultrasound exhibits several beneficial mechanical effects in solid–liquid systems by means of the cavitations phenomenon. In this study, activated carbon adsorbent for removing heavy metals cations such as Cu2+ from aqueous solutions has been prepared. For this purpose, hazelnut shells were impregnated with KOH solution under ultrasound irradiation. After filtration, hazelnut shells have been carbonized under inert N2 atmosphere. The experiments were planned by fractional factorial design and central composite design. Activated carbons were characterized by their copper adsorption capacity. Optimum process conditions were obtained by using a constrained optimization program as follows: particle size 0.83 mm, ultrasound power/volume 19 W/L, impregnation ratio 0.06 g/mL, impregnation time 143 min, activation temperature 838 °C and activation time 19 min, following with maximum adsorption capacity was found as 40 mg Cu2+/g Ac. Activated carbon with the maximum adsorption capacity was further characterized by using scanning electron microscopy and its open pore structure was observed.

Keywords: Statistical Modeling, Hazelnut Shell, Ultrasound, Activated Carbon, Copper Adsorption, Optimization

? Jia, Y., Wang, R. and Fane, A.G. (2006), Atrazine adsorption from aqueous solution using powdered activated carbon—Improved mass transfer by air bubbling agitation. *Chemical Engineering Journal*, **116** (1), 53-59.

Full Text: [2006\Che Eng J116, 53.pdf](2006/Che%20Eng%20J116,%2053.pdf)

Abstract: A set of batch adsorption kinetic tests of atrazine adsorption by powdered activated carbon (PAC) was performed using air bubbling as the mixing method. It was found that air bubbling at appropriate rates could achieve good mixing. Even a slight turbulence generated by a few bubbles could provide a reasonable mixing to facilitate PAC adsorption compared with unstirred processes.

The estimated mass transfer coefficient in the liquid film surrounding the PAC particles increased linearly with the increase in air bubbling rate up to a plateau value. The experimental mass transfer coefficients in the bubbling system compared favorably with values calculated using correlations developed for conventional magnetic stirring systems, with the help of a conversion of the bubbling rates to the equivalent stirring speeds.

The effect of intermittent air bubbling on the adsorption rate was also tested by generating bubbles intermittently at different net air flow rates. It was found that at the same net flow rate, intermittent higher intensity sparging could be more efficient for the PAC adsorption than continuous lower intensity sparging. This suggests that intermittent high intensity bubbling is the preferable operation, with the potential not only to assure good PAC adsorption efficiency but also to reduce the air/energy consumption.

Keywords: Air Bubbling, Powdered Activated Carbon, Mass Transfer Coefficient, Intermittent Bubbling

? Gambardella, F., Galán Sánchez, L.M., Ganzeveld, K.J., Winkelman, J.G.M. and Heeres, H.J. (2006), Reactive NO absorption in aqueous FeII(EDTA) solutions in the presence of denitrifying micro-organisms. *Chemical Engineering Journal*, **116** (1), 67-75.

Full Text: [2006\Che Eng J116, 67.pdf](2006/Che%20Eng%20J116,%2067.pdf)

Abstract: The effect of the presence of denitrifying biomass on the reactive absorption of NO in aqueous FeII(EDTA) solutions has been investigated (*T* = 303, 325 K, *C*FeII(EDTA)=30–35 mol/m3, *C*total solids = 0–7.5 kg/m3, *C*suspended solids = 0–1.2 kg/m3, *C*NO in = 250 vppm). The absorption rate of NO is affected by the presence of the biomass sludge and high sludge loadings resulted in reductions in the NO absorption rates. The decrease is likely due to partial blockage of the gas–liquid interface by inorganic and organic suspended solids and to a lesser extent to changes in the physical properties of the liquid. For one of the samples, an enhancement of the NO absorption rate was observed, presumably as a result of a shuttling effect due to the presence of small, adsorptive particles. A semi-empirical engineering model was developed based on the theory of mass transfer in combination with solid particles. The model includes both possible enhancement of mass transfer due to the presence of small adsorptive particles as well as reduction of the mass transfer rate due to the presence of particles adhering to the gas–liquid interface. The experimental profiles were modeled successfully using this approach.

Keywords: NO Absorption, Solid Particles, Shuttling Effect, BiodeNOx

? Rao V.V.B. and Rao, S.R.M. (2006), Adsorption studies on treatment of textile dyeing industrial effluent by flyash. *Chemical Engineering Journal*, **116** (1), 77-84.

Full Text: [2006\Che Eng J116, 77.pdf](2006/Che%20Eng%20J116,%2077.pdf)

Abstract: Textile effluents are highly toxic as they contain a large number of metal complex dyes. The high concentration of such dyes causes many water borne diseases and increases the BOD of the receiving waters. On the other hand, flyash is a major pollutant generated in coal-based thermal power plants and has potentiality for use as an adsorbent. In the present work, adsorption studies were made in treating the dye solutions of Methylene blue (M-B) and Congo red (CR) textile dyes by using flyash. Effects of quantity of adsorbent, time of contact, initial effluent concentration, pH and temperature have been investigated experimentally and the results were compared with those obtained by using activated carbon. The first-order adsorption rate constants were determined and found decreasing with temperature. The results obtained were fitted by Langmuir model since monolayer formation observed. Also, Langmuir adsorption isotherm parameters were estimated from the experimental data obtained for both Methylene blue and Congo red dyes using both the adsorbents.

Keywords: Dyeing Industrial Effluent, Methylene Blue Dye, Cong Red Dye, Flyash, Activated Carbon, Adsorption, Percentage of Colour Removal, Equilibrium Concentration, First-Order Rate Constants,Langmuir Isotherm Parameters

? Rajgopal, S., Karthikeyan, T., Kumar, B.G.P. and Miranda, L.R. (2006), Utilization of fluidized bed reactor for the production of adsorbents in removal of malachite green. *Chemical Engineering Journal*, **116** (3), 211-217.

Full Text: [2006\Che Eng J116, 211.pdf](2006/Che%20Eng%20J116,%20211.pdf)

Abstract: Activated carbon was prepared from rubberwood (Hevea brasiliensis) sawdust by steam and chemical treatments. Steam activation was carried out in high temperature fluidized bed reactor (FBR) using steam as quenching medium. Chemical activation was carried out by using phosphoric acid. The adsorption capacity was determined by using iodine number and Methylene blue number and surface area by ethylene glycol mono ethyl ether (EGME) method. Further the adsorption studies were carried out using malachite green dye. Langmuir, Freundlich and Temkin adsorption isotherms were analyzed and Langmuir isotherm shows satisfactory fit to experimental data. The adsorption capacity was found to decrease in the order; steam activated carbon > acid+steam activated carbon > commercial activated carbon > acid activated carbon. Temperature effects on adsorption were carried out and it was found that the adsorption reaction was endothermic. Thermodynamic analysis of the process confirms its endothermicity. The adsorption kinetics was found to follow pseudo-second-order kinetic model.

Keywords: Rubberwood Sawdust, Activated Carbon, Malachite Green, Adsorption Isotherm, Mass Transfer, Kinetics

? Mohanty, K., Jha, M., Meikap, B.C. and Biswas, M.N. (2006), Biosorption of Cr(VI) from aqueous solutions by *Eichhornia crassipes*. *Chemical Engineering Journal*, **117** (1), 71-77.

Full Text: [2006\Che Eng J117, 71.pdf](2006/Che%20Eng%20J117,%2071.pdf)

Abstract: This paper reports the research findings of a laboratory-based study on the removal of Cr(VI) from solution using the biomass (both roots and stems) of the non-living Eichhornia Crassipes as a biosorbent. The effect of physico-chemical parameters like pH, sorbent dose, contact time and initial concentrations were investigated. Although the Lagergren first order model was applicable to some of the data, the pseudo-second-order reaction model was applicable to all data. The Freundlich isotherm was found to represent the measured sorption data well. The Fourier transform infrared spectrometry showed that the hydroxyl group was the chromium-binding site within pH range (pH 1–5) where chromium does not precipitate. The results indicated that the biomass of E. Crassipes is suitable for development of efficient biosorbent for the removal of chromium from wastewater of chemical and allied process industries.

Keywords: Activated Carbon, Adsorbent, Adsorption, Biomass, Biosorption, Cadmium Uptake, Chromium, Cr(VI) Removal, Equilibrium, Heavy Metal Removal, Heavy-Metals, Removal, Saccharomyces-Cerevisiae, Waste Water Treatment, Waste-Water, Water Pollution Control

? Srivastava, V.C., Mall, I.D. and Mishra, I.M. (2006), Equilibrium modelling of single and binary adsorption of cadmium and nickel onto bagasse fly ash. *Chemical Engineering Journal*, **117** (1), 79-91.

Full Text: [2006\Che Eng J117, 79.pdf](2006/Che%20Eng%20J117,%2079.pdf)

Abstract: The present study deals with the competitive adsorption of cadmium (Cd(II)) and nickel (Ni(II)) ions onto bagasse fly ash (BFA) from single component and binary systems. BFA is a waste material obtained from the flue gas of the bagasse-fired boilers of sugar mills. Equilibrium adsorption is affected by the initial pH (pH0) of the solution. The pH0 ≈ 6.0 is found to be the optimum for the individual removal of Cd(II) and Ni(II) ions by BFA. The pH of the system, however, increases during the initial sorption process for about 20 min and, thereafter, it remains constant. The equilibrium adsorption data were obtained at different initial concentrations (C0 = 10–100 mg/l), 5 h contact time, 30 °C temperature, BFA dosage of 10 mg/l at pH0 6. The single ion equilibrium adsorption data were fitted to the non-competitive Langmuir, Freundlich and Redlich–Peterson (R–P) isotherm models. The R–P and the Freundlich models represent the equilibrium data better than the Langmuir model in the studied initial metal concentration range (10–100 mg/l). The adsorption capacity of Ni(II) is higher than that for Cd(II) for the binary metal solutions and is in agreement with the single-component adsorption data. The equilibrium metal removal decreases with increasing concentrations of the other metal ion and the combined action of Cd(II) and Ni(II) ions on BFA is generally found to be antagonistic. Equilibrium isotherms for the binary adsorption of Cd(II) and Ni(II) ions onto BFA have been analyzed by using non-modified Langmuir, modified Langmuir, extended Langmuir, extended Freundlich and Sheindorf–Rebuhn–Sheintuch (SRS) models. The competitive extended Freundlich model fits the binary adsorption equilibrium data satisfactorily and adequately. Desorption with various solvents showed that the hydrochloric acid is the best solvent; the maximum elution being about 65% for Cd(II) and about 42% for Ni(II). Since BFA is a waste material obtained at almost no cost, the spent BFA can be combusted to recover its energy value and the bottom ash can be blended with cementitious mixture for making building blocks.

Keywords: Binary Adsorption, Bagasse Fly Ash (BFA), Simultaneous Metal Removal, Multi-Component Isotherms, Cadmium(II), Nickel(II)

? Xu, S.M., Wang, J.L., Wu, R.L., Wang, J.D. and Li, H. (2006), Adsorption behaviors of acid and basic dyes on crosslinked amphoteric starch. *Chemical Engineering Journal*, **117** (2), 161-167.

Full Text: [2006\Che Eng J117, 161.pdf](2006/Che%20Eng%20J117,%20161.pdf)

Abstract: Crosslinked amphoteric starch with carboxymethyl and quaternary ammonium groups is investigated as an adsorbent for removal of both acid and basic dyes in solution. Acid Light Yellow 2G, Acid Red G, Methyl Green and Methyl Violet were used to study the adsorption behaviors under various parameters such as pH, dose of amphoteric starches, initial dye concentration, adsorption time and adsorption temperature. At the preset pH value, the relationship between adsorption amount and the initial dye concentrations is given. The adsorption isotherm is discussed by modeling Langmuir and Freundlich isotherm. The kinetic study shows that the pseudo-second-order model fits the experimental data better. Also, the thermodynamic parameters are shown.

Keywords: Amphoteric Starch, Acid Dyes, Basic Dyes, Adsorption

? Duffy, A., Walker, G.M. and Allen, S.J. (2006), Investigations on the adsorption of acidic gases using activated dolomite. *Chemical Engineering Journal*, **117** (3), 239-244.

Full Text: [2006\Che Eng J117, 239.pdf](2006/Che%20Eng%20J117,%20239.pdf)

Abstract: In this work activated dolomite adsorption was investigated for removal of acidic gaseous pollutants. Charring was found to be an effective method for the activation of dolomite. This thermal processing resulted in partial decomposition, yielding a calcite and magnesium oxide structure. Adsorbents were produced over a range of char temperatures (750, 800 and 850 °C) and char times (1–8 h). The surface properties and the adsorption capability of raw and thermally treated dolomite sorbents were investigated using porosimetry, SEM and XRD. The sorbates individually investigated were CO2 and NO2. Volumetric equilibrium isotherm determinations were produced in order to quantify sorbate capacity on the various sorbents. The equilibrium data were successfully described using the Freundlich isotherm model. Despite relatively low surface area characteristics of the activated dolomite, there was a high capacity for the acidic gas sorbates investigated, showing a maximum of 12.6 mmol/g (554 mg/g) for CO2 adsorption and 9.93 mmol/g (457 mg/g) for NO2 adsorption. Potentially the most cost effective result from the work concerns the adsorptive capacity for the naturally occurring material, which gave a capacity of 9.71 mmol/g (427 mg/g) for CO2 adsorption and 4.18 mmol/g (193 mg/g) for NO2 adsorption. These results indicate that dolomitic sorbents are potentially cost effective materials for acidic gases adsorption.

Keywords: Dolomite, Adsorption, Adsorbent Characterization, Carbon Dioxide, Nitrogen Dioxide, Freundlich Isotherm

? Gazola, F.C., Pereira, M.R., Barros, M.A.S.D., Silva, E.A. and Arroyo, P.A. (2006), Removal of Cr3+ in fixed bed using zeolite NaY. *Chemical Engineering Journal*, **117** (3), 253-261.

Full Text: [2006\Che Eng J117, 253.pdf](2006/Che%20Eng%20J117,%20253.pdf)

Abstract: In this work the chromium exchange mechanism in zeolite NaY was studied. The breakthrough data were determined in an up-flow fixed bed at 30 °C using three bed heights: 1.5, 3.0 and 4.5 cm. It was seen that the bed height influenced the maximum chromium uptake as well as the mass transfer zone due to changes in pH during the ion exchange process. Changes in pH generated different chromium species with particular difficulties in diffusing towards the exchange sites of the zeolite. The linear driving force (LDF) model for breakthrough curves fitted well to the experimental data and the estimated overall mass transfer coefficient also changed with bed height, which is a consequence of different chromium speciation in the ion exchange mechanism. The axial dispersion coefficient can be considered as an average of 8.25×102, 1.04×102 and 3.36×102 cm2/min for the bed heights of 1.5, 3.0 and 4.5 cm, respectively.

Keywords: Zeolite, Chromium, Equilibrium Data, Breakthrough Curve

? Kurniawan, T.A., Chan, G.Y.S., Lo, W.H. and Babel, S. (2006), Physico–chemical treatment techniques for wastewater laden with heavy metals. *Chemical Engineering Journal*, **118** (1-2), 83-98

Full Text: [2006\Che Eng J118, 83.pdf](2006/Che%20Eng%20J118,%2083.pdf)

Abstract: This article reviews the technical applicability of various physico–chemical treatments for the removal of heavy metals such as Cd(II), Cr(III), Cr(VI), Cu(II), Ni(II) and Zn(II) from contaminated wastewater. A particular focus is given to chemical precipitation, coagulation–flocculation, flotation, ion exchange and membrane filtration. Their advantages and limitations in application are evaluated. Their operating conditions such as pH, dose required, initial metal concentration and treatment performance are presented. About 124 published studies (1980–2006) are reviewed. It is evident from the survey that ion exchange and membrane filtration are the most frequently studied and widely applied for the treatment of metal-contaminated wastewater. Ion exchange has achieved a complete removal of Cd(II), Cr(III), Cu(II), Ni(II) and Zn(II) with an initial concentration of 100 mg/L, respectively. The results are comparable to that of reverse osmosis (99% of Cd(II) rejection with an initial concentration of 200 mg/L). Lime precipitation has been found as one of the most effective means to treat inorganic effluent with a metal concentration of higher than 1000 mg/L. It is important to note that the overall treatment cost of metal-contaminated water varies, depending on the process employed and the local conditions. In general, the technical applicability, plant simplicity and cost-effectiveness are the key factors in selecting the most suitable treatment for inorganic effluent.

Keywords: Electroplating Industry, Heavy Metal Uptake, Inorganic Effluent, Metal-Contaminated Water, Water Pollution Control

? Malkoc, E., Nuhoglu, Y. and Abali, Y. (2006), Cr(VI) adsorption by waste acorn of *Quercus ithaburensis* in fixed beds: Prediction of breakthrough curves. *Chemical Engineering Journal*, **119** (1), 61-68.

Full Text: [2006\Che Eng J119, 61.pdf](2006/Che%20Eng%20J119,%2061.pdf)

Abstract: The adsorption of Cr(VI) onto waste acorn of Quercus ithaburensis was studied using fixed-bed adsorption. The experiments were conducted to study the effect of important design parameters such as flow rate, solution pH and particle size of adsorbent. Decrease in adsorbent particle size and flow rate produced a better bed capacity. Also an increase in flow rate and particle size resulted in a decrease in the bed volumes at the breakthrough. The highest bed capacities of fixed-bed column were obtained at pH 2.0. In the beginning of all the pH experiments, the effluent pH increased dramatically and then dropped and approached lower values. The breakthrough data obtained for Cr(VI) was adequately described by the Thomas and Yoon-Nelson adsorption models. Good agreement between the predicted theoretical breakthrough curves and the experimental results were observed. This study indicated that the waste acorn of Quercus ithaburensis can be used as an effective and environmentally friendly adsorbent for the treatment of Cr(VI) containing wastewaters. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Quercus Ithaburensis, Chromium, Adsorption, Modeling, Fixed-Bed Column, Ranular Activated Carbon, Aqueous-Solutions, Heavy-Metals, Removal, Chromium(VI), Biosorption, Sludge, Adsorbents, Columns, Copper

? Nacèra, Y. and Aicha, B. (2006), Equilibrium and kinetic modelling of Methylene blue biosorption by pretreated dead *streptomyces rimosus*: Effect of temperature. *Chemical Engineering Journal*, **119** (2-3), 121-125.

Full Text: [2006\Che Eng J119, 121.pdf](2006/Che%20Eng%20J119,%20121.pdf)

Abstract: This paper aims to investigate the biosorption of basic dye, Methylene blue onto dead Streptomyces rimosus. In our experiments the batch sorption is studied with respect to solute concentration, contact time, adsorbent dose and temperature. The results show that as the amount of the dead bacterial increases, the percentage of dye sorption increases accordingly. The bacterial biomass exhibits the highest Methylene blue uptake capacity at 20 °C. Biosorption capacity decreased from 9.86 to 6.93 mg g−1 with an increase in temperature from 20 to 50 °C at the initial Methylene blue concentration of 50 mg l−1. Intraparticle diffusion, pseudo-first order and pseudo-second order models can be used to describe the kinetics of basic dye sorption for different initial temperature values. In our study, we have used the Freundlich and Langmuir isotherm models to represent the equilibrium data of Methylene blue biosorption at several temperature values. In addition, an activation energy of sorption has also been determined based on the pseudo-second order rate constants.

Keywords: Biosorption, Methylene Blue, Modelization, Sorption Kinetics

? Apiratikul, R. and Pavasant, P. (2006), Sorption isotherm model for binary component sorption of copper, cadmium, and lead ions using dried green macroalga, *Caulerpa lentillifera*. *Chemical Engineering Journal*, **119** (2-3), 135-145.

Full Text: [2006\Che Eng J119, 135.pdf](2006/Che%20Eng%20J119,%20135.pdf)

Abstract: The sorption of Cu2+, Cd2+, and Pb2+ by a dried green macroalga *Caulerpa lentillifera* in binary components systems was investigated. The partial competitive binary isotherm model was proven to be effective in describing the experimental data. The model and experimental data of each binary component system demonstrated that the presence of the secondary metal ion always reduced the total sorption capacity of the biomass. This implied that there existed the same pooled binding sites for the sorption of all of these heavy metal ions. Pb2+ was demonstrated to be the most uptaken species, followed by Cu2+ and Cd2+. The presence of Pb2+ more significantly decreased the sorptions of Cu2+ and Cd2+ than vice versa. Similarly the sorption of Cd2+ was more disturbed by the presence of Cu2+, than that of Cu2+ by Cd2+. The effect of pH on metal sorption could also be described using similar fundamentals with the sorption of binary metal component, and the partial competitive model could also be applied to predict the effect of pH on the sorption of these metals. It was demonstrated that a decrease in pH resulted in a reduction in the sorption capacity and sorption affinity. Finally, carboxyl, hydroxyl, sulfonate, amine, and amide functional groups in the alga could be responsible for the sorption of all heavy metals in this work.

Keywords: Binary Sorption, Biosorption, Heavy Metals, Macroalgae, pH Effect

? Won, S.W., Kim, H.J., Choi, S.H., Chung, B.W., Kim, K.J. and Yun, Y.S. (2006), Performance, kinetics and equilibrium in biosorption of anionic dye Reactive Black 5 by the waste biomass of *Corynebacterium glutamicum* as a low-cost biosorbent. *Chemical Engineering Journal*, **121** (1), 37-43.

Full Text: [2006\Che Eng J121, 37.pdf](2006/Che%20Eng%20J121,%2037.pdf)

Abstract: The protonated biomass of *Corynebacterium glutamicum* was used for the removal of Reactive Black 5 (RB 5). In batch experiments, the parameters studied included the effect of the dye concentration, pH, contact time, salt concentration and temperature. In the range of pH 1–3, the removal of RB 5 was kept at near 100%. The maximum uptakes estimated by using the Langmuir model were 169.5 and 185.2 mg/g at 20 and 40 °C, respectively. Kinetic studies showed a pseudo second-order rate of biosorption with respect to the solution. The uptake of RB 5 was not significantly affected by the high concentration of salts. Various thermodynamic parameters such as ΔG°, ΔH°, and ΔS° were evaluated with results indicating that this system was a spontaneous and endothermic process. In addition, the biomass could be repeatedly reused up to five times of sorption/desorption cycle, confirming that the biomass wastes can be a potential regenerable biosorbent for RB 5 removal.

Keywords: Biosorption, Reactive Black 5, *Corynebacterium Glutamicum*, Isotherm, Desorption, Thermodynamics

? Padmesh, T.V.N., Vijayaraghavan, K., Sekaran, G. and Velan, M. (2006), Application of *Azolla rongpong* on biosorption of Acid Red 88, Acid Green 3, Acid Orange 7 and Acid Blue 15 from synthetic solutions. *Chemical Engineering Journal*, **122** (1-2), 55-63.

Full Text: [2006\Che Eng J122, 55.pdf](2006/Che%20Eng%20J122,%2055.pdf)

Abstract: *Azolla rongpong*, a fresh water macro alga, was tested for its ability to remove acid dyes (acid red 88 (AR88), acid green 3 (AG3), acid orange 7 (AO7) and acid blue 15 (AB15)) separately from aqueous solution. The sorption isotherms, obtained at different ranges of pH (2–3.5) and temperature (25–35 °C), were fitted using Langmuir, Freundlich, Redlich–Peterson and Sips models. The maximum dye uptake of 83.33 mg/g was obtained for AG3 at optimum conditions of pH (2.5) and temperature (30 °C) according to Langmuir isotherm model. Various thermodynamic parameters such as Δ*G*°, Δ*H*° and Δ*S*° were calculated indicating that the present system was spontaneous and endothermic process. The pseudo-first and -second order kinetic models were also applied to the experimental kinetic data obtained during biosorption of four acid dyes and high correlation coefficients favor pseudo-second order model for the present systems. Since *A. rongpong* performed very well in the case of AG3 biosorption compared to other dyes, AG3 was selected as the model dye for examining the potential of *A. rongpong* in continuous biosorption. A glass column (2 cm i.d. and 35 cm height) was used to conduct continuous experiments. At 25 cm (bed height), 5 mL/min (flow rate) and 100 mg/L (initial dye concentration), *A. rongpong* exhibited AG3 uptake of 84.87 mg/g. The experimental data were analyzed using Bed Depth Service Time and Thomas models and the model parameters were evaluated.

Keywords: Biosorption, Acid dyes, *Azolla rongpong*, Kinetics, Packed Column

? Kundu, S. and Gupta, A.K. (2006), Arsenic adsorption onto iron oxide-coated cement (IOCC): Regression analysis of equilibrium data with several isotherm models and their optimization. *Chemical Engineering Journal*, **122** (1-2), 93-106.

Full Text: [2006\Che Eng J122, 93.pdf](2006/Che%20Eng%20J122,%2093.pdf)

Abstract: The present work examines the equilibrium sorption of arsenic(III and V) from aqueous environment onto iron oxide-coated cement (IOCC) at 288, 298 and 308 K, and determines the equilibrium sorption isotherms. The equilibrium for both As(III) and As(V) was achieved in 2 h. The experimental isotherm data were analysed using Langmuir, Freundlich, Dubinin–Radushkevich (D–R), Toth and Temkin isotherm equations. In order to determine the best-fit isotherm for each system, both linear and non-linear regressions were carried out. For this, six error analysis methods were used to evaluate the data: the linear coefficient of determination, the sum of the squares of errors, the sum of absolute errors, the average relative error, the hybrid fractional error function and the Marquardt’s percent standard deviation. The error values indicated that the Freundlich isotherm was able to provide the best quality of fit for all the experimental data, over the concentration range studied, for both As(III) and As(V) at 288, 298 and 308 K. The values of the parameter sets of the isotherms also indicated that the adsorption of arsenic onto IOCC is a temperature dependent phenomena with As(III) and As(V) exhibiting exothermic and endothermic nature of adsorption, respectively.

Keywords: Adsorption, Arsenic, Error analysis, Isotherm, Equilibrium

? Golder, A.K., Samanta, A.N. and Ray, S. (2006), Anionic reactive dye removal from aqueous solution using a new adsorbent—Sludge generated in removal of heavy metal by electrocoagulation. *Chemical Engineering Journal*, **122** (1-2), 107-115.

Full Text: [2006\Che Eng J122, 107.pdf](2006/Che%20Eng%20J122,%20107.pdf)

Abstract: The present work investigates the potential of electrocoagulated metals hydroxide sludge (EMHS) generated during removal of Cr3+ using Al electrode for adsorption of Congo Red (CR) from aqueous solution. The effects of contact time, stirrer speed (to make the external mass transfer effect negligible), pH of the solution, initial concentration of adsorbate and adsorbent dose on dye removal have been investigated. The adsorption is highly pH dependent due to formation of various charged hydroxylated species [Al(OH)2+, Cr(OH)2+, etc.] of EMHS and as resonance of CR occurs at alkaline pH through involvement of free lone pair of electrons. Comparative COD reduction with diminution of color (measured spectrophotometrically) confirms successful removal of the adsorbate. Preferable fitting of Langmuir isotherm over Freundlich isotherm suggests monolayer coverage of adsorbate at the surface of adsorbent. The maximum adsorption capacity (qm) increases from 271 to 513 mg/g when the initial pH is adjusted to 3.0 instead of 10.4. Comparison with literature reported values of qm and n (Freundlich constant) with either CR as adsorbate or metal hydroxide adsorbent, establishes EMHS as an attractive adsorbent. In the pH range of 3–10, concentration of Cr3+ in the leachate remains below the discharge concentration of the same. FT-IR spectrum of dye-loaded sludge suggests that the dye removal is due to chemical interaction of CR and EMHS. The SEM image before and after the adsorption indicates that, CR was adsorbed at the surface of the adsorbent.

Keywords: Adsorption, Congo Red, COD Reduction, Monolayer Coverage, FT-IR Spectrum, SEM Micrograph

? Bhattacharya, A.K., Mandal, S.N. and Das, S.K. (2006), Adsorption of Zn(II) from aqueous solution by using different adsorbents. *Chemical Engineering Journal*, **123** (1-2), 43-51.

Full Text: [2006\Che Eng J123, 43.pdf](2006/Che%20Eng%20J123,%2043.pdf)

Abstract: The removal of Zn(II) from aqueous solution by different adsorbents was investigated. Clarified sludge (a steel industry waste material), rice husk ash, neem bark and a chemical adsorbent activated alumina 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 of Zn(II) increased with increased concentration of the adsorbents and reached maximum uptake at 10 g/L and pH between 5 and 7. The equilibrium time was achieved after 1 h for clarified sludge, 3 h for rice husk ash and 4 h for activated alumina and neem bark, respectively. The adsorption process was found to follow a first-order rate mechanism and rate constant was evaluated at 30 °C. The rate constant was highest in case of clarified sludge (6.90×10−2 min−1) and the activated alumina gave the lowest value (1.86×10−2 min−1). 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 clarified sludge has the largest capacity and affinity for the removal of Zn(II) compared to the other adsorbents used in the study.

Keywords: Zn(II) Removal, Clarified Sludge, Rice Husk Ash, Neem Bark, Activated Alumina, Batch Adsorption, Adsorption Capacity

? Kumar, Y.P., King, P. and Prasad, V.S.R.K. (2006), Zinc biosorption on *Tectona grandis* L.f. leaves biomass: Equilibrium and kinetic studies. *Chemical Engineering Journal*, **124** (1-3), 63-70.

Full Text: [2006\Che Eng J124, 63.pdf](2006/Che%20Eng%20J124,%2063.pdf)

Abstract: The biosorption of zinc ions from aqueous solution by *Tectona grandis* L.f. was studied in a batch adsorption system as a function of pH, contact time, zinc ion concentration, adsorbent concentration and adsorbent size. The biosorption capacities and rates of zinc ions onto *T. grandis* L.f. were evaluated. The Langmuir, Freundlich, Redlich–Peterson and Temkin adsorption models were applied to describe the isotherms and isotherm constants. Biosorption isothermal data could be well interpreted by the Langmuir model followed by Temkin model with maximum adsorption capacity of 16.42 mg g−1 of zinc ion on *T. grandis* L.f. leaves biomass. The kinetic experimental data was properly correlated with the second-order kinetic model. Various thermodynamic parameters such as Δ*G*°, Δ*H*°, and Δ*S*° were calculated indicating that this system was a spontaneous and exothermic process.

Keywords: *Tectona grandis* L.f., Biosorption, Adsorption Isotherm, Kinetic Studies, Thermodynamic Parameters

? Doğan, M., Alkan, M., Demirbaş, Ö., Özdemir, Y. and Özmetin, C. (2006), Adsorption kinetics of maxilon blue GRL onto sepiolite from aqueous solutions. *Chemical Engineering Journal*, **124** (1-3), 89-101.

Full Text: [2006\Che Eng J124, 89.pdf](2006/Che%20Eng%20J124,%2089.pdf)

Abstract: Adsorption isotherm of maxilon blue GRL on sepiolite was determined and correlated with common isotherm equations such as Langmuir and Freundlich models. It was found that the Langmuir model appears to fit the isotherm data better than the Freundlich model. Furthermore, adsorption kinetics experiments were carried out to remove the maxilon blue GRL from its aqueous solutions using sepiolite as an adsorbent. The remove rate of maxilon blue GRL by sepiolite was studied by varying parameters such as the contact time, stirring speed, initial dye concentration, ionic strength, pH and temperature. The kinetics experiments indicated that initial dye concentration, ionic strength, pH and temperature could affect the adsorption rate of maxilon blue GRL. Sorption data were fitted to pseudo-first-order, the Elvoich equation, pseudo-second-order, mass transfer and intra-particle diffusion models, and found that adsorption kinetics can be described according to the pseudo-second-order model, from which the rate constant and the adsorption capacity were determined. Rate constants under different conditions were also estimated. In addition, we found that the rate-limiting step was intra-particle diffusion. According to the change of intra-particle diffusion parameter, the adsorption processes could be divided into different stages. Thermodynamic activation parameters such as activation energy *E*a, enthalpy Δ*H*\*, entropy Δ*S*\* and free energy Δ*G*\* were determined. These parameters indicate that the adsorption has a low potential barrier corresponding to a physisorption; the adsorption reaction is not a spontaneous one; and the adsorption is physical in nature involving weak forces of attraction and is also endothermic.

Keywords: Sepiolite, Dye, Adsorption, Adsorption isotherms, Adsorption kinetics, Diffusion, Activation parameters

? El Qada, E.N., Allen, S.J. and Walker, G.M. (2006), Adsorption of Methylene Blue onto activated carbon produced from steam activated bituminous coal: A study of equilibrium adsorption isotherm. *Chemical Engineering Journal*, **124** (1-3), 103-110.

Full Text: [2006\Che Eng J124, 103.pdf](2006/Che%20Eng%20J124,%20103.pdf)

Abstract: Equilibrium adsorption isotherm for the removal of basic dye (Methylene Blue) from aqueous solution using bituminous coal-based activated carbon has been investigated. Liquid phase adsorption experiments were conducted and the maximum adsorptive capacity was determined. The effect of experimental parameters, namely, pH and adsorbent particle size were studied. Equilibrium data were mathematically modelled using the Langmuir, Freundlich and Redlich-Peterson adsorption models to describe the equilibrium isotherms at different solution pH values and particle sizes, and isotherm constants were determined. The results indicate the potential use of the adsorbent for the removal of Methylene Blue (MB) from aqueous solution. Maximum adsorption capacity of 580 mg/g at equilibrium was achieved. It was found that pH plays a major role in the adsorption process. The optimum pH for the removal of MB from aqueous solution under the experimental conditions used in this work was 11. The Redlich-Peterson isotherm was found to best fit the experimental data over the whole concentration range as indicating from the high values of the correlation coefficients (r(2) > 0.99). (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Bituminous Coal, Steam Activation, Methylene Blue, Adsorption, Equilibrium Isotherm, Aqueous-Solutions, Waste-Water, Humic-Acid, Metal-Ions, Dyes, Removal, Sorption, Peat, Technologies, Adsorbents

? Chabani, M., Amrane, A. and Bensmaili, A. (2006), Kinetic modelling of the adsorption of nitrates by ion exchange resin. *Chemical Engineering Journal*, **125** (2), 111-117.

Full Text: [2006\Che Eng J124, 111.pdf](2006/Che%20Eng%20J124,%20111.pdf)

Abstract: The capacity of ion exchange resins, Amberlite IRA 400, for removal of nitrates from aqueous solution was investigated under different initial concentrations. The suitability of the Freundlich, Langmuir and Dubinin-Radushkevich adsorption models to the equilibrium data was investigated. The equilibrium data obtained in this study were found to follow Freundlich adsorption isotherm. The maximum sorption capacity was 769.2 mg/g at 25 °C. Reversible-first-order, intraparticle diffusion, film diffusion and Bangham models were used to fit the experimental data. The adsorption of nitrates On Amberlite IRA 400 resin follows reversible-first-order kinetics. The overall rate constants were estimated for different initial concentrations. Results of the intra-particle diffusion and the film diffusion models show that the film diffusion was the main rate-limiting step. The low correlation of data to the Bangham’s equation also confirms that diffusion of nitrates into pores of the resin was not the only rate-controlling step. The thermodynamic constants of adsorption phenomena, Δ*H*° and Δ*S*° were found to be −26.122 kJ/mol and −68.76 J/mol in the range 298–318 K and +19.205 kJ/mol and +68.76 J/mol in the range 318–343 K, respectively. The negative values of the Gibbs free energy (Δ*G*) demonstrate the spontaneous nature of adsorption of nitrates onto Amberlite IRA 400.

Keywords: Adsorption, Resin, Nitrates, Kinetics

? Ofomaja, A.E. (2007), Sorption dynamics and isotherm studies of Methylene blue uptake on to palm kernel fibre. *Chemical Engineering Journal*, **126** (1), 35-43.

Full Text: [2007\Che Eng J126, 35.pdf](2007/Che%20Eng%20J126,%2035.pdf)

Abstract: The effect of temperature on the sorption of Methylene blue from aqueous solution onto palm kernel fibre has been studied. Batch kinetics and isotherm studies were performed at temperatures ranging from 299 to 339 K. The kinetic data were studied in terms of the pseudo-first-order and pseudo-second-order kinetic models and the Bangham and intraparticle diffusion models. The pseudo-second-order model best described the sorption process and was employed in predicting the rate constant, equilibrium sorption capacity and the initial sorption rate with effect of temperature. In addition activation energy of sorption has also been determined based on the pseudo-second-order rate constant. The isotherm data was analyzed by the Langmuir and Freundlich isotherms. Palm kernel fibre was found to have a Langmuir monolayer capacity of 233.41 mg g−1 at 299 K. The adsorption is endothermic at ambient temperature and the computation of the thermodynamic parameters, Δ*H*°, Δ*S*° and Δ*G*° indicates that the sorption was favourable at all temperatures.

Keywords: Activation Energy, Adsorption, Ambient, Ambient Temperature, Aqueous-Solution, Basic-Dyes, Biosorption, Capacity, Crystal Violet, Diffusion, Dynamics, Energy, Equilibrium, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Leaf Powder, Methylene Blue, Model, Models, Organic-Dyes, Palm Kernel Fibre, Parameters, Predicting, Pseudo-Second-Order, Rate Constant, Removal, Solution Temperature, Sorption, Sorption Capacity, Spent Bleaching Earth, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake

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Full Text: [2007\Che Eng J126, 147.pdf](2007/Che%20Eng%20J126,%20147.pdf)

Abstract: The potential use of alginate immobilized algal beads for the removal of chromium from aqueous solution has been investigated under optimized conditions in this study using a novel cyanobacterium, Lyngbya putealis isolated from metal contaminated soil. Batch mode experiments were performed to determine the adsorption equilibrium and kinetic behaviour of chromium in aqueous solution allowing the computation of kinetic parameters and maximum metal adsorption capacity. Influences of other parameters like initial metal ion concentration (10-100 mg/L), pH (2-6) and temperature (25-45°C) on chromium adsorption were also examined, using Box-Behnken design. Very high regression coefficient between the variables and the response (R-2 = 0.9984) indicates excellent evaluation of experimental data by second-order polynomial regression model. The response surface method indicated that 50-60 mg/L initial chromium concentration, 2-3 pH and a temperature of 45°C were optimal for biosorption of chromium by immobilized L. putealis, when 82% of the metal is removed from the solution. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Accumulation, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Alginate, Beads, Biosorption, Biosorption, Capacity, Chromium, Column, Concentration, Contaminated Soil, Copper, Cr(VI), Cyanobacterium, Design, Equilibrium, Evaluation, Immobilization, Ion, Ions, Isotherms, Kinetic, Kinetic Parameters, Lead, Lyngbya Putealis, Metal, Metal Adsorption, Microalgae, Model, Parameters, pH, Regression Model, Removal, Soil, Surface, Temperature

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Full Text: [2007\Che Eng J127, 111.pdf](2007/Che%20Eng%20J127,%20111.pdf)

Abstract: Oil palm fibre, an abundant agricultural by-product in Malaysia, was used to prepare activated carbon by physiochemical activation method. Adsorption isotherm of Methylene blue onto the prepared activated carbon was determined by batch tests. The effects of various parameters such as contact time, initial Methylene blue concentration and temperature were investigated, at solution pH of 6.5. The adsorption capacity was found to increase with increase in the three parameters studied. Equilibrium data were fitted to Langmuir, Freundlich, Temkin and Dubinin-Radushkevich isotherms. The equilibrium data were best represented by the Langmuir isotherm, with maximum monolayer adsorption capacity of 277.78 mg/g at 30°C. The adsorption kinetics was found to follow the pseudo-second-order kinetic model. Various thermodynamic parameters such as standard enthalpy (ΔH°), standard entropy (ΔS°) and standard free energy (ΔG°) were evaluated. Oil palm fibre-based activated carbon was shown to be a promising material for adsorption of Methylene blue from aqueous solutions. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Oil Palm Fibre, Activated Carbon, Methylene Blue, Adsorption Isotherm, Equilibrium, Kinetics, Methylene-Blue, Aqueous-Solutions, Waste-Water, Removal, Acid, Performance, Adsorbents, Sorption, Sawdust, Pore

? Chandra, T.C., Mirna, M.M., Sudaryanto, Y. and Ismadji, S. (2007), Adsorption of basic dye onto activated carbon prepared from durian shell: Studies of adsorption equilibrium and kinetics. *Chemical Engineering Journal*, **127** (1-3), 121-129.

Full Text: [2007\Che Eng J127, 121.pdf](2007/Che%20Eng%20J127,%20121.pdf)

Abstract: An activated carbon was prepared from durian shell and used for the removal of Methylene blue from aqueous solutions. The activated carbon was prepared using chemical activation method with potassium hydroxide as the activating agent. The activation was conducted at 673.15 K for 1 h with mass ratio of chemical activating agent to durian shell 1:2. Batch kinetics and isotherm studies were conducted to evaluate the adsorption behavior of the activated carbon from durian shell. The adsorption experiments were carried out isothermally at three different temperatures. The Langmuir and Freundlich isotherm model were used to describe the equilibria data. The Langnmir model agrees with experimental data well. The Langmuir surface kinetics, pseudo first order and pseudo second order models were used to evaluate the kinetics data and the rate constant were also determined. The experimental data fitted very well with the Langmuir surface kinetics and pseudo first order model. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Durian Shell, Aqueous-Solutions, Waste-Water, Reactive Dye, Removal, Sawdust, Biosorption, Sludge, Isotherm, Sorption, Systems

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Full Text: [2007\Che Eng J127, 177.pdf](2007/Che%20Eng%20J127,%20177.pdf)

Abstract: In this study, simultaneous biosorption of Gemazol Turquoise Blue-G reactive dye anions and copper(II) cations to dried sugar beet pulp, an agricultural solid waste by-product, from binary mixtures was studied and compared with single dye and metal ion situation in a batch stirred system. The effects of pH and single and dual component concentrations on the equilibrium uptake of each component, both singly and in mixture were investigated. The working pH value for the biosorption of single Gernazol Turquoise Blue-G dye and single copper(II) was determined as 2.0 and 4.0, respectively. The equilibrium uptake of each component increased with increasing its initial concentration up to 750 mg l-1 for dye and up to 200 mg l-1 for copper(II) ions for both pH values. The presence of increasing concentrations of copper(II) ions increased the equilibrium uptake of dye anions while the adding of increasing concentrations of dye diminished the copper(II) ion uptake for both pH values studied. This situation showed the synergistic effect of copper(II) cations on dye biosorption and the antagonistic effect of dye anions on copper(II) biosorption. Adsorption isotherms were developed for single-dye, single copper(II) and dual-dye-copper(II) ion systems at these two pH values and expressed by the mono-component Langmuir model and multi-component synergistic and antagonistic Langmuir models and model parameters were estimated by the non-linear regression. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Dried Sugar Beet Pulp, Gemazol Turquoise Blue-G, Copper(II), Binary Biosorption, Synergism, Antagonism, Equilibrium Modeling, Agricultural By-Products, Aqueous-Solution, Organic Pollutants, Sorption Isotherms, Activated Carbon, Textile Effluent, Heavy-Metals, Waste-Water, Removal, Adsorption

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Full Text: [2007\Che Eng J127, 163.pdf](2007/Che%20Eng%20J127,%20163.pdf)

Abstract: Experimental data of the adsorption of reactive dyestuffs onto Filtrasorb 400 activated carbon (FS400) were determined in an equilibrium isotherm study. As most industrial wastewater contains more than one pollutant, an investigation into the effect of multisolute systems (using the unhydrolysed form of the reactive dyes) on the adsorption capacity was undertaken. Equilibrium isotherm models were employed to describe the adsorption capacities of single, binary and ternary dye solutions. The results of these analyses showed that adsorption of reactive dyes from single and multisolute systems can be successfully described by Langmuir, and Redlich-Peterson equilibrium isotherm models. Experimental data indicated that competitive adsorption for active sites on the carbon surface results in a reduction in the overall uptake capacity of the reactive dyes investigated. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Reactive Dyes, Competitive Adsorption, Langmuir Isotherm, Gas-Liquid-Chromatography, Sorption Isotherms, Aqueous-Solutions, Activated Carbon, Component, Peat

? Kumar, Y.P., King, P. and Prasad, V.S.R.K. (2007), Adsorption of zinc from aqueous solution using marine green algae - *Ulva fasciata* sp. *Chemical Engineering Journal*, **129** (1-3), 161-166.

Full Text: [2007\Che Eng J127, 161.pdf](2007/Che%20Eng%20J127,%20161.pdf)

Abstract: The removal of zinc from aqueous solution by adsorption on Ulva fasciata sp. was studied as a function of contact time, pH of the solution, metal ion concentration, adsorbent concentration and adsorbent size. Batch experiments results showed that the adsorptive capacity of U. fasciata sp. was 13.5 mg/g of adsorbent. The Langmuir and Freundlich models were used to describe the adsorption equilibrium of zinc on U. fasciata sp. and the adsorption followed the Langmuir isotherm. The Langmuir and Freundlich constants for adsorption of zinc on U. fasciata sp. were determined. The pseudo first and second order rate expressions were used to correlate the experimental data. The kinetic constants were determined for both the models and the second order rate expression was found to be more suitable. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Ulva Fasciata sp., Adsorption, Zinc, Equilibrium Studies, Kinetic Studies, Heavy-Metal Ions, Waste-Water, Biosorption Characteristics, Cu(II), Copper, Lead, Sorption, Removal, Cadmium, Nickel

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Full Text: [2007\Che Eng J132, 205.pdf](2007/Che%20Eng%20J132,%20205.pdf)

Abstract: The Na form of two chelating ion exchange resins Chelex 100 (Bio-Rad) and Amberlite IRC 748, both of which have iminodiacetic acid function group, was used to exchange Cu2+ and Zn2+ from aqueous solutions. Kinetic experiments were performed at 298 K in a batch mode by varying the initial concentration of metal ions (3-9 mol/m3) and initial aqueous pH value (2.0-6.5). The kinetic data were first treated by conventional unreacted-core model and by the Fick’s first law that takes into account diffusion of metal ions within resin pores. The effective diffusion coefficients of metal ions were evaluated. The kinetic data were also treated and compared by a second-order reversible reaction model based on exchange reaction equilibrium. It was shown that the rate constants for Cu2+ and Zn2+ exchange with Amberlite IRC 748 resin were larger than with Chelex 100 resin under comparable conditions. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: 298 K, 298-K, Acid, Adsorption, Amberlite, Aqueous Solutions, Batch, Batch Mode, Cadmium, Chelating Resins, Chelex-100, Concentration, Constants, Cu(II), Cu2+, Desorption, Diffusion, Diffusion Coefficients, Effective, Effective Diffusion, Equilibria, Equilibrium, Function, Group, Heavy Metals, Iminodiacetic Acid, Ion, Ion Exchange, Ion Exchange Kinetics, Ion Exchange Resins, Ion-Exchange, Isotherms, Kinetic, Kinetics, Law, Metal, Metal Ions, Model, pH, Pore Diffusion Model, Pores, Rate, Rate Constants, Reaction, Removal, Resin, Resins, Reversible, Reversible Reaction Model, Second Order, Separation, Solutions, Unreacted-Core Model, Waste-Water, Zn, Zn(II), Zn2+

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Full Text: [2007\Che Eng J132, 279.pdf](2007/Che%20Eng%20J132,%20279.pdf)

Abstract: Porous carbon prepared from rice husk using phosphoric acid activation through precarbonization and chemical activation has been examined for the adsorption of phenol from aqueous solutions. The method adopted could produce carbons with micro and mesoporous structure. The surface area, pore volume and pore size distribution of carbon samples activated at three different temperatures 700, 800 and 900°C have been carried out using nitrogen adsorption isotherms at 77 K. The production yield was observed to decrease with increase in activation temperature. Adsorption behavior of phenol onto the porous carbon was studied by varying the parameters such as agitation time, phenol concentration, pH and temperature. Studies showed that the adsorption decreased with increase in pH and temperature. The sorption process was found to be exothermic in nature. The kinetic models such as pseudo first order, pseudo second order and intra particle diffusion model were fitted to identify the mechanism of adsorption process. The isotherm data were fitted to Langnmir and Freundlich models. The maximum uptake of phenol was found to be 2.35×10-4 mol/g at 20°C and final pH 2.7. (c) 2007 Elsevier B.V.. All rights reserved.

Keywords: 77 K, Acid, Acid Activation, Activated Carbon, Activated Carbons, Activation, Adsorption, Adsorption Isotherms, Adsorption Process, Agitation, Aqueous Solutions, Behavior, Carbon, Chemical, Chemical Activation, Concentration, Diffusion, Diffusion Model, Distribution, Dyes, Exothermic, First Order, Freundlich, Intra Particle Diffusion, Isotherm, Isotherm Data, Isotherms, Kinetic, Kinetic Models, Langnmir, Mechanism, Mesoporous, Mesoporous Carbon, Model, Models, Nitrogen, Nitrogen Adsorption, Order, Parameters, Particle, Particle Diffusion, Particle Diffusion Model, pH, Phenol, Phenol Adsorption, Phosphoric Acid, Pore, Pore Size, Pore Size Distribution, Pore Volume, Porous, Process, Production, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Rice, Rice Husk, Second Order, Size, Size Distribution, Solutions, Sorption, Structure, Surface, Surface Area, Temperature, Temperatures, Time, Two-Stage, Uptake, Water, Yield

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Full Text: [2007\Che Eng J132, 289.pdf](2007/Che%20Eng%20J132,%20289.pdf)

Abstract: Adsorption of lead(II) ions onto activated carbon prepared from renewable plant material, which is Euphorbia rigida, was investigated with the variation in the parameters of pH, contact time, the amounts of adsorbent, lead(II) ions concentration and temperature. Adsorption data of lead(II) ions onto activated carbon by E. rigida obeys the Langmuir isotherm model. Maximum adsorption capacity (q(max)) of lead(II) ions onto adsorbent was 1.35×10-1 mol g-1 or 279.72 mg g-1 at 40°C. Three kinetic models are the first-order, pseudo- second-order and intraparticle diffusion equations. were selected to interpret the adsorption data. Kinetic parameters such as the rate constants, equilibrium adsorption capacities and related correlation coefficients, for each kinetic model were calculated and discussed. It was indicated that the adsorption of lead(II) ions onto activated carbon by E. rigida could be described by the pseudo-second-order kinetic model and also followed the simple external diffusion model the initial 10 min and then by intraparticle diffusion model up to 50 min. (c) 2007 Elsevier B.V All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacities, Adsorption Capacity, Aqueous Solutions, Biomass, Biosorption, Capacity, Carbon, Concentration, Constants, Contact Time, Correlation, Diffusion, Diffusion Model, Equations, Equilibrium, Equilibrium Adsorption, Euphorbia Rigida, External Diffusion, First Order, Heavy-Metal Ions, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Langmuir-Isotherm, Lead, Lead(II), Methylene-Blue, Model, Models, Parameters, pH, Plant, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rate, Rate Constants, Removal, Second Order, Shell, Solutions, Sorption, Temperature, Time, Water

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Full Text: [2007\Che Eng J132, 299.pdf](2007/Che%20Eng%20J132,%20299.pdf)

Abstract: Adsorption of copper and lead ions onto tea waste from aqueous solutions was studied to enable comparison with alternative commonly available absorbents. Batch experiments were conducted to determine the factors affecting adsorption and kinetics of the process. Fixed bed column experiments were performed to study practical applicability and breakthrough curves were obtained. Tea waste is capable of binding appreciable amounts of Pb and Cu from aqueous solutions. The adsorption capacity was highest at solution pH range 5-6. The adsorbent to solution ratio and the metal ion concentration in the solution affect the degree of metal ion removal. The equilibrium data were satisfactorily fitted to Langmuir and Freundlich isotherms. Highest metal uptake of 48 and 65 mg/g were observed for Cu and Pb, respectively. Pb showed higher affinity and adsorption rate compared to Cu under all the experimental conditions. Kinetic studies revealed that Pb and Cu uptake was fast with 90% or more of the adsorption occurring within first 15-20 min of contact time. The kinetic data fits to pseudo second order model with correlation coefficients greater than 0.999. Increase in the total adsorption capacity was observed when both Cu and Pb ions are present in the solution. Higher adsorption rate and the capacity were observed for smaller adsorbent particles. Tea waste is a better adsorbent compared to number of alternative low cost adsorbents reported in literature. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Absorbents, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Rate, Affect, Affinity, Aqueous Solutions, Aqueous-Solutions, Binding, Biosorption, Breakthrough, Breakthrough Curves, Cadmium, Capacity, Column, Column Experiments, Comparison, Concentration, Contact Time, Copper, Correlation, Cost, Cu, Equilibrium, Equilibrium Data, Experimental, Freundlich, Freundlich Isotherms, Heavy Metals, Heavy-Metal Ions, Ion, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir And Freundlich Isotherms, Lead, Lead Ions, Low, Low Cost Adsorbent, Low Cost Adsorbents, Metal, Metal Ion, Metal Ion Concentration, Metal Ion Removal, Metal Uptake, Model, Order, Particles, Pb, Pb-Ions, pH, Process, Pseudo Second Order, Pseudo-Second-Order, Range, Rate, Removal, Rice Husk, Sawdust, Second Order, Solution Ph, Solutions, Sorption, Tea, Tea Waste, Time, Uptake, Waste, Wastewater

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Full Text: [2007\Che Eng J133, 195.pdf](2007/Che%20Eng%20J133,%20195.pdf)

Abstract: Removal of acid green 25 (AG25) dye onto activated palm ash from aqueous solutions was investigated. Experiments were carried out as function of contact time, initial concentration (50-600mg/L), pH (2-12) and temperature (30-50°C). The equilibrium adsorption data of AG25 dye on activated palm ash were analyzed by Langmuir and Freundlich models. The results indicate that the Freundlich model provides the best correlation of the experimental data. The adsorption capacities of the activated palm ash for removal of AG25 dye was determined with the Langmuir equation and found to be 123.4, 156.3 and 181.8mg/g at 30, 40, and 50°C, respectively. Adsorption data were modeled using the pseudo-first-order, pseudo-second-order and intra-particle diffusion kinetics equations. It was shown that pseudo- second-order kinetic equation could best describe the adsorption kinetics. Isotherms have also been used to obtain the thermodynamic parameters such as free energy, enthalpy and entropy of adsorption. The positive value of the enthalpy change (26.64 kJ/mol) indicates that the adsorption is endothermic process. The results indicate that activated palm ash is suitable as adsorbent material for adsorption of AG25 dye from aqueous solutions. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Acid Dye, Acid Green 25 Dye, Activated Palm Ash, Adsorbent, Adsorption, Adsorption Capacities, Adsorption Isotherm, Adsorption Kinetics, Aqueous Solutions, Aqueous-Solutions, Ash, Basic Dye, Bentonite, Carbon, Concentration, Contact Time, Correlation, Diffusion, Diffusion Kinetics, Dye, Dye Adsorption, Endothermic, Energy, Enthalpy, Entropy, Equations, Equilibrium, Equilibrium Adsorption, Experimental, Experimental Data, Fly-Ash, Free Energy, Freundlich, Freundlich Model, Function, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Kinetic, Kinetics, Langmuir, Langmuir Equation, Model, Models, Palm, Palm Ash, Parameters, pH, Process, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-First-Order, Pseudo-Second-Order, Removal, Second Order, Sepiolite, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time, Waste-Water

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Full Text: [2007\Che Eng J133, 325.pdf](2007/Che%20Eng%20J133,%20325.pdf)

Abstract: The flocculation kinetics of kaolin particles suspended in 0.01 mol/L NaCl solution and adsorption properties of cationic starch on kaolin surface have been investigated at pH 5.0. Adsorption kinetics of cationic starch followed pseudo-second-order model (R-2 > 0.98). Flocculation kinetics showed that increase in flocculant dosage resulted in higher rate constants for the flocculation process and lower rate constant for the aggregate breakage. The rate of aggregation of particles and frequency of collisions of particles are very slow and the two steps determined the rate of flocculation process. The adsorption of cationic starch on the kaolin surface followed Langmuir isotherm (R-2 > 0.99). Thermodynamic study indicated that the values of AGO were strongly temperature-dependent and that cationic starch adsorption onto kaolin particles entropically dominated rather than enthalpically driven since vertical bar H-theta vertical bar < vertical bar -T Delta S-theta vertical bar. The negative values of Delta G(theta) and the positive values of Delta H-theta suggested that the adsorption process is spontaneous and endothermic. The value of Delta H-theta (37.262 kJ/mol) suggested that the electrostatic interaction is the dominant mechanism for the adsorption of cationic starch on kaolin. The fractional coverage decreased with increasing temperature, consistent with a reduced hydrodynamic diameter and a more contracted polymer conformation. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Adsorption Process, Adsorption Properties, Aggregate, Aggregation, Anionic Polyacrylamide, Behavior, Cationic Starch, Conformation, Constants, Derivatives, Diameter, Dispersions, Dosage, Endothermic, Flocculation, Interaction, Investigation, Isotherm, Kaolin, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Langmuir-Isotherm, Mechanism, Model, Nacl, Particles, pH, Polymer, Polymer Adsorption, Process, Properties, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate, Rate Constant, Rate Constants, Spontaneous, Starch, Surface, Suspension, Temperature, Thermodynamics

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Full Text: [2007\Che Eng J134, 246.pdf](2007/Che%20Eng%20J134,%20246.pdf)

Abstract: The various pathways of high-ash biomass processing to the valuable carbonaceous composites are considered. From the rice husk carbon-silica composites and supermicroporous carbon materials (SMC) were prepared. In the new SMCs, the specific surface area A(BET) reaches 3460 m(2)/g while micropore volume V-mu is up to 1.9 cm(3)/g at the total of pore volume, V-Sigma, as large as 3.0 cm(3)/g. These carbons were shown to absorb up to 41 wt% of methane at room temperature and 60 atm and more than 6 wt% of hydrogen under mild cryogenic conditions (at 77 K). Also methods for the synthesis of carbon-silica composites with A(BET) up to 710 m(2)/g and with average size of SiO2 particles less 5 nm are proposed. The expected practical application of the obtained carbon-silica composites may be first of all reinforcing rubber extenders and bi-functional sorbents for the gas and liquid purification. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Biomass, Carbon, Carbon-Silica, Carbons, Chemical Activation, Composite, Copper-Catalysts, Hydrogen Adsorption, Ion-Exchange, Micropore Volume, Palm Shell, Pore, Pore Volume, Porous Carbon, Potassium Hydroxide, Preparation, Rice, Rice Husk, Rice Husk Ash, Si, Silicon-Carbide, Supermicroporous, Surface Area, Synthesis, Temperature, Volume

? El Qada, E.N., Allen, S.J. and Walker, G.A. (2008), Adsorption of basic dyes from aqueous solution onto activated carbons. *Chemical Engineering Journal*, **135** (3), 174-184.

Full Text: [2008\Che Eng J135, 174.pdf](2008/Che%20Eng%20J135,%20174.pdf)

Abstract: The aim of this research is to compare the adsorption capacity of different types of activated carbons produced by steam activation in small laboratory scale and large industrial scale processes. Equilibrium behaviour of the activated carbons was investigated by performing batch adsorption experiments using bottle-point method. Basic dyes (Methylene blue (MB), basic red (BR) and basic yellow (BY)) were used as adsorbates and the maximum adsorptive capacity was determined. Adsorption isotherm models, langmuir, freundlich and redlich-peterson were used to simulate the equilibrium data at different experimental parameters (ph and adsorbent particle size). It was found that PAC2 (activated carbon produced from New Zealand coal using steam activation) has the highest adsorptive capacity towards MB dye (588 mg/g) followed by F400 (476 mg/g) and PAC 1 (380 mg/g). BR and BY showed higher adsorptive affinity towards PAC2 and F400 than MB. Under comparable conditions, adsorption capacity of basic dyes, MB, BR and BY onto PAC 1, PAC2 and F400 increased in the order: MB < BR < BY. Redlich-Peterson model was found to describe the experimental data over the entire range of concentration under investigation. All the systems show favourable adsorption of the basic dyes with 0 < R-L < I (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Equilibrium Isotherm, Basic Dye, Activated Carbon, Bagasse Pith, Waste-Water, Reactive Dyes, Metal-Ions, Removal, Equilibrium, Isotherm, Effluent, Color, Acid

? Bhattacharyya, K.G. and Sen Gupta, S. (2008), Influence of acid activation on adsorption of Ni(II) and Cu(II) on kaolinite and montmorillonite: Kinetic and thermodynamic study. *Chemical Engineering Journal*, **136** (1), 1-13.

Full Text: [2008\Che Eng J136, 1.pdf](2008/Che%20Eng%20J136,%201.pdf); [2008\Che Eng J136, 1-1.pdf](2008/Che%20Eng%20J136,%201-1.pdf)

Abstract: The removal of Ni(II) and Cu(II) with clays (kaolinite, montmorillonite and their acid-activated forms) in aqueous medium have been studied. Batch adsorption experiments were carried out by considering various solution pH, interaction time, and temperature. The adsorption was strongly dependent on pH of the medium. The uptake was very fast initially and maximum adsorption was observed within 180 and 360 min of agitation for Ni(II) and Cu(II), respectively. The kinetics of the interactions was best described by second order mechanism. The adsorption data yielded Langmuir monolayer capacity as 4.3-28.0 and 7.1-21.3 mg g-1 for clay-Cu(II) and clay-Ni(II) interaction, respectively. Adsorption of Ni(II) and Cu(II) followed exothermic and endothermic paths, respectively. The results showed that kaolinite and montmorillonite and their acid-activated forms are good adsorbents for Ni(II) and Cu(II) in aqueous medium. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Treated Clays, Acid-Activation, Activation, Adsorbents, Adsorption, Aqueous-Solution, Bagasse Fly-Ash, Copper, Cu(II), Heavy-Metals, Interaction, Kaolinite, Kinetics, Langmuir, Mechanism, Montmorillonite, Nickel Ions, pH, Red Mud, Removal, Solution, Sorption, Sugar-Industry Waste, Temperature, Tree Fern

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Full Text: [2008\Che Eng J136, 92.pdf](2008/Che%20Eng%20J136,%2092.pdf)

Abstract: The sorption rates of Cr(VI) ion from acid chromate solutions with Aliquat 336 impregnated microspheres (MS) were examined. MS of polysulfone (PSf) and poly(styrene-acrylenitrile) (SAN) were prepared by phase inversion process. The MS obtained have different size and morphology. The sorption behavior and the rate-control ling sorption step have been discussed from the Elovich equation, pseudo-second order and Crank kinetic models. Even all models gave satisfactory correlations with the experimental data, the Crank model showed to be more realistic and appropriate to interpret the Cr(VI) kinetic sorption results. These analysis indicate that the intraparticle solute diffusion is the rate-controlling sorption step, and suggest that there is a surface diffusion contribution to the overall Cr(VI) mass transport inside the MS which is more important as the MS pore size decreases. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Analysis, Aqueous-Solutions, Behavior, Chromate, Correlations, Cr(VI), Cr(VI) Sorption, Diffusion, Elovich Equation, Experimental, Kinetic, Kinetic Models, Kinetic Sorption, Kinetics, Mass-Transfer, Metal Ions, Microcapsules, Microspheres, Model, Models, Morphology, Polysulfone, Pseudo-Second Order, Resins Sir, Rights, Separation, Size, Sorption, Transport

? Adebowale, K.O., Unuabonah, E.I. and Olu-Owolabi, B.I. (2008), Kinetic and thermodynamic aspects of the adsorption of Pb2+ and Cd2+ ions on tripolyphosphate-modified kaolinite clay. *Chemical Engineering Journal*, **136** (2-3), 99-107.

Full Text: [2008\Che Eng J136, 99.pdf](2008/Che%20Eng%20J136,%2099.pdf)

Abstract: Kaolinite clay obtained from Ubulu-Ukwu, Delta state in Nigeria was modified with tripolyphosphate reagent to obtain TPP-modified Kaolinite clay. The kinetics and thermodynamics of the adsorption of Pb2+ and Cd2+ by TPP-Kaolinite clay were studied. Increasing temperature and initial metal ion concentration increased the sorption capacity of the adsorbent. The rates of adsorption of both Pb2+ and Cd2+ increased with increasing temperature but decreased with increasing initial metal ion concentration and time. The pseudo-second-order initial sorption rates for the sorption of Pb2+ were found to be higher than those of Cd2+. Pseudo-first-order model was found to only describe well, the data obtained in the first 8 min of the adsorption process. The sorption of both metal ions was endothermic and spontaneous with ΔH° values of + 13.94 kJ mol-1 and +24.93 kJ mol-1 for Pb2+ and Cd2+, respectively. Activation energy values obtained were between +8 kJ mol-1 and +22 kJ mol-1. These values suggest that the rate-controlling step in the adsorption of Pb2+ and Cd2+ by TPP-Kaolinite clay was diffusion-controlled. The sorption of metal ions from binary solutions of both metal ions at different initial metal ion concentrations reduced the initial sorption rates of the adsorption of Pb2+ by TPP-Kaolinite clay and increased that for Cd2+. The adsorption capacity of TPP-Kaolinite clay for both metal ions was also decreased by simultaneous presence of both metal ions. (c) 2007 Published by Elsevier B.V.

Keywords: Activation, Activation Energy, Adsorbent, Adsorption, Adsorption of Metals, Aqueous-Solution, Behavior, Cadmium, Capacity, Cd2+, Clay, Endothermic, First, Industry Waste, Kaolinite, Kaolinite Clay, Kinetic, Kinetics, Lead, Metal, Metal Ions, Metal-Ions, Model, Nigeria, Pb2+, Removal, Sorption, Temperature, Thermodynamics, Tripolyphosphate, Water

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Full Text: [2008\Che Eng J136, 164.pdf](2008/Che%20Eng%20J136,%20164.pdf)

Abstract: Adsorption of reactive dye from aqueous solution onto cross-linked chitosan/oil palm ash composite beads (CC/OPA) was investigated in a batch system. Kinetic and isotherm studies were carried out by considering the effects of various parameters, such as initial concentration (50-500 mg/L), contact time, pH (2-13), and temperature (30,40, 50°C). It was found that the dye uptakes were much higher in acidic solutions than those in neutral and alkaline conditions. Langmuir, Freundlich, Redlich-Peterson, and Temkin isotherms were used to analyze the equilibrium data at different temperatures. The Redlich-Peterson isotherm fits the experimental data significantly better than the other isotherms. Adsorption kinetics data were tested using pseudo-first-order and pseudo-second-order models. Kinetic studies showed that the adsorption followed a pseudo-second-order model. The pseudo-first-order and pseudo-second-order rate constants for different initial concentrations were evaluated and discussed. Thermodynamic parameters such as standard Gibbs free energy (Delta G degrees), standard enthalpy (Delta H degrees), and standard entropy (Delta S degrees) were evaluated by applying the Van’t Hoff equation. The thermodynamics of reactive dye adsorption onto cross-linked chitosan/oil palm ash composite beads indicates its spontaneous and endothermic nature. (c) 2007 Elsevier B.V All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solution, Composite, Cross-Linked Chitosan, Oil Palm Ash Composite Beads, Dye, Endothermic, Entropy, Equilibria, Equilibrium, Experimental, Fly-Ash, Freundlich, Isotherm, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Metal Hydroxide Sludge, Model, Models, pH, Pseudo-Second-Order Model, Pseudo-Second-Order Rate, Reactive Blue 19, Reactive Dye, Removal, Rights, Solution, Sorption, Standard, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2008\Che Eng J136, 295.pdf](2008/Che%20Eng%20J136,%20295.pdf)

Abstract: One kind of adsorbents with high adsorption capacity of direct dye was prepared by exchanging the organic cations as quaternary ammonium for sodium (Na+) on the layer surface of clay. In this study, the adsorption of Benzopurpurin 4B (Direct Red 2) by cetyltrimethylammonium bromide-bentonite (CTAB-bentonite) has been examined in order to measure the ability of this mineral to remove colored textile dyes from wastewater. XRD data showed that the interlayer spacing (d(001)) of bentonite was increased from 12 to 19 angstrom. The surface modification of CTAB-bentonite was examined using the FTIR technique. The batch sorption model, based on the assumption of a pseudo-second order mechanism, has been developed to predict the rate constant of sorption and the equilibrium capacity with the effect of initial dye concentration, and temperature. The equilibrium time was reached within 40 min. The rates of sorption were found to conform to pseudo-second order kinetics with good correlation with regard to intra-particle diffusion rate. The adsorption capacity increased largely with increasing initial dye concentration and temperature. The related apparent activation energy was also evaluated and discussed. The adsorption capacity has been increased from 109.89 to 153.84 mg/g with increasing temperature from 20 to 60°C. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activation, Activation Energy, Adsorbents, Adsorption, Aqueous-Solution, Basic-Dyes, Batch System, Bentonite, Benzopurpurin 4B, Bleaching Earth, Capacity, Clay, Congo Red, Diffusion, Dye, Dye Removal, Dyes, Equilibrium, Fly-Ash, FTIR, Intra-Particle Diffusion, Isotherm, Kinetics, Mechanism, Methylene-Blue, Model, Modification, Organic Contaminants, Organophilic Clay, Pseudo-Second Order, Pseudo-Second Order Sorption Kinetics, Rights, Sorption, Surface Modification, Temperature, Thermodynamic, Wastewater, XRD

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Full Text: [2008\Che Eng J137, 238.pdf](2008/Che%20Eng%20J137,%20238.pdf)

Abstract: Three organic dyes namely, Coomassie Blue, Malachite Green and Safranin Orange were removed from solution by adsorption on sand at 298 K. Characteristics of local sand sample used as an adsorbent in this work were initially found from the low-temperature adsorption of nitrogen on sand samples at 77 K. Conditions for maximum adsorption of these dyes on sand sample were then optimized. It was seen that under these conditions, 65-70% of dye could be removed from solution onto the sand surface. Adsorption data was fitted to Freundlich equation for the calculation of various parameters and it was found that for all the three dyes 1/n < 1, which indicates that adsorption was favorable. The adsorption kinetics followed the pseudo second order equation for all the three dyes investigated in this work with the k values lying in the region of 6.2×105 to 3.0×106. The intra-particle diffusion rate coefficient values obtained by using the Morris-Weber equation showed that Malachite Green reached equilibrium faster than Coomassie Blue and Safranin Orange. The diffusion coefficient values calculated for the three dyes were in the range of 7.8×10-8 to 9.3×10-8 cm2/s A and are compatible with other studies reported in the literature. The adsorption behavior of the dyes was also investigated in terms of added cations and anions and it was found that adsorption of Commassie Blue and Safranin Orange decreased substantially in the presence of sulphate, thiosulphate, acetate, potassium, nickel and zinc ions. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Acetate, Adsorbent, Adsorption, Adsorption Behavior, Adsorption Kinetics, Aqueous Solutions, Behavior, Carbon, Diffusion, Dye, Dyes, Equilibrium, Fly-Ash, Freundlich, Freundlich Isotherm, Intra-Particle Diffusion, Kinetic, Kinetics, Lagergen Equation, Literature, Low Temperature, Mechanism, Methylene-Blue, Morris-Weber Equation, Nickel, Oxidation, Removal, Rights, Safranin, Sand, Solution, Sorption, Waste-Water, Work, Zinc

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Full Text: [2008\Che Eng J137, 480.pdf](2008/Che%20Eng%20J137,%20480.pdf)

Abstract: The sorption of hexavalent chromium by marine brown algae Cystoseira indica, which was chemically-modified by cross-linking with epichlorohydrin (CB1, CB2), or oxidized by potassium permanganate (CB3), or only washed by distilled water (RB) was studied with variation in the parameters of contact time, pH, initial metal ion concentration and solid/liquid ratio. They were used for equilibrium sorption uptake studies with Cr(VI). The results indicate that biosorption equilibriums were rapidly established in about 2 h. The Cr(VI) adsorption was strictly pH dependent, and maximum removal of Cr(VI) on biosorbents were observed at pH 3.0. The maximum Chromium uptakes were 22.7,24.2,20.1 and 17.8 mg g-1, respectively, for CB1, CB2, CB3 and RB. The order of maximum Cr(VI) uptakes for various biomasses was CB2 > CB1 > CB3 > RB. A comparison of different isotherm models revealed that the Dubinin-Radushkevich (D-R) isotherm model fitted the experimental data best based on R-2, q(max) and standard error (S.E.) values and the mean energy of the sorption values indicated that biosorption of Cr(VI) by C indica may be an ion exchange reaction. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Hexavalent Chromium, Cystoseira Indica, Chemical Modifications, Sorption Isotherm Models, Heavy-Metal Biosorption, Marine-Algae, Aqueous-Solutions, Waste-Water, Fundamental Properties, Brown-Algae, Removal, Biomass, Adsorption, Lead

? Bhattacharya, A.K., Naiya, T.K., Mandal, S.N. and Das, S.K. (2008), Adsorption, kinetics and equilibrium studies on removal of Cr(VI) from aqueous solutions using different low-cost adsorbents. *Chemical Engineering Journal*, **137** (3), 529-541.

Full Text: [2008\Che Eng J137, 529.pdf](2008/Che%20Eng%20J137,%20529.pdf)

Abstract: The removal of Cr(VI) from aqueous solution by batch adsorption technique using different low-cost adsorbents was investigated. Adsorbents such as clarified sludge-a steel industry waste material, rice husk ash, activated alumina, fuller’s earth, fly ash, saw dust and neem bark were used to determine the adsorption efficiency. The influence of pH, adsorbent type and concentration, initial Cr(VI) concentration and contact time on the selectivity and sensitivity of the removal process were investigated. Adsorption process was found to be highly pH dependent. The optimum pH range for adsorption of Cr(VI) was found to be between 2 and 3. Kinetics studies were performed to understand the mechanistic steps of the adsorption process and the rate kinetics for the adsorption of Cr(VI) was best fitted with the pseudo-2nd-order kinetic model. Langmuir and Freundlich adsorption isotherms were applicable to the adsorption process and their constants were evaluated. The thermodynamic equilibrium constant and the Gibbs free energy were determined for each system. The adsorption capacity (q(max)) calculated from Langmuir isotherm and the Gibbs free energy (Delta G degrees) value obtained for the different adsorbents showed that clarified sludge was the most effective among the selected adsorbents for the removal of Cr(VI) from aqueous solution. The adsorption efficiencies of rice husk ash and activated alumina were also equally comparable with that of clarified sludge. (C) 2007 Published by Elsevier B.V.

Keywords: Chromium(VI), Low-Cost Adsorbents, Clarified Sludge, Langmuir Isotherm, Gibbs Free Energy, Industrial-Waste-Water, Heavy-Metal Ions, Hexavalent Chromium, Activated Carbon, Hazelnut Shell, Biosorption, Wastewaters, Mechanisms, Biosorbent, Recovery

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Full Text: [2008\Che Eng J138, 35.pdf](2008/Che%20Eng%20J138,%2035.pdf)

Abstract: The adsorption of 2-picoline from aqueous solutions onto bagasse fly ash (BFA), a solid waste collected from the particulate collection equipment attached to the stacks of bagasse fired boilers, is presented in this paper. The influence of various parameters like initial pH (pH(0)), adsorbent dose (m), contact time (t), initial concentration (C-0) and temperature (7) on the adsorption of 2-picoline from the aqueous solutions were studied using batch adsorption experiments. Equilibrium adsorption and kinetic studies for 2-picoline adsorption onto BFA were also carried out. Various adsorption isotherm equations, viz. Langmuir, Freundlich, Redlich-Peterson and Temkin equilibrium equations were used to test their suitability in describing experimental isotherm data. The adsorption of 2-picoline on bagasse fly ash follows second order kinetics and the equilibrium adsorption increases with increasing initial concentration. The equilibrium sorption isotherm data could be well represented by the Langmuir and Redlich-Peterson isotherm equations. The maximum removal of 2-picoline is found to be 98% at lower concentrations (<50 mg dm-3) and 49% at higher concentrations (600 mg dm-3) using 5 kg m-3 of BFA dosage at normal temperature and natural pH(0) (similar to 6.5). Thermodynamic studies revealed that the adsorption of 2-picoline on BFA is endothermic in nature and that the isosteric heat of adsorption decreases with the increase in the equilibrium uptake of 2-picoline on the BFA surface. Desorption of 2-picoline from the loaded BFA using water at different pH, and various other solvents showed that 2-picoline could be recovered by using acidic water and 0.1N H2SO4. Comparative assessment of BFA and activated carbon showed the superiority of BFA in terms of 2-picoline uptake, the rate of adsorption and the eventual cost of operation. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: 2-Picoline, Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Aqueous Solution, Aqueous Solutions, Assessment, Bagasse Fly Ash, Bagasse Fly Ash (BFA), Batch Adsorption, Carbon, Cost, Desorption, Endothermic, Equilibrium, Equilibrium Isotherm Analyses, Equipment, Experimental, Experiments, Fly Ash, Freundlich, Heat of Adsorption, Isosteric Heat of Adsorption, Isotherm, Isotherm Equations, Kinetic, Kinetic Studies, Kinetics, Langmuir, pH, Pyridine-Derivatives, Removal, Rights, Solution, Sorption, Sorption Isotherm, T, Temperature, Thermodynamic, Water

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Full Text: [2008\Che Eng J138, 179.pdf](2008/Che%20Eng%20J138,%20179.pdf)

Abstract: Alum-impregnated activated alumina (AIAA) was investigated in the present work as an adsorbent for the removal of As(V) from water by batch mode. Adsorption study at different pH values shows that the efficiency of AIAA is much higher than as such activated alumina and is suitable for treatment of drinking water. The adsorption isotherm experiments indicated that the uptake of As(V) increased with increasing As(V) concentration from I to 25 mg/l and followed Langmuir-type adsorption isotherm. Speciation diagram shows that in the ph range of 2.8-11.5, arsenate predominantly exists as H2AsO4- and HAsO42- species and hence it is presumed that these are the major species being adsorbed on the surface of aiaa. intraparticle diffusion and kinetic studies revealed that adsorption of As(V) was due to physical adsorption as well as through intraparticle diffusion. Effect of interfering ions revealed that As(V) sorption is strongly influenced by the presence of phosphate ion. The presence of arsenic on AIAA is depicted from zeta potential measurement, scanning electron microscopy (SEM) and energy-dispersive analysis of X-ray (EDAX) mapping study. Alum-impregnated activated alumina successfully removed As(V) to below 40ppb (within the permissible limit set by WHO) from water, when the initial concentration of As(V) is 10 mg/l. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Arsenic(V), Speciation, Impregnation, Alumina, Isotherm, Kinetics, Edax Mapping, Arsenic Removal, Iron, Equilibrium, Sorption, As(III), Carbon, Groundwater, Fluoride, Kinetics, Oxides

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Full Text: [2008\Che Eng J138, 187.pdf](2008/Che%20Eng%20J138,%20187.pdf)

Abstract: The natural rectorite (REC) was modified with the surfactant of dodecyl benzyl dimethyl ammonium chloride, hexadecyl trimethyl ammonium bromide and octadecyl trimethyl ammonium bromide, respectively. Three kinds of organic-modified rectorite (OREC), termed OREC1, OREC2 and OREC3, respectively, were prepared. Three kinds of OREC were used as adsorbents for Cr(VI) removal in aqueous solution. Through FrIR and X-ray diffraction (XRD) analyses, it was confirmed that they indeed carried out cation exchange reaction between REC and surfactant. Through the research of Cr(VI) adsorption, the removal percentage (%) of Cr(VI) increased with increasing adsorbents dose. The adsorption efficiency of OREC adsorbent was greatly affected by the initial solution pH value. According to thermodynamics study, it can be concluded that the adsorption of Cr(VI) with three adsorbents was carried out spontaneously. The research of adsorption isotherm demonstrated that, adsorption reactions of three prepared OREC adsorbents belonged to Langmuir model. The kinetic data of Cr(VI) with OREC adsorbents were well fitted to the Lagergren rate equation, which indicated that the three adsorption processes belonged to first-order adsorption reaction. Values of coefficients of intra-particle diffusion and mass transfer have been determined for three different OREC adsorbents. Intra-particle diffusion analysis demonstrated that Cr(VI) ions diffused quickly at the beginning of the adsorption process, and then intra-particle diffusion slowed down and stabilized. Mass transfer analysis showed the process of transfer of Cr(VI) removal onto the adsorbents surface was rapid enough. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Surfactant, Rectorite, Chromium, Adsorption Kinetic, Adsorption Isotherm, Layered Double Hydroxides, Heavy-Metals, Waste-Water, Aqueous-Solutions, Removal, Clay, Contamination, Bentonite, Effluents, Products

? Şener, S. (2008), Use of solid wastes of the soda ash plant as an adsorbent for the removal of anionic dyes: Equilibrium and kinetic studies. *Chemical Engineering Journal*, **138** (1-3), 207-214.

Full Text: [2008\Che Eng J138, 207.pdf](2008/Che%20Eng%20J138,%20207.pdf)

Abstract: Solid wastes (SW) from the distiller waste (DW), which is the by-product of the ammonia-soda process (the Solvay method) for the production of soda ash, has been used as an alternative adsorbent for removing the anionic dyes from aqueous medium. The effects of pH, initial dye concentration and temperature were investigated on kinetics and equilibrium of the adsorption. The results indicated that adsorption was strongly pH dependent. The typical dependence of dye uptake on temperature and the kinetics of adsorption indicated the process to be chemisorption. The results showed that as the pH increased, extent of dye uptake increased and Ca(OH)2 particles precipitated at higher pHs were mainly responsible for the removal of anionic Procion Crimson H-EXL (Reactive Red 231) dye. The necessary time to reach the equilibrium was found to be less than 2 min. Dye uptake process followed the pseudo-second-order rate expression. The Freundlich isotherm best fitted for the adsorption of the dye on SW. Various thermodynamic parameters, such as ΔG°, ΔH° and ΔS° were calculated. The thermodynamics of PC/SW system indicated spontaneous and exothermic nature of the process. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Alternative, Aqueous-Solutions, Biosorption, Congo Red, Dye, Dye Removal, Dyes, Equilibrium, Expression, Freundlich, Freundlich Isotherm, Isotherm, Isotherm, Kinetic, Kinetic Studies, Kinetics, Particles, pH, pH-Dependent, Plant, Pseudo-Second-Order Rate, Removal, Rights, Soda Ash Waste, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Wastewater

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Full Text: [2008\Che Eng J138, 616.pdf](2008/Che%20Eng%20J138,%20616.pdf)

Abstract: In the present studies chemically and thermally treated watermelon peels (TWMP) have been utilized for the removal of methyl parathion (MP) pesticide from water. The effect of process variables such as pH of solution, shaking speed, shaking time, adsorbent dose, concentration of solution and temperature have been optimized. maximum adsorption (99 ± 1%) was achieved for (0.38-3.80)×10-4 mol dm-3 of mp solution, using 0.1 g of adsorbent in 20 ml of solution for 60 min agitation time at pH 6. BET and SEM analysis have been carried out for the characterization of TWMP. Adsorption data has been analyzed by Freundlich, Langmuir and Dubinin-Radushkevich (D-R) adsorption isotherms. Lagergren, Morris-Weber and Reichenberg equations have been used for kinetic studies of adsorption process. Thermodynamic parameters ΔH, ΔS and ΔG have been calculated. Positive value of ΔH and negative value of ΔG show endothermic and spontaneous nature of adsorption respectively. The developed adsorption method has been employed. to surface water samples with percent removal 99% ± 1. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Watermelon (Citrullus Lanatus) Peels, Methyl Parathion, Adsorption, Isotherms, Kinetics, Thermodynamics, Aqueous-Solutions, Activated Carbon, Waste-Water, Fly-Ash, Removal, Sorption, Equilibrium, Lead(II), Kinetics, Peat

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Full Text: [2008\Che Eng J139, 2.pdf](2008/Che%20Eng%20J139,%202.pdf)

Abstract: The adsorption of Acid Red 14 (AR14) and Acid Blue 92 (AB92) onto the microporous and mesoporous egg shell membrane (ESM) was investigated in aqueous solution in a batch system with respect to initial dye concentration, pH, contact time, particle size and biosorbent doses at 20±1°C. The surface area, Fourier transform infrared (FTIR) and scanning electron microscopy (SEM) of ESM were obtained. The surface area of ESM was found to be 2.2098 m2/g. The pseudo-first-order, pseudo-second-order kinetics and the intraparticle diffusion models were used to describe the kinetics data. The rate constants at different pH values (2-12) were evaluated. The experimental data fitted well to the pseudo-second-order kinetics model at pH values of 2-8 and pseudo-first-order kinetics model at pH values of 10 and 12 for both dyes. Equilibrium isotherms were analyzed by Langmuir, Freundlich and Redlich-Peterson adsorption models. Maximum desorption of >= 89.6% was achieved for AR14 and 82.8% for AB92 in aqueous solution at pH 12. The results indicate that ESM could be fruitfully employed as effective biomaterial for the removal of residual color from effluents. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solutions, Biosorbent, Congo Red, Desorption, Diffusion, Dye, Dye Removal, Dyes, Electron Microscopy, Equilibrium, ESM, Experimental, Freundlich, FTIR, Fundamental Properties, Immobilized Nanoparticles, Isotherms, Kinetics, Kinetics Model, Langmuir, Low-Cost Adsorbents, Mesoporous, Model, Models, Orange Peel, Particle Size, pH, Photocatalytic Degradation, Potential, Pseudo-Second-Order Kinetics, Reactive Dyes, Removal, Rights, Scanning Electron Microscopy, SEM, Size, Solution, Surface Area, Titanium-Dioxide

? Hameed, B.H. and Daud, F.B.M. (2008), Adsorption studies of basic dye on activated carbon derived from agricultural waste: *Hevea brasiliensis* seed coat. *Chemical Engineering Journal*, **139** (1), 48-55.

Full Text: [2008\Che Eng J139, 48.pdf](2008/Che%20Eng%20J139,%2048.pdf)

Abstract: Activated carbon prepared from rubber (Hevea brasiliensis) seed coat was used to remove basic blue 3 (BB3) from aqueous solutions. Batch adsorption studies were conducted to evaluate the effect of contact time, and initial concentration (50-500 mg/L) on the removal of BB3 at temperature of 30°C. The equilibrium adsorption data of BB3 on activated carbon were analyzed by the Langmuir, Freundlich and Temkin isotherm models. The isotherm data were well described by the Freundlich isotherm model. The monolayer adsorption capacity was 227.27 mg/g at 30°C. Pseudo-first-order, pseudo-second-order and intraparticle diffusion models were used to analyze the kinetic data obtained at different concentrations. The adsorption kinetics was well described by the pseudo-second-order kinetic model. Rubber seed coat-based activated carbon was shown to be a promising material for adsorption of BB3 from aqueous solutions. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Agricultural Waste, Aqueous Solutions, Aqueous-Solution, Basic Blue, Basic Dye, Capacity, Carbon, Coir Pith, Diffusion, Dye, Equilibrium, Freundlich, Freundlich Isotherm, Industry Waste, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Liquid-Phase Adsorption, Methylene-Blue, Model, Models, Monolayer, Pseudo-Second-Order Kinetic Model, Removal, Rights, Rubber Seed Coat, Temperature, Water

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Full Text: [2008\Che Eng J139, 213.pdf](2008/Che%20Eng%20J139,%20213.pdf)

Abstract: The use of sepiolite for the removal of maxilon blue 5G from aqueous solutions at different contact times, stirring speeds, initial dye concentrations, pHs, ionic strengths and temperatures was investigated. The adsorption process attained equilibrium within 60 min, which was an economically favorable requisite, in addition to the local abundance of the raw material. The extent of dye removal increased with increasing initial dye concentration, contact time, pH and temperature, and decreased with increasing ionic strength. On the other hand, stirring speed had no important effect on adsorption process. The adsorption process was found to be endothermic and physical in nature. Four kinetic models, the pseudo-first- and second-order equations, Elovich equation and the intraparticle diffusion models were selected to follow the adsorption process. Kinetic parameters, rate constants, equilibrium adsorption capacities and related correlation coefficients for each kinetic model were calculated and discussed. It was shown that the adsorption of maxilon blue 5G onto sepiolite could be described by the pseudo-second-order equation. The diffusion coefficients were calculated and found to be in the range of 3.625×10-8 to 12.100×10-9 cm2/s. Various thermodynamic activation parameters such as enthalpy of sorption Delta H\*, Gibbs energy change Delta G\* and entropy Delta S\* were estimated. The positive value of Delta H\* and Delta G\* shows the sorption process is endothermic and not spontaneous. The negative value of entropy Delta S\* shows the decreased randomness at the solid-liquid interface during the sorption of dye ions onto sepiolite particles. In addition, an activation energy of sorption has also been determined based on the pseudo-second-order rate constants. The activation energy of system (E-a) was calculated as 19.25 kJ/mol. Sepiolite, an inexpensive and easily available material, could be an alternative for more costly adsorbents used for dye removal in wastewater treatment processes. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorbents, Adsorption, Adsorption Kinetics, Alternative, Anionic Dyes, Aqueous Solutions, Bagasse-Fly-Ash, Basic-Dyes, Diffusion, Dye, Dye Removal, Elovich Equation, Endothermic, Entropy, Equilibrium, Equilibrium Isotherm Analyses, Industry Waste, Ionic Strength, Kinetic, Kinetic Model, Kinetic Models, Kinetic Parameters, Kinetics, Linked Chitosan Beads, Low-Cost Adsorbents, Mechanism, Methylene-Blue, Model, Models, Particles, pH, Pseudo-Second-Order, Pseudo-Second-Order Rate, Randomness, Reactive Dyes, Removal, Rights, Sepiolite, Sorption, Sorption Process, Temperature, Thermodynamic, Treatment, Waste-Water, Wastewater, Wastewater Treatment

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Full Text: [2008\Che Eng J139, 245.pdf](2008/Che%20Eng%20J139,%20245.pdf)

Abstract: Cr(VI) removal studies were carried out by using activated carbon obtained from waste weed, Salvinia cucullata. Effects of various parameters, such as pH, contact time, temperature, adsorbate concentration, adsorbent dose and particle size of the adsorbent on percentage of adsorption were studied. The adsorption studies were carried out at an agitation speed of 600 rpm to minimize the film diffusion. The adsorption kinetics followed dual rate; it was fast during a first stage and then it was reduced. The equilibrium was achieved in 12 h. The kinetics increased with decrease in pH. Adsorbate and adsorbent concentration also influenced the kinetics. The adsorption process was endothermic in nature. The reaction kinetics followed pseudo-second-order kinetic equation. Empirical rate equation developed, which explained the effect of various adsorption parameters, was studied. Theoretical numbers of stages were calculated based on the results. Intra-particle diffusion was found to be the rate-controlling step. Optimization studies were also carried out to establish the upper and lower breakthrough points. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Biosorption, Breakthrough, Carbon, Chitosan, Column Studies, Cr(VI), Diffusion, Endothermic, Equilibrium, First, Hexavalent Chromium, Intra Particle Diffusion, Intraparticle Diffusion, Kinetic, Kinetics, Kinetics, Metals, Optimization, Particle Size, pH, Pseudo-Second-Order, Reaction Kinetics, Removal, Rights, Size, Temperature, Thermodynamics, Waste-Water

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Full Text: [2008\Che Eng J139, 453.pdf](2008/Che%20Eng%20J139,%20453.pdf)

Abstract: The adsorption of acid brilliant blue onto thermally activated coir pith carbon in aqueous solution was studied in a batch system with respect to contact time, pH, and temperature. Acidic pH was favorable for the adsorption of this dye. The surface characterization of thermally activated coir pith carbon was performed using the FT-IR technique. Kinetic studies showed that the adsorption of dye on coir pith carbon was a gradual process. Lagergren-first-order, second-order, intra-particle diffusion model and Bangham were used to fit the experimental data. Equilibrium isotherms were analysed by Langmuir, Freundlich, Dubinin-Radushkevich and Tempkin isotherms. The adsorption capacity was found to be 15.24 mg/g by Langmuir isotherm. The pH effect and desorption studies suggest that chemisorption might be the major mode of the adsorption process. The change is entropy (ΔS°) and heat of adsorption (ΔH°) of coir pith carbon was estimated as185.45 J/(mol K) and 48.02 kJ/mol, respectively. The high negative value of change in Gibbs free energy indicates the feasible and spontaneous nature of adsorption on acid brilliant blue on coir pith carbon. © 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Brilliant Blue, Activated Carbon, Adsorption, Adsorption Capacity, Adsorptive Removal, Agricultural Solid-Waste, Aqueous Solution, Aqueous-Solution, By-Product, Capacity, Carbon, Characterization, Coir Pith, Coir Pith Carbon, Desorption, Diffusion, Diffusion Model, Dye, Entropy, Equilibrium, Experimental, Freundlich, FTIR, Heat Of Adsorption, Intra-Particle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Model, pH, pH Effect, Removal, Rights, Solution, Sorption, Temperature, Temperature Effect, Textile Dyes, Wastewaters, Water

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Full Text: [2008\Che Eng J139, 462.pdf](2008/Che%20Eng%20J139,%20462.pdf)

Abstract: Multiwalled carbon nanotubes (MWCNTs) were oxidized by mixed HNO3/H2SO4 (3N+1S), HNO3, KMnO4 and NaClO and were selected as sorbents to study their characterization and isotherm of Zn2+ sorption in an aqueous solution. The physicochemical properties of MWCNTs were improved after oxidation, which made MWCNTs possess not only a more hydrophilic surface but also a more negatively charged surface, and consequently resulted in sorption of more Zn2+. The maximum Zn2+ sorption capacities of MWCNTs, MWCNTs(3N+1S), MWCNTs(HNO3), MWCNTs(KMnO4) and MWCNTs(NaClO) calculated by Langmuir model are 10.21, 18.14, 27.20, 28.01 and 32.68 mg g-1, respectively. The MWCNTs(NaClO) have the best sorption performance of Zn2+ and their sorption kinetics was found to follow the pseudo second-order rate law. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Carbon, Carbon Nanotubes, Characterization, Chemical Oxidation, Functionalization, Ions, Isotherm, Kinetics, Langmuir, Langmuir Model, Law, Model, Modification, Multiwalled Carbon Nanotubes, Mwcnts, Nanotubes, Oxidation, Pseudo Second-Order, Pseudo-Second-Order, Rate Law, Removal, Rights, Solution, Sorption, Sorption Kinetics, Surface Functional Groups, Water, Zn2+, Zn2+ Sorption

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Full Text: [2008\Che Eng J139, 503.pdf](2008/Che%20Eng%20J139,%20503.pdf)

Abstract: Organobentonite is suggested as potential super-sorbents for the removal of organic pollutants such as dyes from wastewater. Limited by the high operation cost and the complicate process of its synthesis, however, organobentonite is not widely applied in wastewater treatment. Based on the truth that organobentonite was normally synthesized by cationic surfactants and bentonite with cationic exchanging, a one-step process was proposed here to remove an acid dye (Orange II) and a cationic surfactant (cetyltrimethylammonium bromide, CTMAB) simultaneously from wastewater using bentonite alone. The effects of contact time, pH and inorganic salt on the removal of the acid dye and surfactant from wastewater were also examined. High removal efficiencies (>99%) of Orange II and CTMAB by bentonite were observed. In the one-step process, the cationic surfactants in the wastewater were utilized to form organobentonite and then available for the removal of acid dye as sorbents. Furthermore, the separated synthesis process of organobentonite was consequently deleted. Therefore, this one-step process would be an efficient, simple and low cost for the treatment of organic wastewater especially for textile wastewater and makes it possible that bentonite could be applied widely in wastewater treatment as sorbent. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Bentonite, Sorption, Cationic Surfactant, Acid Dye, Wastewater Treatment, One-Step Process, Aqueous-Solutions, Basic-Dyes, Organic Contaminants, Iron Humate, Adsorption, Sorption, Montmorillonite, Organobentonites, Acid-Blue-193, Sepiolite

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Full Text: [2008\Che Eng J140, 6.pdf](2008/Che%20Eng%20J140,%206.pdf)

Abstract: This paper examines the kinetics of fluoride removal from water by the adsorbent alumina cement granules (ALC), exploring the mechanisms involved. ALC exhibited a biphasic kinetic profile of sorption with an initial rapid uptake phase followed by a slow and gradual phase. The kinetic profile has been modeled using pseudo-first-order model, pseudo-second-order model, intraparticle diffusion model and Elovich model. The kinetic sorption profiles offered excellent fit with pseudo-second-order model with a high R-2 value of 0.9987. The value of activation energy of the system (17.67 kJ mol-1) indicates the significance of diffusion in the sorption process. The rate-limiting step of sorption was evaluated by analyzing the response of the system to pH, inert electrolyte concentration, and desorption pattern of the adsorbent, instead of assigning it to a single kinetic model. Accordingly, the surface reactions involving the heterogeneity of the surface site bonding energy or other reactions occurring on the surface of ALC were found predominant in defining the rate-limiting step. The dominant mechanism of fluoride removal appeared to be a chemisorptive ligand exchange reaction involving the formation of inner-sphere complexation of fluoride with ALC. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorbent, Adsorption, Alumina, Anion Adsorption, Batch Study, Cement, Complexation, Defluoridation, Defluoridation, Desorption, Diffusion, Diffusion, Diffusion Model, Drinking-Water, Elovich Model, Equation, Equilibrium, Fluoride, Fluoride Removal, Goethite, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetic, Kinetic Model, Kinetic Sorption, Kinetics, Ligand, Ligand Exchange, Mechanism, Mechanisms, Model, pH, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Limiting Step, Rate-Limiting Step, Removal, Rights, Sorption, Sorption Process, Water

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Full Text: [2008\Che Eng J140, 165.pdf](2008/Che%20Eng%20J140,%20165.pdf)

Abstract: A two-level seven-factor (2(7-2)) fractional factorial design analysis was conducted to examine the parameters influencing dimethylarsinic acid (DMA) removal from an aqueous solution using iron oxide-coated A. niger biomass. The factors examined were the concentration of DMA in solution, the mass of the adsorbent, the solution temperature, the Ca2+ ions in solution, the Fell ions in solution, the SO42- ions in solution, and the Cl- ions in solution. The magnitude of the influence of the factors considered on DMA removal was observed in the order: presence of Ca2+ ions in solution > the DMA concentration > solution temperature > presence of SO42- in solution > presence of Fe2+ in solution > the mass of adsorbent > the presence of Cl- in solution. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: A.Niger, Adsorbent, Adsorption, Analysis, Arsenic, Arsenic Removal, Biomass, Ca2+, Dimethylarsinic Acid, Dimethylarsinic Acid, Factorial Design, Fungal Biomass, Groundwater, Hydrous Oxides, Iron, Iron Oxide-Coated Fungal Biomass, Organic Arsenic, Organoarsenicals, Removal, Sorption, Surface Complexation, Temperature, Toxicity, Waters

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Full Text: [2008\Che Eng J140, 183.pdf](2008/Che%20Eng%20J140,%20183.pdf)

Abstract: This paper describes the fluoride removal potential of a novel sorbent, magnesia-amended activated alumina (MAAA) from drinking water. MAAA, prepared by calcining magnesium hydroxide impregnated alumina at 450°C has shown high fluoride sorption potential than activated alumina from drinking water. Batch sorption studies were performed as a function of contact time, pH, initial fluoride concentration, and adsorbent dose. Studies were also performed to understand the effect of various other co-existing ions present in real ground water samples. X-ray powder diffraction (XRD), scanning electron microscope (SEM), energy dispersive X-ray (EDAX) and a gas adsorption porosimetry analyses were used to characterize the physicochemical properties of MAAA. More than 95% removal of fluoride (10 mg l-1) was achieved within 3 h of contact time at neutral pH. Sorption of fluoride onto MAAA was found to be pH dependant and a decrease in sorption was observed at higher pHs. Among the kinetic models tested, pseudo-second-order model fitted the kinetic data well, suggesting the chemisorption mechanism. Among the various isotherm model tested, Sips model predicted the data well. The maximum sorption capacity of fluoride deduced from Sips equation was 10.12 mg g-1. Most of the co-existing ions studied have negligible effect on fluoride sorption by MAAA. However, higher concentrations of bicarbonate and sulfate have reduced the fluoride sorption capacity. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorbent, Adsorbent Dose, Adsorption, Alumina, Aqueous-Solution, Capacity, Carbon, Chemisorption, Coated Alumina, Defluoridation, Diffusion, Drinking Water, Equilibrium, Fluoride, Fluoride Removal, Function, Isotherm, Isotherm Model, Kinetic, Kinetic Models, Kinetics, Kinetics, Magnesia-Amended Activated Alumina, Mechanism, Model, Models, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Sem, Sorbent, Sorption, Sorption, Sorption Capacity, Sorption Potential, Sulfate, Water, XRD

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Full Text: [2008\Che Eng J140, 214.pdf](2008/Che%20Eng%20J140,%20214.pdf)

Abstract: The different adsorption characteristics of sodium dodecyl sulfate (SDS)-coated nano/microsized alumina systems for di-ethyl-phthalate (DEP) were studied in this paper. The investigations were carried out in a series of batch experiments under different solution conditions such as SIDS concentration, pH value, ionic strength and temperature. Freundlich equation was used for evaluating the influences of various experimental conditions on the adsorption process. The Freundlich constants indicated that SIDS-coated nanosized alumina had a greater adsorption affinity and capacity than SDS-coated microsized alumina; kinetics study results of pesudo-second-order rate equation proved that SIDS-coated nanosized alumina had a higher adsorption rate. The experimental results showed that SDS-coated nanosized alumina was more effective and suitable for adsorbing DEP in water; furthermore, the feasibility of this method can also be a useful guidance for adsorbing other hydrophobic organic contaminants in water. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsolubilization, Adsorption, Adsorption Rate, Alumina, Aqueous Solutions, Capacity, Cationic Surfactants, Di-Ethyl-Phthalate, Experimental, Experiments, Freundlich, Freundlich Equation, Ionic Strength, Kinetics, Microsize, Nanosize, pH, Removal, Rights, Sids, Silica, Sodium, Sodium Dodecyl Sulfate, Sodium Dodecyl-Sulfate, Solution, Sorption, Sulfate, Temperature, Treated Alumina, Waste-Water, Water

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Full Text: [2008\Che Eng J140, 235.pdf](2008/Che%20Eng%20J140,%20235.pdf)

Abstract: Removal/preconcentration of thallium(I) ions from aqueous solution by sawdust; a waste material derived from the commercial processing of Cedrus Deodar wood for furniture production war, investigated. A simple and low-cost modification results in increasing the sorption capacity of raw sawdust from 2.71 to 13.18 mg g-1. Sorption was found to be rapid (similar to 98% within 8 min). The binding of metal ions was found to be pH dependent, optimal sorption accruing at around pH 6-9. Potentiometeric titrations of sawdust revealed two distinct pK(a) values, the first having the value similar to carboxylic groups (3.3-4.8) and second comparable with that of amines (8.53-10.2) with the surface site densities of 1.99×10-4 and 7.94×10-5 mol g-1, respectively. Retained Tl(I) ions were eluted with 5 ml 0.1 mol l-1 HCl. Detection limit of 0.0125 mu g ml-1 was achieved with an enrichment factor of 160. Recovery was quantitative using sample volume of 800 ml. The Langmuir, Freundlich and D-R isotherm equations were used to describe partitioning behavior for the system at different temperatures. Kinetic and thermodynamic behavior of sawdust for Tl(I) ions removal was also studied. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Sawdust, Thallium, Removal, Kinetics, Thermodynamics, Absorption-Spectrometry, Waste-Water, Adsorption, Cadmium, Preconcentration, Biosorption, Metal, Lead

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Full Text: [2008\Che Eng J140, 247.pdf](2008/Che%20Eng%20J140,%20247.pdf)

Abstract: In the present study, the adsorption of cadmium on phosphogypsum, a waste material from the manufacture of phosphoric acid by wet process, was studied. Before batch adsorption study, phosphogypsum was pre-conditioned by milk of lime. Effect of initial pH on cadmium adsorption was investigated. It was found that cadmium adsorption was dependent on solution pH and maximum cadmium removal was observed in the pH range of 9.5 and 11.5. The Langmuir and Freundlich theories were used to describe the cadmium adsorption process, and the Freundlich isotherm showed the best fit to the process. Maximum adsorption capacity of lime-preconditioned phosphogypsum was found to be 131.58 mg/g. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Cadmium, Isotherm, Phosphogypsum, Wastewater, Bagasse Fly-Ash, Waste Fe(III)/Cr(III) Hydroxide, Heavy-Metal Removal, Activated Carbon, Component Adsorption, Aquatic Systems, Cd(II) Removal, Methylene-Blue, Industry Waste, Lead Removal

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Full Text: [2008\Che Eng J140, 609.pdf](2008/Che%20Eng%20J140,%20609.pdf)

Abstract: The sorption of Methylene blue onto untreated guava leaf powder has been studied. The kinetics of sorption of Methylene blue is described by pseudo-second-order model. Effects of initial dye concentration, solution temperature, and adsorbent dosage have been studied. The pseudo-second-order rate constant has been correlated as a function of the system variables. Statistical tools like Student’s t-test, F-test, ANOVA and lack of fit have been employed to determine the significance of each coefficient that appeared in the model. Model adequacy has been checked by residual distribution. The proposed model explains 95.1% of the total variation in the response. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Analysis, Aqueous-Solution, Biosorbent, Biosorption, Design, Dye, Equilibrium, Function, Guava Leaf Powder, Kinetics, Methylene Blue, Model, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Pseudo-Second-Order Rate, Rate Constant, Removal, Rice Husk, Rights, Solution, Sorption, Sorption Rate Constant, Statistical Analysis, Temperature

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Full Text: [2008\Che Eng J141, 99.pdf](2008/Che%20Eng%20J141,%2099.pdf)

Abstract: In this paper, results of Cr(VI) and Cr(III) sorption from aqueous phase by palm flower (Borassus aethiopum) is presented. Batch kinetic and equilibrium experiments were conducted to determine the adsorption kinetic rate constants and maximum adsorption capacities. Both Cr(III) and Cr(VI) adsorption followed a second-order kinetics. For Cr(III), maximum adsorption capacity was 6.24 mg/g by raw adsorbent and 1.41 mg/g by acid treated adsorbent. In case of Cr(VI), raw adsorbent exhibited a maximum adsorption capacity of 4.9 mg/g, whereas the maximum adsorption capacity for acid treated adsorbent was 7.13 mg/g. There was a significant difference in the concentrations of Cr(VI) and total chromium removed by palm flower. In case of Cr(VI) adsorption, first it was reduced to Cr(III) with the help of tannin and phenolic compounds and subsequently adsorbed by the biosorbent. Acid treatment significantly increased Cr(VI) adsorption capacity of the biosorbent whereas, alkali treatment reduced the adsorption capacities for Cr(VI). However, in case of Cr(III), acid treatment significantly reduced the adsorption capacity whereas the adsorption capacity of alkali treated biosorbent was slightly less than that of raw adsorbent. FT-IR spectrum showed the changes in functional groups during acid treatment and biosorption of Cr(VI) and Cr(III). Column studies were conducted for Cr(III) to obtain the design parameters require for scale-up. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Treatment, Acid-Treatment, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Kinetic, Agave-Lechuguilla Biomass, Aqueous Phase, Aqueous-Solution, Biosorbent, Biosorption, Brown Seaweed, Capacity, Changes, Chromium, Column Study, Cr(III), Cr(VI), Cr(VI) Adsorption, Equilibrium, Equilibrium Models, Experiments, First, FT-IR, FTIR, Functional Groups, Heavy-Metals, Hexavalent Chromium, Kinetic, Kinetics, Palm Flower, Parameters, Rate Constants, Reduction, Regeneration, Removal, Rights, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Sorption, Treatment, Trivalent Chromium, Waste

? Kumar, P.A., Chakraborty, S. and Ray, M. (2008), Removal and recovery of chromium from wastewater using short chain polyaniline synthesized on jute fiber. *Chemical Engineering Journal*, **141** (1-3), 130-140.

Full Text: [2008\Che Eng J141, 130.pdf](2008/Che%20Eng%20J141,%20130.pdf)

Abstract: In the present study, short chain polyaniline (PANI), a polymer was synthesized on the surface of jute fiber and was used as an adsorbent to remove hexavalent chromium (Cr(VI)). Experiments were conducted in batch mode with the variables such as amount of jute fiber on PANI, chain length of PANI, solution pH, initial concentration of Cr(VI), dose of PANI-jute and temperature. The PANI formed was found to be short chain polyaniline (oligoaniline). Optimum amount of jute fiber and chain terminating agent 1,4-phenylenediamine were observed as 5 g and 3.05 mmol, respectively, for 21.5 mmol of aniline. Maximum adsorption of total chromium (Cr(VI), Cr(Ill) and its other forms) was observed at reaction pH of 3 by electrostatic attraction of acid chromate ion with protonated PANI-jute. Adsorption equilibrium was achieved within 40-120 min for initial Cr(VI) of 50-500 mg/L. Maximum monolayer capacity of PANI-jute was observed as 62.9 mg/g at pH 3 and temperature 20°C. Total chromium adsorption decreased with rise in temperature suggesting an exothermic adsorption of chromium. During desorption almost 83% efficiency was achieved within 10 min by 2 M NaOH. By ignition of chromium bounded PANI-jute, 94% Cr(VI) were able to recover as Cr(III) along with reduction in weight by 95%. PANI-jute can be used effectively to remove chromium from wastewater. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Short Chain Polyaniline, Pani-Jute, Total Chromium Adsorption, Chromium Recovery, Amine Group, Coordination Bond, Ead Fungal Biomass, Hexavalent Chromium, Aqueous-Solution, Activated Carbons, Cr(VI) Removal, Metal-Ions, Adsorption, Reduction, Sorption, Biosorption

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Full Text: [2008\Che Eng J142, 23.pdf](2008/Che%20Eng%20J142,%2023.pdf)

Abstract: In this study dried Trametes versicolor, a white-rot fungus and chitosan, a fungal component derivative were used for the removal of Acid Blue 161 (AB 161) acidic dye from aqueous solution and the results were compared with the outcomes of acid-washed powdered activated carbon (PAC). The influence of suspension pH, temperature, and initial dye concentration on AB 161 dye removal was investigated by conducting a series of batch adsorption experiments. All sorbents exhibited the highest dye uptake capacity at an initial pH value of 3.0. The effect of temperature on dye removal indicated that maximum capacity was obtained at 45 °C for each AB 161 dye–sorbent system. Sorption capacity of each sorbent increased with increasing initial dye concentration up to 500 mg l−1. Among the three sorbents, chitosan was the most effectively sorbent showing a maximum acidic dye uptake of 471.6 mg g−1 at 45 °C. The Freundlich, Langmuir, Redlich–Peterson and Langmuir–Freundlich, the two- and three-parameter adsorption models were used for the mathematical description of the sorption equilibrium and isotherm constants were evaluated depending on sorption temperature. Equilibrium data of AB 161 sorption fitted very well to all models except that the Freundlich model for each acid dye–sorbent system in the concentration and temperature ranges studied. For each sorbent–dye system simple kinetic models were applied to the experimental data to examine the mechanisms of sorption and potential rate-controlling steps such as external mass transfer, intraparticle diffusion and sorption process. The sorption 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. Pseudo-second-order kinetic model described the adsorption kinetics accurately at all concentrations and temperatures studied. The thermodynamic analysis indicated that the sorption process was endothermic and the sorption of dye on each sorbent might be chemical in nature.

Keywords: Adsorption, Biosorption, Powdered Activated Carbon, Trametes Versicolor, Chitosan, Acid Blue 161, Isotherms, Kinetics, Thermodynamics

? Özacar, M., Şengil, İ.A. and Türkmenler, H. (2008), Equilibrium and kinetic data, and adsorption mechanism for adsorption of lead onto valonia tannin resin. *Chemical Engineering Journal*, **143** (1-3), 32-42.

Full Text: [2008\Che Eng J143, 32.pdf](2008/Che%20Eng%20J143,%2032.pdf)

Abstract: The adsorption of lead onto valonia tannin resin studied using a batch adsorber. The aim of this study was to understand the mechanisms that govern lead removal and find a suitable equilibrium isotherm and kinetic model for the lead removal in a batch reactor. The experimental isotherm data were analyzed using the Langmuir, Freundlich, Temkin and Dubinin-Radushkevich equations. The equilibrium data fit well the Langmuir isotherm. The experimental data were analyzed using four adsorption kinetic models - the pseudo first- and second-order equations, the Elovich equation and intraparticle diffusion equation - to determine the best fit equation for the adsorption of lead-ions onto valonia tannin resin. The characteristic parameters for each kinetic models have been determined and the correlation coefficients have been calculated in order to assess which model provides the best fit predicted data with experimental results. Also, predicted q(1) values from the kinetic equations were compared with the experimental data. Results show that the pseudo second-order equation provides the best correlation for the adsorption process. Adsorption mechanism was also proposed for the adsorption of lead-ions onto valonia tannin resin. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Valonia Tannin Resins, Lead, Adsorption Kinetics And Isotherms, Pseudo Second-Order Equation, Adsorption Mechanism, Ftir Studies, Heavy-Metal Removal, Aqueous-Solutions, Condensed-Tannin, Waste-Water, Hexavalent Chromium, Persimmon Tannin, Activated Carbon, Calcined Alunite, Malachite-Green, Coagulant AID

? Ofomaja, A.E. (2008), Kinetic study and sorption mechanism of methylene blue and methyl violet onto mansonia (Mansonia altissima) wood sawdust. *Chemical Engineering Journal*, **143** (1-3), 85-95.

Full Text: [2008\Che Eng J143, 85.pdf](2008/Che%20Eng%20J143,%2085.pdf)

Abstract: Batch sorption kinetic experiments were performed to study the adsorption of methylene blue and methyl violet dyes from aqueous solution using mansonia wood sawdust as adsorbent. Operating variables studied include solution pH and particle size of sawdust. Maximum dye removal was observed at a basic pH 10 for both dyes. Sorption kinetic data was fitted to both pseudo-first and pseudo-second-order kinetic models. The experimental data were found to deviate from the straight line of the pseudo-first-order plots after 30 min for the methylene blue and after 15 min for the methyl violet sorption. The pseudo-second-order kinetics was found to fit the experimental data and was able to consistently predict the amount of dye adsorbed over the sorption period and for the range of sawdust particle size used. The process mechanism was found to be complex, consisting of both mass transfer and intraparticle diffusion. Analysis of the sorption data using the Boyd’s plot confirms mass transfer as the dominant mechanism for both methylene blue and methyl violet sorption. Mass transfer mechanism was more predominant in the methyl violet sorption and became more dominant as the particle size of the sawdust material increased. This was confirmed by the values of effective diffusion parameter D-i, which were found to be higher for methylene blue, and reduced with increasing sawdust particle size. The molecular sizes of the basic dyes and the stability of the positive charge on the dyes played a significant role in their sorption onto the sawdust material. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption-Kinetics, Aqueous, Aqueous-Solution, Basic Dye, Basic Dyes, Batch, Biosorption, Cationic Dyes, Complex, Diffusion, Dye, Dye Removal, Dyes, Elsevier, Fly-Ash, Intraparticle Diffusion, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Mansonia Wood Sawdust, Mass Transfer, Mechanism, Methyl Violet, Methylene Blue, Models, Palm Kernel Fiber, Particle Size, pH, Positive, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Removal, Sawdust, Sorption, Sorption Mechanism, Wood

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Full Text: [2008\Che Eng J143, 117.pdf](2008/Che%20Eng%20J143,%20117.pdf)

Abstract: With synthetic wastewater, the sorption characteristics of 4-hydroxyphenol on Cr-bentonite were investigated using a lab-scale batch experiment technique. The effects of relevant parameters, such as pH value of solution, contact time and temperature of solution were examined. Equilibrium modeling data were fitted to linear Langmuir and Freundlich models. Dubinin-Redushkevich (D-R) isotherm was applied to describe the nature of 4-hydroxyphenol uptake and it was found that it occurred physically. The pseudo first-order, second-order kinetic models and intraparticle diffusion model were used to describe the kinetic data. The pseudo second-order kinetic model provided excellent kinetic data fitting (R-2 > 0.999) and intraparticle diffusion affects 4-hydroxyphenol uptake. Thermodynamic functions, the change of free energy (Delta G degrees), enthalpy (Delta H degrees) and entropy (Delta S degrees) of sorption were also calculated. These parameters show that the sorption process of 4-hydroxyphenol on Cr-bentonite is spontaneous and exothermic at 15-45 degrees C. The results indicate that there is significant potential for Cr-bentonite as an adsorbent material for phenolic compounds removal from aqueous solutions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: 4-Hydroxyphenol, Activated Carbon, Adsorption, Ammonium Ion, Aqueous-Solution, Batch, Chlorophenols, Cr-Bentonite, Diffusion, Equilibrium, Freundlich, Isotherm, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Modeling, Phenolic-Compounds, Removal, Sorption, Thermodynamics, Wastewater

? Hameed, B.H., Tan, I.A.W. and Ahmad, A.L. (2008), Adsorption isotherm, kinetic modeling and mechanism of 2,4,6-trichlorophenol on coconut husk-based activated carbon. *Chemical Engineering Journal*, **144** (2), 235-244.

Full Text: [2008\Che Eng J144, 235.pdf](2008/Che%20Eng%20J144,%20235.pdf)

Abstract: The adsorption characteristics of 2,4,6-trichlorophenol (TCP) on coconut husk-based activated carbon prepared Under optimized conditions were evaluated. Batch adsorption studies were conducted to study the effects of various parameters Such its initial concentration, agitation time and solution pH on TCP adsorption. Adsorption capacity was found to increase with increase in initial concentration and agitation time, while acidic pH was more favourable for the adsorption of TCP. Equilibrium data were analyzed by the Langmuir, Freundlich, Temkin and Redlich-Peterson models by using non-linear regression technique. The equilibrium data were best represented by the Langmuir isotherm, yielding maximum monolayer adsorption capacity of 716.10 mg/g at 30 degrees C. The adsorption kinetics was found to follow the pseudo-second-order kinetic model. The mechanism of the adsorption process was determined from the intraparticle diffusion model. Boyd plot revealed that the adsorption of TCP on the activated carbon was mainly governed by particle diffusion. Coconut husk-based activated carbon was shown to be an efficient adsorbent for removal of TCP from aqueous solutions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Coconut Husk Activated Carbon, 2,4,6-Trichlorophenol, Adsorption, Isotherm, Kinetics, Response-Surface Methodology, Coir Pith Carbon, Aqueous-Solution, Basic Dye, Chemical-Properties, Methylene-Blue, Removal, Chlorophenols, Equilibrium, 2,4-Dichlorophenol

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Full Text: [2008\Che Eng J144, 400.pdf](2008/Che%20Eng%20J144,%20400.pdf)

Abstract: Removal of dyes and pigments from wastewaters of dying and printing industries is a major environmental issue. Sorption rate and equilibrium parameters of Methylene Blue on granular and powdered activated carbons were investigated in a batch adsorber. Due to the significance of pore diffusion resistance and partial closure of pore mouths by dissociatively chemisorbed dyes, both sorption rate and sorption capacity values evaluated for granular Carbon were lower than the corresponding values for powdered activated carbon. Concentration independent effective pore diffusivity values in the order of magnitude of 10-9 cm2/s were obtained by the moment analysis of a proposed diffusion model (Model I). (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Methylene Blue, Adsorption, Effective Diffusivity, Moment Technique, Low-Cost Materials, Aqueous-Solutions, Catalyzed Decolorization, Synthetic Dyes, Cationic Dyes, Color Removal, Waste-Water, Fly-Ash, Adsorption, Effluent

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Full Text: [2008\Che Eng J145, 259.pdf](2008/Che%20Eng%20J145,%20259.pdf)

Abstract: In this study, the sorption of Cu and Zn onto NaOH-treated oil palm frond (OPF) in a fixed-bed up flow column operated in continuous mode at hydraulic retention times (HRTs) of 6, 12 and 18 min was investigated. The column was operated at room temperature and fed with 100 mg/l of heavy metal solution. The data confirmed high ability of sorption in continuous mode (>90% removal) and breakthrough occurred after 216 min. The whole continuous sorption process was simulated using an empirical model and the parameters were estimated. The fitting of experimental data to different models such as Adams-Bohart. Wolborska, Thomas and Yoon and Nelson Models was also tested for comparison. The best fitting was generally obtained with Adams-Bohart model which showed high degree of fitting within this HRT range. The software used the experimental data to fit a model to simulate the behaviour of the continuous System and was based oil the concentration of the effluent and time as the main variables. A high accuracy (R(2) > 0.96) was achieved and the model was modified to be used for the heavy metal sorption system. (C) 2008 Published by Elsevier B.V.

Keywords: Sorption, Oil Palm Frond, Naoh Treatment, Heavy Metal, Packed Bed, Modeling, Immobilized Activated-Sludge, Packed-Bed, Aqueous-Solution, Heavy-Metals, Dynamic Removal, Biosorption, Adsorption, Ions, Carbon, Adsorbent

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Full Text: [2009\Che Eng J145, 496.pdf](2009/Che%20Eng%20J145,%20496.pdf)

Abstract: Adsorption equilibrium and kinetic of methylene blue (MB) onto natural zeolite was studied in a batch system. Variables of the system include contact time, pH, salt concentration, temperature, and initial MB concentration. The increase in temperature resulted in a higher MB loading per unit weight of the zeolite. Langmuir, Freundlich, Redlich-Peterson, Koble-Corrigan and Temkin isotherm models were applied to experimental equilibrium data of MB adsorption depending on temperature. The effect of contact time at different temperatures and initial concentration were fitted to pseudo-second-order kinetic model. Linear regressive method and nonlinear regressive method were used to obtain the relative parameters. The error analysis was conducted to find whether linear method or nonlinear method was better to predict the experimental results and which model was better to fit the experimental data. Both methods were suitable to obtain the parameters. The Redlich-Peterson equation was best to fit the equilibrium data. The pseudo-second-order kinetic model can be used to describe the adsorption behavior. The nonlinear method may be better with the absolute error as limited condition. The adsorption process was spontaneous and endothermic. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Natural Zeolite, Methylene Blue, Adsorption Isotherm, Kinetic Model, Regressive Analysis, Error Analysis, Low-Cost Adsorbents, Aqueous-Solution, Regression-Analysis, Waste-Water, Activated Carbon, Industry Waste, Dye Removal, Biosorption, Sorption, Isotherm

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Full Text: [2009\Che Eng J146, 86.pdf](2009/Che%20Eng%20J146,%2086.pdf)

Abstract: The flow inside an adsorption column for the treatment of landfill leachate is a poorly understood parameter due to lack of studies on its fluid dynamics. In order to address this matter, axial dispersion modelling was conducted to determine the flow pattern of landfill leachate in a column with palm shell-activated carbon (PSAC) as media. In addition, the treatment profile of leachate via adsorption onto PSAC in terms of chemical oxygen demand (COD) and turbidity removal as well as leachate pH was studied. Lithium chloride (LiCl) was used as a non-reactive tracer. The vessel dispersion number (D/uL) was determined to be between 0.01 and 1, implying small and slow dispersion occurring in a plug flow-like dynamics. The model was applicable for modeling of leachate flow inside a pack bed column. Empty bed contact time (EBCT) was utilized to determine the treatment profile with regards to COD and turbidity removal from leachate. The highest 50% breakthrough of COD removal at 1460 mg/g was obtained at EBCT of 14.7 min. The EBCT has no significant effect on turbidity removal and effluent pH. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Breakthrough, Carbon, Chemical Oxygen Demand, COD, COD Removal, Contact Time, Dispersion, Dynamics, Effluent, Fixed Bed Adsorption, Landfill Leachate, Model, Modeling, Modelling, Palm Shell-Activated Carbon, pH, Removal, Treatment, Vessel Dispersion Number

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Full Text: [2009\Che Eng J146, 90.pdf](2009/Che%20Eng%20J146,%2090.pdf)

Abstract: Adsorption studies for sorption of distillery spent wash onto fly ash particles were studied in both batch and packed column. Equilibrium data were fitted to the Sips, Elvoich and Dubinin-Radushkevich, Redlich-Peterson, Langmuir four types and Ho’s four types of pseudo-second-order kinetic models. The complete error analysis was done to determine the best isotherm model using six different non-linear error functions: chi-square (chi(2)), SUM of square errors (SSEs), composite fractional error function (HYBRD), derivative of Marquardt’s percent standard deviation (MPSD), average relative error (ARE), sum of absolute errors (EABS) and linear regression correlation coefficient (r(2)). The Biot number was determined using internal mass transfer coefficient and the external mass transfer coefficient estimated using Mathews and Weber model and Furusawa and Smith model. The Biot number estimated provides that external film transfer controls the mechanism of sorption of spent wash onto fly ash. Packed column adsorption was analyzed using Thomas model and Adams-Bohart model for different flow rates of studies. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Fly Ash, Kinetics, Mass Transfer Studies, Divalent Metal-Ions, Aqueous-Solutions, Electrochemical Treatment, Nonlinear Methods, Adsorption, Removal, Water, Effluent, Dye, Decolorization

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Full Text: [2009\Che Eng J146, 211.pdf](2009/Che%20Eng%20J146,%20211.pdf)

Abstract: Biosorption can be an efficient low-cost process to remove toxic heavy metals from wastewater This. Study investigated the uptake of Pb2+ by processed orange peels, a pectin-rich byproduct of the fruit juice industry. Potentiometric titrations showed a significantly higher negative surface charge of protonated peels compared to Original peels, with acidic groups around pH 4, 6, and 10. FRIR spectra of peels were similar to those of pectin. The carboxylic group peak shifted from 1636 to 1645 cm-1 after Pb2+ binding, indicated the involvement of caboxyl groups in Pb-2 binding. Depending on the particle size, equilibrium was achieved in 30 min to 2 h. The first-order model was inferior to second- or third-order models. The obtained rate constants were much higher for smaller particles, while the capacity was similar for all sizes. Low pH, increased ionic strength, OF competing co-ions reduced Pb2+ binding at low sorbent dosages, but at high sorbent dosages removal remained above 90%. The Pb2+ uptake at 300 ppm was 2 mmol/g (40% of the dry weight). Due to high uptake, favorable kinetics and good stability, Citrus peel biosorbents hold high promise for industrial applications. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biosorption, Divalent-Cations, Equilibrium, FTIR, Heavy Metals, Heavy-Metal Biosorption, Ionic-Strength, Kinetics, Mechanism, Orange Peel, Pectin Degree, pH, Removal, Sorption, Titration, Transform Infrared-Spectroscopy

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Full Text: [2009\Che Eng J146, 370.pdf](2009/Che%20Eng%20J146,%20370.pdf)

Abstract: Adsorption mechanism of a natural compound, alizarin (1.2-dihydroxyanthraquinone), onto three types of microporous polymeric adsorbents (XAD-4, XAD-7. XAD-16) has been proposed using Langmuir. Freundlich and Redlich-Petersen isotherms. Adsorption capacity and optimum adsorption isotherms were predicted by linear least squares and non-linear regression method. Adsorption kinetics was proposed by pseudo-first and second second order models. The adsorption capacity of XAD-16 was the highest at 0.0424 mg/mg, with initial alizarin concentration of 200 mg/L. Pseudo-second-order kinetics was more appropriate in explaining the adsorption mechanism than pseudo-first-order. Over the studied concentration ranges. only XAD-4 adsorption can be reasonably described by the three isotherms. XAD-16 data is only best-fitted to Langmuir and Redlich-Petersen isotherms. Non-linear method proved a better way to predict the equilibrium isotherm parameters. The combination of parameters, such as specific surface area, pore diameter. polarity of the network of the resins, the solubility and polarity of the adsorbate, are the significant parameters for optimum adsorption process. Crown Copyright (C) 2008 Published by Elsevier B.V. All rights reserved.

Keywords: Adsorption, Isotherm Models, Linear and Non-Linear Regression, Microporous Polymeric Adsorbents, Adsorption Kinetics, Optimum Sorption Isotherm, Activated Carbon, Aqueous-Solution, Equilibrium, Anthraquinones, Cultures, Dyes

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Full Text: [2009\Che Eng J147, 87.pdf](2009/Che%20Eng%20J147,%2087.pdf)

Abstract: This study explored the feasibility of using waste iron hydroxide-eggshell as adsorbent for the removal of phosphate under different experimental conditions. In our experiments, the batch sorption is studied with respect to solute concentration (2.8-110 mg/L), contact time, adsorbent dose (2.5-20 g/L) and solution temperature (20-45°C). The Langmuir, Freundlich, and Langmuir-Freundlich adsorption models were applied to experimental equilibrium data at different solution temperatures and the isotherm constants were calculated using linear regression analysis. A comparison of kinetic models applied to the adsorption of phosphate onto iron hydroxide-eggshell was evaluated for the pseudo-second-order, Elovich, intra-particle diffusion and Bangham’s kinetics models. The experimental data fitted very well the pseudo-second-order kinetic model and also followed by intra-particle diffusion model up to 5 min, whereas diffusion is not only the rate-controlling step. The results show that the sorption capacity increases with an increase in solution temperature from 20 to 45°C at the initial phosphate solution concentration of 27 mg/L The thermodynamics parameters were evaluated. The positive value of ΔH° (81.84 kJ/mol) indicated that the adsorption of phosphate onto iron hydroxide-eggshell was endothermic, which result was supported by the increasing adsorption of phosphate with temperature. The positive value of ΔS° (0.282 kJ/mol) reflects good affinity of phosphate ions towards the waste iron hydroxide-eggshell. The results have established good potentiality for the waste iron hydroxide-eggshell particles to be used as a sorbent for the removal of phosphorus from wastewater. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Aqueous-Solutions, Capacity, Diffusion, Dye Adsorption, Equilibrium, Equilibrium, Fly-Ash, Intra-Particle Diffusion, Isotherm, Kinetic, Kinetic Models, Kinetics, Mechanisms, Modelization, Particles, Phosphorus, Phosphorus Removal, Pseudo Second Order, Removal, Soils, Solute, Sorption, Thermodynamic, Thermodynamics, Wastewater, Water

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Full Text: [2009\Che Eng J147, 150.pdf](2009/Che%20Eng%20J147,%20150.pdf)

Abstract: This work is a contribution to the use of natural, cost-effective biosorbants in industrial wastewater treatment processes, addressing more particularly to the effluents resulting from surface treatment and mining industries. A dead fungal biomass (i.e., Pleurotus mutilus) collected as a waste from an antibiotic production plant was tested as a biosorbent for iron(III)-cyanide complex ions. A physicochemical characterization of this biomass was followed by batch biosorption experiments. Potentiometric titration confirmed by FTIR analysis indicated a variety of functionalities on the biomass surface, primarily carboxylic and amine groups which conferred to the biosorbent a positive charge in acid medium and a negative charge in alkaline medium. Biomass pre-treatment with acetic acid slightly improved its biosorption efficiency which was also affected by the initial pH of the test solution, the size and concentration of biosorbent particles, and the stirring speed of the particle suspension. In particular, the best performance was obtained at strongly alkaline pH (around 12) even though the overall electrical charge of the biomass was negative in this pH range. The sorption kinetics obeyed both pseudo-first-order and pseudo-second-order models and intraparticle diffusion was the main limiting step in the biosorption kinetics. Applying the Langmuir isotherm modelling, the highest biosorption efficiency, i.e., the maximum solid phase concentration of complex ions (forming a complete monolayer coverage on the sorbent surface) was over 620 mg g-1. Continuous fixed-bed sorption-desorption experiments are in progress to confirm these promising results. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption-Kinetics, Aqueous-Solution, Biosorption, Chromium(VI) Biosorption, Cyanide Solutions, Equilibrium Modelling, Fungal Biomass, Fungal Biosorbent, Heavy-Metals, Iron(III)-Cyanide Ions, Kinetic Modelling, Mass-Transfer, Methylene-Blue, Pleurotus Mutilus, Potentiometric Titration, Rhizopus-Arrhizus

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Full Text: [2009\Che Eng J147, 173.pdf](2009/Che%20Eng%20J147,%20173.pdf)

Abstract: The ability of microporous titanosilicate ETS-4 to uptake Cd2+ from aqueous solutions has been investigated, assessing its potential in water remediation. In order to study the equilibrium and the kinetics of the process, batch stirred tank experiments have been carried out by contacting a fixed volume of solution with known masses of ETS-4. The evolution of the cadmium concentration with time has been monitored by inductively coupled plasma mass spectrometry. Concerning equilibrium, Freundlich isotherm performs accurately in the range of experimental conditions studied. The solid loadings measured in this essay surmount significantly the values found in literature for different ion exchangers in the same range of temperatures. A Nernst-Planck based model combining internal and external diffusion resistances has been used to describe the ion exchange process, where the convective mass transfer coefficient and the self-diffusivities of the counter ions are the unique parameters. The Nernst-Planck based model accomplishes good representations (average absolute deviation of 6.74%), even in the transition from the steep descent to the horizontal branch of the bulk concentration versus time curve. The results obtained using the commonly adopted pseudo first- and second-order models found in literature are worse (average absolute deviation of 215.7% and 12.11%, respectively), although more parameters are involved. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Batch Experiments, Cadmium(II), Clinoptilolite, Equilibrium, Ets-4, Ion Exchange, Ion-Exchange Kinetics, Mass-Transfer, Nernst-Planck, Removal, Self-Diffusion Coefficients, Sorption, Systems, Waste, Zeolite-A

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Full Text: [2009\Che Eng J147, 188.pdf](2009/Che%20Eng%20J147,%20188.pdf)

Abstract: The potential of adsorptive removal of Cu(II) ions with titanate nanotubes (TNT) was investigated. TNT was prepared via a hydrothermal treatment of TiO2 powders in a 10 M NaOH solution at 150°C for 24 h, and subsequently washed with HCl aqueous solution of different concentrations. Effects of the alteration of microstructures of TNT, induced by the acid washing process, on the Cu(II) ions removal performance were discussed. Also examined was the effects of Cu(II) adsorption on the pore structure characteristics of TNT. It was experimentally concluded that if the amount of Na+ in the TNT was not very low, the TNT might be a good adsorbent for the removal of Cu(II) ions from aqueous solution with the adsorption capacity reaching 120 mg/g. The adsorption mechanisms of Cu(II) ions from aqueous solution onto TNT were examined with the aid of model analyses of the adsorption equilibrium and kinetic data of Cu(II) ions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Biomass, Cation Exchange, Copper Ions, Heavy-Metals, Lead, Low-Cost Adsorbents, Microstructures, Sodium, Sorption, Temperature, Titanate Nanotubes, Waste-Water

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Full Text: [2009\Che Eng J147, 194.pdf](2009/Che%20Eng%20J147,%20194.pdf)

Abstract: In this study, the adsorption mechanism of cetyltrimethylammonium bromide (CTAB), a cationic surfactant, to a clayey soil from aqueous solution was investigated as a function of ionic strength, pH, temperature, CTAB equilibrium concentration, and stirring speed. In addition, both kinetics and thermodynamic evaluations of the adsorption data were supported with measurements of particle zeta potential and suspension electrical conductivity. The amount of cetyltrimethylammonium bromide adsorbed to clayey soil increased with increasing CTAB equilibrium concentration, temperature and ionic strength, but was not affected from pH and stirring speed. The isosteric enthalpy and entropy changes were calculated as 28.27 kJ mol-1 and -0.091 kJ mol-1 K-1, respectively. This positive enthalpy value indicates that the adsorption process was endothermic. The negative and quite small isosteric entropy change indicates that the orderless of adsorption system slightly decreases with adsorption of CTA+ ions to the clayey soil. In addition, it was found that the kinetic data agrees very well to the pseudo-second-order kinetic model, indicating the presence of effective electrostatic interactions between the charged active sites on the surface and CTA+ ions. The measured zeta potential values of particles support this result. Addition of the neutral electrolyte, NaCl, increased the adsorption efficiency and effectiveness of ionic surfactants due to decreased electrical repulsion between free CTA+ ions and similarly charged adsorbed ions. Polyvalent cations, such as Al3+ and Ca2+, tend to compete for adsorption with CTA+ ions, but the increased ionic strength of the media favored adsorption of CTA+ ions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Anionic Surfactants, Cationic Surfactants, Clayey Soil, Coadsorption, Ctab, Electrolyte, Hydrophobic Interaction, Interface, Model, Pure, Silica, Sodium Dodecyl-Sulfate, Sorption, Systems, Thermodynamics, Zeta Potential

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Full Text: [2009\Che Eng J147, 226.pdf](2009/Che%20Eng%20J147,%20226.pdf)

Abstract: A novel sorbent, *Carica papaya*, was evaluated for sorption of Hg(II) from aqueous solution under the varying conditions of contact time, metal ion concentration, sorbent dose and pH. The results indicate that sorption equilibrium was established in about 120 min. The Hg(II) sorption was strictly pH dependent, and maximum removal was observed at pH 6.5. The sorption interaction of Hg(II) onto C papaya obeyed the pseudo-second order rate equation. The batch biosorption rate for the system based on an intraparticle diffusion rate parameter derived from the plots of Hg(II) sorbed versus the square root of time indicated that the adsorption mechanism was predominantly intraparticle diffusion but there was also a dependence on pore size as the Hg(II) diffuses through macro-, meson-, and microspores. The sorption isotherm data provided a very good fit to the Langmuir isotherm equation with a monolayer sorption capacity of 155.6 mg g-1 and the regression coefficient (R-2) 0.9959 with low S.E. and SSE values. A design procedure was proposed using the Langmuir isotherm to design a two stage sorption system to minimize the amount of biomass required for the treatment of Hg(II) solution using C papaya. Desorption studies indicated that the maximum percent recovery of Hg(II) was 96.7±0.80 with 0.1 N HCl and 99.0±0.49 with 1% KI. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Basic-Dyes, C.Papaya, Desorption, Fly-Ash, Fundamental Properties, Heavy-Metals, Intraparticle Diffusion, Isotherm Models, Kinetics, Mercury, Mercury(II) Removal, Methylene-Blue, *Rhizopus-arrhizus*, Sorption

? Sathishkumar, M., Binupriya, A.R., Kavitha, D., Selvakumar, R., Jayabalan, R., Choi, J.G. and Yun, S.E. (2009), Adsorption potential of maize cob carbon for 2,4-dichlorophenol removal from aqueous solutions: Equilibrium, kinetics and thermodynamics modeling. *Chemical Engineering Journal*, **147** (2-3), 265-271.

Full Text: [2009\Che Eng J147, 265.pdf](2009/Che%20Eng%20J147,%20265.pdf)

Abstract: The present study deals with the adsorption potential of thermally activated carbon developed from maize cob for the removal of 2,4-dichlorophenol (2,4-DCP) from aqueous solutions. Studies were conducted to delineate the effects of contact time, 2,4-DCP initial concentration, pH and temperature. The kinetics of 4-DCP adsorption from a solution onto an adsorbent was explored experimentally. Non-linear form of pseudo-second-order model showed a better fit with good correlation co-efficient. Bangham’s and intraparticle diffusion model were also used. Non-linear form of Langmuir isotherm model was applied and the data correlate well and the maximum adsorption capacity was found to be 17.94 mg/g for the particle size of 250-500 mu m. Acidic pH was favorable for the adsorption of 2,4-DCP. Studies on pH effect and desorption showed that chemisorption mechanism was involved in the adsorption process. Thermodynamic study showed that adsorption of 2,4-DCP on maize cob carbon is more favored. The change in entropy (AS,) and heat of adsorption (Delta H degrees) of maize cob carbon were estimated as 26.91 J/(K mol) and 6.78 kJ/mol, respectively. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: 2,4-Dichlorophenol, Activated Carbon, Adsorption, Agricultural Solid-Waste, Chlorophenols, Coir Pith, Equilibrium, Industry Waste, Kinetics, Liquid-Phase Adsorption, Maize Cob, pH Effect, Pith Carbon, Rice Husk, Substituted Phenols, Thermodynamics, Water

? Kumar, K.V. and Porkodi, K. (2009), Modelling the solid-liquid adsorption processes using artificial neural networks trained by pseudo second order kinetics. *Chemical Engineering Journal*, **148** (1), 20-25.

Full Text: [2009\Che Eng J148, 20.pdf](2009/Che%20Eng%20J148,%2020.pdf)

Abstract: A three-layer feed forward neural network was constructed and tested to analyze the second order kinetics of solid-liquid adsorption process. The pseudo second order kinetics of auramine O onto activated carbon was used to train the artificial neural network (ANN) to model the sorption system for various operating conditions. The operating variables studied are the contact time, initial dye concentration, agitation speed, temperature, initial solution pH and activated carbon mass. The studied operating variables were used as the input to the constructed neural network to predict the dye uptake by pseudo second order kinetics at any time as the output or the target. The dye uptake predicted by ANN trained by pseudo second order kinetics was found to be precise in representing the experimental kinetics of auramine O uptake by activated carbon. The constructed network was also found to be precise in predicting the sorption kinetics of auramine O by activated carbon for the new input data which are kept unaware of the trained neural network showing its applicability to determine the dye uptake rate for any operating conditions under interest. The ANN was also trained using pseudo second order kinetics of sorption of divalent metal ions onto peat particles and also using the second order kinetics of cadmium ions onto tree fern particles. The ANN and pseudo second order kinetics compliment each other to model the studied sorption systems for a wide range of operating conditions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Artificial Neural Networks, Equilibrium, Feed Forward Network, Ions, Kinetics, Malachite Green, Optimization, Pseudo Second Order Kinetics, Removal, Simulation, Solid-Liquid Adsorption, Sorption, Systems, Tree Fern

? Akar, S.T., Gorgulu, A., Kaynak, Z., Anilan, B. and Akar, T. (2009), Biosorption of Reactive Blue 49 dye under batch and continuous mode using a mixed biosorbent of macro-fungus *Agaricus bisporus* and *Thuja orientalis* cones. *Chemical Engineering Journal*, **148** (1), 26-34.

Full Text: [2009\Che Eng J148, 26.pdf](2009/Che%20Eng%20J148,%2026.pdf)

Abstract: A biosorbent was developed by mixing the macro-fungus Agaricus bisporus and Thuja orientalis cones and Successfully used for the biosorption of Reactive Blue 49 (RB49) dye. The biosorbent system was evaluated in batch and continuous biosorption process. A series of batch studies was carried out to identify the Optimum biosorption conditions Such as pH, biosorbent dosage and equilibrium time. The biosorption process followed the pseudo-first-order and the pseudo-second-order kinetic models and the Freundlich, Langmuir and Dubinin-Radushkevich (D-R) isotherm models at different temperatures. The maximum biosorption capacity of the mixed biomass system was 1.85🞨10-4 mol g-1 at 45°C. The negative ΔG° values and the positive ΔH values indicated that the biosorption process was spontaneous and endothermic. The dynamic flow biosorption potential of the biomass system was investigated as a function of the now rate, column size and inlet solute concentration. FTIR and SEM analysis were used to characterize the biosorbent and biosorption mechanism. The functional groups Such as carboxyl, amine, amide and hydroxyl on the biosorbent surface may be responsible for RB49 biosorption. In combination, our results Suggest that this eco-friendly and economical biomass system may be useful for the removal of contaminating reactive dyes. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, *Agaricus bisporus*, Aqueous-Solutions, Basic Dye, Biosorption, Dye Pollution, Equilibrium, Isotherm, Kinetics, Kinetics, Methylene-Blue, Removal, Textile Dye, *Thuja orientalis*, Treated Biomass, Waste Biomass

? Naiya, T.K., Chowdhury, P., Bhattacharya, A.K. and Das, S.K. (2009), Saw dust and neem bark as low-cost natural biosorbent for adsorptive removal of Zn(II) and Cd(II) ions from aqueous solutions. *Chemical Engineering Journal*, **148** (1), 68-79.

Full Text: [2009\Che Eng J148, 68.pdf](2009/Che%20Eng%20J148,%2068.pdf)

Abstract: The ability of saw dust and neem bark as low-cost natural adsorbents were investigated for adsorptive removal of Zn(II) and 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 optimum pH for adsorption was found to be 5 for Zn(II) and 6 for Cd(II). Kinetics data were best described by pseudo-second-order model. Mass transfer coefficients were also determined for individual adsorbents for removal of Zn(II) and Cd(II) ions from aqueous solutions. The equilibrium adsorption data were fitted to Langmuir and Freundlich isotherm models for Zn(II) and Cd(II) adsorption respectively. The adsorption capacities (*q*max) for individual metal ions in terms of monolayer adsorption were compared with the other reported values. The sorption energy calculated by using Dubinin-Radushkevich isotherm for different system indicated that the adsorption process is physical in nature. The thermodynamic equilibrium constant and the Gibbs free energy were determined for each system and results indicated the spontaneous nature of the adsorption process. FT-IR studies were carried out to understand the type of functional groups in saw dust and neem bark responsible for metal binding process. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Capacities, Bagasse Fly-Ash, Cadmium, Cadmium(II), Functional Groups, Isotherm, Kinetics, Lead, Low-Cost, Metal Binding Process, Metal-Ions, Neem Bark, Saw Dust, Sorption, Toxic Metals, Waste-Water, Zinc, Zinc(II)

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Full Text: [2009\Che Eng J148, 80.pdf](2009/Che%20Eng%20J148,%2080.pdf)

Abstract: The influence of equilibration conditions and hydroxyapatite (HAP) physico-chemical properties onto retention of Cu2+ ions was studied in batch conditions. The amount of cation removed from the solution increased with increasing pH, reaching almost 100% at pH 3. 4 and 7 for 5🞨10-4, 10-3 and 5🞨10-3 mol/dm3 solutions. respectively. Contact time necessary for reaching equilibrium was found to increase with the increase of Cu2+ concentration. Kinetic and equilibrium data were best described by pseudo-second-order kinetic model and Langmuir theoretical model. The calculated values of separation factors and Gibbs free energy change confirmed that the sorption was spontaneous and thermodynamically feasible at room temperature. The experiments conducted using HAP samples with different physico-chemical characteristics have revealed that the amounts of sorbed Cu2+ depended mainly on the specific surface area and crystallinity of the applied powders. Desorption of Cu2+ was more efficient in acidic conditions than in the Solution of competing cation-Ca2+. The samples with higher sorption capacities also demonstrated higher stability; consequently, from the aspects of both higher sorption and lower desorption, utilization of low-crystalline HAP samples with high specific surface area was superior for immobilization of Cu2+ ions. Taking into account molar Cu/Ca ratios. observed final pH changes, copper speciation in the function of pH and the results of X-ray diffraction analyses, conclusions about sorption mechanisms at different experimental conditions were derived. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Copper(II) Ions, Cu(II), Cu2+, Desorption, Fly-Ash, Hydroxyapatite, Lead, Metal-Ions, Removal, Sorption, Sorption Properties, Zinc

? Wang, X.S., Tang, Y.P. and Tao, S.R. (2009), Kinetics, equilibrium and thermodynamic study on removal of Cr(VI) from aqueous solutions using low-cost adsorbent Alligator weed. *Chemical Engineering Journal*, **148** (2-3), 217-225.

Full Text: [2009\Che Eng J148, 217.pdf](2009/Che%20Eng%20J148,%20217.pdf)

Abstract: The removal of Cr(VI) from aqueous solutions using Alligator weed, a freshwater macrophyte, was investigated as a function of initial pH, contact time, reaction temperature and adsorbent concentration in batch studies. An initial solution pH of 1.0 was most favorable for Cr(VI) removal. The kinetic experimental data fitted the pseudo-second-order equation, Elovich equation and Langmuir-Hinshelwood equation very well. The adsorption of Cr(VI) onto Alligator weed conformed to the linear forms of the Langmuir, Freundlich and Temkin equations. The removal efficiencies increased with the increased adsorbent dose from 1 to 8 g/L and were 86.6, 97.6 and 99.7% at the adsorbent dose of 8 g/L, solution pH 1.0 and temperatures of 30, 40 and 50 C, respectively. Thermodynamic parameters (activation enthalpy change, activation entropy change and activation free energy change) revealed that the adsorption of Cr(VI) onto Alligator weed is endothermic, non-spontaneous, with a decreased randomness in nature. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alligator Weed, Biomass, Biosorbents, Biosorption, Biosorption, Chromium(VI), Cr(VI), Cr(VI), Hazelnut Shell, Kinetics, Low-Cost Adsorbent, Macrophytes, Metal-Ions, Pseudo Second Order, Sorption, Thermodynamics

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Full Text: [2009\Che Eng J148, 226.pdf](2009/Che%20Eng%20J148,%20226.pdf)

Abstract: Peepul leaves were identified as the most potent Pb(II) sorbent (*q*max = 127.34 mg g-1), followed in decreasing order by banana peels (72.79 mg g-1), peanut hulls (69.75 mg g-1), coir fibers (52.03 mg g-1), rice stem (49.57 mg g-1). teak saw dust (40.70 mg g-1), discarded tea leaves (35.89 mg g-1), mango leaves (31.54 mg g-1), rice husk (31.13 mg g-1) and grass clippings (29.05 mg g-1). The tested plant materials sorbed Pb(II) optimally at pH 4 or 5, but peepul leaves showed substantial sorption even at lower pH values. Kinetics of Pb(11) sorption by the selected biomass types, excepting peepul leaves. was very fast with >90% sorption occurring within 10 min. The kinetic data of Pb(II) sorption are in good agreement with both pseudo-first-order and -second-order reaction models. However, external diffusion, rather than infra-particle diffusion, seems to be the major mechanism of Pb(II) sorption by the tested plant materials. The isotherm data of Pb(II) biosorption more significantly fitted to Langmuir (r2 = 0.96-0.99) than to Freundlich (r2 = 0.88-0.97) model. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Algae, Aqueous-Solution, Biosorption, Biosorption, Black Gram Husk, Cd(II), Equilibrium, Heavy-Metal Adsorption, Lead, Pb(II), Plant Materials, Removal, Sawdust, Sorption Isotherms, Sorption Kinetics

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Full Text: [2009\Che Eng J148, 354.pdf](2009/Che%20Eng%20J148,%20354.pdf)

Abstract: This study was to evaluate the adsorption capability of clay minerals of bentonite, kaolin and zeolite to remove Congo Red from aqueous solution. The experiments were carried out in a batch system to optimise operation variables: adsorbent dosage. Congo Red concentration, pH and temperature. Adsorption kinetic and equilibrium isotherm of the clay materials were studied using pseudo-first order and second order kinetic equations, and Freundlich and Langmuir models. The equilibrium data of kaolin was found to best fit to the Langmuir model, while bentonite and zeolite were best explained by the Freundlich model. The adsorption kinetic followed the pseudo-second order equation for the three adsorbents. Intra-particle diffusion studies revealed that the adsorption rates were not solely controlled by the diffusion step. Further thermodynamic investigations showed that the adsorption is an exothermic and spontaneous process. Sodium bentonite demonstrated the best adsorptive capacity followed by kaolin clay, and they can be employed as low-cost alternatives for recalcitrant dye removal from industrial wastewater. (C) 2008 Published by Elsevier B.V.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Basic Dye, Congo Red, Dye Adsorption, Fly-Ash, Freundlich Model, Kaolin, Methylene-Blue, Pseudo Second Order, Removal, Sodium Bentonite, Sorption, Waste, Water, Zeolite

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Full Text: [2009\Che Eng J148, 378.pdf](2009/Che%20Eng%20J148,%20378.pdf)

Abstract: The adsorption behaviour of beta-carotene on synthetic adsorbent was studied by batch tests. This study was to develop the adsorption isotherm and thermodynamic aspects of beta-carotene from crude palm oil on native silica. The experiments were studied by employing a spectrophotometer to measure the concentration of beta-carotene before and after adsorption. The effects of various parameters such as contact time, temperature and initial beta-carotene concentration were determined. The adsorption capacity increased with increasing contact time and temperature. Langmuir and Freundlich isotherms were applied to fit the equilibrium data to identify the best isotherm to describe the beta-carotene adsorption. The data were best described by Langmuir isotherm, maximum monolayer adsorption capacity of beta-carotene onto florisil was 86.207 mg/g. Three kinetic models were used to investigate the adsorption mechanism which included pseudo-first-order kinetic, pseudo-second-order kinetic and intraparticle diffusion models. The adsorption followed second-order kinetic model. The data obtained from adsorption isotherm models were used to determine the thermodynamic parameters such as enthalpy change (ΔN). entropy change (ΔS) and free energy change (ΔG). The positive value of Delta H indicated that the adsorption process was endothermic in nature. The negative value of ΔG indicated the spontaneity of the adsorption of beta-carotene on the adsorbents. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Aqueous-Solution, Basic Dye, Beta-Carotene, Equilibrium, Isotherm, Isotherms, Kinetics, Palm Oil, Pseudo Second Order, Sepiolite, Sorption, Thermodynamics

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Full Text: [2009\Che Eng J148, 420.pdf](2009/Che%20Eng%20J148,%20420.pdf)

Abstract: In this study, the use of Amberlite IR-120, a strong acidic cation exchange resin. was investigated to remove calcium impurity from saturated boric acid solutions. Calcium impurity arised from high calcium content of colemanite ore is a very important problem as it increases impurity on the boric acid crystals. Ion exchange experiments were carried out in batch mode as a function of solution pH. resin-to-solution ratio, temperature, and resin contact time. Optimum operation conditions were determined as pH 1.5, resin-to-solution ratio 6.174 g/250 mL, temperature 303 (K), contact time 20 min and, in those conditions maximum calcium removal was about 99%. Also, data calculated by a mass balance equation were employed with the pseudo-first-order and the pseudo-second-order equations. It was determined that the pseudo-second-order equation was the best fitting kinetic equation with a correlation range of 0.991-1. Furthermore, an empirical kinetic model was developed to predict operational conditions of the batch process in the following form; t/q(t), = 6.1452🞨(S/L)(0.8903)🞨[H+](-0.00094)🞨exp(-31.2181/T)🞨[C-0](-0.7319)🞨t(0.9567). (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Batch, Boric Acid, Boron-Containing Wastewaters, Calcium Removal, Elovich Equation, Empirical Model, Heavy-Metals, Ion Exchange, Pseudo Second Order, Reactor, Recovery, Sorption, Waste Minimization, Water

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Full Text: [2009\Che Eng J148, 480.pdf](2009/Che%20Eng%20J148,%20480.pdf)

Abstract: The adsorption of Cu(II) ions from aqueous solutions by hazelnut shell activated carbon (HSAC) was studied in a batch adsorption system. Factors influencing copper adsorption such as initial copper ion concentration (25-200 mg L-1), pH (2-6), adsorbent dosage (0.5-3.0 g L-1) and temperature (293-323 K) were investigated. The adsorption process was relatively fast and equilibrium was established about 90 min. Maximum adsorption of Cu(II) ions occurred at around pH 6. A comparison of the kinetic models on the overall adsorption rate showed that the adsorption system was best described by the pseudo second-order kinetics. Desorption experiments were carried out to test the performance of the carbon and desorption efficiencies in four cycles were found to be in the range 74-79%. The adsorption equilibrium data fitted best with the Langmuir isotherm and the monolayer adsorption capacity of Cu(II) ions was determined as 58.27 mg g-1 at 323 K. Thermodynamic parameters were calculated for the Cu(II) ion-HSAC system and the positive value of OH (18.77 kJ mol-1) showed that the adsorption was endothermic and physical in nature. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Biosorption, Cadmium, Copper Ions, Cr(VI), Desorption, Hazelnut Shell Carbon, Heavy-Metals, Kinetics, Olive Stones, Pseudo Second Order, Removal, Sawdust, Sorption, Waste-Water

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Full Text: [2009\Che Eng J149, 123.pdf](2009/Che%20Eng%20J149,%20123.pdf)

Abstract: A new composite adsorbent, iron oxide coated zeolite (IOCZ). was characterized and employed for the removal of Cu(II) from aqueous Solution using fixed bed column. Scanning electron microscope (SEM), FTIR, X-ray diffraction spectrum (XRD) and BET analyses were used to study the surface properties of the coated layer. The effects of various experimental conditions, such as the flow rate, initial metal concentration and bed depth, were studied. The dynamics of the adsorption process were fitted by Adams-Bohart model and Thomas model. The Thomas model was found suitable for the description of breakthrough curve at all experimental conditions, while Adams-Bohart model was only for an initial part of dynamic behavior of the IOCZ column. The bed depth service time (BDST) model was applied to predict the service times with other flow rate and initial concentration. The theoretical breakthrough curve was compared with experimental breakthrough curve profile in the dynamic process. The saturated column was regenerated by I mol l-1 hydrogen chloride solution and IOCZ could be reused in Cu(II) removal. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Behavior, Biosorption, Chromium(III), Column Adsorption, Copper Ion, Dynamic Model, Ion-Exchange, Iron Oxide-Coated Zeolite (IOCZ), Lead(II), Natural Zeolite, Waste, Water

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Full Text: [2009\Che Eng J149, 242.pdf](2009/Che%20Eng%20J149,%20242.pdf)

Abstract: X-ray powder diffraction (XRPD) analysis demonstrated that the main montmorillonite component of Unye bentonite was more effective in the Pb2+, Cull, Ni2+, Co2+, Zn2+, Al3+ and Fe3+ fixation processes in the interlayer space of the mineral than the nonclay fractions. All cation-exchanged bentonites experienced slight shifts in non-lattice bands whereas the features emerged at similar to 3400 and 3200 cm(-1) are unique to the newly inserted cations. The clay dehydration up to 150 degrees C and then the release of the water of the cation hydration shell in the temperature range of 150-300 degrees C were followed by dehydroxilation between 300 and 700 degrees C, after which no water remains in the bentonite structure. Additional features observed at elevated temperatures were assigned to the cation migration and the collapse of the clay framework. The surface areas of the Zn- and Fe-bentonites and those of the Pb-, Cu-, Ni-, Co- and Al-bentonites were found to be much higher and lower than that of raw bentonite, respectively, which were explained by the emergence of the micropores and medium mesopores in the interlayer spacings of the samples, respectively. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Analyses, Analysis, Atr, Base-Line, Bentonite, Bentonites, BET, Cation, Cation Exchange, Characterization, Clay, Co, Co2+, Cu, Dehydration, Framework, Heavy-Metals, Hydration, Kaolinite, Measurement, Migration, Minerals, Montmorillonite, Ni2+, Pb, Pb(110) Surface, Pb2+, Pore Structure, Release, Rights, Society Source Clays, Structure, Surface, Surface Area, Surface Areas, Temperature, Thermal Analysis, Water, X-Ray, XRPD, Zn2+

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Full Text: [2009\Che Eng J149, 143.pdf](2009/Che%20Eng%20J149,%20143.pdf)

Abstract: This study investigates the feasibility Of using synthetic zeolite Na A-X blend prepared from fly ash as near surface disposal backfill material. Tests were conducted at laboratory scale to evaluate the physical and chemical properties of the prepared zeolite. The zeolite density, porosity, and particle size distribution were measured. The distribution coefficient (K-d) value of Cs ions was evaluated using batch sorption experiment in synthetic groundwater to simulate possible conditions for near surface disposal. The transient behavior of the batch sorption experimental data were analyzed using Lagergren, Ho and Mckay. and Morris-Weber rate models to assess the controlling mechanism of the sorption process. It was found that the sorption process is chemisorption and controlled by diffusion mechanism. The dispersional behavior of Cs ions on the prepared material was studied using column experiment and the hydrodynamic dispersion coefficient was determined. To provide an overall functional performance of the proposed backfill material, the long-term behavior of the prepared zeolite has been evaluated using computer model. This model consists of two modules that has been developed to study the migration of Cs radionuclides from bare cementitious waste form through the backfill. The study compares the release rate from bentonite-crushed rock mixture to that from the prepared zeolite. The result demonstrates that synthetic zeolite Na A-X blend shows a better performance in terms of radionuclide containment. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Backfill Material, Batch, Behavior, Cesium, Chemistry, Clay, Compacted Bentonite, Hydraulic Conductivity, Liner, Mathematical Models, Mixtures, Radioactive Wastes, Sorption, Synthetic Zeolite

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Full Text: [2009\Che Eng J149, 196.pdf](2009/Che%20Eng%20J149,%20196.pdf)

Abstract: The synthetic iron(III)-tin(IV) mixed oxide (HITMO) has been characterized by the FTIR, XRD and SEM image analyses. The mixed oxide is found hydrated and amorphous with irregular surface morphology. The relevant parameters studied for fluoride removal by using HITMO are the effects of pH, contact time, and equilibrium. The fluoride adsorption capacity is nearly constant in the pH range 5.0-7.5. The pseudo-second order equation explains the kinetic data well and, the overall rate is multi-stage controlled. The Langmuir isotherm describes the equilibrium data well and gives high Langmuir capacity (similar to 10.50 mg g-1) value. The mean adsorption energy (9.05 kJ mol-1) computed from the Dubinin-Redushkevich isotherm suggests the ion exchange mechanism for fluoride adsorption. The evaluated change of enthalpy (ΔH-0), entropy(ΔS-0) and free energy (ΔG(0)) of adsorption values indicates the endothermic and non-spontaneous nature of the present reaction. Excepting bicarbonate, other common ions show no adverse effect on fluoride removal. The regeneration (similar to 75%) of fluoride-rich (10.0 mg g-1) material is possible by a solution of pH 13.0. Two gram HITMO per liter of the fluoride-doped (2.97 mg L-1) natural water reduces fluoride level below 1.5 mg L-1 (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Alumina, Drinking-Water, Equilibrium, Fixed-Bed, Fluoride, Fly-Ash, Iron(III)-Tin(IV) Mixed Oxide, Kinetics, Kinetics, Low-Cost Materials, Removal, Sorption, Thermodynamics

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Full Text: [2009\Che Eng J149, 249.pdf](2009/Che%20Eng%20J149,%20249.pdf)

Abstract: In this work, the adsorption of lead(II) was studied on activated carbon prepared from Tamarind wood with zinc chloride activation. Adsorption studies were conducted in the range of 10-50 mg/l initial lead(II) concentration and at temperature in the range of 10-50°C. The experimental data were analyzed by the Freundlich isotherm and the Langmuir isotherm. Equilibrium data fitted well with the Langmuir model and Freundlich model with maximum adsorption capacity of 43.85 mg/g. The rates of adsorption were found to confirm to pseudo-second-order kinetics with good correlation and the overall rate of lead(II) uptake was found to be controlled by pore diffusion, film diffusion and particle diffusion. throughout the entire adsorption period. Boyd plot confirmed that external mass transfer was the rate-limiting step in the sorption process. Different thermodynamic parameters, viz., ΔH°, ΔS°, and ΔG° have also been evaluated and it has been found that the sorption was feasible, spontaneous and endothermic in nature. The results indicate that the Tamarind wood activated could be used to effectively adsorb lead(II) from aqueous solutions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Characteristics, Aqueous-Solutions, Bagasse, Biomass, Chemical Activation, Coconut Shells, Column, Lead Removal, Pb(II), Performance, Reactor, Recovery, Removal, Wastewater Treatment, Zinc Chloride

? Kyzas, G.Z., Bikiaris, D.N. and Lazaridis, N.K. (2009), Selective separation of basic and reactive dyes by molecularly imprinted polymers (MIPs). *Chemical Engineering Journal*, **149** (1-3), 263-272.

Full Text: [2009\Che Eng J149, 263.pdf](2009/Che%20Eng%20J149,%20263.pdf)

Abstract: In this study, two water-compatible molecularly imprinted polymers (MIPs) were prepared for the selective adsorption of a Reactive Red (RR) and Basic Red dye (BR). The preparation of BR-MIP was carried out in organic medium, while the preparation of RR-MIP in aqueous medium. Characterization of the obtained dye-MIPs was achieved by FTIR spectra, SEM micrographs, and swelling experiments. Kinetic experiments were successfully described by the intraparticle diffusion model. Equilibrium experiments, at various temperatures, were described by the Freundlich model. The process was endothermic and could be classified as electrostatic adsorption. The effect of pH on adsorption and desorption was studied, as well as a potential adsorption/rebinding mechanism of dyes by MIPs is also proposed. The regenerability of MIPs was affirmed in four sequential cycles of adsorption/desorption, without significant loss in adsorption capacity. Selectivity experiments showed the high affinity of target molecules over competitive dyes for the respective MIPs. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Basic Dyes, Binding, Biosorbents, Design, Effluent, Heat, Isotherms, Kinetics, Kinetics, Molecular Imprinting, Reactive Dyes, Real Effluents, Selective Adsorption, Sorption, Thermodynamics

? Kumar, P.A., Ray, M. and Chakraborty, S. (2009), Adsorption behaviour of trivalent chromium on amine-based polymer aniline formaldehyde condensate. *Chemical Engineering Journal*, **149** (1-3), 340-347.

Full Text: [2009\Che Eng J149, 340.pdf](2009/Che%20Eng%20J149,%20340.pdf)

Abstract: An amine-based polymer, aniline formaldehyde condensate (AFC) was coated on silica gel and used as an adsorbent for removal of trivalent chromium [Cr(III)] in aqueous environment. A comparative study with mixed metal solutions containing Cu(II), Cd(II), Pb(II), Cr(III) and Ni(II) showed that adsorption was in the order of Cu(II) > Ni(II) > Cr(III) > Pb(II) > Cd(II). Comparative adsorption of mixed metal ions by AFC was according to preferences dictated by the hard-soft theory of acids and bases and ligand exchange rate of metal ions. It was observed that in mixed metal solution Cr(III) adsorption by AFC though thermodynamically favoured with high binding constant, however, limited kinetically. Cr(III) adsorption by AFC increased with pH achieving maximum removal of 80% at pH 6. Formation of multidentate coordinate bond between [CrOH]2+ and [Cr(OH)2]1+ and deprotonated amine group (-NH2) of AFC was probable mechanism for removal of Cr(III) in aqueous environment. Adsorption of Cr(III) on AFC followed Lagergren’s second order kinetic model and Langmuir-Freundlich’s isotherm model with maximum monolayer coverage of 30.77 mg/g (0.57 mmol/g). Electromagnetic paramagnetic resonance and energy dispersive X-ray spectra confirmed the presence of trivalent chromium ion on surface of AFC coated silica gel. (C) 2009 Published by Elsevier B.V.

Keywords: Agricultural Waste, Aniline Formaldehyde Condensate, Aqueous-Solutions, Coated Silica-Gel, Coordination Bond, Cr(III), Cr(VI), Dyes, Environment, Hard-Soft Theory Of Acid-Bases, Hexavalent Chromium, Ligand Exchange Rate, Mixed Metal Solution, Removal, Trivalent Chromium, Waste-Water

? Acharya, J., Sahu, J.N., Sahoo, B.K., Mohanty, C.R. and Meikap, B.C. (2009), Removal of chromium(VI) from wastewater by activated carbon developed from Tamarind wood activated with zinc chloride. *Chemical Engineering Journal*, **150** (1), 25-39.

Full Text: [2009\Che Eng J150, 25.pdf](2009/Che%20Eng%20J150,%2025.pdf)

Abstract: In this work, the adsorption of chromium(VI) was studied on activated carbon prepared from Tamarind wood with zinc chloride activation. Adsorption Studies were conducted in the range of 10-50 mg/l initial chromium(VI) concentration and at temperature in the range of 10-50°C. The experimental data were analyzed by the Freundlich isotherm and the Langmuir isotherm. Equilibrium data fitted well with the Langmuir model and Freundlich model with maximum adsorption capacity of 28.019 mg/g. The rates of adsorption were found to confirm to pseudo-second-order kinetics with good correlation and the overall rate of chromium(VI) uptake was found to be controlled by pore diffusion, film diffusion and particle diffusion, throughout the entire adsorption period. Boyd plot confirmed that external mass transfer was the rate-limiting step in the adsorption process. Different thermodynamic parameters. viz., ΔH°, ΔS°and ΔG° have also been evaluated and it has been found that the adsorption was feasible, spontaneous and endothermic in nature. The results indicate that the Tamarind wood activated could be used to effectively adsorb chromium(VI) from aqueous solutions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Aqueous-Solutions, Chemical Activation, Chromium Removal, Cr(VI), Husk, Mechanisms, Pb(II), Performance, Sorption, Wastewater Treatment, Zinc Chloride

? Nadeem, R., Nasir, M.H. and Hanif, M.S. (2009), Pb (II) sorption by acidically modified *Cicer* *arientinum* biomass. *Chemical Engineering Journal*, **150** (1), 40-48.

Full Text: [2009\Che Eng J150, 40.pdf](2009/Che%20Eng%20J150,%2040.pdf)

Abstract: In this study, efficacy of native and acidically modified Cicer arientinum pod biomass was investigated for Pb (II) removal using metal ion concentration, kinetic, sorbent dose, pH and pretreatment as operational parameters. The metal uptake of biomass increased as a result of pretreatments and maximum sorption capacity (171.28 mg/g) was shown by H3PO4 modified biomass. The sorption capacity increased in the order H3PO4 > H2SO4 > HCl > native, with increase in metal concentration. The equilibrium data was analysed using different sorption models to know sorption mechanism and results of ANOVA showed that Dubinin-Radushkevich model is fitted well to the experimental data. Sorption rate was slow because equilibrium was attained within 7 h and rate was best described by pseudo-first-order, second-order rate equation, Bangham and intraparticle diffusion models. Sorption capacity was maximum at pH 4 and it was observed also that sorption capacity decreased but % removal increased with increase in biosorbent dose. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Anova, Aqueous-Solution, Biosorption, Cicer Arientinum, Heavy-Metal Biosorption, Hexavalent Chromium, Ions, Isotherms, Kinetic, Lead, Marine-Algae, pH, Removal, Sorption, Waste-Water

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Full Text: [2009\Che Eng J150, 55.pdf](2009/Che%20Eng%20J150,%2055.pdf)

Abstract: Two silica samples were prepared through precipitation of silica in the presence and absence of magnetite particles (Fe3O4). The products were immobilized with 3-aminopropyltriethoxysilane and characterized by means of FNR and X-ray. Surface area (BET), pore volume and pore diameter were also measured. The adsorption behavior of both silicas towards C.I. acid orange 10 in aqueous solutions was studied at different experimental conditions including contact time, pH and initial concentrations. The monoamine modified magnetic silica (MAMMS) displayed higher and faster adsorption relative to magnetite free one (MAMPS). The maximum adsorption capacity of the dye on MAMPS and MAMMS are 48.98 and 61.33 mg g-1, respectively. Adsorption of the dye on both MAMMS and MAMPS fitted to Langmuir adsorption model and followed the pseudo-second order kinetics. The values of Gibbs free energy of adsorption (ΔG(0)) were found to be -26.52 and -28.49 kJ/mol at 298 K for MAMPS and MAMMS. respectively. These negative values indicated the spontaneity of the adsorption of the dye on both silica samples. Regeneration of the dye-loaded silica was carried out using aqueous solution of pH 10. Desorption ratio of 98% was obtained over three adsorption/desorption cycles. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorption, Adsorption Behavior, Anionic Dyes, Aqueous-Solutions, Chitosan, Equilibrium, Magnetic Silica, Modified Silica, Nanoparticles, pH, Reactive Dyes, Removal, Sorption, Water Treatment

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Full Text: [2009\Che Eng J150, 90.pdf](2009/Che%20Eng%20J150,%2090.pdf)

Abstract: Gypsum was investigated as an inexpensive and efficient adsorbent to remove Toluidine Blue from aqueous solution. The adsorption studies were carried out at room temperature. Batch mode experiments were conducted at 25°C to study the effects of pH and initial concentration of Toluidine Blue. The adsorption data was analyzed by using the Langmuir, Freundlich and Tempkin isotherm models and was found to give better results with respect to Langmuir equation. The maximum monolayer adsorption capacity was found to be 28 mg of the dye per gram of gypsum. The data were also studied in terms of their kinetic behavior and was found to obey the pseudo second order equation. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Basic Dye, Dye, Dye Adsorption, Equilibrium, Fly-Ash, Gypsum, Kinetic-Behavior, Kinetics, Methylene-Blue, pH, Removal, Textile Effluent, Toluidine Blue, Water

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Full Text: [2009\Che Eng J150, 96.pdf](2009/Che%20Eng%20J150,%2096.pdf)

Abstract: The possibility of selective preconcentration of palladium(H) complexes by the polystyrene-divinylbenzene (Varion ATM, ADM) and polyacrylate (Varion ADAM) anion exchangers and the mechanism of their sorption onto these anion exchangers were investigated. The aim of this study was to find an appropriate model for the kinetics of Pd(II) complexes sorption and examine the influence of acids concentration and phase contact time on palladium(II) preconcentration. The rate constants for the three models (pseudo-first and pseudo-second and intraparticle diffusion) and the correlation coefficients have been calculated in order to assess which model provides the best fit predicted data with experimental results. The pseudo-second order equation provides the best fit to experimental data. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Anion Exchanger, Aqueous-Solutions, Extraction, Ion-Exchangers, Nitric-Acid, Noble Metals, Platinum-Group Metals, Preconcentration, Reactive Dyes, Separation, Sorption, Sorption Kinetics, Spectrophotometric Determination

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Full Text: [2009\Che Eng J150, 122.pdf](2009/Che%20Eng%20J150,%20122.pdf)

Abstract: Batch studies were conducted for thermodynamic, kinetics and equilibrium studies on the biosorption of Acid Blue 225 (AB 225) and Acid Blue 062 (AB 062) from aqueous solution by *Paenibacillus macerans*. The operating variables studied were initial dye concentration, biomass concentration, contact time, temperature and solution pH. Results show that the pH value of 1 is favorable for the biosorption of dyes. The biosorption data have been analysed using Langmuir, Freundlich and Tempkin isotherms. The isothermal data for biosorption followed Langmuir Model. The biosorption processes conformed to the pseudo-second-order rate kinetics. Thermodynamic parameters such as enthalpy, entropy, and Gibb’s free energy changes were also calculated and it was found that the biosorption of dyes by Paenibacillus macerans was a spontaneous process. The biosorption mechanism of biomass was explained by FT-IR spectroscopy and the FT-IR spectrum confirmed the presence of -COOH, C=O, and -NH2 groups in the biomass structure. The maximum adsorption efficiency of AB 225 and AB 062 is 94.98 mg g-1 and 95.08 mg g-1, respectively. (C) 2009 Published by Elsevier B.V.

Keywords: Acidic Dye, Adsorption, Biosorption, Chitosan, Effluent, Fungus Aspergillus-Niger, Isotherms, Kinetic, Langmuir, Methylene-Blue, *Paenibacillus macerans*, pH, Reactive Dyes, Removal, *Rhizopus-arrhizus*, Wastewaters, Water

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Full Text: [2009\Che Eng J150, 145.pdf](2009/Che%20Eng%20J150,%20145.pdf)

Abstract: The present study investigates the adsorption potential of metal sludge (a waste product of the electroplating industry) for the removal of cadmium from water. The adsorption capacity of the waste sludge for cadmium was ca. 40 mg g-1 at 25°C. The adsorption was studied as a function of contact time, concentration and temperature by batch experiments. The adsorption has been found to be endothermic and data conform to the Langmuir model. The analysis of kinetic data indicates that the present adsorption system followed pseudo-first-order kinetics. After the adsorption studies, the metal-laden sludge adsorbent was immobilized in cement for its ultimate disposal. Physical properties such as initial and final setting time and the compressive strength of cement-stabilized wastes were tested to investigate the effect of the metal-laden sludge. The results of the present study clearly reveal that waste metal sludge can be used beneficially in treating industrial effluents containing cadmium and safely disposed of by immobilizing into cement. The proposed technology provides a two-fold advantage of wastewater treatment and solid waste management. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption Rates, Aqueous-Solution, Blast-Furnace Sludge, Cadmium Removal, Cement Immobilization, Equilibrium Isotherm Analyses, Fly-Ash, Heavy-Metals, Isotherms, Kinetic Modeling, Low-Cost Adsorbent, Red Mud, Rice Husk, Solid-Waste, Waste Metal Sludge, Wastewater Treatment

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Full Text: [2009\Che Eng J150, 280.pdf](2009/Che%20Eng%20J150,%20280.pdf)

Abstract: The removal of Co(II) and Ni(II) from aqueous solutions in the presence of complexing agent on the polyacrylate anion exchangers with different basicity of functional groups Amberlite IRA 458, Amberlite IRA 958 and Amberlite IRA 67 was described. The complexing agent Baypure CX 100 is a new generation of chelators, undergoing biodegradation. It constitutes an alternative for the reagents of EDTA or NTA type. The studies were carried out by the static (batch) and the dynamic (column) methods. The influence of several parameters such as ratio of M(II)-L, pH, temperature were studied with respect to sorption equilibrium. Sorption isotherms were obtained and fitted using the Langmuir and Freundlich models. Kinetic curves were fitted using the pseudo first-order, the pseudo second-order as well as the intraparticle diffusion model equations to evaluate most effective one. Physicochemical properties of anion exchangers such as their structure, basicity of functional groups were also taken into account. Additionally, the obtained results were compared with those for the weakly acidic cation exchanger Purolite C-104. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Aqueous-Solutions, Baypure, Chelating-Agents, Complexing Agents, Equilibria, Ethylenediaminetetraacetic Acid EDTA, Extraction, Heavy Metal Ions, Iminodisuccinate, Polyacrylate Anion Exchangers, Removal, Soil, Stability

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Full Text: [2009\Che Eng J150, 289.pdf](2009/Che%20Eng%20J150,%20289.pdf)

Abstract: The present work reports the feasibility of using sugar-beet pectin gels for the removal of heavy metals from aqueous solutions. Sugar-beet pectin hydro- and xerogels were tested in the batch biosorption and desorption of cadmium, lead and copper. Pectins were successfully extracted and demethylated from the sugar-beet pulp, an agricultural residue, and gelled in the presence of CaCl2. The stability of the hydro- and xerogel pectin beads made them suitable for biosorption of heavy metals in different conditions. Biosorption data were fitted to the pseudo-second order kinetic model and the Langmuir isotherm model, obtaining the corresponding parameters. Treated and untreated beads were characterized using FTIR and SEM to determine possible binding mechanisms. The main mechanisms involved were ion exchange with calcium of gel structure and chelation or complexation with carboxyl groups. After biosorption, calcium in the gels was substituted by metal cations reorganizing the structure of the gel matrix in a way that was visible using scanning electron microscopy. HNO3 0.1 M was the best eluant for the reutilization of the gels and recovered all the adsorbed metal unlike HCl and H2SO4. Sugar-beet pectins could be used as an efficient biosorbent for the treatment and recovery of Cu, Pb and Cd from wastewater. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Alginate, Aqueous-Solutions, Beta Vulgaris, Binding, Biomass, Biosorption, Complexes, Desorption, Divalent-Cations, Heavy Metals, Ions, Model, Pectin, Removal, Sorption, Sugar-Beet

? Kołodyńska, D. and Hubicka, H. (2009), Polyacrylate anion exchangers in sorption of heavy metal ions with non-biodegradable complexing agents. *Chemical Engineering Journal*, **150** (2-3), 308-315.

Full Text: [2009\Che Eng J150, 308.pdf](2009/Che%20Eng%20J150,%20308.pdf)

Abstract: The polyacrylate anion exchangers are widely used in purification of heavy metal ions from wastewaters and different accompanying complexing agents. Such effluents containing the chelators (EDTA, NTA, HEDTA, DTPA, and IDA) are discharged from relevant industries such as printed circuits boards, plating on plastics, metal finishing and others. The sorption was studied as a function of phase contact time and pH by the batch technique. It was found that the removal of heavy metal ions in the presence of EDTA, NTA and IDA strictly depends on the phase contact time and pH values. Various kinetic models such as the pseudo first-order and the pseudo second-order as well as the intraparticle one were also tested to estimate the sorption rate. The equilibrium capacities of the studied anion exchangers for Cu(II), Zn(II), Co(II), Ni(II), Pb(II) and Cd(II) in the presence of EDTA were the highest for Pb(II) and Cd(II). The order of sorption for Amberlite IRA 458, Amberlite IRA 958 as well as Amberlite IRA 67 can be as follows: Pb(II) > Cd(II) > Zn(II) > Cu(II) > Ni(II) > Co(II). The stability of forming complexes was also compared. The estimation of the capacities of anion exchangers under investigation by the continuous column studies was also carried out. (C) 2009 Published by Elsevier B.V.

Keywords: Cadmium, Chelating-Agents, Complexing Agents, Copper, Edta Complexes, Heavy Metal Ions, Iron, Kinetic-Analysis, Natural Organic-Matter, Polyacrylate Anion Exchangers, Removal, Resins, Tree Fern

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Full Text: [2009\Che Eng J150, 385.pdf](2009/Che%20Eng%20J150,%20385.pdf)

Abstract: The sorption of boron from aqueous solution onto Caulerpa racemosa var. cylindracea (CRC), collected from Seferihisar/Izmir region in Turkey, was investigated as a function of pH, temperature, initial boron concentration, adsorbent dosage, contact time and ionic strength. Optimum conditions for the sorption of boron were obtained at pH 7.5, 318 K, 8 mg L-1 initial boron concentration, 0.2 g of CRC, 2.5 h contact time and greater ionic strength (10-1 M NaCl). As the temperature was increased the boron removal took place with higher percentages. In experiments conducted at optimum conditions, maximum boron sorption was determined to be about 63%. The experimental data were analyzed by Freundlich, Langmuir and Dubinin-Radusckevich (DR) equations. Freundlich and DR models provide best conformity with the experimental data. In order to describe kinetics of boron sorption onto CRC, first-order Lagergren equation, pseudo-second-order kinetic model and intraparticle diffusion model were used. It was seen that the first order Lagergren equation was better described than the pseudo-second-order kinetic model. Thermodynamic parameters of sorption process were also calculated. It was obtained that sorption process was not spontaneous. The characterization of CRC was carried out by Fourier transform infrared spectroscopy (FTIR) analysis. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption Isotherms, Aqueous-Solution, Biological Invasion, Boron, Caulerpa Racemosa Vac Cylindracea, Dye, Green Macroalga, Ion-Exchange-Resin, Lentillifera, Methylene-Blue, Removal, Sorption, System, Water

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Full Text: [2009\Che Eng J150, 403.pdf](2009/Che%20Eng%20J150,%20403.pdf)

Abstract: We report herein a kinetic and thermodynamic study of the adsorption of azo-dye Orange II from aqueous solutions onto titania aerogels. Aerogels structure was confirmed by MR and N-2 adsorption revealed their specific surface area (500 m2/g), pore volume (2.86 cm3/g) and pore size (mean 13.9 nm). Adsorption tests were conducted in batch reactors under various conditions where the effect of pH, temperature. contact time, dye concentration, and adsorbent dose were studied. Experiments performed at pH 2 show the optimal adsorption due to the best surface charge interactions. The temperature shows a weak influence with a decrease in the adsorption uptake as the temperature increases. Adsorption kinetics is shown to be very fast and follows a pseudo second-order indicating the coexistence of chemisorption and physisorption with the intra-particle diffusion being the rate controlling step. The experimental data fit perfectly with Sips isotherms and reveal the ability of titania aerogel to adsorb 420 mg of Orange II per gram of adsorbent at the optimal conditions. The thermodynamic study reveals the activation energy (42.1 kJ mol-1) and the changes in Gibbs free energy (1.2 kJ mol-1), enthalpy (-16.4 kJ mol-1), and entropy(-58 J mol-1 K-1). The entire regeneration of the titania aerogel adsorption sites at pH 11 and 30°C shows a total recovery of the dye and the efficient reusability and the economic interest of these adsorbing materials for environmental purposes. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid Orange-7, Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solution, Azo-Dye, Bottom Ash, Carcinogenicity, Orange II, Removal, Silica Aerogels, Surface, Titania Aerogel, Waste-Water

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Full Text: [2009\Che Eng J150, 455.pdf](2009/Che%20Eng%20J150,%20455.pdf)

Abstract: Steam-activated carbons from oil-palm shells were prepared and used in the adsorption of phenol. The activated carbon had a well-developed non-micropore structure which accounted for 55% of the total pore volume. The largest Brunauer-Emmett-Teller (BET) surface area of the activated carbon was 1183 m(2)/g with a total pore volume of 0.69 cm(3)/g using N-2 adsorption at 77 K. Experimental tests on the adsorption of phenol by the activated carbons were carried out in a fixed bed. The aqueous phase adsorption isotherms could be described by the Langmuir equation. The effects of the operation conditions of the fixed bed on the breakthrough curve were investigated. A linear driving force model based on particle phase concentration difference (LDFQ model) was used to simulate the fixed bed adsorption system. The model simulations agreed with the experimental data reasonably well. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherms, Bet, Breakthrough, Breakthrough Curve, Breakthrough Curves, Carbon, Dispersion, Fixed Bed Reactor, Isotherms, Kinetic Modelling, Langmuir, Langmuir Equation, Model, N2, Oil-Palm Shell, Phenol, Pore, Pore Volume, Removal, Surface Area, System, Volume

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Full Text: [2009\Che Eng J150, 509.pdf](2009/Che%20Eng%20J150,%20509.pdf)

Abstract: The sorption of Tartrazine. Allura Red, Sunset Yellow and Indigo Carmine from aqueous solutions onto the strongly basic anion-exchanger (Lewatit MonoPlus M-600) of dimethylethanolamine functional groups and styrene-divinylbenzene matrix was investigated. The experimental data obtained at 50,100, 200, 300 and 500 mg/dm3 initial concentrations at 20°C were applied to the pseudo-first order, pseudo-second order and Weber-Morris kinetic models. The calculated sorption capacities (q1,cal) and the rate constant of the first-order adsorption (k1) were determined. The pseudo-second order kinetic constants (k2) and capacities (q2,cal) were calculated from the plots of t/q(1) vs. t, 1/q(1) vs. 1/t, 1/t vs. 1/q(t), q(t)/t vs. q(t) and 1/q(2-)q(t) vs. t for type 1, type 2, type 3, type 4 and type 5 of the pseudo-second order expression, respectively. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Anion-Exchanger, Batch, Biosorption, Dyes, Equilibrium, Kinetics, Methylene-Blue, Nonlinear-Regression Analysis, Phase, Pseudo-Second Order, Reactive Dyes, Removal, Sorption

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Full Text: [2009\Che Eng J150, 352.pdf](2009/Che%20Eng%20J150,%20352.pdf)

Abstract: In the present study, a low-cost adsorbent is developed from the naturally and abundantly available sawdust which is biodegradable. The removal capacity of Cr(VI) from aqueous solutions and from the synthetically prepared industrial effluent of electroplating and tannery industries is obtained. The batch experiments are carried out to investigate the effect of the significant process parameters such as initial pH, change in pH during adsorption, contact time, adsorbent amount, and the initial Cr(VI) concentration. The maximum adsorption of Cr(VI) on sawdust is obtained at an initial pH value of 1. The value of pH increases with increase in contact time and initial Cr(VI) concentration. The equilibrium data for the adsorption of Cr(VI) on sawdust is tested with various adsorption isotherm models such as Langmuir, Freundlich, Redlich-Peterson, Koble-Corrigan, Tempkin, Dubinin-Radushkevich and Generalized equation. The Langmuir isotherm model is found to be the most suitable one for the Cr(VI) adsorption using sawdust and the maximum adsorption capacity obtained is 41.5 mg g-1 at a pH value of 1. The adsorption process follows the second-order kinetics and the corresponding rate constants are obtained. Desorption of Cr(VI) from sawdust using acid and base treatment exhibited a higher desorption efficiency by more than 95%. A feasible solution is proposed, for the disposal of the contaminant (acid and base solutions) containing high concentration of Cr(VI) obtained during the desorption process. The interference of other ions which are generally present in the electroplating and tannery industrial effluent streams on the Cr(VI) removal is investigated. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Aqueous Solutions, Batch, Batch Experiments, Capacity, Chromium(VI), Coir Pith, Concentration, Contaminant, Cr(VI), Cr(VI) Adsorption, Cr(VI) Removal, Data, Desorption, Disposal, Efficiency, Electroplating Waste-Water, Equilibrium, Experiments, Freundlich, Fungal Biomass, Hexavalent Chromium Removal, Industrial Effluent, Industry Waste, Interference, Ions, Isotherm, Isotherm Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Low-Cost Adsorbents, Metal, Model, Models, pH, pH Value, Rate Constants, Redlich-Peterson, Regeneration, Removal, Rights, Sawdust, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Solutions, Streams, Tannery Effluent, Tea Factory Waste, Toxic, Treatment, Value, Wheat-Straw

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Full Text: [2009\Che Eng J151, 1.pdf](2009/Che%20Eng%20J151,%201.pdf)

Abstract: Since the introduction of pseudo-second-order (PSO) model for the description of adsorption kinetics in 1999, it has been widely applied in liquid-phase adsorption systems. An approaching equilibrium factor (Rw) was defined and deduced from the PSO model in this work. The adsorption characteristic curves were built up, in which three different zones of the PSO model were classified. Activated carbons with various particle sizes were prepared from fir wood with KOH activation for the adsorption of phenol, 4-chlorophenol (4-CP), 2,4-dichlorophenol (2,4-DCP), 2,4,6-trichlorophenol (2,4,6-TCP), and Methylene blue (MB) from water. Suitable ranges of the PSO model and the effect of adsorbent particle size on the Rw value were analyzed. It was found that the quantity k2qe was exactly the inverse of the half-life of adsorption process. It could be used as an indicator of kinetic performance because it was a key parameter affecting the fractional adsorption at any time. That is, k2qe, a newly defined rate index, could provide the related information between the static and dynamic behavior of adsorption processes in engineering practice.

Keywords: 2,4,6-Trichlorophenol, 2,4-DCP, 2,4-Dichlorophenol, 4-Chlorophenol, Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorption, Adsorption Kinetics, Approaching Equilibrium Factors, Aqueous-Solution, Behavior, Bleaching Earth, Dynamic, Engineering, Equilibrium, Fly-Ash, Half-Life, Herbicide Paraquat, Index, Indicator, Information, Kinetic, Kinetic Model, Kinetics, KOH, Lathyrus-Sativus, Liquid-Phase Adsorption, MB, Metal-Ions, Methylene Blue, Methylene-Blue, Model, Particle Size, Performance, Phenol, Practice, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rate Index, Reactive Dyes, Size, Systems, Value, Water, Wheat Bran, Wood, Work

? El-Ghaffar, M.A.A., Mohamed, M.H. and Elwakeel, K.Z. (2009), Adsorption of silver(I) on synthetic chelating polymer derived from 3-amino-1,2,4-triazole-5-thiol and glutaraldehyde. *Chemical Engineering Journal*, **151** (1-3), 30-38.

Full Text: [2009\Che Eng J151, 30.pdf](2009/Che%20Eng%20J151,%2030.pdf)

Abstract: New types of polymer condensation adducts were synthesized through the reaction of 3-amino-1,2,4-triazole-5-thiol (AZ) with glutaraldehyde in the absence and in the presence of thiourea at different molar ratios. The adsorption behavior of the chelating polymers towards Ag(I) from aqueous solutions was studied. Better adsorption behavior was achieved for Ag(I) by thiourea polymeric adducts. The chelating matrix obtained from a molar ratio of 2:1:3 of AZ, thiourea and glutaraldehyde. respectively, showed uptake capacity of 3.6 mmol/g. These polymers were evaluated for their recovery of Ag(I) from aqueous solutions using batch methods. The obtained polymers achieved promising results in the selective separation of Ag(I) from other metal ions. Both kinetics and thermodynamic parameters of the adsorption process were obtained. The data indicated that the adsorption process is an endothermic reaction and kinetically proceeds according to pseudo-first-order model. These parameters indicated that the polymers can be applied in the recovery of Ag(I). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: 3-Amino-1,2,4-Triazole-5-Thiol, Activated Carbon Column, Adsorption, Adsorption Behavior, Alkaline Cyanide Solution, Aqueous Solutions, Batch, Behavior, Capacity, Chelating Polymers, Chitosan, Data, Endothermic, Extraction, Glutaraldehyde, Gold, Ion-Exchange-Resins, Ions, Kinetics, Matrix, Metal, Metal Ions, Methods, Model, Piperazine Functionality, Polymer, Polymeric, Polymers, Preconcentration, Pseudo First Order, Pseudo-First-Order, Recovery, Rights, Selective, Selective Separation, Separation, Silver Recovery, Solutions, Sorption, Thermodynamic, Thermodynamic Parameters, Uptake

? Singh, K.K., Hasan, S.H., Talat, M., Singh, V.K. and Gangwar, S.K. (2009), Removal of Cr(VI) from aqueous solutions using wheat bran. *Chemical Engineering Journal*, **151** (1-3), 113-121.

Full Text: [2009\Che Eng J151, 113.pdf](2009/Che%20Eng%20J151,%20113.pdf)

Abstract: The possible use of ‘wheat bran’ as novel biosorbent has been successfully demonstrated in the removal of Cr(VI) from aqueous solution. The effect of different parameters (such as contact time, sorbate concentration, pH of the medium and temperature) were investigated. and maximum uptake of Cr(VI) was attained as 310.58 mg g-1 at pH 2.0, under the initial Cr(VI) concentration of 200 mg L-1 and temperature of 40°C. Effect of pH showed that wheat bran was not only removing aqueous Cr(VI) but also reducing it into less toxic Cr(III). When the sorption kinetics were tested with first-order reversible, pseudo-first-order, and pseudo-second-order reaction, Cr(VI) uptake process followed the pseudo-second-order rate expression. Mass transfer of Cr(VI) from bulk to the solid phase (wheat bran) was studied at different temperatures. Different thermodynamic parameters viz., ΔG°, ΔH° and ΔS° have also been evaluated, and the sorption was feasible, spontaneous, and endothermic in nature. The sorption equilibrium, when expressed by the Langmuir and Freundlich equations, indicated that the process was in compliance with Langmuir isotherm. The results of desorption studies also demonstrated that complete desorption of Cr(VI) took place at pH of 9.5. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Aqueous Solution, Aqueous Solutions, Batch Process, Biomass, Biosorbent, Biosorption, Chromium(VI), Compliance, Concentration, Cr(VI), Desorption, Desorption Studies, Endothermic, Equilibrium, Expression, First Order, Freundlich, Hexavalent Chromium, Isotherm, Kinetics, L1, Langmuir, Langmuir Isotherm, Mass Transfer, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Reduction, Removal, Rice Husk, Rights, Solution, Solutions, Sorbate, Sorption, Sorption Isotherms, Sorption Kinetics, Temperature, Thermodynamic, Thermodynamic Parameters, Toxic, Trivalent Chromium, Uptake, Waste-Water, Wheat Bran

? Kwok, K.C.M., Lee, V.K.C., Gerente, C. and McKay, G. (2009), Novel model development for sorption of arsenate on chitosan. *Chemical Engineering Journal*, **151** (1-3), 122-133.

Full Text: [2009\Che Eng J151, 122.pdf](2009/Che%20Eng%20J151,%20122.pdf)

Abstract: The sorption of arsenate onto chitosan flakes has been studied. Chitosan, a natural, non-toxic, biodegradable polysaccharide is derived by the deacetylation of chitin, a major component of crustacean shells of prawn, crab or shrimp. Its main attributes correspond to its polycationic nature and the abundance of amine functional groups. Chitosans have received increasing attention as renewable polymeric materials for the treatment of metal contaminated water and wastewater. The effect of initial pH on the sorption isotherm has been studied for two initial concentration ranges of arsenate (0-3000 μg L-1 and 0-10,000 μg L-1) on chitosan. The equilibrium data have been modelled using Langmuir and Freundlich type isotherms at three initial pH values. The maximum adsorption capacity occurs at an initial pH 3.5 and empirical correlations have been developed to model the effect of pH on the sorption isotherm parameters. Each initial pH(i) value, namely, 3.5, 4.0 and 4.5, corresponded to a fixed final pH, value, namely, 4.69. 6.40 and 6.73 respectively. A series of batch kinetic experiments has been carried out at different initial pH values. The arsenate sorption process appears to be completed after 30 min, however, a previously unreported phenomenon was observed, namely, a steady desorption of arsenate. There is a natural buffering effect from the chitosan. The batch kinetic data have been correlated using the pseudo-first order, pseudo-second order and pseudo-first order reversible models: this latter model was modified to incorporate the arsenate desorption step as a function of the changing system pH. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorption, Adsorption Capacity, Aqueous-Solution, Arsenate, Arsenate Sorption, As(III), Batch, Capacity, Chitin, Chitosan, Concentration, Correlations, Crustacean, Data, Desorption, Development, Equilibrium, Equilibrium, Experiments, Ferrihydrite, Freundlich, Function, Functional Groups, Isotherm, Isotherm Parameters, Isotherms, Kinetic, Kinetics, L1, Langmuir, Metal, Model, Model Development, Modelling, Models, Modified, Natural, Neutralized Red Mud, pH, Polymeric, Polymeric Materials, Polysaccharide, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Sorption, Sorption Isotherm, Sorption Process, Treatment, Value, Wastewater, Wastewaters, Water

? Aydın, Y.A. and Aksoy, N.D. (2009), Adsorption of chromium on chitosan: Optimization, kinetics and thermodynamics. *Chemical Engineering Journal*, **151** (1-3), 188-194.

Full Text: [2009\Che Eng J151, 188.pdf](2009/Che%20Eng%20J151,%20188.pdf)

Abstract: Surface response methodology was involved in the optimization of Cr(VI) adsorption upon chitosan flakes against the process parameters pH, adsorbent dose and initial Cr(VI) concentration. The effects of these factors were studied in the ranges 1.5-9.5, 1.8-24.2 gl-1 and 15-95 mg l-1, respectively. A predictive quadratic model was constructed by variance analysis of data obtained from a total of 20 experimental runs with three replicates each. Maximum removal was attained from a solution as concentrated as 30 ppm at pH 3 with an adsorbent dosage of 13 g l-1. The adsorption capacity of chitosan flakes was determined as 22.09 mg g-1 at these specified conditions. However, the adsorption capacity was recorded as high as 102 mg g-1 for 100 mg l-1 initial concentration. Out of Langmuir, Freundlich and Dubinin-Radushkevich isotherm models, adsorption data was best described by Langmuir isotherm with 0.99 consistency. The process kinetics was evaluated by pseudo-first, pseudo-second order and infra-particle diffusion models. Pseudo-second order kinetic model exhibited the highest correlation with data. The results showed that both monolayer adsorption and infra-particle diffusion mechanisms limited the rate of Cr(VI) adsorption. Thermodynamic parameters revealed the feasibility, spontaneity and exothermic nature of adsorption. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbent Dose, Adsorption, Adsorption Capacity, Analysis, Aqueous-Solutions, Biosorption, Capacity, Chitosan, Chromium, Chromium Adsorption, Concentration, Consistency, Constructed, Correlation, Cr(VI), Cr(VI) Adsorption, Cross-Linked Chitosan, Data, Diffusion, Exothermic, Experimental, Experimental Design, Feasibility, Freundlich, Heavy-Metals, Hexavalent Chromium, Industrial-Waste, Isotherm, Kinetic, Kinetic Model, Kinetics, Kinetics and Thermodynamics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Mechanisms, Methodology, Model, Models, Monolayer, Optimization, pH, Predictive, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Kinetic Model, Pseudo-Second-Order, Removal, Response Surface Methodology, Rights, Solution, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

? Lopes, C.B., Otero, M., Lin, Z., Silva, C.M., Rocha, J., Pereira, E. and Duarte, A.C. (2009), Removal of Hg2+ ions from aqueous solution by ETS-4 microporous titanosilicate-Kinetic and equilibrium studies. *Chemical Engineering Journal*, **151** (1-3), 247-254.

Full Text: [2009\Che Eng J151, 247.pdf](2009/Che%20Eng%20J151,%20247.pdf)

Abstract: Batch stirred tank experiments were carried out to study the application of ETS-4 microporous titanosilicate for Hg2+ ions removal from aqueous solution. The effect of operational conditions was assessed and it was proved that Hg2+ uptake (%) increases with increasing contact time, increasing ETS-4 mass and decreasing initial Hg2+ concentration. It was confirmed that stirring rate does not affect the Hg2+ removal by ETS-4 as long as it is high enough to break the diffusion resistance. Two simplified models, the pseudo first-order and the pseudo second-order equations, were used to describe the kinetics of the sorption process and better fittings were obtained by the last one. The Bt versus t plots indicated that film diffusion is the rate-limiting step of the removal of Hg2+ by ETS-4. Langmuir, Freundlich and Dubinin-Radushkevich isotherm equations fitted quite well the equilibrium data and the Langmuir maximum capacity of ETS-4 was found to be 246 mg g-1 at 21ºC. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Application, Aqueous Solution, Biosorption, Cadmium(II), Capacity, Concentration, Data, Diffusion, Equilibrium, Equilibrium Studies, ETS-4, Experiments, Film Diffusion, First Order, Freundlich, Hg(II) Ions, Ions, Isotherm, Isotherm Equations, Isotherms, Kinetics, Langmuir, Mercury, Mercury Ions, Metal-Ions, Models, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Removal, Resistance, Rights, Second Order, Second-Order, Solution, Sorption, Sorption, Sorption Process, T, Titanosilicates, Uptake, Water

? Anayurt, R.A., Sari, A. and Tuzen, M. (2009), Equilibrium, thermodynamic and kinetic studies on biosorption of Pb(II) and Cd(II) from aqueous solution by macrofungus (*Lactarius scrobiculatus*) biomass. *Chemical Engineering Journal*, **151** (1-3), 255-261.

Full Text: [2009\Che Eng J151, 255.pdf](2009/Che%20Eng%20J151,%20255.pdf)

Abstract: The equilibrium, thermodynamics and kinetics of the biosorption of Pb(II) and Cd(II) onto (Lactarius scrobiculatus) macrofungus from aqueous solution were investigated at different experimental conditions. Optimum experimental parameters were determined to be pH 5.5, contact time 60 min, biomass concentration 4g/L of solution, and temperature 20ºC. The maximum biosorption capacity of L scrobiculatus was found to be 56.2 mg/g for Pb(II) and to be 53.1 mg/g for Cd(II). The mean free energy values evaluated by using the Dubinin-Radushkevich (D-R) model indicated that the biosorption of the metal ions onto L. scrobiculatus biomass was taken place by chemical ion-exchange. The kinetic studies indicated that the biosorption process of the metal ions followed well pseudo-second order model. The calculated thermodynamic parameters (ΔGº, ΔHº, and ΔSº) showed that the biosorption of Pb(II) and Cd(II) ions onto L. scrobiculatus biomass was feasible, spontaneous and exothermic in nature. The recovery of the metal ions from L scrobiculatus biomass was found as higher than 95% using 1 M HCl and 1 M HNO3. Furthermore, the reusability of the biosorbent was determined after six consecutive sorption-desorption cycles. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Aqueous Solution, *Aspergillus-niger*, Biomass, Biosorbent, Biosorption, *Botrytis-cinerea*, By-Products, Cadmium, Capacity, Cd(II), Cd(II) Ions, Chemical, Concentration, Cu(II) Ions, Energy, Equilibrium, Exothermic, Experimental, Heavy-Metal Biosorption, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Kinetic, Kinetic Studies, Kinetics, L.Scrobiculatus, Lead, Lead(II) Ions, Macrofungus, Metal, Metal Ions, Model, Pb(II), pH, Phanerochaete-Chrysosporium, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Recovery, Rights, Solution, Sorption-Desorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Toxic Metals, Waste-Water

? Nadeem, R., Ansari, T.M., Akhtar, K. and Khalid, A.M. (2009), Pb(II) sorption by pyrolysed *Pongamia pinnata* pods carbon (PPPC). *Chemical Engineering Journal*, **152** (1), 54-63.

Full Text: [2009\Che Eng J152, 54.pdf](2009/Che%20Eng%20J152,%2054.pdf)

Abstract: Experiments employing pyrolysed *Pongamia pinnata* pods carbon (PPPC) to delineate the effects of environmental variables like pH, sorbent dosage, sorbate concentration, contact time and physicochemical pretreatments on Pb(II) sorption were conducted. Maximum adsorption capacity 170.6 mg g-1 was observed at pH 3.5. Pb(II) sorption data was fitted to Langmuir, Fruendlich, Dubnin-Radushkevich and Tempkin isotherms while time dependent study was well described by pseudo-second-order kinetic model. The equilibrium data suited well the Langmuir isotherm with q(max) value of 370 mg g-1. FFIR spectroscopic analysis of PPPC revealed the existence of various alkane, aromatic C = C and oxygen functionalities along with aromatic NO2 and surface SO2 complexes. The surface modification by various physicochemical approaches markedly influenced the chemical structure of PPPC. FFIR spectra confirmed that the basic pretreatment caused an increase in the hydroxyl group contents; acidic treatment increased the amount of single bonded oxygen functional groups along with bond cleavage while significant changes took place in the spectrum of boiled PPPC. (C) 2009 Published by Elsevier B.V.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorptive Properties, Analysis, Aqueous-Solutions, Biosorption, Capacity, Carbon, Changes, Chemical, Cleavage, Concentration, Data, Environmental, Equilibrium, FTIR, Functional Groups, Heavy-Metal, Isotherm, Isotherms, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Model, Modification, Moringa-Oleifera, NO2, Oxygen, Palm Shell, Pb(II), pH, Phosphoric-Acid, Pongamia Pinnata, Pretreatment, Pretreatments, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Pyrolysis, Removal, SO2, Sorbate, Sorbent, Sorption, Structure, Surface, Surface Modification, Time, Time-Dependent, Treatment, Value, Waste-Water

? Çelekli, A., Yavuzatmaca, M. and Bozkurt, H. (2009), Kinetic and equilibrium studies on the adsorption of reactive red 120 from aqueous solution on *Spirogyra majuscula*. *Chemical Engineering Journal*, **152** (1), 139-145.

Full Text: [2009\Che Eng J152, 139.pdf](2009/Che%20Eng%20J152,%20139.pdf)

Abstract: The removal of reactive red (RR) 120 on Spirogyra majuscula was performed as a function of initial dye concentration, contact time and pH regimes. Change in pH values strongly affected (p<0.01) the adsorption of RR 120 and increasing initial pH value decreased the amount of adsorbed dye. Amount of dye uptake increased (p < 0.01) with increasing contact time and concentration of initial dye. Adsorption behavior was well described by pseudo second-order kinetic model. It was observed that equilibrium dye uptake significantly increased (p < 0.01) from 25.52 to 351.97 mg g-1 when initial RR 120 concentration increased from 25 to 750 mg L-1. Experimental data were well fitted to Langmuir, Freundlich and Redlich-Peterson models. Three different error functions were conducted to find better model to describe the experimental data. The lower values of error functions exhibited that Freundlich model was more suitable for the adsorption of RR 120, which implied a heterogeneous sorption phenomenon. Results indicated that S. majuscula could be used as adsorbent in industrial scale for textiles wastewater treatment without excessive cost. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous Solution, Behavior, Biosorbents, Biosorption, Caulerpa-Lentillifera, Concentration, Cost, Data, Dye, Equilibrium, Equilibrium Studies, Error, Experimental, Freundlich, Freundlich Model, Function, Functions, Green, Kinetic, Kinetic Model, Kinetics, L1, Langmuir, Methylene-Blue, Model, Models, Parameters, pH, pH Value, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Reactive Red 120, Redlich-Peterson, Removal, Rice Husk Ash, Rights, Scale, Second Order, Second-Order, Solution, Sorption, Spirogyra, Spirogyra Majuscula, Textiles, Time, Treatment, Uptake, Value, Waste, Wastewater, Wastewater Treatment

? Fonseca, B., Maio, H., Quintelas, C., Teixeira, A. and Tavares, T. (2009), Retention of Cr(VI) and Pb(II) on a loamy sand soil Kinetics, equilibria and breakthrough. *Chemical Engineering Journal*, **152** (1), 212-219.

Full Text: [2009\Che Eng J152, 212.pdf](2009/Che%20Eng%20J152,%20212.pdf)

Abstract: Illegal discharges are of great concern among industry activities, since they occur under uncontrolled conditions. In most cases. effluents are acidic and the concentrations of heavy metals are very high. With this in mind, the main goal of this study was to evaluate the sorption on a soil of two of the most toxic heavy metals, Cr(VI) and Pb(II), in those conditions. A loamy sand soil was collected in Oporto, Portugal. Batch equilibrium and sorption kinetics were evaluated using both metals solutions, with concentrations ranging from 50 mg L-1 to 200 mg L-1, at pH 2 and 5, between 2 h and 288 h. To evaluate the sorption equilibrium, eight isotherm models were fitted to experimental data. The best adjustments were observed for the Redlich-Peterson and Khan models for the adsorption of chromium (R2 = 0.99), and of lead (R2 = 0.99), respectively. The sorption kinetics was evaluated using three models - Elovich, pseudo first order and an empirical power function. The retention of lead was almost instantaneous and the empirical power function described better the sorption kinetics of chromium (0.89 < R2 < 0.99). In addition, flow experiments were performed with effluents of both metals (50 mg L-1) at pH 2 and 5, for about 90 h. Results revealed a high retention of chromium and a weak retention of lead, for low pH values. FTIR analyses to the column samples revealed that clay minerals have an important role in the retention of both metals. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Equilibria, Analyses, Aqueous-Solution, Biosorption, Breakthrough, Cadmium, Chromium, Clay, Clay Minerals, Column, Competitive Sorption, Cr(VI), Data, Discharges, Effluents, Elovich, Equilibria, Equilibrium, Experimental, Experiments, First, First Order, Flow, Flow Experiments, FTIR, Function, Heavy Metals, Heavy-Metals, Hexavalent Chromium, Isotherm, Kinetics, L1, Lead, Metals, Minerals, Models, Pb(II), pH, Portugal, Power, Pseudo First Order, Pseudo-First-Order, Redlich-Peterson, Retention, Rights, Role, Sand, Soil, Solutions, Sorption, Sorption Kinetics, Toxic

? Bayramoglu, G., Altintas, B. and Arica, M.Y. (2009), Adsorption kinetics and thermodynamic parameters of cationic dyes from aqueous solutions by using a new strong cation-exchange resin. *Chemical Engineering Journal*, **152** (2-3), 339-346.

Full Text: [2009\Che Eng J152, 339.pdf](2009/Che%20Eng%20J152,%20339.pdf)

Abstract: Poly(glycidylmethacrylate) was grafted via surface-initiated-atom transfer radical polymerization (Sl-ATRP) on a cross-linked acrylate based resin. Epoxy groups of the grafted polymer. were modified into strong cation-exchange groups (i.e., sulfonic groups) in the presence of sodium sulfite. The adsorption of Crystal Violet and Basic Fuchsine on the strong cation-exchange resin was studied under different experimental conditions. The adsorption process for both basic dyes was pH dependent. The maximum adsorption was observed for both dyes between pH 2.0 and 7.0. The maximum adsorption capacity of the cation-exchange resin for CV and BF dyes were found to be 76.8 and 127.0 mg/g, respectively. Adsorption of the dyes on the resin fitted to Langmuir and Temkin isotherm models and followed the pseudo-second-order kinetics. The values of Gibbs free energy of adsorption (ΔG°) were found to be -2.92 and -6.31 kJ/mol at 308 K for CV and BF dyes, respectively. These negative values indicated the spontaneity of the adsorption of the dyes on the resin. Desorption of both dyes was achieved from the resin by using 0.1 M HNO3 and desorption ratio up to 97% was obtained over seven adsorption/desorption cycles. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption, Desorption, Aqueous Solutions, Azo Dyes, Basic Dyes, Basic-Dyes, Biosorption, Capacity, Cation Exchange, Cation Exchanger, Cationic Dyes, Cross-Linked, Crystal Violet, Desorption, Dyes, Energy, Experimental, Gibbs Free Energy, Grafted, Isotherm, Isotherms, Kinetics, Langmuir, Magnetic Beads, Malachite Green, Membranes, Models, Modified, pH, pH-Dependent, Polymer, Polymerization, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Reactive Dye, Removal, Resin, Rights, Si-ATRP, Sodium, Solutions, Temkin Isotherm, Thermodynamic, Thermodynamic Parameters

? Rao, R.A.K., Khan, M.A. and Hameed, B.H. (2009), Sorption/desorption studies on some natural minerals for the removal of toxic organic pollutants from aqueous solution. *Chemical Engineering Journal*, **152** (2-3), 421-427.

Full Text: [2009\Che Eng J152, 421.pdf](2009/Che%20Eng%20J152,%20421.pdf)

Abstract: This work explored the sorption potential of Kyanite and Pyrolusite for the removal of phenol, chlorophenol (CP) and beta-Naphthol (BN). Uptake of phenol and CP was negligible on Kyanite and Pyrolusite. BN was significantly sorbed on these two sorbents. Maximum uptakes of BN on Kyanite and Pyrolusite were observed in acidic medium. Langmuir and Freundlich isotherms confirm favorable sorption of BN on Kyanite and Pyrolusite with high sorption efficiency in acidic medium. The kinetics studies indicate that Pseudo-second-order models are better obeyed than Pseudo-first-order model. The intraparticle diffusion models show the lines were not passing through the origin. Statistical data analysis also verifies the applicability of Pseudo-second-order model. Desorption studies were carried out by a batch process. 100% BN was recovered from Pyrolusite when hexane and hexane:propanol mixture (99:1) was used as eluent. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption, Analysis, Aqueous Solution, Batch, Batch Process, Biodegradation, Biosorption, Data, Data Analysis, Degradation, Desorption, Diffusion, Efficiency, Fixed-Bed, Freundlich, Intraparticle Diffusion, Isotherms, Kinetics, Kyanite, Langmuir, Langmuir And Freundlich Isotherms, Minerals, Model, Models, Natural, Organic, Organic Pollutants, Origin, Oxidation, Phenol, Pollutants, Potential, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Pyrolusite, Removal, Rights, Rp-Hplc, Solution, Sorbents, Sorption, Sorption Potential, Sorption, Desorption, Substituted Phenols, Toxic, Waste-Water Treatment, Work

? Kyzas, G.Z., Kostoglou, M. and Lazaridis, N.K. (2009), Copper and chromium(VI) removal by chitosan derivatives: Equilibrium and kinetic studies. *Chemical Engineering Journal*, **152** (2-3), 440-448.

Full Text: [2009\Che Eng J152, 440.pdf](2009/Che%20Eng%20J152,%20440.pdf)

Abstract: Chitosan sorbents, cross-linked and grafted with amido or carboxyl groups, were prepared and their sorption properties for Cu(II) and Cr(VI) uptake were studied. Equilibrium sorption experiments were carried out at different pH values and initial ion concentrations. The equilibrium data were successfully fitted to the Langmuir-Freundlich (L-F) isotherm. The calculated maxi mum sorption capacity of the carboxyl-grafted sorbent for Cu(II) was found to be 318 mg/g at pH 6, while the respective capacity for Cr(VI) uptake onto the amido-grafted sorbent was found to be 935 mg/g at pH 4. Thermodynamic parameters of the sorption process such as ΔG°, ΔH°, and ΔS° were also calculated. The experimental kinetic data were successfully fitted to a novel phenomenological diffusion-reaction model (DIFRE). which combines: (i) mass transfer of the metal ions from the bulk solution on the sorbent surface; (II) diffusion of the ions through the swollen polymer particle; and (iii) instantaneous local chelation (for cations) or electrostatic attraction (for anions) on the amino groups of the polymer. The regeneration of sorbents was affirmed in four sequential cycles of sorption-desorption experiments, without significant loss in sorption capacity. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Anions, Aqueous-Solution, Beads, Capacity, Chelation, Chitin, Chitosan, Chromium(VI), Chromium(VI) Removal, Copper, Cr(VI), Cross-Linked, Cross-Linked Chitosan, Cross-Linking, Cu(II), Cu(II) Ions, Data, Diffusion, Diffusion-Model, Diffusion-Reaction Model (DIFRE), Equilibrium, Experimental, Experiments, Grafted, Hexavalent Chromium, Hexavalent Chromium, Ions, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Langmuir-Freundlich, Local, Mass Transfer, Metal, Metal Ions, Metal-Anion Sorption, Model, P, Polymer, Regeneration, Removal, Rights, Solution, Sorbent, Sorbents, Sorption, Sorption Capacity, Sorption Process, Sorption Properties, Sorption-Desorption, Surface, Thermodynamic, Thermodynamic Parameters, Uptake

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Full Text: [2009\Che Eng J153, 62.pdf](2009/Che%20Eng%20J153,%2062.pdf)

Abstract: The biosorption potential of pine (*Pinus brutia* Ten.) bark in a batch system for the removal of Pb(II) ions from aqueous solutions was investigated. The biosorption characteristics of Pb(II) ions on the pine bark was investigated with respect to well-established effective parameters including the effects of solution pH, initial Pb(II) concentration, mass of bark, temperature, and interfering ions present, reusability, and desorption. Initial Solution pH and contact time were optimized to 4.0 and 4 h, respectively. The Langmuir and Freundlich equilibrium adsorption models were Studied and observed to fit well. The maximum adsorption capacity of the bark for Pb(II) was found to be 76.8 mg g-1 by Langmuir isotherms (mass of bark: 10 gL-1). The kinetic data fitted the pseudo-second-order model with correlation coefficient greater than 0.99. The thermodynamic parameters Gibbs free energy (ΔGº), enthalpy (ΔHº), and entropy (ΔSº) changes were also calculated, and the values indicated that the biosorption process was spontaneous. Reutilization of the biosorbent was feasible with a 90.7% desorption efficiency using 0.5 M HCl. It was concluded that pine bark can be used as an effective, low cost, and environmentally friendly biosorbent for the removal of Pb(II) ions from aqueous solution. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: adsorption, Adsorption Capacity, Aqueous Solution, Aqueous Solutions, Bark, Batch, Batch System, Biosorbent, Biosorption, Biosorption Characteristics, Cadmium, Capacity, Changes, Characteristics, Concentration, Correlation, Correlation Coefficient, Cost, Data, Desorption, Efficiency, Energy, Enthalpy, Entropy, Environmentally Friendly, Equilibrium, Freundlich, Gibbs Free Energy, Heavy-Metals, Ions, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherms, Lead, Low Cost, Model, Models, NOV, Pb(II), Pb(II) Ions, pH, Pine Bark, *Pinus brutia* Ten., Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Removal, Rice Husk, Rights, Sawdust, Solution, Solution pH, Solutions, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2009\Che Eng J153, 70.pdf](2009/Che%20Eng%20J153,%2070.pdf)

Abstract: In the present study, the application for the removal of Ni(II), Cd(II) and Pb(II) ions from aqueous solution by using mesoporous silica materials, namely, MCM-41, nanoparticle of MCM-41. NH2-MCM-41 (amino functionalized MCM-41) and nano NH2-MCM-41 was investigated. Suitable adsorbents preparation techniques were developed in the laboratory. The effects of the solution pH, metal ion concentrations, adsorbent dosages, and contact time were studied. It was found that NH2-MCM-41 showed the highest uptake for metal ions in aqueous solution. The results indicated that the adsorption of Ni(II). Cd(II) and Pb(II) ions on the surface of the adsorbent was increased with increasing solution pH. The experimental data were analyzed using the Langmuir and Freundlich equations. Correlation coefficients were determined by analyzing each isotherm. It was found that the Langmuir equation showed better correlation with the experimental data than the Freundlich. According to the parameters of the Langmuir isotherm. the maximum adsorption capacity of NH2-MCM-41 for Ni(II), Cd(II) and Pb(II) was found to be 12.36, 18.25 and 57.74 mg/g, respectively. The kinetic data of adsorption reactions and the evaluation of adsorption equilibrium parameters were described by pseudo-first-order and pseudo-second-order equations. The synthesized solid sorbents were characterized by Fourier transform infrared (FT-IR) spectrometry. X-ray diffraction (XRD), scanning electron microscopy (SEM) and nitrogen sorption measurements. (C) 2009 Published by Elsevier B.V.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Equilibrium, Application, Aqueous Solution, *Aspergillus-niger*, Cadmium Biosorption, Capacity, Cd(II), Correlation, Data, Electron Microscopy, Equilibrium, Evaluation, Experimental, Freundlich, FT-IR, FTIR, Heavy-Metals, Ions, Ions Adsorption, Isotherm, Isotherms, Kinetic, Langmuir, Langmuir Equation, Langmuir Isotherm, MCM-41, Mesoporous, Mesoporous Silica, Metal, Metal Ions, Metals Removal, Molecular-Sieves, Nano NH2-MCM-41, Nanoparticle, Ni(II), Nitrogen, NOV, Pb(II), Pb(II) Ions, pH, Preparation, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Response-Surface Methodology, Scanning Electron Microscopy, SEM, Silica, Solution, Sorbents, Sorption, Spectrometry, Surface, Techniques, Uptake, Waste-Water, X-Ray, X-Ray Diffraction, XRD

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Full Text: [2009\Che Eng J153, 101.pdf](2009/Che%20Eng%20J153,%20101.pdf)

Abstract: This paper describes the arsenite [As(III)] removal performance of manganese oxide-coated-alumina (MOCA) and its interaction with As(III) in drinking water. MOCA was characterized by XRD, SEM, EDAX, gas adsorption porosimetry, and point of zero charge (pH(pzc)) measurements. Raman spectroscopy coupled with sorption experiments were carried out to understand the As(III) interaction with MCCA. As(III) sorption onto MOCA was pH dependent and the optimum removal was observed between a pH of 4 and 7.5. The Sips isotherm model described the experimental equilibrium data well and the predicted maximum As(III) sorption capacity was 42.48 mg g-1, which is considerably higher than that of activated alumina (20.78 mg g-1). The sorption kinetics followed a pseudo-second-order equation. Based on sorption and spectroscopic measurements, the mechanism of As(III) removal by MOCA was found to be a two-step process, i.e. oxidation of As(III) to arsenate (As(V)) and retention of As(V) on MOCA surface, with As(V) forming an inner surface complex with MOCA. The results of this study indicated that MOCA is a promising alternative sorbent for As(III) removal from drinking water. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Activated Carbon, Adsorbent, Adsorption, Adsorption, Alternative, Alumina, Arsenate, Arsenite, Arsenite, As(III), As(V), Binding, Capacity, Charge, Data, Drinking Water, EDAX, Equilibrium, Evaluation, Experimental, Experiments, Fe, Interaction, Isotherm, Isotherm Model, Kinetics, Manganese, Manganese Oxide-Coated-Alumina, Mechanism, Mn, Model, NOV, Oxidation, Oxidation of As(III), Performance, pH, pH-Dependent, Point of Zero Charge, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Raman, Raman Spectroscopy, Removal, Retention, Rights, SEM, Sorbent, Sorption, Sorption Capacity, Sorption Kinetics, Speciation, Spectroscopy, Surface, Synthetic Birnessite, Water, XRD

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Full Text: [2009\Che Eng J153, 175.pdf](2009/Che%20Eng%20J153,%20175.pdf)

Abstract: The amino acid L-cysteine (L-Cys) was intercalated into a MgAl layered double hydroxide (LDH). and its oxidation reaction by hexacyanoferrate (III) (Fe(CN)63-) in the confined region between sheets of LDH has been studied in detail. Based on the measurement results of XRD, Raman and FT-IR, it was found that the interlayer L-Cys was oxidized to cystine by Fe(CN)63-. Furthermore, the kinetics of this reaction was investigated in batch mode. The influences of initial Fe(CN)63- concentration, L-Cys-LDH quantity and reaction temperature on the interlayer oxidation reaction have been studied, respectively. The reaction follows a diffusion-controlled mechanism represented by Crank-Ginstling and Brounshtein kinetic model with the apparent activation energy of 29.93 kJ/mol. Therefore, this layered material may have prospective application as a novel “molecular reactor” for confined chemical reactions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Active Compounds, Amino Acid, Application, Aqueous-Solutions, Batch, Batch Mode, Catalysts, Chemical, Chemistry, Chromium(VI), Concentration, Confined Reaction, Cystine, Double Hydroxide, Energy, Equilibrium, FT-IR, FTIR, Intercalation, Iron, Kinetic, Kinetic Model, Kinetics, L-Cysteine, Layered Double Hydroxide, Layered Double Hydroxide (LDH), Layered Double Hydroxides, Matrix, Measurement, Mechanism, Mg-Al-Co3 Hydrotalcite, Mode, Model, NOV, Oxidation, Prospective, Raman, Removal, Rights, Temperature, XRD

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Full Text: [2009\Che Eng J155, 108.pdf](2009/Che%20Eng%20J155,%20108.pdf)

Abstract: In this work, the removal of Cd2+ ions from aqueous solution using microporous titanosilicate ETS-10 was investigated in order to assess its potential as decontaminating agent in tertiary treatments. Accordingly, batch stirred tank experiments were carried out to study the ion exchange kinetics and equilibrium. Results show that pH affects considerably the ion exchange capability of ETS-10: at pH 4 it is 1.567×102 eq m-3, at pH 6 it is 3.629×103, and no further increment was observed at pH 8. This is an extremely important observation since pH of industrial effluents and other wastewaters rounds 6. Both Langmuir and Langmuir-Freundlich isotherms were fitted to the experimental data measured. The second model performs slightly better as the calculated absolute average deviations show: AAD(L) = 2.94% and AAD(LF) = 2.40%. Concerning the kinetic behavior, the ion exchange was successfully represented by a Nernst-Planck based model (AAD = 11.9%). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Aqueous Solution, Batch, Behavior, Cadmium, Cadmium(II), Cd2+, Data, Diffusion-Coefficients, Effluents, Equilibrium, ETS-10, Experimental, Experiments, Fixed-Bed Column, Heavy-Metal Ions, Ion Exchange, Ion-Exchange, Ions, Isotherm, Isotherms, Kinetic, Kinetic-Models, Kinetics, Langmuir, Langmuir-Freundlich, Length-Column Method, Mass-Transfer, Maxwell-Stefan Approach, Mercury Removal, Model, Nernst-Planck, Observation, pH, Potential, Removal, Rights, Solution, Waste-Water, Wastewaters, Work, Zeolite-A

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Full Text: [2009\Che Eng J155, 184.pdf](2009/Che%20Eng%20J155,%20184.pdf)

Abstract: The lead adsorption from aqueous solution was studied in batch experiments using two typical Indian origin nickel lateritic ores having high (46.29%) and low iron content (28.56%) coded as NH and NL respectively. The adsorption was found to be strongly dependent on pH of the medium showing increase in uptake of Pb(II) from 11.0 to 53% and 8.2 to 44% for NH and NL samples respectively with the increase in pH in the range of 2.0-5.23. The time data generated at different temperatures for both the samples fitted well to second-order kinetic model and Elovich equation. The later is indicative of a chemisorption process. The +ve ΔH degrees values (8.90 and 10.29 kJ mol-1 for NH and NL samples) support the endothermic nature of adsorption. The +ve ΔS degrees values (28.56 and 29.40 kJ mol-1 K-1 for NH and NL respectively) suggest that the adsorption occurs with internal structural changes. The activation energy was estimated to be 7.6 and 3.12 kJ mol-1 for NH and NL respectively. The thermodynamic activation parameters were also evaluated using Eyring equation. The loading capacities of NH and NL were estimated to be 44.4 and 28.45 mg g-1 respectively under the experimental conditions: adsorbent concentration 2 g l-1, time 30 min, temperature 308 K and pH 5.23. Data fitted well to Langmuir and Freundlich isotherm models for NH while in case of NL only Langmuir isotherm showed good fit. Due to high loading capacities and favorable kinetics, these materials can be utilized for Pb(II) removal from aqueous solutions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Activation Parameters, Adsorbent, Adsorption, Aqueous Solution, Aqueous Solutions, Aqueous-Solution, Bagasse Fly-Ash, Batch, Batch Experiments, Batch Mode, Biosorption, Cadmium, Changes, Chemisorption, Concentration, Content, Data, Elovich, Elovich Equation, Endothermic, Energy, Experimental, Experiments, Freundlich, Freundlich Isotherm, Ion-Exchange, Iron, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Lead, Loading, Metal Removal, Model, Models, Nickel, Nickel Laterite, Origin, Pb(II), Pb(II) Adsorption, Pb(II) Removal, pH, Range, Removal, Rights, Second Order, Second-Order, Solution, Solutions, Sorption, Sugar-Industry Waste, Support, Temperature, Thermodynamic, Thermodynamic Activation Parameters, Thermodynamics, Time, Uptake

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Full Text: [2009\Che Eng J155, 199.pdf](2009/Che%20Eng%20J155,%20199.pdf)

Abstract: The present study explores the ability of orange waste biomass to remove Cr (III) from aqueous solutions. Batch kinetic and isotherm studies were carried out on a laboratory scale to evaluate the adsorption capacity of orange waste. The effects of particle size, adsorbent dose and solution pH on Cr (III) removal were also studied. The results showed that the higher the adsorbent dosage and the pH, the higher the percentage of metal removal. No significant influence of particle size on sorption capacity was observed in the experimental conditions studied. A kinetic study revealed that the adsorption of Cr (III) onto orange waste was a gradual process and equilibrium was reached within 3 days. A pseudo-second order model was the most appropriate to describe the kinetic experimental data. Equilibrium assays displayed a maximum sorption capacity ranging from 0.57 mmol/g to 1.44 mmol/g when the pH increased from 3 to 5, according to the Sips model, which along with the Redlich-Peterson equation, is very suitable for correlating equilibrium data. The use of the studied adsorbent in the removal of chromium in continuous mode was successful and the breakthrough curves were adequately represented by BDST model. Due to the slow kinetics of chromium sorption onto orange waste, the sorption capacity in batch assays was higher than that in continuous assays. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbent Dose, Adsorption, Adsorption Capacity, Aqueous Solutions, Aqueous-Solution, Batch, Bdst, Bdst Model, Biomass, Biosorption, Bone Char, Breakthrough, Breakthrough Curves, Cadmium Ions, Capacity, Chromium, Coir Pith, Continuous, Data, Elovich Equation, Equilibrium, Experimental, Fixed-Bed, Fixed-Bed Column, Heavy-Metals, Hexavalent Chromium, Isotherm, Kinetic, Kinetic Study, Kinetics, Lead(II) Ions, Metal, Mode, Model, Orange Waste, Particle Size, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Redlich-Peterson, Removal, Rights, Scale, Size, Solution, Solutions, Sorption, Sorption Capacity, Waste, Waste Biomass

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Full Text: [2009\Che Eng J155, 234.pdf](2009/Che%20Eng%20J155,%20234.pdf)

Abstract: The work is carried out to minimize the organic chemical load (unexhausted dye contents) in direct dyes effluent using low cost adsorbents. The studies are made with different direct dyes, i.e. Direct Red 28, Direct Yellow 12, Direct Orange 26 and Direct Blue 1 with various adsorbents. Three different bio/natural materials have been selected as adsorbents. These includes, Sugarcane bagasse pith (SB), Saw dust (SD)-the plant origin products, and Brick powder (BP)-a silica based material obtained from earth’s crust on thermal heating. These substances are almost discarded waste products with the possibility of use as adsorbents. Experimental work for the dye removal from the effluent by activated charcoal (AC) has also been carried out and the results are compared with other adsorbents. The amount of unexhausted organic dye present in the effluent is measured as chemical oxygen demand (COD) before and after the treatment. Adsorbent Sugarcane bagasse pith shows good performance as compared to Saw dust and Brick powder. For understanding the behaviour of adsorbents Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) and scanning electron microscopy (SEM) has also been carried out. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Chemical Oxygen Demand, Color, Decolorisation, Direct Dyes, Dye Removal, Ftir, Low Cost Adsorbents, Microscopy, Organic Chemical Load, Pith, Plant, Removal, Silica, Sugarcane Bagasse, Treatment, Water, XRD

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Full Text: [2009\Che Eng J155, 320.pdf](2009/Che%20Eng%20J155,%20320.pdf)

Abstract: Formic acid is an important chemical and biochemical compound used in various industries. It is important to separate this acid from wastewater streams. In this study, adsorption of formic acid was studied from aqueous solution by using weakly basic adsorbent (Amberlite IRA-67) at three different temperatures (298K, 318 K, and 328 K). Adsorption of formic acid was investigated in terms of equilibrium, kinetics and thermodynamic conditions. Optimal amount of IRA-67 was determined as 1.00 g. The most used isotherms, Freundlich and Langmuir, were applied to experimental data. Langmuir isotherm gave good results with R-2 value over 0.99 at different temperatures. Pseudo-second-order model was fitted for this adsorption system. Thermodynamic parameters, ΔH°, ΔS° and ΔG°, were calculated. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Equilibria, Amberlite IRA-67, Anion-Exchange Resins, Aqueous Solution, Aqueous-Solutions, Carboxylic-Acids, Chemical, Data, Equilibria, Equilibrium, Experimental, Fermentation Broth, Formic Acid, Freundlich, Glycolic Acid, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Levulinic Acid, Model, Organic-Solvents, Plus Liquid Equilibria, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Solution, Streams, Thermodynamic, Thermodynamic Parameters, Value, Wastewater

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Full Text: [2009\Che Eng J155, 551.pdf](2009/Che%20Eng%20J155,%20551.pdf)

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Full Text: [2009\Che Eng J155, 567.pdf](2009/Che%20Eng%20J155,%20567.pdf)

Abstract: Carica papaya seeds were defatted and used for the adsorption of methylene blue dye (MB dye). The pHpzc and specific surface area (SSA) of the defatted and undefatted Carica papaya seeds were found to be 6.25 and 143.27 m2g-1 respectively. The adsorption capacities of the defatted Carica papaya seeds were 1250 and 769.23 m2g-1. Fourier transformed infrared (FT-IR) spectra analysis of defatted seeds suggests the presence of alpha,beta-unsaturated ketone, beta-keto (enolic) esters and lactones, quinones and carboxylic acids which were absent in the undefatted sample. The presence of carboxylic acid, phenolic and lactone functional groupswere confirmed by surface chemistry studies. Adsorption of MB dye onto DPS adsorbent was found to be exothermic and spontaneous. FT-IR spectra of various particle sizes indicate the presence of functional groups on every particle size necessary for the adsorption of MB dye. Pseudo-second-order kinetic rate constant increased with increasing initial MB dye concentration. The adsorption reaction was observed to be very fast perhaps because of the presence of multiple functional groups with some of them having lone pair of electrons. Increasing pH was observed to have very little positive effect on the adsorption of MB dye on DPS adsorbent. Increasing particle size decreased the adsorption capacity of DPS adsorbent for MB dye. It is suggested that the mechanism for the adsorption of MB dye onto DPS adsorbent might not only be solely controlled by film diffusion but also by pore diffusion. Mathematical models for the optimization of adsorbent dose, number of adsorption stages and minimum contact time were developed. The optimum conditions for the adsorption of 99% of 100 mg L-1 MB dye from 10 m3 of aqueous solution of the dye were five adsorption stages, approximate to 21 kg for each stage with a total minimum contact time of approximate to 71 min. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Stages, Analysis, Aqueous Solution, Aqueous-Solution, Capacity, Carboxylic, Carica Papaya, Chemistry, Concentration, Diffusion, DPS, Dye, Equilibrium, Exothermic, Film Diffusion, FT-IR, FTIR, FTIR Spectra, Functional Groups, Kinetic, Kinetic Rate, Kinetics, L1, Malachite Green, Mathematical Models, MB, Mechanism, Methylene Blue, Minimum, Models, Optimization, Orange Peel, Particle Size, pH, Pore Diffusion, Pseudo-Second-Order, Rate Constant, Reaction, Removal, Rights, Size, Solution, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Surface Chemistry, Surface-Area, Time, Waste-Water

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Full Text: [2009\Che Eng J155, 580.pdf](2009/Che%20Eng%20J155,%20580.pdf)

Abstract: This work describes the sorption of 134Cs, 60Co and 152+154Eu by crystals of unmodified and phosphoric acid modified silico-antimonates (SiSb). Equilibrium and selectivity sequence for co-exiting metal ions under strongly acidic conditions of HClO4, H2SO4, HNO3 and HCl were investigated. The results showed that the silico-antimonate either in the high Sb5+ content or in the phosphated form possesses acidic characters and shows cation-exchange properties more efficient in acidic media. Kinetic studies indicated that pseudo-second-order model gave better fitting parameters comparing to that of pseudo-first-order one. The thermodynamic parameters of the sorption processes revealed spontaneous and endothermic nature. High negativity of Delta G degrees values for the modified SiSb confirms the positive role of phosphoric acid impregnation in the sorption process. The break-through capacities of the studied ions were further calculated from a column investigation. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Breakthrough, Carbons, Cation Exchange, Column, Content, Endothermic, Equilibrium, Eu3+, Exchange, Impregnation, Investigation, Ion, Ions, Kinetic, Kinetic Studies, Media, Metal, Metal Ions, Metals, Model, Modified, Phosphate, Phosphoric Acid, Phosphoric Acid Activation, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rights, Role, Sb, Selectivity, Silico-Antimonate, Sorption, Sorption Kinetics, Sorption Process, Thermodynamic, Thermodynamic Parameters, Ti, Waste, Work

? Calvete, T., Lima, E.C., Cardoso, N.F., Dias, S.L.P. and Pavan, F.A. (2009), Application of carbon adsorbents prepared from the Brazilian pine-fruit-shell for the removal of Procion Red MX 3B from aqueous solution-Kinetic, equilibrium, and thermodynamic studies. *Chemical Engineering Journal*, **155** (3), 627-636.

Full Text: [2009\Che Eng J155, 627.pdf](2009/Che%20Eng%20J155,%20627.pdf)

Abstract: Activated (AC-PW) and non-activated (C-PW) carbonaceous materials were prepared from the Brazilian pine-fruit-shell (Araucaria angustifolia) and tested as adsorbents for the removal of Procion Red MX 3B dye (PR-3B) from aqueous effluents. The activation process lead to increase in the specific surface area, average porous volume, and average porous diameter of the adsorbent AC-PW when compared to C-PW. The effects of shaking time, adsorbent dosage and pH on adsorption capacity were studied. PR-3B uptake was favorable at pHs ranging from 2.0 to 3.0 for C-PW and 2.0 to 7.0 for AC-PW. The contact time required to obtain the equilibrium using C-PW and AC-PW as adsorbents was 6 and 4 h at 298 K, respectively. The values of the function error (F-error) of fractionary-order kinetic model was at least 15 times lower than the values obtained with pseudo-first-order, pseudo-second order and Elovich kinetic models, indicating that this kinetic model was better fitted to the experimental results. For equilibrium data the F-error values of the Sips isotherm model were at least 4.0 lower than the values of Langmuir, Freundlich, and Redlich-Peterson isotherm models using C-PW and AC-PW as adsorbents. The enthalpy and entropy of adsorption of PR-3B were obtained from adsorption experiments ranging from 298 to 323 K. Simulated dyehouse effluents were used to check the applicability of the proposed carbons for effluent treatment. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Activated Carbon, Activated Carbon, Activation, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Capacity, Anionic Dyes, Araucaria-Angustifolia Wastes, Batch Conditions, Brazilian Pine-Fruit-Shell, Capacity, Carbon, Carbonaceous Materials, Data, Dye, Effluent Treatment, Effluents, Elovich, Enthalpy, Entropy, Equilibrium, Error, Experimental, Experiments, Freundlich, Function, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetic Models, Langmuir, Lead, Methylene-Blue Biosorption, Model, Models, Pecan Nutshell, pH, Procion Red MX 3B Dye, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Reactive Dyes, Redlich-Peterson, Removal, Rights, Simulated Dyehouse Effluent, Specific Surface, Specific Surface Area, Statistical Design, Surface, Surface Area, Thermodynamic, Thermodynamic Studies, Thin Chitosan Membranes, Time, Treatment, Uptake, Volume, Yellow Passion-Fruit

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Full Text: [2009\Che Eng J155, 654.pdf](2009/Che%20Eng%20J155,%20654.pdf)

Abstract: Silicalite-1 zeolite was used for selective adsorption and separation of p-chloronitrobenzene (*p*-CNB) and o-chloronitrobenzene (*o*-CNB). Maximum adsorption amounts of *p*-CNB in the zeolite are found to be approximately 4 molecules per unit cell (mol./u.c.), much higher than those of *o*-CNB. *p*-CNB molecules are considered to be located in zeolite intersections and channels. CNBs adsorption in Silicalite-1 zeolite follows pseudo-second-order kinetic model. Adsorption amounts and temperatures are the important parameters in affecting CNBs adsorption rate constants. Adsorption rate constants of *p*-CNB are higher than those of *o*-CNB in Silicalite-1 zeolite. *p*-CNB with a purity of 94.9% and *o*-CNB of 96.1% can be recovered with Silicalite-1 zeolite under an optimal separation condition investigated. Compared with Silicalite-1 zeolite, the presence of acid sites in zeolites is not only favorable for *p*-CNB selective adsorption from CNBs aqueous solution, but also improves the adsorption heat of *p*-CNB. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Adsorption, Adsorption Rate, Aqueous Solution, Benzene, Catalysis, Chloronitrobenzene, Degradation, Equilibrium, Isomers, Kinetic, Kinetic Model, MFI, Model, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Purity, Rate Constants, Removal, Rights, Selective, Selective Adsorption, Separation, Silicalite-1 Zeolite, Simulation, Solution, Sorption, Y-Zeolite, Zeolite, Zeolites

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Full Text: [2009\Che Eng J155, 666.pdf](2009/Che%20Eng%20J155,%20666.pdf)

Abstract: In this work the potential of Catla catla scales to remove Cr(VI) ions from aqueous solutions was investigated as a function of time, initial Cr(VI) concentration, initial pH, biomass dose and agitation speed. Optimum biosorption conditions were found to be pH 1.0, 0.05 g L-1 biomass dosage, 200 rpm agitation speed and 180 min equilibrium time. The fitness of biosorption equilibrium data for Freundlich, Langmuir and Dubinin-Radushkevich isotherm models were tested. It was found that Freundlich model was better suitable for biosorption of Cr(VI) ions onto C. catla biomass. Three kinetic models viz. the Lagergren firstorder and pseudo-second-order and intra-particle diffusion model were used to analyze the biosorption data and the results suggested that the pseudo-second-order model represented the best correlation. FTIR spectrum analysis revealed that O-H, N-H and C-O groups were the leading Cr(VI) binding groups. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Adsorption, Agitation, Analysis, Aqueous Solutions, Binding, Biomass, Biosorption, Chromium, Co, Concentration, Correlation, Cr(VI), Data, Diffusion, Diffusion Model, Equilibrium, Fitness, Freundlich, Freundlich Model, FTIR, Function, Fungal Biomass, Heavy Metal, Hexavalent Chromium, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Isotherm, Kinetic, Kinetic Models, Kinetics, L1, Langmuir, Metals, Model, Models, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Scales, Solutions, Spectrum Analysis, Time, VI, Waste, Wastewater Treatment, Work

? Rahman, R.O.A. and Zaki, A.A. (2009), Assessment of the leaching characteristics of incineration ashes in cement matrix. *Chemical Engineering Journal*, **155** (3), 698-708.

Full Text: [2009\Che Eng J155, 698.pdf](2009/Che%20Eng%20J155,%20698.pdf)

Abstract: In this work, the effort is directed to assess the feasibility of immobilizing the ash produced from the incineration of solid radioactive wastes. Within this context, the ash was characterized to determine its chemical composition and physical properties. Immobilized cement-ash matrices have been prepared to investigate the influence of waste to cement ratio. To characterize the extent of the solidification process of the immobilized waste matrices, the mechanical strength test was conducted. The standard mass transfer leach test has been employed to test the extent of 137Cs and 60Co stabilization. Non-linear fitting of the experimental leach data to different mathematical models was conducted to evaluate the mechanisms those instigate the leaching phenomena and the leaching parameters were determined. The controlling leaching mechanism and leachability indices were calculated for the studied waste matrices. The results indicated that 137Cs leaching is resulted from first-order reaction between the surface of the waste matrix and the leaching solution followed by diffusion through the studied matrices. The leaching of 60Co was found to be as result of four subsequent mechanisms that include release of loosely bound 60Co followed by first-order reaction the diffusion and finally dissolution. It was found that the studied immobilized waste matrices have acceptable mechanical performance. The values of the leachability indices indicate that the performance of the studied matrices in 137Cs stabilization is not acceptable.

Keywords: Radioactive Waste, Incineration, Leaching Mechanisms, Mathematical Models

? Huang, J.H., Wang, X.G. and Huang, K.L. (2009), Adsorption of p-nitroaniline by phenolic hydroxyl groups modified hyper-cross-linked polymeric adsorbent and XAD-4: A comparative study. *Chemical Engineering Journal*, **155** (3), 722-727.

Full Text: [2009\Che Eng J155, 722.pdf](2009/Che%20Eng%20J155,%20722.pdf)

Abstract: Phenolic hydroxyl groups modified hyper-cross-linked polymeric adsorbent HJ-02 was prepared and it was applied to remove p-nitroaniline in aqueous solution as compared with Amberlite XAD-4. The results indicated that the adsorption at the solution pH of 3.7-7.8 was efficient for HJ-02 resin while that at the solution pH higher than 4.1 was favorable for XAD-4. The ionic strength affected the adsorption slightly and NaCl at a low concentration (< 10%) had a positive effect. The adsorption kinetic curves obeyed the pseudo-second-order rate equation and HJ-02 resin had lower rate constant than XAD-4. The adsorption isotherms could be fitted by Langmuir isotherm and the adsorption capacity onto HJ-02 resin was much larger than that onto XAD-4. The adsorption enthalpy, adsorption free energy, and adsorption entropy onto HJ-02 resin were a little more negative than those onto XAD-4. Analysis of the adsorption mechanism suggested that the phenolic hydroxyl groups uploaded on HJ-02 resin and the predominant mesopores (2-5 nm) were the main reasons for its much larger adsorption capacity. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption Enthalpy, Adsorption Isotherms, Adsorption Kinetic, Adsorption Mechanism, Amberlite Xad-4, Amide Group, Aqueous Solution, Aqueous-Solution, Behavior, Capacity, Comparative Study, Concentration, Diaminoethane Sporopollenin, Energy, Enthalpy, Entropy, Functionality, Ionic Strength, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Methylene-Blue, Modified, NaCl, P-Nitroaniline, pH, Polymeric, Polymeric Adsorbent, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rate Constant, Removal, Resin, Rights, Solution, Strength, Thermodynamics, Waste-Water, XAD-4

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Full Text: [2010\Che Eng J156, 2.pdf](2010/Che%20Eng%20J156,%202.pdf)

Abstract: Concern about environmental protection has increased over the years from a global viewpoint. To date, the prevalence of adsorption separation in the environmental chemistry remains an aesthetic attention and consideration abroad the nations, owning to its low initial cost, simplicity of design, ease of operation, insensitivity to toxic substances and complete removal of pollutants even from dilute solutions. With the renaissance of isotherms modeling, there has been a steadily growing interest in this research field. Confirming the assertion, this paper presents a state of art review of adsorption isotherms modeling, its fundamental characteristics and mathematical derivations. Moreover, the key advance of the error functions, its utilization principles together with the comparisons of linearized and non-linearized isotherm models have been highlighted and discussed. Conclusively, the expanding of the nonlinear isotherms represents a potentially viable and powerful tool, leading to the superior improvement in the area of adsorption science.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Isotherms, Attention, Bagasse Fly-Ash, Brilliant Green-Dye, Design, Dilute Aqueous-Solutions, Environmental, Equilibrium Isotherm, Error Function, Interest, Isotherm, Isotherm Models, Isotherms, Linear, Low-Cost Adsorbents, Malachite Green, Methylene-Blue Adsorption, Modeling, Nonlinear, Nonlinear-Regression Analysis, Pollutants, Prevalence, Removal, Research, Review, Science, Separation, Shell Activated Carbon, Sorption Isotherm, Toxic Substances, Utilization

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Full Text: [2010\Che Eng J156, 11.pdf](2010/Che%20Eng%20J156,%2011.pdf)

Abstract: Natural zeolites are abundant and low cost resources, which are crystalline hydrated aluminosilicates with a framework structure containing pores occupied by water, alkali and alkaline earth cations. Due to their high cation-exchange ability as well as to the molecular sieve properties, natural zeolites have been widely used as adsorbents in separation and purification processes in the past decades. In this paper, we review the recent development of natural zeolites as adsorbents in water and wastewater treatment. The properties and modification of natural zeolite are discussed. Various natural zeolites around the world have shown varying ion-exchange capacity for cations such as ammonium and heavy metal ions. Some zeolites also show adsorption of anions and organics from aqueous solution. Modification of natural zeolites can be done in several methods such as acid treatment, ion exchange, and surfactant functionalisation, making the modified zeolites achieving higher adsorption capacity for organics and anions. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Natural Zeolite, Adsorption, Inorganic Ions, Organics, Water Treatment, Surfactant-Modified Zeolite, Low-Cost Adsorbents, Reactive Azo Dyes, Heavy-Metal Ions, Nonlinear-Regression Analysis, Clinoptilolite-Rich Tuff, Aqueous-Solution, Ammonia Removal, Organo-Zeolites, Drinking-Water

? Ayranci, E. and Duman, O. (2010), Structural effects on the interactions of benzene and naphthalene sulfonates with activated carbon cloth during adsorption from aqueous solutions. *Chemical Engineering Journal*, **156** (1), 70-76.

Full Text: [2010\Che Eng J156, 70.pdf](2010/Che%20Eng%20J156,%2070.pdf)

Abstract: Interactions of benzene and naphthalene sulfonates with activated carbon cloth (ACC) during adsorption from aqueous solutions were investigated. Systematically chosen sulfonates were sodium salt of benzene sulfonic acid (NaBS), disodium salt of 1,3-benzene disulfonic acid (Na2BDS), sodium salt of 1-naphthalene sulfonic acid (NaNS), disodium salt of 1,5-naphthalene disulfonic acid (Na2NDS) and trisodium salt of 1,3,(6 or 7)-naphthalene trisulfonic acid (Na3NTS). The adsorption behaviors of these adsorbates from solutions in water and in 0.01 MH2SO4 onto the ACC were monitored by in-situ UV-visible spectroscopic technique. The order of rates and extents of adsorption of sulfonates were explained in terms of acidity of the medium and structural factors influencing the interactions between sulfonates and the ACC surface. Kinetic data of adsorption were treated according to pseudo first-order, pseudo second-order, Elovich and intra-particle diffusion models. The best model representing the experimental kinetic data was found to be the pseudo second-order model. Adsorption isotherms of the sulfonates onto the ACC were derived at 30ºC. Isotherm data were found to fit the Freundlich model better than the Langmuir model. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Acid, Acidity, Activated Carbon, Activated Carbon Cloth, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solutions, Behaviors, Benzene, Benzene Sulfonates, Carbon, Data, Diffusion, Electrosorption, Elovich, Experimental, Felt Electrodes, Fibers, First Order, Freundlich, Freundlich Model, In Situ, In-Situ UV Spectroscopy, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Langmuir, Langmuir Model, Model, Models, Molecules, Naphthalene, Naphthalene Sulfonates, Phenol, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rates, Rights, Salt, Second Order, Second-Order, Second-Order Model, Sodium, Solutions, Sorption, Surface, Waste-Water Purification, Water

? Rao, R.A.K., Khan, M.A. and Rehman, F. (2010), Utilization of Fennel biomass (*Foeniculum vulgari*) a medicinal herb for the biosorption of Cd(II) from aqueous phase. *Chemical Engineering Journal*, **156** (1), 106-113.

Full Text: [2010\Che Eng J156, 106.pdf](2010/Che%20Eng%20J156,%20106.pdf)

Abstract: This work presents the biosorption potential of Fennel biomass for the effective removal of Cd(II) ions. The biosorption was maximum (92%) at pH 4.3. Maximum biosorption capacities of Cd(II) at 30, 40 and 50ºC temperatures were 21, 24 and 30 mg/g, respectively. The biosorption of Cd(II) was concentration dependent and increases from 0.49 to 9.3 mg/g with increase in concentration from 5 to 100 mg/L. Biosorption follows Freundlich isotherm at 50ºC. Mean free energies at different temperatures were in between 7.1 and 11.95 kJ/mol indicating chemical nature of biosorption process. Kinetics studies showed that pseudo-second-order kinetics model was applicable to the data. The process was endothermic and spontaneous, the spontaneity of the process increases with increase in temperature. Regeneration studies showed a decrease in the recovery of Cd(II) from 99.8% to 41.7% in five consecutive cycles. 80% of the Cd(II) in single and multi-metal systems was recovered in 10 mL. Breakthrough and exhaustive capacities of Cd(II) in single metal system were 10 and 40 mg/g. For multi-metal systems in double distilled water the breakthrough and exhaustive capacities of Cd(II) were 2 and 12 mg/g. In saline solution the breakthrough and exhaustive capacities of Cd(II) were 0.8 and 4 mg/g. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Adsorption, Aqueous Phase, Biomass, Biosorption, Breakthrough, Breakthrough Capacity, Cadmium(II), Cd(II), Cd(II) Ions, Chemical, Chromium, Concentration, Data, Desorption, Endothermic, Equilibrium, Fennel Biomass, Freundlich, Freundlich Isotherm, Ions, Isotherm, Kinetics, Kinetics Model, Mechanism, Metal, Model, pH, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Recovery, Regeneration, Removal, Rights, Solution, Sorption, Systems, Temperature, Waste, Water, Work

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Full Text: [2010\Che Eng J156, 134.pdf](2010/Che%20Eng%20J156,%20134.pdf)

Abstract: Magnesium(II) doped spinel lithium manganese oxide (LMS) was synthesized by soft chemical method and nanosized ion sieve manganese oxide (HMS) was prepared by extracting lithium and magnesium from LMS. The characteristics of HMS were studied by X-ray diffraction, scanning electron microscopy, transmission electron microscopy, surface areas and determination of pH at the point of zero charge. Experiments were performed to study the effects of pH, adsorbent dose, contact time and Li+ concentration. The competitive model was used to describe the competition between Li+-H+ and the applicability of different kinetic models was evaluated. The results showed that the pH at the point of zero charge of HMS was about 7.8. The recycle of HMS explained that it could be used as Li+ adsorbent with topotactical extraction of lithium. Under optimized batch conditions up to 99.2% Li+ could be recovered from solution within 24h. The adsorption process followed the pseudo-second-order model and followed an intraparticle diffusion model at the beginning. (C) 2009 Published by Elsevier B. V.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Aqueous-Phase, Batch, Behavior, Biosorption, Characteristics, Charge, Chemical, Competition, Competitive, Concentration, Diffusion, Diffusion Model, Dye, Electron Microscopy, Exchange, Extraction, HMS, Hybrid, Insertion Reactions, Intraparticle Diffusion, Intraparticle Diffusion Model, Ion Sieve, Isotherm, Kinetic, Kinetic Models, Kinetics, Lithium, Lithium Ion Sieve, Magnesium, Manganese, Manganese Oxide, Model, Modeling, Models, Oxide, pH, Point of Zero Charge, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Recycle, Removal, Scanning Electron Microscopy, Solution, Sorption, Spinel, Surface, Surface Areas, Time, Transmission, X-Ray, X-Ray Diffraction

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Full Text: [2010\Che Eng J156, 146.pdf](2010/Che%20Eng%20J156,%20146.pdf)

Abstract: This study explored the feasibility of utilizing a novel adsorbent, humic acid-immobilized-amine-modified polyacrylamide/bentonite composite (HA-Am-PAA-B) for the adsorption of Cu(II), Zn(II) and Co(II) ions from aqueous solutions. The FTIR and XRD analyses were done to characterize the adsorbent material. The effects of pH, contact time, initial adsorbate concentration, ionic strength and adsorbent dose on adsorption of metal ions were investigated using batch adsorption experiments. The optimum pH for Cu(II), Zn(II) and Co(II) adsorption was observed at 5.0, 9.0 and 8.0, respectively. The mechanism for the removal of metal ions by HA-Am-PAA-B was based on ion exchange and complexation reactions. Metal removal by HA-Am-PAA-B followed a pseudo-second-order kinetics and equilibrium was achieved within 120 min. The suitability of Langmuir, Freundlich and Dubinin-Radushkevich adsorption models to the equilibrium data was investigated. The adsorption was well described by the Langmuir isotherm model. The maximum monolayer adsorption capacity was 106.2, 96.1 and 52.9 mg g(-1) for Cu(II), Zn(II) and Co(II) ions, respectively, at 30 degrees C. The efficiency of HA-Am-PAA-B in removing metal ions from different industry wastewaters was tested. Adsorbed metal ions were desorbed effectively (97.7 for Cu(II), 98.5 for Zn(II) and 99.2% for Co(II)) by 0.1 M HCl. The reusability of the HA-Am-PAA-B for several cycles was also demonstrated. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Capacity, Analyses, Aqueous Solutions, Batch, Batch Adsorption, Capacity, Clay, Co(II), Cobalt, Complexation, Composite, Concentration, Copper, Cu(II), Data, Efficiency, Equilibrium, Equilibrium Modeling, Experiments, Feasibility, Freundlich, FTIR, Heavy Metal Ion, Heavy Metals, Humic Acid, Ion Exchange, Ion-Exchange, Ionic Strength, Ions, Isotherm, Isotherm Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanism, Metal, Metal Ions, Metal Removal, Metals, Model, Modeling, Models, Monolayer, pH, Polymer, Clay Composite, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Regeneration, Removal, Reusability, Rights, Solutions, Strength, Time, Uptake, Waste-Water, Wastewater, Wastewaters, XRD, Zn(II)

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Full Text: [2010\Che Eng J156, 243.pdf](2010/Che%20Eng%20J156,%20243.pdf)

Abstract: Activated carbon/CoFe2O4 composite (AC/CFO) was synthesized by a simple one-step refluxing route and was used as adsorbent for the removal of malachite green (MG) dye from water. The structure, morphology and magnetic properties of as-prepared composite were characterized by X-ray diffractometer (XRD), scanning electron microscope (SEM), transmission electron microscope (TEM) and vibrating sample magnetometer (VSM). The results indicated that CoFe2O4 particles deposited on the surface of activated carbon in the composite were uniform with the particle size in the range of 14-20 nm. The composite adsorbents exhibited a clearly hysteretic behavior under applied magnetic field, which allowed their magnetic separation from water. Batch experiments were carried out to investigate adsorption isotherms and kinetics of MG onto the composite. The experimental data fitted well with the Langmuir model with a monolayer adsorption capacity of 89.29 mg g(-1). The adsorption kinetics was found to follow pseudo-second-order kinetic model. It was indicated that the as-prepared composite could be used as a promising and effective adsorbent for the removal of MG from water. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Application, Aqueous-Solutions, Azo-Dye, Behavior, Binary Oxide Adsorbent, Capacity, Carbon, Cationic Dyes, CoFe2O4, Composite, Composites, Data, Dye, Dye Removal, Equilibrium, Experimental, Experiments, Field, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Magnetic, Magnetic Field, Magnetic Performance, Magnetic Properties, Malachite Green, Mg, Model, Monolayer, Morphology, Particle Size, Particles, Performance, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Range, Removal, Rights, Route, SEM, Separation, Size, Sorption, Structure, Surface, Synthesis, Tem, Transmission, Waste-Water, Water, X-Ray, XRD

? Xiong, L., Yang, Y., Mai, J.X., Sun, W.L., Zhang, C.Y., Wei, D.P., Chen, Q. and Ni, J.R. (2010), Adsorption behavior of methylene blue onto titanate nanotubes. *Chemical Engineering Journal*, **156** (2), 313-320.

Full Text: [2010\Che Eng J156, 313.pdf](2010/Che%20Eng%20J156,%20313.pdf)

Abstract: Calcined titanate nanotubes were synthesized with hydrothermal treatment of the commercial TiO2 (Degussa P25) followed by calcination. The morphology and structures of as-prepared samples were investigated by transmission electron microscopy, X-ray diffraction and N-2 adsorption/desorption. The samples exhibited a tubular structure and a high surface area of 157.9 m2/g. The adsorption of methylene blue onto calcined titanate nanotubes was studied. The adsorption kinetics was evaluated by the pseudo-first-order, pseudo-second-order and Weber’s intraparticle diffusion model. The pseudo-second-order model was the best to describe the adsorption kinetics, and intraparticle diffusion was not the rate-limiting step. The equilibrium adsorption data were analyzed with three isotherm models (Langmuir model, Freundlich model and Temkin model). The best agreement was achieved by the Langmuir isotherm with correlation coefficient of 0.993, corresponding to maximum adsorption capacity of 133.33 mg/g. The adsorption mechanism was primarily attributed to chemical sorption involving the formation of methylene blue-calcined titanate nanotubes nanocomposite, associated with electrostatic attraction in the initial bulk diffusion. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Mechanism, Adsorption, Desorption, Aqueous-Solution, Behavior, Calcination, Calcination Temperature, Calcined, Capacity, Chemical, Correlation, Correlation Coefficient, Data, Diffusion, Diffusion Model, Electron Microscopy, Equilibrium, Freundlich, Freundlich Model, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Model, Leaf Powder, Mechanism, Methylene Blue, Model, Models, Morphology, N2, N2, Nanocomposite, Nanotubes, Photocatalytic Activity, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Limiting Step, Rate-Limiting Step, Rights, Sorption, Structure, Surface, Surface Area, TiO2, Titanate Nanotubes, Transmission, Treatment, X-Ray, X-Ray Diffraction

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Full Text: [2010\Che Eng J157, 29.pdf](2010/Che%20Eng%20J157,%2029.pdf)

Abstract: Synthetic diazo dye Acid Blue 29 was removed from aqueous solution using the strongly basic anion exchanger of macroporous structure - Purolite A-520E. The influence of phase contact time (1-180 min), anion exchanger dosage (0.25-1.0 g), solution pH (1-8), initial dye concentration (100-500 mg/L) and temperature (20-50ºC) was studied by the batch method. Additionally, the obtained results were compared with those for the activated carbon Purolite AC-20G. The amounts of Acid Blue 29 adsorbed at equilibrium using the strongly basic anion exchanger were equal to 9.9, 19.9, 29.9 and 48.2 mg/g for the dye solutions of the initial concentrations 100, 200, 300 and 500 mg/L, respectively. The experimental data were analyzed by means of the Langmuir, Freundlich and Temkin models of adsorption. The maximum monolayer capacity Q(0) for sorption of the dye on the activated carbon was 30.2 mg/g. The Q(0) obtained for the strongly basic anion exchanger was ten times higher (321.5 mg/g) than that obtained for Purolite AC-20G. The kinetic data obtained at different concentrations were modelled using the pseudo-first order, pseudo-second order and intraparticle diffusion equations. The experimental data were well described by the pseudo-second order kinetic model. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Acid Blue, Acidic Dye, Activated Carbon, Activated Carbon, Adsorption, Agricultural Waste, Aqueous Solution, Aqueous-Solutions, Basic Dye, Batch, Batch Method, Capacity, Carbon, Concentration, Data, Diffusion, Dye, Equilibrium, Experimental, Fly-Ash, Freundlich, Intraparticle Diffusion, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Macroporous, Methylene-Blue, Model, Models, Monolayer, pH, Polystyrene Anion Exchanger, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Reactive Dyes, Removal, Resins, Rights, Solution, Solutions, Sorption, Structure, Temperature, Time

? Rahman, R.O.A., Ibrahim, H.A., Hanafy, M. and Monem, N.M.A. (2010), Assessment of synthetic zeolite Na A-X as sorbing barrier for strontium in a radioactive disposal facility. *Chemical Engineering Journal*, **157** (1), 100-112.

Full Text: [2010\Che Eng J157, 100.pdf](2010/Che%20Eng%20J157,%20100.pdf)

Abstract: The retention of strontium onto synthetic zeolite Na A-X, candidate as backfill material in a near surface disposal facility, was studied using batch and column techniques. In order to investigate the sorption mechanism, the kinetic data were tested using pseudo-first-order, pseudo-second-order, homogenous particle, and intraparticle models. The suitability of the geochemical conditions was preliminarily assessed by conducting equilibrium sorption studies at different pH ranging from 2.0 to 9.0. To optimize the design of the barrier, the effect of the initial concentration on the retention of Sr2+ onto the proposed material at three temperatures was investigated. The sorption equilibrium data were analyzed using non-linear Freundlich, Langmuir, and D-R models to evaluate the sorption characteristics and the thermodynamic parameters such as changes in free energy (Δ*G*), enthalpy (Δ*H*), and entropy (Δ*S*) were calculated. To assess the effect of the utilized method to determine the retardation coefficients on the predicted concentration, a simple pulse analytical model was used. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Backfill Material, Barrier, Batch, Changes, Characteristics, Column, Concentration, Data, Design, Disposal, Energy, Engineered Barrier, Enthalpy, Entropy, Equilibrium, Freundlich, Geochemical, Kinetic, Kinetics, Langmuir, Mathematical Models, Mechanism, Metal-Ions, Model, Models, Natural Zeolite, Pb(II) Ions, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Radioactive Waste, Removal, Retention, Rights, Sorption, Sorption Mechanism, Sorption Studies, Strontium, Surface, Techniques, Thermodynamic, Thermodynamic Parameters, Waste-Water, Zeolite

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Full Text: [2010\Che Eng J157, 238.pdf](2010/Che%20Eng%20J157,%20238.pdf)

Abstract: Surface functionalization of multi-walled carbon nanotubes (MWCNTs) by ethylenediamine, via chemical modification of carboxyl groups, using O-(7-azabenzotriazol-1-yl)-N,N,N’,N’-tetramethyluronium hexafluorophosphate, was performed. The resulting materials were characterized by different techniques, such as FTIR, TGA and elemental analysis. Biocompatibility studies showed that the functionalized MWCNTs, at concentrations between 1 and 50 mu g mL-1, were not cytotoxic for the fibroblast L929 cell line. In batch tests, the influences of solution pH, contact time, initial metal ion concentration and temperature on the sorption of Cd2+ ions onto raw-MWCNTs (raw-MWCNT), oxidized MWCNTs (o-MWCNT) and ethylenediamine-functionalized MWCNTs (e-MWCNT) were studied. The adsorption of Cd2+ ions by o-MWCNT and e-MWCNT was strongly pH dependent. The time dependent Cd2+ sorption onto raw-MWCNT, o-MWCNT and e-MWCNT can be described by a pseudo-second-order kinetic model. The Langmuir isotherm model agrees well with the equilibrium experimental data. The maximum capacity was obtained for e-MWCNT, 25.7 mgg-1, at 45ºC. The thermodynamic parameters were also deduced for the adsorption of Cd2+ ions on raw-MWCNT, o-MWCNT and e-MWCNT and the results showed that the adsorption was spontaneous and endothermic. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Amino-Functionalization, Analysis, Aqueous Solutions, Batch, Batch Tests, Biosorption, Cadmium, Cadmium Adsorption, Capacity, Carbon, Carbon Nanotubes, Cd2+, Chelating Resins, Chemical, Chemical Modification, Chemical-Modification, Competitive Adsorption, Concentration, Cytotoxicity, Data, Divalent Metal-Ions, Endothermic, Equilibrium, Ethylenediamine, Experimental, FTIR, Heavy-Metals, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Metal, Metal Ion, Model, Modification, Modified Biomass, Multiwalled Carbon Nanotubes, Mwcnts, Nanotubes, Pb(II), pH, pH-Dependent, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solution, Solutions, Sorption, Surface-Chemistry, Techniques, Temperature, TGA, Thermodynamic, Thermodynamic Parameters, Time, Time-Dependent

? Liu, Q.S., Zheng, T., Wang, P., Jiang, J.P. and Li, N. (2010), Adsorption isotherm, kinetic and mechanism studies of some substituted phenols on activated carbon fibers. *Chemical Engineering Journal*, **157** (2-3), 348-356.

Full Text: [2010\Che Eng J157, 348.pdf](2010/Che%20Eng%20J157,%20348.pdf)

Abstract: Activated carbon fibers (ACFs) were used for the adsorption of phenol, 2-chlorophenol (2-CP), 4-chlorophenol (4-CP), 2,4-dichlorophenol (DCP), 2,4,6-trichlorophenol (TCP), 4-nitrophenol (4-NP) and 2,4-dinitrophenol (DNP) from aqueous solutions, and the adsorption capacities followed the order of TCP>DNP approximate to DCP>4-NP>4-CP>2-CP>phenol. Adsorption isotherms at different temperatures were determined and modeled with Langmuir, Freundlich and Redlich-Peterson equations. Thermodynamic parameters were calculated and correlated with the adsorption behaviors. The effects of solution pH on the adsorption were also studied. The adsorption mechanism was discussed based on the experimental results, and the pi-pi interactions, solvent effects, hydrophobic interactions and molecular dimensions were considered to be important in the adsorption. Kinetic studies showed rapid adsorption kinetics of the phenols, due to the open pore structure of the ACFs. The kinetics was fitted with the pseudo-first-order, pseudo-second-order and intraparticle diffusion models. Steric effects on adsorption kinetics were observed for TCP, 4-NP and DNP, but serious impact on the ultimate uptake was only found for DNP. The relationship between the steric effects and the molecular dimension was also proposed. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2-Chlorophenol, 4-Chlorophenol, 4-Nitrophenol, Activated Carbon, Activated Carbon Fibers, Adsorption, Adsorption Capacities, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Adsorption Mechanism, Aqueous Solutions, Aqueous-Solutions, Carbon, Competitive Adsorption, DCP, Diffusion, Experimental, Fibers, Freundlich, Functional-Groups, Impact, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, Liquid-Phase Adsorption, Mar, Mechanism, Models, Open, P-Nitrophenol, pH, Phenol, Phenols, Pore-Size Distribution, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Reactive Dyes, Redlich-Peterson, Removal, Rights, Solution, Solutions, Structure, Substituted Phenols, Surface-Chemistry, TCP, Thermodynamic, Thermodynamic Parameters, Uptake, Water

? Munagapati, V.S., Yarramuthi, V., Nadavala, S.K., Alla, S.R. and Abburi, K. (2010), Biosorption of Cu(II), Cd(II) and Pb(II) by *Acacia leucocephala* bark powder: Kinetics, equilibrium and thermodynamics. *Chemical Engineering Journal*, **157** (2-3), 357-365.

Full Text: [2010\Che Eng J157, 357.pdf](2010/Che%20Eng%20J157,%20357.pdf)

Abstract: The kinetics, equilibrium and thermodynamics of the biosorption of Cu(II), Cd(II) and Pb(II) onto *Acacia leucocephala* bark powder from aqueous solution were investigated at different experimental conditions. The biosorption characteristics of Cu(II), Cd(II) and Pb(II) ions on the bark powder was investigated with respect to well-established effective parameters including the effect of pH, initial metal ion concentration, biosorbent dosage, contact time and temperature. Optimum adsorption of Cu(II), Cd(II) and Pb(II) took place at pH values of 6.0, 5.0 and 4.0, respectively. Further, the biosorbent was characterized by Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). The Langmuir and Freundlich equilibrium adsorption models were studied and observed to fit well. The Langmuir model gives a better fit than the Freundlich model. The kinetic studies indicated that the biosorption process of the metal ions followed well pseudo-second-order model. The thermodynamic parameters Gibbs free energy (ΔGº), enthalpy (ΔHº), and entropy (ΔSº) changes were also calculated, and the values indicated that the biosorption process was exothermic and spontaneous. It was concluded that A. leucocephala bark powder can be used as an effective, low cost, and environmentally friendly biosorbent for the removal of Cu(II), Cd(II) and Pb(II) ions from aqueous solution. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acacia Leucocephala Bark, Adsorption, Aqueous Solution, Aqueous-Solution, Biomass, Biosorbent, Biosorption, Biosorption Characteristics, Cd(II), Changes, Characteristics, Concentration, Copper(II), Cost, Cr(III), Cu(II), Energy, Enthalpy, Entropy, Environmentally Friendly, Equilibrium, Exothermic, Experimental, Freundlich, Freundlich Model, FTIR, Gibbs Free Energy, Heavy Metals, Heavy-Metals, Ions, Isotherm, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Low Cost, Mar, Metal, Metal Ion, Metal Ions, Model, Models, Pb(II), Pb(II) Ions, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rice Husk, Rights, SEM, Solution, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time, Waste-Water

? Li, Q., Liu, H.N., Liu, T.Y., Guo, M., Qing, B.J., Ye, X.S. and Wu, Z.J. (2010), Strontium and calcium ion adsorption by molecularly imprinted hybrid gel. *Chemical Engineering Journal*, **157** (2-3), 401-407.

Full Text: [2010\Che Eng J157, 401.pdf](2010/Che%20Eng%20J157,%20401.pdf)

Abstract: The adsorption of strontium and calcium ions by strontium ion-imprinted hybrid gel derived from bis(trimethoxysilylpropyl)amine (TSPA) was comparatively studied. The effects of initial solution pH, ionic strength, initial metal ion concentration, and temperature on the equilibrium adsorption amount and the separation factor between strontium and calcium ions were comprehensively investigated. In description of the adsorption kinetics, the pseudo second-order model was found to be more suitable than the pseudo first-order model. In general, the equilibrium adsorption amount of both Sr2+ and Ca2+ ions was found to increase with the increase in both the initial metal ion concentration and pH, but not to be so sensitive to ionic strength and temperature. The separation of Sr2+ and Ca2+ ions could rely on the difference in adsorption kinetics, because Sr2+ ions were found to adsorb more rapidly than Ca2+ ions at the early adsorption stage. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solutions, Calcium, Concentration, Equilibrium, Exchange, First Order, First-Order Model, Functionalized Silica-Gel, Gel, General, Hybrid, Hybrid Gel, Ion-Imprinted, Ionic Strength, Ions, Kinetics, Mar, Metal, Metal Ion, Model, Molecular Imprinting, pH, Polymer, Preconcentration, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rights, Second Order, Second-Order, Second-Order Model, Separation, Solid-Phase Extraction, Solution, Sorption Kinetics, Strength, Strontium, Surface, Temperature

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Full Text: [2010\Che Eng J157, 434.pdf](2010/Che%20Eng%20J157,%20434.pdf)

Abstract: The adsorption of a large reactive dye, Reactive Black 5, onto four adsorbents has been studied. A commercial active carbon, F400, was selected as a standard and two active carbons prepared from bamboo, a biomaterial. The two bamboo derived carbons, BACX2 and BACX6 had high specific surface areas, namely, 2123 and 1400 m2/g, respectively. A fourth widely used adsorbent, bone char, was also tested. The adsorption capacities for F400, bone char, BACX2 and BACX6 were 198, 160, 286 and 473 mg/g, respectively. A series of batch kinetics were carried out to investigate the rate and possible mechanism of Reactive Black 5 adsorption. Two pseudo-kinetic models and one intraparticle diffusion model were tested. The experimental concentration versus time decay curves were best explained by the intraparticle diffusion model. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Active Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Area, Bamboo, Bamboo Activated Carbon, Basic Dye Adsorption, Batch, Bone, Bone Char, Carbon, Char, Comparative Study, Concentration, Diffusion, Diffusion Model, Dye, Equilibrium, Experimental, Intraparticle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Kinetics, Mar, Mechanism, Mechanisms, Model, Models, Pore-Size, Reactive Black 5, Reactive Dye, Removal, Rights, Sorption, Specific Surface, Standard, Surface, Surface Areas, Surface-Chemistry, Time, Waste

? Yin, J.J., Chen, R., Ji, Y.S., Zhao, C.D., Zhao, G.H. and Zhang, H.X. (2010), Adsorption of phenols by magnetic polysulfone microcapsules containing tributyl phosphate. *Chemical Engineering Journal*, **157** (2-3), 466-474.

Full Text: [2010\Che Eng J157, 466.pdf](2010/Che%20Eng%20J157,%20466.pdf)

Abstract: Porous polysulfone (PSF) microcapsules containing both tributyl phosphate (TBP) as extractant and magnetic nanoparticles (Fe3O4) that help the isolation operation have been successfully prepared for the first time using a phase inversion method. Several techniques, including Fourier transform infrared (FTIR), scanning electron microscope (SEM), vibrating sample magnetometer (VSM) and thermogravimetric analysis (TGA) have been used to characterize the microcapsules. The adsorption of four kinds of phenols (4-chlorophenol, 4-CP; 2-chlorophenol, 2-CP; 4-nitrophenol, 4-NP: phenol, Ph) from aqueous solutions on to the magnetic microcapsules has then been studied in a batch system as a function of contact time (5-60 min), initial phenols concentrations (about 99-1050 mg/L) and pH (2-12). The results show that increasing the initial concentration of the phenols and the adsorption time favored the adsorption. In contrast, the adsorption decreased for pH > 6. Adsorption data were modeled using Freundlich and Langmuir adsorption isotherms and the appropriate parameters were calculated. The Freundlich equation provided a better fit for the four phenols than the Langmuir equation. Simultaneously, various kinetic models including pseudo-first-order, pseudo-second-order and intraparticle diffusion were investigated to determine the mechanism of adsorption. The experimental data fitted the pseudo-second-order kinetic model well, and showed that intraparticle solute diffusion was not the only rate-controlling sorption step. In an investigation of potential industrial applications. it is demonstrated that the final concentration of phenols treated with the novel magnetic microcapsules will be within allowed limits. After six extraction and regeneration cycles, the microcapsules were unchanged and showed almost the same adsorption ability. These results demonstrate that these novel magnetic microcapsules have potential applications in the treatment of environmental pollution caused by phenols. This study broadens the application of microcapsules, which are, at the moment, mainly used to remove heavy metals from water. (C) 2009 Published by Elsevier B.V.

Keywords: 2-Chlorophenol, 4-Chlorophenol, 4-Nitrophenol, Adsorption, Adsorption Isotherms, Analysis, Application, Aqueous Solutions, Aqueous-Solution, Batch, Batch System, Concentration, Data, Diffusion, Environmental, Environmental Pollution, Experimental, Extraction, Fe3O4, First, Fly-Ash, Freundlich, Freundlich Equation, FTIR, Function, Heavy Metals, Intraparticle Diffusion, Inversion, Investigation, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Langmuir Equation, Magnetic, Magnetic Nanoparticles, Mar, Mechanism, Mechanism of Adsorption, Metal-Ions, Metals, Methylene-Blue, Model, Models, Nanoparticles, Operation, P-Nitrophenol, pH, Phenol, Phenols, Phosphate, Pollution, Polysulfone, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Regeneration, Removal, SEM, Solutions, Sorption, Techniques, TGA, Time, Treatment, Tributyl Phosphate, Waste-Water, Water

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Full Text: [2010\Can J Che Eng88, 241.pdf](2010/Can%20J%20Che%20Eng88,%20241.pdf)

Abstract: This paper is a report on an investigation conducted on adsorption of lead ions (Pb2+) onto powdered corn cobs (PCC) Corn cobs were collected from a selected location in Nigeria The corn cobs were crushed and pulverised into different particle sizes Its compositions and adsorption properties of Pb2+ onto PCC were studied The effects of pH, particle size of PCC, and initial concentration of Pb2+ on the adsorption properties were monitored The adsorption capacities were analysed by using standard adsorption models The models were evaluated statistically (total error, coefficient of determination (CD), model of selection criterion (MSC), and root mean square error) The study revealed that PCC contained 2.33%, 86.89%, 10.78%, 0.52%, and 4.56% ash, volatile, moisture, solubility in water, and solubility in 0.25 M of HCl by mass, respectively Acid digestion of a gram of PCC indicated that PCC contained no chromium and lead, but contained 131 mg Fe, 54.79% carbon, 8.03% hydrogen, 0.41% nitrogen, 0.010 mg of Al, and 1.70 mg calcium. The isotherm models parameters were 28.509 L/mg and 0.141 mg/g, 0.138 mg/g and 11.494 L/mg, 0.142 L/mg and 0.013 mg/g, 0.129 mg/g and 25.641 L/mg, 28.509 L/mg, 3.795 mg/g and 2.336 for Langmuir, Freundlich, Temkin, activated sludge, and Redlich-Peterson The PCC particle size, initial pH, and initial Pb2+ concentration had effects on the adsorption parameters The statistical evaluations showed that the best model for adsorption of lead ions from raw water onto PCC based on lower errors, high CD (0.88), reliability (97 5%), and MSC (1.86) was Freundlich and followed by activated sludge model It was concluded that PCC is a good adsorbent like powdered eggshell and other carbon-based materials.

Keywords: Activated Carbon, Activated Sludge, Activated Sludge Model, Adsorbent, Adsorption, Adsorption Capacities, Adsorption Isotherms, Adsorption Properties, Biosorption Characteristics, Cadmium, Calcium, Carbon, Cd, Chromium, Clay, Concentration, Corn, Environmental Pollution Control, Equilibrium Adsorption, Error, Errors, Freundlich, Heavy-Metal Ions, Hexavalent Chromium, Hydrogen, Investigation, Ions, Isotherm, Langmuir, Lead, Location, Marine-Algae, Model, Models, Moisture, Nigeria, Nitrogen, Particle Size, Pb2+, PCC, pH, Powdered Corn Cobs, Redlich-Peterson, Reliability, Removal, Size, Sludge, Solubility, Sorption, Standard, Temkin, Water

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Full Text: [2010\Che Eng J158, 108.pdf](2010/Che%20Eng%20J158,%20108.pdf)

Abstract: A series of silica-based organic-inorganic hybrid materials were prepared by the sol-gel process for Cr(III) and Cr(VI) adsorption. These silica materials generally had high surface areas, good physical-chemical stability and high thermal stability. Trialkylmethylammonium bis 2,4,4-trimethylpentylphosphinate ([A336][C272]) and trihexyl(tetradecyl)phosphonium bis 2,4,4-trimethylpentylphosphinate (Cyphos IL 104) were explored as porogens to prepare porous silica and as extractants to extract chromium ions. Cyphos IL 104 and [A336][C272] functionalized silica sorbents (SG-2, SG-5) can be effectively used for the removal of Cr(III) and Cr(VI) from aqueous solutions by adjusting pH values, whereas trialkylmethylammonium chloride (Aliquat 336) and bis(2,4,4-trimethylpentyl)phosphinic acid (Cyanex 272) functionalized silica sorbents (SG-3, SG-4) can only be used for the removal of the single chromium species, Cr(VI) or Cr(III). The maximum adsorption amounts of Cr(III) and Cr(VI) were 2.14 and 19.31 mg g-1 for SG-2 and 2.32 and 15.29 mg g-1 for SG-5. Langmuir and Freundlich isotherm models were used to evaluate the adsorption of Cr(III) and Cr(VI) on sol-gel sorbents. The adsorption kinetics of Cr(III) and Cr(VI) on SG-2 and SG-5 could be well described by pseudo-second-order kinetic model. In terms of Cr(III) and Cr(VI) uptake capacities and kinetics, SG-2 and SG-5 appeared to be more suitable for Cr(III) and Cr(VI) removal than SG-3 and SG-4. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Kinetics, Aliquat 336, Aliquat-336, Alkaline Media, Ammonium, Anion-Exchange Resins, Aqueous Solutions, Aqueous-Solutions, Chloride, Chromium, Chromium Ions, Cr(III), Cr(VI), Cr(VI) Adsorption, Cr(VI) Removal, Cyanex 272, Cyphos II 104, Freundlich, Freundlich Isotherm, Heavy-Metals, Hybrid, Hybrid Materials, Ionic Liquid, Ionic Liquids, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Model, Models, Part I, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Silica, Sol-Gel, Sol-Gel Process, Solutions, Solvent-Extraction, Sorbents, Species, Stability, Surface, Surface Areas, Thermal Stability, Trivalent Chromium, Uptake, VI

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Full Text: [2010\Che Eng J158, 173.pdf](2010/Che%20Eng%20J158,%20173.pdf)

Abstract: The article describes the performance of acid activated jute stick char (AAJSC) for the adsorption of 4-nitrophenol (4-NP) from aqueous solution in batch mode. Jute stick, a bulk volume agricultural waste, was utilized for adsorption. The char of jute stick prepared at 773 K was activated with phosphoric acid and adsorption experiments were carried out at 298, 308 and 318 K. Equilibrium adsorption data were analyzed using two-parameter models-Langmuir, Freundlich, Temkin. Dubunin-Radushkevich and three-parameter-Redlich-Peterson model. The goodness of the fit was measured using linear regression coefficient (R-2) value and five different error functions. The adsorption data was found to be well described by Langmuir model. The equilibrium time for adsorption was achieved within 4 h. Studies showed that adsorption decreases with the increasing temperature. pH studies were also performed to obtain the equilibrium pH for adsorption. The pseudo-first-order, pseudo-second-order and Elovich kinetic models were applied to test the kinetic data, and were found to closely follow the pseudo-second-order kinetic model. The thermodynamic constants of the adsorption process; Δ*G*, Δ*H* and Δ*S* were evaluated as -18.79 kJ/mol at 25ºC, 3917.4 J/mol, 76.21 J/mol K-1 respectively. These showed that the adsorption process was endothermic and spontaneous. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: 4-Nitrophenol, 4-Nitrophenol (4-Np), Acid Activated Jute Stick Char (AAJSC), Adsorption, Agricultural, Agricultural Waste, Aqueous Solution, Aqueous-Solutions, Bagasse Fly-Ash, Batch, Batch Adsorption, Batch Mode, Char, Data, Dubunin-Radushkevich, Elovich, Endothermic, Equilibrium, Equilibrium Adsorption, Error, Error Analysis, Experiments, Freundlich, Functions, Isotherm, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Langmuir, Langmuir Model, Linear Regression, Mode, Model, Models, Organic Pollutants, P-Nitrophenol, Performance, pH, Phenol, Phosphoric Acid, Polymeric Adsorbents, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Redlich-Peterson, Regression, Removal, Rights, Solution, Sorption, Temkin, Temperature, Thermodynamic, Thermodynamic Studies, Time, Value, Volume, Waste, Waste-Water

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Full Text: [2010\Che Eng J158, 188.pdf](2010/Che%20Eng%20J158,%20188.pdf)

Abstract: Moringa oleifera (MO) wood, a solid waste was used for the preparation of activated carbon (ACMO) for the removal of copper, nickel and zinc from synthetic wastewater. Effects of various operating variables namely solution pH, contact time, carbon dose, adsorbate concentration and temperature on the removal of metal ions have been studied. Thermodynamic parameters such as free energy change, enthalpy change and entropy change were calculated. The optimum pH for the adsorption for all the above mentioned metals was found to be 6. The adsorption process was found to be endothermic for Cu and exothermic for Ni and Zn. The Langmuir, Freundlich, Temkin and Dubinin Radushkevich isotherm models were used to analyze the equilibrium data at different temperatures. The data were also fitted to kinetic models such as pseudo-first-order and pseudo-second-order model. Kinetic studies showed that the adsorption followed a pseudo-second-order model. The intra-particle diffusion rate constants and effective diffusion coefficient for different temperatures were evaluated and discussed. Adsorption occurs both by film diffusion and particle diffusion mechanism. The ACMO could be regenerated using 0.1 M H2SO4, with up to 98% recovery for all the three metals. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Adsorption Isotherms, Adsorption Mechanism, Agricultural Waste, Aqueous Solutions, Carbon, Concentration, Copper, Cu, Data, Desorption, Diffusion, Diffusion Coefficient, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Film Diffusion, Freundlich, FT IR, Heavy Metals, Heavy-Metal Ions, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Isotherm, Isotherm Analyses, Kinetic, Kinetic Models, Kinetic Studies, Langmuir, Low-Cost Adsorbent, Mechanism, Metal, Metal Ions, Metals, Mo, Model, Models, Moringa Oleifera, Nickel, Particle Diffusion, pH, Preparation, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Constants, Recovery, Removal, Rights, Seed Husks, SEM, Single-Component, Solid Waste, Solution, Solutions, Sorption, Temkin, Temperature, Thermodynamic, Thermodynamic Parameters, Time, Waste, Waste-Water, Wastewater, Wood, Zinc

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Full Text: [2010\Che Eng J158, 200.pdf](2010/Che%20Eng%20J158,%20200.pdf)

Abstract: The equilibrium, thermodynamics and kinetics of selenium(IV) biosorption from aqueous solution by dead green algae (Cladophora hutchinsiae) biomass was investigated. Optimum biosorption conditions were determined with respect to pH, biomass concentration, contact time, and temperature. The equilibrium data were analyzed using the Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherm models. The maximum biosorption capacity of C. hutchinsiae biomass for Se(IV) was found to be 74.9 mg/g at pH 5, biomass concentration 8 g/L, contact time 60 min, and temperature 20º C. The biosorption percentage decreased from 96% to 60% as temperature was increased from 20 to 50ºC during the equilibrium time. From D-R model, the calculated mean biosorption energy (10.9 kJ/mol) indicated that the biosorption of Se(IV) onto C. hutchinsiae biomass was taken place by chemical ion-exchange. The highest recovery (95%) was achieved using 0.5 M HCl. The high stability of C. hutchinsiae permitted a slightly decrease about 20% in recovery of Se(IV) ions after ten times of adsorption-elution process. The calculated thermodynamic parameters, ΔGº (between -18.39 and -16.08 kJ/mol at 20-50ºC) and ΔHº (-45.96 kJ/mol) showed that the biosorption of Se(IV) onto C. hutchinsiae biomass was feasible, spontaneous and exothermic, respectively. The experimental data was also fitted to the Lagergren’s first-order and pseudo second-order kinetic models. The results revealed that the pseudo second-order reaction model provided the best description these data with coefficients of determination in range of 0.992-0.999. The biosorption rate constant was calculated as 24.9×10-2 g/(mg min). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Algae, Aqueous Solution, Biomass, Biosorption, C.Hutchinsiae, Capacity, Cd(II), Chemical, Cladophora, Concentration, Copper, D-R Model, Data, Energy, Equilibrium, Exothermic, Experimental, First Order, Freundlich, Green Algae, Ion Exchange, Ion-Exchange, Ion-Exchange-Resin, Ionexchange, Ions, Isotherm, Kinetic, Kinetic Models, Kinetic Studies, Kinetics, Langmuir, Lead, Marine-Algae, Metal-Ions, Model, Models, pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Range, Rate Constant, Reaction, Recovery, Removal, Rights, Se(IV), Second Order, Second-Order, Selenium, Selenium(IV), Solution, Sorption, Stability, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time

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Full Text: [2010\Che Eng J158, 315.pdf](2010/Che%20Eng%20J158,%20315.pdf)

Abstract: In the present study, the performance of Ti-Al binary metal oxide supported beads using chitosan template was studied for fluoride removal from drinking water. The adsorbent was synthesized by precipitation method and characterized using FTIR, SEM, XRD and BET. The higher surface area of the synthesized adsorbent 323.83 m2/g results in a much higher fluoride removal capacity Qmax = 2.22 mg g-1 as compared to bare chitosan. Pore size of beads is 42.97 angstrom, suggesting mesoporous nature of adsorbent. Material works very effectively at all pH except at pH greater than 9. The presence of carbonate and bicarbonate ions showed significant decline in the fluoride removal capacity of adsorbent. The experimental data fitted well to Langmuir adsorption model. The kinetic studies indicate that the system follows the pseudo-second-order and intra-particle diffusion model. Thermodynamic study reveals that the fluoride adsorption by Ti-Al binary metal oxide supported beads is an exothermic and spontaneous process. Alum appears to be the promising regeneration media showing 80% regeneration. The applicability of the adsorbent for fluoride removal was tested in field water collected from the Dhar district in Madhaya Pradesh, India. (C) 2010 Published by Elsevier B.V.

Keywords: Activated Alumina, Adsorbent, Adsorption, Adsorption Isotherm, Aqueous-Solution, Beads, BET, Binary Oxide, Capacity, Carbonate, Cement, Chitosan, Data, Defluoridation, Diffusion, Diffusion Model, Drinking Water, Drinking-Water, Equilibrium, Exothermic, Experimental, Field, Fluoride, Fluoride Adsorption, Fluoride Removal, Fluoride Removal, FTIR, India, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Kinetic, Kinetic Studies, Kinetics, Langmuir, Media, Mesoporous, Metal, Metal Oxide, Model, Oxide, Performance, pH, Precipitation, Pseudo Second Order, Pseudo-Second-Order, Regeneration, Removal, SEM, Size, Sorption, Surface, Surface Area, Template, Thermodynamic, Thermodynamic Parameters, Thermodynamic Study, Water, XRD

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Full Text: [2010\Che Eng J158, 393.pdf](2010/Che%20Eng%20J158,%20393.pdf)

Abstract: Chitosan grafted poly(alkyl methacrylate)s (namely chitosan grafted poly(methyl methacrylate) (ChgPMMA), chitosan grafted poly(ethyl methacrylate)(ChgPEMA), chitosan grafted poly(butyl methacrylate) (ChgPBMA) and chitosan grafted poly(hexyl methacrylate) (ChgPHMA)) were synthesized and characterized by using FT-IR and C-13 NMR techniques. The adsorption batch experiments on these grafted copolymers were conducted by using an anionic sulfonated dye. Orange-G. A pseudo-second-order kinetic model was used to determine the kinetics of adsorption. The effect of grafting, effect of process variables and the effect of different sulfonated anionic dyes (Orange-C, Congo Red, Remazol Brill Blue R and Methyl Blue) on the adsorption kinetics was determined. The Langmuir and Freundlich models were used to fit the adsorption isotherms and from the values of correlation coefficients (R-2), it was observed that the experimental data fits very well to the Langmuir model. The values of the maximum adsorption capacity of the adsorbents follow the order: ChgPMMA > ChgPEMA > ChgPBMA > ChgPHMA > chitosan. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Anionic Dyes, Aqueous-Solution, Batch, Batch Experiments, Beads, C-13, Capacity, Cationic Dyes, Chitin, Chitosan, Chitosan Grafting, Congo Red, Correlation, Data, Dye, Dyes, Experimental, Experiments, Freundlich, FT IR, FT-IR, FTIR, Grafted, Grafting, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics Of Adsorption, Langmuir, Langmuir Model, Model, Models, NMR, Orange G, Poly(Alkyl Methacrylate)S, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reactive Dye, Removal, Rights, Techniques, Water

? Alagumuthu, G. and Rajan, M. (2010), Equilibrium and kinetics of adsorption of fluoride onto zirconium impregnated cashew nut shell carbon. *Chemical Engineering Journal*, **158** (3), 451-457.

Full Text: [2010\Che Eng J158, 451.pdf](2010/Che%20Eng%20J158,%20451.pdf)

Abstract: Zirconium impregnated cashew nut shell carbon was studied to assess its capacity for the adsorption of fluoride from aqueous solutions. The dependence of the adsorption of fluoride on the pH of the solution has been studied to achieve the optimum pH value and a better understanding of the adsorption mechanism. The influence of addition of the co-existing ions on the adsorption of fluoride was also studied. Adsorption isotherms have been modeled by Langmuir, Freundlich and Redlich-Peterson equations and their constants were determined. Pseudo-first- and second-order equations were used to describe the adsorption rate of fluoride and adsorption rate constant was calculated. A mechanism involving three stages, viz.; external surface adsorption, intra-particle diffusion and final equilibrium has been proposed for the adsorption of fluoride onto adsorbent material. Thermodynamic parameters such as Δ*G*º, Δ*H*º and Δ*S*º were calculated in order to understand the nature of sorption. Field studies were carried out with the fluoride containing water sample collected from a fluoride-endemic area in order to test the suitability of the sorbent at field conditions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Adsorption Mechanism, Adsorption Rate, Aqueous Solutions, Aqueous-Solution, Biomass, Capacity, Carbon, Cashew Nut Shell, Diffusion, Equilibrium, Field, Fluoride, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Ion, Ions, Isotherm, Isotherms, Kinetics, Kinetics of Adsorption, Langmuir, Mechanism, pH, pH Value, Rate Constant, Red Mud, Redlich-Peterson, Removal, Rights, Second Order, Second-Order, Solution, Solutions, Sorbent, Sorption, Surface, Temperature, Thermodynamic, Thermodynamic Parameters, Understanding, Value, Water

? Aksu, Z., Ertuğrul, S. and Dönmez, G. (2010), Methylene Blue biosorption by Rhizopus arrhizus: Effect of SDS (sodium dodecylsulfate) surfactant on biosorption properties. *Chemical Engineering Journal*, **158** (3), 474-481.

Full Text: [2010\Che Eng J158, 474.pdf](2010/Che%20Eng%20J158,%20474.pdf)

Abstract: The biosorption of Methylene Blue, a cationic dye, onto dried Rhizopus arrhizus, a filamentous fungus, was examined in the absence and in the presence of increasing concentrations of sodium dodecylsulfate (SDS), an anionic surfactant. The fungus exhibited the maximum dye uptake at an initial pH value of 10 in the absence of surfactant. The addition of SDS did not change the initial pH of maximum dye uptake. Dye uptake by the fungus increased with increasing initial dye concentration up to 1100 mg l-1. The presence of 1 mM surfactant in biosorption medium enhanced the dye removal dramatically. The Freundlich model better described the equilibrium dye uptake than the Langmuir model. According to the Langmuir model, the maximum dye uptake was determined as 370.3 mg dye g-1 of dried biomass in the absence of surfactant. When 1 mM (288.4 mg l-1) SDS was added to the biosorption medium, this value raised to 1666.6 mg g-1 resulting in 4.5-fold increase in uptake capacity. The pseudo-second-order kinetic model described the biosorption kinetics accurately for all cases studied confirming that a chemisorption process controls the sorption rate. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agricultural By-Products, Aqueous-Solution, Basic-Dyes, Batch, Biomass, Biosorption, Biosorption Kinetics, Capacity, Cationic Dye, Chemisorption, Concentration, Dye, Dye Removal, Effluents, Equilibrium, Freundlich, Freundlich Model, Fungus, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Low-Cost Adsorbents, Methylene Blue, Model, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rhizopus Arrhizus, Rights, SDS, Sodium, Sorption, Surfactant, Surfactant (SDS), Uptake, Value, Wastewaters, Water

? Li, Q., Yue, Q.Y., Su, Y., Gao, B.Y. and Sun, H.J. (2010), Equilibrium, thermodynamics and process design to minimize adsorbent amount for the adsorption of acid dyes onto cationic polymer-loaded bentonite. *Chemical Engineering Journal*, **158** (3), 489-497.

Full Text: [2010\Che Eng J158, 489.pdf](2010/Che%20Eng%20J158,%20489.pdf)

Abstract: The adsorption equilibrium, thermodynamics and process design of the polyepicholorohydrin-dimethylamine (EPI-DMA) cationic polymer-loaded bentonite (EPI-DMA, bentonite) for the removal of two acid dyes (Acid Scarlet GR and Acid Dark Blue 2G) were studied to assess the adsorption capacities, mechanisms and the minimum adsorbent amount. The effects of solution pH and salt concentration on the removal of acid dye were also investigated. The equilibrium data were analyzed by the Langmuir and Freundlich model, which revealed that Freundlich model was more suitable to describe the acid dyes adsorption than Langmuir model. According to the dependence of thermodynamic equilibrium constant (K-s) on temperatures, the thermodynamic parameters associated with the adsorption process were calculated. The negative values of ΔG(0) indicate that the overall adsorption processes are spontaneous. And the positive values of ΔH-0 show that the adsorption processes are endothermic in nature and the adsorption mechanisms are between physical adsorption and chemisorption. Based on the well correlated adsorption isotherm, an adsorption process design model has been developed for the design of a two-stage batch adsorber to predict the minimum amount of adsorbent to achieve a specified percentage of dye removal. Results show that compared with the single-stage batch adsorption, the two-stage process can significantly save adsorbent to meet the needs for higher dye removal efficiency (>99%) and therefore minimize capital investment costs. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Acid Dyes, Adsorbent, Adsorption, Adsorption Capacities, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Mechanisms, Aqueous-Solutions, Basic-Dyes, Batch, Batch Adsorption, Bentonite, Cationic Polymer, Bentonite, Chemisorption, Concentration, Contact Time, Costs, Data, Design, Disperse Dyes, Dye, Dye Removal, Dyes, Efficiency, Endothermic, Equilibrium, Freundlich, Freundlich Model, Humic-Acid, Isotherm, Langmuir, Langmuir And Freundlich Model, Langmuir Model, Mechanisms, Minimum, Model, Needs, pH, Physical, Polymer, Bentonite, Process Design, Reactive Dyes, Removal, Removal Efficiency, Rights, Salt, Salt Concentration, Solution, Sorption, Textile Dye, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Two Stage Batch Adsorber

? Cheknane, B., Bouras, O., Baudu, M., Basly, J.P. and Cherguielaine, A. (2010), Granular inorgano-organo pillared clays (GIOCs): Preparation by wet granulation, characterization and application to the removal of a Basic dye (BY28) from aqueous solutions. *Chemical Engineering Journal*, **158** (3), 528-534.

Full Text: [2010\Che Eng J158, 528.pdf](2010/Che%20Eng%20J158,%20528.pdf)

Abstract: The aim of the study was to prepare resistant and spherical inorgano-organo pillared clays (GIOCs) granules for wastewater treatment using a new and simple method named high-shear wet granulation. To optimize the preparation method, the effects of the main process parameters, such as binder concentration, liquid to solid ratio and impeller speed on granule properties (size distribution, friability and disintegration tests) were investigated. Experimental results showed that the granulation of inorgano-organo pillared clays (PIOCs) with industrial Silicone is significantly influenced by the binder concentration, the liquid to solid ratio (H %) and the impeller speed (N). A modification of these parameters can greatly alter the characteristics of the granules. The impact of wet granulation on the kinetics and adsorption capacities of GIOCs was estimated using Basic Yellow 28 as model pollutant. Kinetic studies reveals that BY 28 adsorbed faster on PIOCs (k(1) = 7.40×10-2 min-1) than on granular forms. Results best fitted the pseudo-first-order kinetic model. It was also found that the adsorption kinetic is directly related to the surface diffusion of prepared GIOCs. The adsorption equilibrium data were analyzed by the Langmuir and Freundlich models using non-linear regression. The best fit to the data was obtained with the Langmuir isotherm. The highest adsorption capacities (Q(max) = 514 mg/g; pH 6) for GIOCs were obtained for the finest forms (300-400 mu m). (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Equilibrium, Adsorption Kinetic, Adsorption Properties, Application, Aqueous Solutions, Basic Dye, Basic Yellow 28, Basic-Yellow-28, Breakage Phenomena, Characteristics, Characterization, Clays, Concentration, Data, Diffusion, Distribution, Dye, Equilibrium, Forms, Freundlich, Granular Inorgano-Organo Pillared Clays (GIOCs), Granulation, Granule, High-Shear Mixer, High-Shear Wet Granulation, Impact, Industry Waste, Isotherm, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Liquid, Model, Models, Modification, Montmorillonite, N, Non-Linear Regression, Nonlinear Regression, pH, Physico-Chemical Characterization, Powder Inorgano-Organo Pillared Clays (Piocs), Preparation, Pseudo First Order, Pseudo-First-Order, Regression, Removal, Rights, Size, Solutions, Sorption, Surface, Surface Diffusion, Treatment, Wastewater, Wastewater Treatment

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Full Text: [2010\Che Eng J159, 27.pdf](2010/Che%20Eng%20J159,%2027.pdf)

Abstract: This paper presents the equilibrium and kinetic studies of Cu(II), Zn(II),Co(II), Pb(II) and Cd(II) complexes with Dissolvine GL-38 (GLDA) and Enviomet (TM) C140 (EDDS) from aqueous solution by the chelating ion exchanger Diphonix Resin (R). The selected complexing agents Dissolvine GL-38-tetrasodium salt of N,N-bis(carboxylmethyl)-L-glutamic acid and Enviomet (TM) C140-trisodium salt of ethylenediaminedisuccinic acid belong to the group of a new generation of complexons which easily undergo biodegradation but their complexes are not biodegradable. The effect of pH, phase contact time and concentration has been studied using the batch technique at room temperature. After achieving the best conditions for complexes sorption, isotherms were obtained and fitted to the Langmuir, Freundlich, Temkin and Dubinin-Radushkevich (D-R) models. The kinetic data were fitted using the pseudo-first-order, pseudo-second-order and intraparticle diffusion models. The respective characteristic rate constants were presented. The results showed that the sorption processes of Cu(II), Zn(II), Pb(II) and Cd(II) complexes with Dissolvine GL-38 and Enviomet (TM) C140 on Diphonix Resin (R) followed well the pseudo-second-order kinetics. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dependencies, Adsorption, Aqueous Solution, Aqueous-Solution, Batch, Biodegradation, Cd(II), Concentration, Copper, Cu(II), Data, Diffusion, Diphonix Resin (R), EDD, EDDs, Electrolytes, Equilibrium, Equilibrium And Kinetic Studies, Exchange-Resin, Ferric Ions, Freundlich, Generation, GLDA, Heavy Metal, Heavy Metal Ions, Industrial Effluents, Intraparticle Diffusion, Ions, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, Metal, Metal Ions, Models, Natural-Waters, Pb(II), pH, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rate Constants, Removal, Resin, Rights, Room Temperature, Salt, Solution, Sorption, Temperature, Zn(II)

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Full Text: [2010\Che Eng J159, 67.pdf](2010/Che%20Eng%20J159,%2067.pdf)

Abstract: The potential of *Agave americana* fibers as biosorbent was investigated in batch Pb(II) and Cd(II) removal as a function of pH, initial metal concentration and temperature. Metal sorption followed pseudo-second-order kinetics with excellent correlation. The Langmuir model was successfully applied to describe the sorption isotherms. Under optimum conditions (20ºC, pH 5.0, contact time of 30-60 min and 5 g L-1 biomass concentration), the maximum sorption capacity of A. americana fibers was 40.0 mg g-1 for Pb and 12.5 mg g-1 for Cd, respectively. The results obtained at different temperatures allowed estimating the thermodynamic parameters (Δ*G*º, Δ*H*º and Δ*S*º) from the sorption equilibrium constants. The positive Δ*H*º value obtained for sorption of both metals indicates the endothermic nature of the process. A. americana fibers were also analyzed by IR-FT spectroscopy and scanning electron and metallographic microscopy, with the aim of investigating the interactions of biomass functional groups with cations and evaluating the mechanisms involved in metal sorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agave Americana, Aqueous Solutions, Batch, Biomass, Biosorbent, Cadmium Biosorption, Capacity, Cd, Cd(II), Cd(II) Removal, Concentration, Correlation, Endothermic, Equilibrium, Fibers, Function, Functional Groups, Heavy Metals Sorption, Heavy-Metal Ions, IR-FT Spectroscopy, Isotherm Modeling, Isotherms, Kinetics, L. Fibers, L1, Langmuir, Langmuir Model, Lechuguilla, Mechanisms, Metal, Metal Sorption, Metals, Model, Pb, Pb(II), pH, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Rights, Scanning Electronic Microscopy, Solutions, Sorption, Sorption Capacity, Sorption Isotherms, Spectroscopy, Temperature, Thermodynamic, Thermodynamic Parameters, Value

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Full Text: [2010\Che Eng J159, 84.pdf](2010/Che%20Eng%20J159,%2084.pdf)

Abstract: The present research evaluates the efficacy of granular ferric hydroxide (GFH) for perchlorate removal from aqueous solutions. Laboratory scale experiments were conducted to investigate the influence of various experimental parameters such as contact time, initial perchlorate concentration, temperature, pH and competing anions on perchlorate removal by GFH. Results demonstrated that perchlorate uptake rate was rapid and maximum adsorption was completed within first 30 min and equilibrium was achieved within 60 min. Pseudo-second-order model favorably explains the sorption mechanism of perchlorate on to GFH. The maximum sorption capacity of GFH for perchlorate was ca. 20.0 mg g-1 at pH 6.0-6.5 at room temperature (25ºC). The optimum perchlorate removal was observed between pH range of 3-7. The Raman spectroscopy results revealed that perchlorate was adsorbed on GFH through electrostatic attraction between perchlorate and positively charged surface sites. Results from this study demonstrated potential utility of GFH that could be developed into a viable technology for perchlorate removal from water. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbers, Adsorption, Adsorption Isotherms, Anions, Aqueous Solutions, Autotrophic Bacteria, Capacity, Concentration, Efficacy, Equilibrium, Experimental, Experiments, First, GFH, Granular Ferric Hydroxide, Granular Ferric Hydroxide (GFH), Groundwater, Ion-Exchange, Kinetics, Mechanism, Model, Perchlorate, pH, Potential, Pseudo-Second-Order, Pseudo-Second-Order Model, Raman, Raman Spectroscopy, Reduction, Removal, Research, Rights, Room Temperature, Scale, Solutions, Sorption, Sorption Capacity, Sorption Mechanism, Spectroscopy, Surface, Technology, Temperature, Uptake, Utility, Water

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Full Text: [2010\Che Eng J159, 98.pdf](2010/Che%20Eng%20J159,%2098.pdf)

Abstract: The kinetics and biosorption mechanism of Cr(III) ions on vineyard pruning waste (VPW) have been studied using different parameters such as initial concentration, biosorbent dosage, temperature, contact time and solution pH. The results indicated that adsorption was pH-dependent and temperature-dependent. VPW exhibited the highest Cr(III) uptake capacity of 12.453 mg g-1 at 303 K and at an initial pH value of 4.2. The kinetic data for the VPW samples support the pseudo-second-order model (R-2 > 0.99), but the first-order kinetic model (R-2 < 0.89) and intra-particle model (R-2 < 0.88) did not adequately correspond to the experimental values. The equilibrium adsorption data were interpreted using Langmuir and Freundlich models, and the adsorption of Cr(III) on VPW was better represented by the Langmuir equation (R-2 >0.990) than Freundlich (R-2 <0.980). In addition, thermodynamic parameters such as Δ*G*\*, Δ*H*\* and Δ*S*\* were found out to be 72.71, 18.77 kJ/mol and 301.93 J/mol K. respectively. The negative value of ΔH\* (-18.77 kJ/mol) showed that the biosorption of Cr(III) on VPW is exothermic. VPW has been characterized by FT-IR, scanning electron microscopy (SEM), BET surface area and energy dispersive X-rays (EDXs). The results have confirmed the applicability of this the VPW as an efficient biosorbent for Cr(III) ions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agricultural Waste, Aqueous-Solutions, Bagasse Fly-Ash, BET, Bet Surface Area, Biomass *Oedogonium sp*, Biosorbent, Biosorption, Biosorption Mechanism, Cadmium(II) Biosorption, Capacity, Concentration, Cr(III), Cr(III) Ions, Data, Desorption, Electron Microscopy, Energy, Equilibrium, Exothermic, Experimental, First Order, First-Order Kinetic Model, Freundlich, FT-IR, FTIR, Ions, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Equation, Low-Cost Adsorbents, Mechanism, Model, Models, pH, pH Value, Ph-Dependent, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Red Mud, Rights, Scanning Electron Microscopy, SEM, Solution, Solutions, Sugar-Industry Waste, Support, Surface, Surface Area, Temperature, Thermodynamic, Thermodynamic Parameters, Trivalent Chromium, Trivalent Chromium, Uptake, Value, Vineyard Pruning Waste, Waste, ZnCl2 Activation

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Full Text: [2010\Che Eng J159, 107.pdf](2010/Che%20Eng%20J159,%20107.pdf)

Abstract: Mercury(II) ions adsorption from aqueous solutions onto silica, polyacrylamide, and hybrid silica-polyacrylamide aerogels is studied. The aerogels structure was verified by FTIR spectroscopy and their texture by nitrogen adsorption. The adsorbents were tested under different experimental conditions where the effect of temperature, pH, contact time, initial mercury(II) concentration, and aerogels quantity were investigated. The mercury adsorption onto the three aerogels was shown to be very fast, with the fastest being performed at 45ºC onto the hybrid aerogels. pH 11 was revealed optimum indicating a superlative surface interaction between the adsorbent and the adsorbate. The adsorption kinetics follows a pseudo second-order pointing out the co-existence of chemisorption and physisorption with the intra-particle diffusion being the rate controlling step. The mercury(II) adsorption fits well with Langmuir adsorption isotherms where the polyacrylamide aerogels showed the highest adsorption capacity, followed by the hybrid aerogels. The regeneration of the aerogels at pH 2 and their reuse at pH 11 was conducted for three consecutive reuses where the adsorption capacity was successfully maintained. The hybrid aerogels were found to be the most economically interesting adsorbents due to their noticeable adsorptive capacity after regeneration coupled with their no-swelling behavior. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Aerogel, Aqueous Solutions, Behavior, Capacity, Carbon Aerogel, Chemisorption, Concentration, Diffusion, Equilibrium, Experimental, FTIR, FTIR Spectroscopy, Heavy-Metal Ions, Hybrid, Hydrogels, Interaction, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Isotherms, Kinetics, Langmuir, Mercury, Mercury Adsorption, Mercury Removal, Mercury(II), Mercury(II) Adsorption, Nitrogen, pH, Pollutants, Polyacrylamide, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Regeneration, Removal, Reuse, Rights, Second Order, Second-Order, Silica, Solutions, Spectroscopy, Structure, Surface, Surface Interaction, Temperature

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Full Text: [2010\Che Eng J160, 57.pdf](2010/Che%20Eng%20J160,%2057.pdf)

Abstract: A novel process for the preparation of Fe3O4-loaded activated carbon (MY) was developed using waste biomass. The key point of the synthetic strategy was that the carbonization, activation and Fe3O4 loading were accomplished simultaneously. The low-cost composite was characterized and used as an adsorbent for arsenate removal from water. The results showed that the Fe3O4 particles were uniformly deposited on the surface of the composite. The composite exhibited high surface area of 349 m2/g, pore volume of 0.20 cm3/g and iron of 39 wt.% for arsenate adsorption. As an adsorbent, higher temperature favored the adsorption capacity and the adsorption process was well fitted by pseudo-second-order model. The composite showed an excellent adsorption capability for arsenate with a maximum adsorption capacity of 204.2 mg/g at pH 8.0 and the adsorption process followed the Freundlich isotherm model well. In addition, the composite exhibited a saturation magnetization of 47.67 emu/g, which allowed it to be easily recovered by an external magnetic field after the adsorption process. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Activation, Activated Carbon, Activation, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Arsenate, Arsenate Removal, Arsenic, Arsenite, As(III), As(V), Biomass, Capacity, Carbon, Carbonization, Composite, Fe3O4, Field, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Iron, Isotherm, Isotherm Model, Loading, Low Cost, Magnetic, Magnetic Field, Magnetization, Model, Oxide, Particles, pH, Pore Volume, Preparation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Pyrolysis, Removal, Rights, Saturation, Saturation Magnetization, Strategy, Surface, Surface Area, Surface-Area, Temperature, Volume, Waste, Waste Biomass, Water

? Singh, V., Singh, S.K. and Maurya, S. (2010), Microwave induced poly(acrylic acid) modification of *Cassia javanica* seed gum for efficient Hg(II) removal from solution. *Chemical Engineering Journal*, **160** (1), 129-137.

Full Text: [2010\Che Eng J160, 129.pdf](2010/Che%20Eng%20J160,%20129.pdf)

Abstract: Microwave induced poly(acrylic acid) modification of *Cassia javanica* (CJ) seed gum furnished an efficient Hg(II) sorbent. Copolymer samples of different performances in terms of Hg(II) binding were synthesized by changing acrylic acid concentration at fixed microwave power and exposure time. The optimum sample has been characterized using FTIR spectroscopy, X-Ray diffraction, BET and SEM analysis and using this sample adsorption of mercury (II) was studied as a function of pH, sorbent dose, initial Hg(II) concentration, % grafting, temperature and ionic strength. Equilibrium isotherm data were analyzed using the Langmuir and Freundlich isotherms. The Langmuir model yielded a much better fit than the Freundlich model indicating unilayer sorption. Isotherms have also been used to obtain the thermodynamic parameters such as free energy, enthalpy, and entropy of sorption. The maximum sorption capacity was 135 mg g-1 at 30ºC. In order to investigate the mechanism of sorption, kinetic data were modeled using the first order Lagergren, pseudo-second-order and intra-particle diffusion model where intra-particle diffusion and chemical reaction both seem relatively significant in the rate controlling step. The regeneration experiments revealed that the CJ-graft-poly(acylic acid) can be successfully reused for six cycles without any significant loss in the sorption capacity. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Analysis, Aqueous-Solutions, Bet, Binding, Capacity, Cassia Javanica Seed Gum, Chemical, Chitosan, Concentration, Copolymers, Data, Diffusion, Diffusion Model, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherm, Experiments, Exposure, First, First Order, Freundlich, Freundlich Model, FTIR, FTIR Spectroscopy, Function, Grafting, Hg(II), Induced, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ionic Strength, Isotherm, Isotherms, Kinetic, Kinetic Data, Kinetics, Langmuir, Langmuir And Freundlich Isotherms, Langmuir Model, Mechanism, Mercury, Mercury Sorption, Mercury(II), Metal-Ions, Microwave, Microwaves, Model, Modification, pH, Poly(Acrylic Acid), Power, Pseudo Second Order, Pseudo-Second-Order, Regeneration, Removal, Rights, SEM, Solution, Sorbent, Sorbent Dose, Sorption, Sorption Capacity, Spectroscopy, Strength, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2010\Che Eng J160, 157.pdf](2010/Che%20Eng%20J160,%20157.pdf)

Abstract: A novel chitosan/clinoptilolite composite, as beads with an average size of 800 mu m in diameter, in dry state, was used for comparative studies on the removal of toxic metal ions like: Cu2+, Co2+ and Ni2+ from aqueous solutions. The effects of the initial pH value of the solution, contact time, the initial metal ion concentration and temperature on the adsorption capacity of the composite were investigated. The kinetics data were analysed by pseudo-first order, pseudo-second order, and intra-particle diffusion equations. The adsorption kinetics were well described by the pseudo-second order equation, and the adsorption isotherms were better fitted by the Langmuir equation. The maximum theoretical adsorption capacities of the chitosan/clinoptilolite composite for Cu2+, Co2+ and Ni2+ were found to be 11.32, 7.94 and 4.209 mmol/g, respectively. The negative values of Gibbs free energy of adsorption (ΔG(ads)º) indicated the spontaneity of the adsorption of all metal ions on the novel composite. Desorption of the metal ions from the composite was achieved by using 0.1 M HCl in about 20 min. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Adsorption Properties, Aqueous Solution, Aqueous Solutions, Beads, Biosorbent, Capacity, Chitosan, Chitosan, Clinoptilolite, Co2+, Composite, Concentration, Cu(II), Cu2+, Data, Desorption, Diffusion, Energy, Gibbs Free Energy, Heavy Metals, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Isotherms, Kinetics, Langmuir, Langmuir Equation, Metal, Metal Ion, Metal Ions, Metal-Ions, Ni2+, Nickel, Parameters, pH, pH Value, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Size, Solution, Solutions, Sorption, State, Temperature, Toxic, Value, Waste-Water

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Full Text: [2010\Che Eng J160, 164.pdf](2010/Che%20Eng%20J160,%20164.pdf)

Abstract: This study investigated degradation of azo dyes by using microbial fuel cell (MFC)-Fenton system, in which in-situ production of H2O2 was achieved through two-electron reduction of oxygen in neutral catholyte. Based on sequential operation where H2O2 was synthesized followed by Fenton reaction, the MFC-conventional Fenton system was shown able to remove amaranth (75 mg/L) with the ratio of 82.59% within 1 h when 1 mmol/L Fe2+ was applied. For the MFC-electrochemical Fenton system with 0.5 mmol/L Fe3+ addition, the removal ratio of amaranth (75 mg/L) could reach 76.43% and cathode potential could keep stable for 1 h. Meanwhile, a maximum power density of 28.3 W/m3 was obtained, which was larger than that of 17.2 W/m3 when K3Fe(CN)6 was used as cathodic electron acceptor. This study suggests a proof-in-concept new manner for biorefractory wastewater treatment using the energy produced from biodegradable wastewater along with electrical energy generation simultaneously, which makes dye-containing wastewater treatment a green treatment process and more sustainable. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Amaranth, Aqueous-Solutions, Azo Dyes, Azo-Dyes, Coagulation, Degradation, Dyes, Electro-Fenton, Electrochemical Oxidation, Energy, Fe3+, Fenton, Fuel Cell, Generation, H2O2, Hydrogen Peroxide, In Situ, Iron Reduction, Microbial, Microbial Fuel Cell, Mineralization, Operation, Organic-Compounds, Oxidation Processes, Oxygen, Potential, Power, Radicals, Reduction, Removal, Rights, Sustainable, Treatment, Waste-Water, Wastewater, Wastewater Treatment

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Full Text: [2010\Che Eng J160, 190.pdf](2010/Che%20Eng%20J160,%20190.pdf)

Abstract: The paper presents a novel support for Cr(VI) sorption and its removal from wastewaters. The support is a new extratant-impregnated resin, EIR. Toluidine blue o as an extractant was impregnated onto/into Amberlite XAD-7 beads, and kinetics, equilibrium and thermodynamic aspects of Cr(VI) sorption were investigated. An eluent solution having concentration of 0.1 M respect to NH3 and NaCl was used for regenerating new EIR and the concentration of Cr(VI) was measured spectrophotometrically. The maximum adsorption of Cr(VI) on/in TBO-impregnated XAD-7 occurs at pH range of 3.0-4.0. The results obtained from equilibrium adsorption studies were fitted in Langmuir model of adsorption. The thermodynamic parameters of Cr(VI) adsorption onto/into EIR beads were estimated. The kinetic studies were showed that tip was less than 5 min and equilibrium could be obtained in 50 min. The pseudo-second-order kinetics model fitted with kinetic data. It also was observed that after rapid saturation of surface and big pores, the intra-particle diffusion is the only mechanism of Cr(VI) sorption into new EIR. The performance of new EIR under flow conditions was also studied and the results indicate that columns packed with TBO-impregnated XAD-7 beads can be effectively used for treating wastewaters containing Cr(VI). (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Amberlite XAD-7, Application, Aqueous-Solution, Atomic-Absorption-Spectrometry, Beads, Chelating Resin, Chemical Cross-Linking, Concentration, Cr(VI), Cr(VI) Adsorption, Cr(VI) Removal, Cr(Vi) Sorption, Data, Diffusion, Equilibrium, Extractant-Impregnated Resins, Flow, Heavy-Metal Ions, Hexavalent Chromium, Intra-Particle Diffusion, Intraparticle Diffusion, Ion-Exchange-Resin, Kinetic, Kinetic Data, Kinetic Studies, Kinetic Study, Kinetics, Kinetics Model, Langmuir, Langmuir Model, Mechanism, Mode Separation, Model, NaCl, NH3, Packed-Column, Performance, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Resin, Rights, Saturation, Solid-Phase Extraction, Solution, Sorption, Support, Surface, Thermodynamic, Thermodynamic Parameters, Toluidine Blue O, Treatment, Wastewaters

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Full Text: [2010\Che Eng J160, 432.pdf](2010/Che%20Eng%20J160,%20432.pdf)

Abstract: Manganese dioxide nanowhiskers (MDN), prepared by the reduction of potassium permanganate by ethyl alcohol has been investigated as an adsorbent for Hg(II) removal from aqueous medium. Characterization of the as-synthesized material was carried out using transmission electron microscopy (TEM), scanning electron microscopy (SEM), energy dispersive analysis of X-rays (EDAX), X-ray photoelectron spectroscopy (XPS), and X-ray diffraction (XRD). SEM and TEM data showed that the as-synthesized MDN looks like agglomerated whiskers of 5-10 nm in diameter and 100-300 nm in length. XRD data revealed the formation of birnessite type layered manganese dioxide. Mn(IV) oxidation state of Mn in MDN was confirmed by XPS. Batch experiments were conducted to evaluate the Hg(II) adsorption capacity of MDN. Hg(II) adsorption on MDN is a fast process and the kinetics followed a pseudo-second-order rate equation. The Hg(II) uptake varied with pH and showed optimum performance at pH 6-9. The experimental evidence revealed that physisorption is the dominating mechanism in Hg(II) removal. Considering the practical difficulty in handling nanomaterials, MDN was supported on Al2O3 (MDN@Al2O3) and the composite was shown to be an efficient adsorbent for Hg(II) from simulated chlor-alkali industrial effluent. The results suggest that this material can be a practical solution for Hg(II) scavenging in several industrial processes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous-Solutions, Cadmium, Carbon, Chlor-Alkali Industrial Effluent, Heavy-Metals, Hg(II), Kinetics, Manganese Dioxide Nanowhiskers, Mercury(II), Nickel, Oxide Nanostructures, Sorption, Waste, Water

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Full Text: [2010\Che Eng J160, 440.pdf](2010/Che%20Eng%20J160,%20440.pdf)

Abstract: Arsenic and its compounds are toxic pollutants for the environment and all living organisms. At present, there is considerable interest in studying new sorbent materials for the removal of arsenic from aqueous solutions. This work discusses the feasibility of arsenic uptake onto dolomite which is considered to be a potential inexpensive adsorbent. Thermodynamic and kinetic experiments were undertaken to assess the capacity and rate of As uptake onto dolomite. Experimental data were mathematically described using adsorption kinetic models, namely pseudo-first-order and pseudo-second-order models. The arsenic removal was found to be dependent on the dosage of dolomite, adsorbent particle size and the presence of various anions. Thermodynamic results indicate that the adsorption follows an exothermic chemisorption process. The experimental data indicate successful removal of As(V) ion from aqueous solution indicating that dolomite be used as an inexpensive treatment process. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Arsenic, As(III), As(V), Biomass, Dolomite, Ions, Iron, Kinetic, Kinetic Models, Phosphate, Removal, Thermodynamic, Water, Water Treatment

? Akar, T., Celik, S. and Akar, S.T. (2010), Biosorption performance of surface modified biomass obtained from Pyracantha coccinea for the decolorization of dye contaminated solutions. *Chemical Engineering Journal*, **160** (2), 466-472.

Full Text: [2010\Che Eng J160, 466.pdf](2010/Che%20Eng%20J160,%20466.pdf)

Abstract: The present research provides information on the dye biosorption potential of chemically modified non-conventional biomass obtained from Pyracantha coccinea. A cationic surfactant hegzade-cylethyldimethylammonium bromide (HDEDMABr) was used as modification agent. Dye biosorption characteristics of modified biomass were explored by batch mode equilibrium studies, zeta potential measurements and FTIR studies. When compared with the dried natural biomass, modified biomass was found to have high biosorption yield for Acid Red 44 (AR44) dye. Kinetic measurements revealed that the biosorption equilibrium was established in about 40 min of contact time. The biosorption process could be explained by the pseudo-second-order kinetic model and also followed the intraparticle diffusion model up to 40 min, but diffusion is not the only rate controlling step. A comparison of the different isotherms indicated that the dye biosorption by using modified biomass was well described by the Langmuir isotherm model with maximum monolayer capacity of 105.0 mg dye g(-1) biosorbent. Calculated thermodynamic parameters of biosorption indicated the exothermic and spontaneous process. Good biosorption yields ranged from 73.32 to 87.44% were obtained in the presence of the different concentrations of salt in the biosorption medium. Our results revealed that this developed biomass system may be useful for the decolorization of reactive dye contaminated solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Adsorption, Aqueous-Solution, Biosorption, Chromium(Vi), Diffusion, Dye, Equilibrium, Equilibrium, Isotherm, Isotherms, Kinetic, Kinetic-Parameters, Langmuir, Langmuir Isotherm, Methylene-Blue, Modification, Natural Biomass, Removal, Research, Sorption, Waste-Water

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Full Text: [2010\Che Eng J160, 503.pdf](2010/Che%20Eng%20J160,%20503.pdf)

Abstract: Natural apatites represent a cost effective soil amendment, which can be used for in situ reduction of lead bioavailability and mobility. In our previous work, we selected Lisina apatite (LA) as a promising natural mineral for lead immobilization based on theoretical predictions. This study investigated the adsorption equilibrium and kinetics of aqueous Pb sorption onto Lisina apatite and synthetic hydroxyapatite (HAP) at different temperatures. XRD analysis indicated that LA consists of three minerals: fluorapatite, quartz and muscovite. After reaction with a Pb solution, only FA peaks were changed, confirming that fluorapatite present in LA is responsible for Pb sorption. Sorption experiments confirmed that both LA and HAP are effective in Pb removal. Langmuir, Freundlich, Temkin, Koble-Corrigan and Redlich-Peterson isotherm models were applied to experimental data. The kinetics of the sorption process on both minerals was well characterized by the pseudo-second order reaction rate. Results indicate that Pb immobilization by HAP is a two-step process: the first rapid phase, possibly surface complexation and secondary dissolution of HAP and precipitation of pyromorphite. The sorption of Pb by Lisina apatite is also a two-step process, but the reaction mechanisms are more complicated and need further research as the results indicate that different mechanisms dominate at different temperatures. The values of thermodynamic equilibrium constants and Gibbs free energy were also calculated. The values of AG obtained confirm the feasibility of both HAP and LA as effective sorbents of the Pb ion. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Contaminated Soils, Dissolution, Equilibrium, Hydroxyapatite, Hydroxyapatite, In-Situ Stabilization, Ions, Isotherm, Kinetics, Langmuir, Lead, Lead Immobilization, Mechanism, Mineral Apatite, Natural Apatite, Phosphate Rocks, Remediation, Removal, Research, Sorption, Sorption Kinetics

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Full Text: [2010\Che Eng J160, 586.pdf](2010/Che%20Eng%20J160,%20586.pdf)

Abstract: Cobalt ferrite magnetic particles were coated with polystyrene through atom transfer radical polymerization (ATRP), followed by surface functionalization with 2-(3-(2-aminoethylthio)propylthio)ethanamine. The obtained products (AEPE-PS-MPs) were employed in the extraction of Ag(I) and Au(III) ions in solution. The modified magnetic particles showed a good affinity toward Ag(I) and Au(III) ions and the stability of the particles in acidic solutions was also improved by the coating. The optimal pH for Ag(I) and Au(III) extraction was pH 5.0 and pH 4.0, respectively. The adsorption of the metal ions onto AEPE-PS-MPs followed Langmuir isotherm model with the maximum adsorption capacity of 0.44 mmol Ag(I) g-1 and 0.19 mmol Au(III)g-1. The recovery of Ag and Au from the adsorbents could be achieved by using 1.0 M thiourea in 1% HNO3 and 1.0 M thiourea in 2% NCl, respectively. The reuse of the adsorbents is possible. The products were shown to have potential in the extraction of Ag and Au in real wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, ATRP, Extraction, Gold, Gold(III), Hg(II) Ions, Isotherm, Langmuir, Langmuir Isotherm, Magnetic Particles, Maximum Adsorption Capacity, Oxide, Polystyrene Core, Shell Nanoparticles, Polymer Coating, Recovery, Resins, Silver, Silver(I), Transfer Radical Polymerization

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Full Text: [2010\Che Eng J161, 1.pdf](2010/Che%20Eng%20J161,%201.pdf)

Abstract: This fundamental work deals with the biosorption removal of Al (III) using a Rhodococcus opacus strain. Several variables that have an effect on the capacity of aluminum biosorption from water streams by R. opacus were studied, particularly the effects of solution pH, biosorbent concentration, metal concentration, contact time, ionic strength and temperature of biosorption. The most favorable biosorption pH value of Al (III) was determinate as around 5.0 and the maximum sorption capacity was found to be 41.59 mg g-1 at pH 5.0 (initial concentration of 50 mg L-1) and temperature 25ºC. The experimental data obtained have been analyzed using four two-parameter models (Langmuir, Freundlich, Temkin and Dubinin-Radushkevich) and two three-parameter models (Redlich-Peterson and Sips). In order to determine the best fit isotherm, three error analysis methods were used to evaluate the data: correlation coefficient, chi-square and residual root mean square error. Dynamics of sorption process were studied and the values of rate constant of biosorption were calculated. The uptake capacity is a function of pH solution, ionic strength and biosorbent concentration. (C) 2010 Elsevier By. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aluminum, Analysis, Aqueous-Solution, Biosorbent, Biosorption, Capacity, Chi-Square, Concentration, Correlation, Correlation Coefficient, Data, Equilibrium, Error, Error Analysis, Experimental, Freundlich, Function, Heavy-Metals, Ionic Strength, Ions, Isotherm, Kinetics, L1, Langmuir, Liquid Streams, Metal, Methods, Models, pH, pH Value, Rate Constant, Redlich-Peterson, Removal, Rhodococcus Opacus, Rice Bran, Rights, Single-Component, Solution, Sorption, Sorption Capacity, Sorption Process, Streams, Strength, Temperature, Uptake, Value, Wastewaters, Water, Work

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Full Text: [2010\Che Eng J161, 34.pdf](2010/Che%20Eng%20J161,%2034.pdf)

Abstract: The adsorption behaviour of Ginsenoside from aqueous solution onto polymeric resins such as XAD-4, XAD-7, XAD-16 and XAD-1180 was studied. Adsorption isotherms were interpreted from various isotherm models like Langmuir, Freundlich, Redlich-Peterson, Dubinin-Radushkevich and Temkin and their parameters were evaluated and compared. The adsorption kinetics was analyzed using series of rate equations like first-order rate equation, second-order rate equation, Bangham’s model, Intra-particle diffusion model, Boyd’s diffusivity model and Elovich kinetic equation. The adsorption performance was investigated thermodynamically under batch equilibrium conditions at 293, 298, 303 and 308 K. The optimum temperature of adsorption was observed to be 298 K. Studies of external mass transfer and pore diffusion effects revealed that both film and pore diffusion play significant role in different extent and stages of contact in the sorption process. The adsorption efficiency and uptake rates of Ginsenoside were compared and the highest adsorption efficiency was observed with XAD-7 (>90%). The removal effectiveness is in order of XAD-7 > XAD-16 > XAD-1180 > XAD-4. The rate of Ginsenoside removal better follows pseudo-second-order rate kinetic model, corroborating high correlation coefficients for calculated parameters with the experimental data. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorbents, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Adsorption Performance, Alumina, Aqueous Solution, Batch, Behaviour, Correlation, Data, Diffusion, Diffusion Model, Effectiveness, Efficiency, Elovich, Equilibrium, Experimental, Extraction, First Order, Freundlich, Ginsenoside, Intra Particle Diffusion, Intra-Particle Diffusion, Intra-Particle Diffusion Model, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherm, Isotherms, Kinetic, Kinetic Equation, Kinetic Model, Kinetics, Langmuir, Mass Transfer, Model, Models, Peat, Performance, Polymeric, Pore Diffusion, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rates, Redlich-Peterson, Removal, Resins, Rights, Role, Second Order, Second-Order, Separation, Shake-Flask, Solution, Sorption, Sorption Process, Temperature, Thermodynamic, Thermodynamic Studies, Uptake, XAD-4

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Full Text: [2010\Che Eng J161, 73.pdf](2010/Che%20Eng%20J161,%2073.pdf)

Abstract: The aim of the present study was to investigate the adsorption properties of surface modified chitosans in the aqueous solutions containing Co(II) and/or Ni(II) ions. For this purpose, the ligands of ethylene-diaminetetraacetic acid (EDTA) or diethylenetriaminepentaacetic acid (DTPA) were immobilized onto polymer matrices of chitosan. Adsorption of Co(II) and Ni(II) by prepared adsorbents was investigated in batch techniques. The effects of pH, functional group, contact time, and the concentration of metals were studied. Metal uptake by EDTA-chitosan was 63.0 mg g-1 for Co(II) and 71.0 mg g-1 for Ni(II) and by DTPA-chitosan 49.1 mg g-1 for Co(II) and 53.1 mg g-1 for Ni(II). The adsorption efficiency of studied adsorbents ranged from 93.6% to 99.5% from 100 mg L-1 Co(II) and/or Ni(II) solution, when the adsorbent close was 2 g L-1 and solution pH 2.1. The kinetics of Co(II) and Ni(II) on both of the modified chitosans followed the pseudo-second-order model but the adsorption rate was also influenced by intraparticle diffusion. The equilibrium data was best described by the Sips isotherm and its extended form was also well fitted to the two-component data obtained for systems containing different ratios of Co(II) and Ni(II). Nevertheless, the obtained modeling results indicated relatively homogenous system for Co(II) and heterogeneous system for Ni(II) adsorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Isotherm, Adsorption Properties, Adsorption Rate, Aqueous Solutions, Aqueous-Solution, Batch, Binary System, Chemically-Modified Chitosan, Chitosan, Co(II), Co(II) and Ni(II), Complexane Types, Concentration, Data, Diffusion, DTPA, EDTA, Efficiency, Equilibrium, Equilibrium Modeling, Functional Group, Heavy-Metals, Immobilized, Intraparticle Diffusion, Ions, Isotherm, Kinetic, Kinetics, L1, Ligands, Metal, Metal Removal, Metals, Model, Modeling, Modified, Modified Chitosan, Ni(II), Ni(II) Ions, pH, Polymer, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Purpose, Rights, Solid, Solution Interfaces, Solution, Solutions, Sorption Isotherms, Statistical Rate Theory, Surface, Systems, Techniques, Theoretical-Analysis, Uptake, Waste-Water

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Full Text: [2010\Che Eng J161, 99.pdf](2010/Che%20Eng%20J161,%2099.pdf)

Abstract: The present investigation explores the chemical modification of natural dry babassu coconut (*Orbignya speciosa*) mesocarp (BM), using a quasi solvent-free procedure in which the precursor was added to molten succinic (S), maleic (M) or phthalic (P) anhydrides, to give new products named BMS, BMM and BMP (babassu coconut mesocarp modified with succinic, maleic and phthalic anhydride, respectively). These synthesized biopolymers were characterized by infrared spectroscopy and thermogravimetry and the degree of substitution was calculated, based on the number of carboxylic groups covalently attached to the lignocellulosic polymer. The chemically modified biopolymers suspended in aqueous or hydroalcoholic solutions have the ability to remove copper from aqueous or aqueous-alcohol solutions in the order BMS > BMP > BMM. The kinetic process followed a pseudo-second-order model and the results for sorbents were better represented by the Langmuir sorption model. The effectiveness of these biopolymers for application to real samples of sugar cane spirits reflected in using only 1.0 g dm-3 to reduce the copper to a value lower than 5.0 mg dm-3 for all sorbents. Thus, these inexpensive chemically modified biopolymers may be useful to permit sugar cane spirits to meet the requirements of Brazilian legislation with respect to copper contamination. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Anhydride, Application, Aqueous Solutions, Babassu Coconut Mesocarp, Bagasse, Biopolymers, Bmp, Carboxylic, Cellulose, Chemical, Chemical Modification, Contamination, Copper, Effectiveness, Equilibrium Adsorption, Heavy Metal, Infrared Spectroscopy, Investigation, Ionic Liquid, Isotherm, Kinetic, Kinetics, Langmuir, Legislation, Model, Modification, Modified, Natural, P, Part I, Polymer, Procedure, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Single Metal Solutions, Solutions, Sorbents, Sorption, Spectroscopy, Substitution, Thermogravimetry, Value, Viscose Rayon Succinate

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Full Text: [2010\Che Eng J161, 161.pdf](2010/Che%20Eng%20J161,%20161.pdf)

Abstract: The removal of Cr(VI) from aqueous solution by two commercially available resins (Amberlite IRA96 and Dowex 1 × 8) was investigated. Batch adsorption processes were carried out as a function of time, adsorbent dosage, pH and temperature to evaluate the performance of the resins. The optimum pH for Cr(VI) adsorption was found as 3.0 for these resins. It was found that more than 93% removal was achieved under optimal conditions. The maximum adsorption capacities are 0.46 and 0.54 mmolig of Amberlite IRA96 and Dowex 1 × 8 resin for Cr(VI) ion, respectively. The suitability of Freundlich and Langmuir adsorption models were investigated for Cr(VI)-resin equilibrium. A pseudo-second order kinetic model has been proposed to correlate the experimental data. The equilibrium adsorption level for Dowex 1 × 8 decreased with increasing temperature, while it increased for Amberlite IRA96. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacities, Amberlite IRA96, Aqueous Solution, Batch Adsorption, Chromium, Cr(VI), Cr(VI) Adsorption, Data, Dowex 1 × 8, Equilibrium, Experimental, Freundlich, Function, Hexavalent Chromium, Ion Exchange, Ion Exchange Resins, Ion-Exchange, Ion-Exchange Resin, Ion exchange, Kinetic, Kinetic Model, Kinetics, Langmuir, Model, Models, Performance, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Recovery, Removal, Resin, Resins, Rights, Solution, Temperature, Thermodynamics, Waste Acid-Solution, Water

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Full Text: [2010\Che Eng J161, 182.pdf](2010/Che%20Eng%20J161,%20182.pdf)

Abstract: The adsorption kinetics of CO2 on amine-functionalized mesoporous silica at low concentrations was investigated. Experimental data of CO2 uptake as a function of time at temperatures between 25 and 70ºC were fit to a series of kinetic models, namely Lagergen’s pseudo-first and pseudo-second order and Avrami’s kinetic models. The best fit was obtained using Avrami’s model, as it provided a fractional reaction order (ca. 1.4), which has been associated with the occurrence of multiple adsorption pathways. In addition, simulations of CO2 adsorption in a column packed with amine-grafted mesoporous silica using computational fluid dynamics were carried out to predict breakthrough curves. The simulation results were compared to experimental data produced at various flow rates of a stream containing 5% CO2 balance nitrogen. In all cases, the predicted breakthrough time and the corresponding CO2 uptake were in close agreement with the experimental data. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Adsorption Modeling, Aminosilane Grafting, Aqueous-Solutions, Breakthrough, Breakthrough Curves, Capture, Carbon-Dioxide, CO2, CO2 Adsorption, Column, Computational Fluid Dynamics, Data, Dynamics, Equilibrium, Experimental, Flow, Function, Kinetic, Kinetic Models, Kinetics, MCM-41, Mesoporous, Mesoporous Silica, Model, Modeling, Models, Molecular-Sieve, Nitrogen, Pathways, Performance, Pore-Size, Pseudo Second Order, Pseudo-First and, Pseudo-Second Order, Pseudo-Second-Order, Rates, Removal, Rights, Separation, Silica, Simulation, Stream, Uptake

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Full Text: [2010\Che Eng J162, 28.PDF](2010/Che%20Eng%20J162,%2028.PDF)

Abstract: This manuscript reports sol-gel derived cross-linked poly(vinyl alcohol) (PVA)-3-(2-aminoethylamino) propyl trimethoxysilane (AEAPTMEOS) beads with low degree of swelling as a new adsorbent for the removal of Pb(II) from aqueous solution. Beads were prepared by condensation polymerization followed via acid-catalyzed sol-gel process in presence of non-ionic surfactant. Cross-linking was achieved by glutaraldehyde. Presence of -NH/-NH2 groups in beads provide active sites for Pb(II) adsorption, and were responsible for high adsorption capacity. SEM/TEM studies confirmed the spherical and rough surface morphology, which was changed after Pb(II) adsorption. For the removal of Pb(II) in aqueous solution, effect of equilibrium time, temperature, pH, adsorbent dose and adsorbate concentration were investigated in batch process. Pseudo-first- and pseudo-second-order kinetics were also evaluated. The equilibrium adsorption followed Langmuir and Freundlich isotherms. Thermodynamic parameters such as ΔGº, ΔHº and ΔSº revealed endothermic and spontaneous adsorption. Monolayer adsorption capacity (Q(0)) value for the developed PVA-AEAPTMEOS beads was 67.56 mg g-1 at pH: 5.0, much higher as compared to other adsorbents reported in literature. Desorption studies also suggested that cross-linked PVA-AEAPTMEOS beads can be effectively utilized for the removal of Pb(II) from wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Pb(II) Ion, Adsorption Properties, Alcohol, Aqueous Solution, Batch, Batch Process, Beads, Capacity, Chitosan, Concentration, Cross-Linked, Cross-Linking, Desorption, Endothermic, Equilibrium, Freundlich, Glutaraldehyde, Hybrid, Isotherms, Kinetics, Langmuir, Langmuir And Freundlich Isotherms, Lead Removal, Literature, Metal-Ions, Morphology, Nonionic Surfactant, Pb(II), pH, Polymerization, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, PVA-Aeaptmeos Beads, Removal, Rights, Silica, Sol-Gel, Sol-Gel Process, Solution, Sorption, Surface, Surfactant, Swelling, Temperature, Thermodynamic, Thermodynamic Parameters, Value, Waste-Water, Wastewater

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Full Text: [2010\Che Eng J162, 97.PDF](2010/Che%20Eng%20J162,%2097.PDF)

Abstract: Adsorptive features of the composites of polyacrylamide (PAAm) and bentonite (B), and zeolite (Z) were investigated for Tl+ and TP3+. Langmuir monolayer adsorption capacities for the corresponding ions were 1.85 and 0.97 mol kg-1 for PAAm-Z and 0.36 and 0.16 mol kg-1 for PAAm-B. The values of enthalpy and entropy changes were positive for both composites and ions. The compatibility of the second order adsorption kinetics implied that the rate-controlling step was concentration dependent; the sorption process was ion exchange. High adsorption rate was found for both composites; the time required for adsorption of half of Tl+ concentrations was 7 min. In the presence of both ions, PAAm-B was more selective for Tl3+ than PAAm-Z. The reusability tests for Tl+ for five uses proved that the composites were reusable after complete recovery of the loaded ion. The values of Tl+ adsorption onto PAAm-Z from solutions containing Fe3+, Pb2+, Zn2+ confirmed that the effect of the presence of these ions on Tl+ extraction was not significant. Although Tl+ sorption decreased with increasing ionic strength (CaCl2) of the medium, the results of adsorption from sea water containing 5 x 10(-6) mol L-1 (1 mg L-1) of Tl+ ascertained that the composites still adsorbed about 10% of Tl. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacities, Adsorption Kinetics, Adsorption Rate, Aluminosilicate, Bentonite, Changes, Composite, Composites, Concentration, Enthalpy, Entropy, Extraction, Ion Exchange, Ion-Exchange, Ionic Strength, Ions, Isotope Tracer, Kinetics, L1, Langmuir, Low-Cost Adsorbents, Monolayer, Pb2+, Phytic Acid, Polyacrylamide, Polyacrylamide-Bentonite, Recovery, Removal, Rights, Second Order, Second-Order, Separation, Solutions, Sorption, Sorption Process, Strength, Thallium, Thermodynamics, Tracer, Uo22+, Water, Zeolite, Zn2+

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Full Text: [2010\Che Eng J162, 158.PDF](2010/Che%20Eng%20J162,%20158.PDF)

Abstract: In this study, a novel hyper-cross-linked HJ-Y10 resin was synthesized and its adsorption behaviors for p-aminobenzoic acid were investigated from aqueous solution. The results indicated that the skeleton surface of Hi-Y10 resin was modified by formaldehyde carbonyl, quinone carbonyl and phenolic hydroxyl groups, the unadjusted p-aminobenzoic acid solution was favorable for the adsorption, the isotherms could be fitted by Langmuir model and the adsorption was an exothermic process, the adsorption kinetics could be characterized by pseudo-second-order rate equation and the initial stage was controlled by the intra-particle diffusion model. Hydrogen bonding between formaldehyde carbonyl, quinone carbonyl groups on Hi-Y10 resin and carboxyl groups of p-aminobenzoic acid was one of the primary driving forces for the adsorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Aqueous Solution, Chemical, Chemical Modification, Diffusion, Diffusion Model, Driving, Exchange Character, Exothermic, Formaldehyde, Hydrogen Bonding, Hyper-Cross-Linked Resin, Hypercrosslinked Polymers, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ion-Exchangers, Isotherms, Kinetics, Langmuir, Langmuir Model, Mechanism, Model, Modification, Modified, Phenol, Polar Compounds, Polymeric, Polymeric Adsorbent, Primary, Protein Adsorption, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Resin, Rights, Solid-Phase Extraction, Solution, Surface, Surface Chemical Modification, Water

? Al-Ghouti, M.A., Yousef, I., Ahmad, R., Ghrair, A.M. and Al-Maaitah, A.A. (2010), Characterization of diethyl ether adsorption on activated carbon using a novel adsorption refrigerator. *Chemical Engineering Journal*, **162** (1), 234-241.

Full Text: [2010\Che Eng J162, 234.PDF](2010/Che%20Eng%20J162,%20234.PDF)

Abstract: In order to remove the limitations originating from inefficient heat and mass transfer in adsorption refrigeration/heat pump, an innovative arrangement design was proposed. It was equipped with meshed multi-tubular involving activated carbon in a sealed cylindrical adsorber. Related aspects of adsorption refrigeration key parameters were addressed. Working pair, activated carbon-diethyl ether, is used in the above system in order to determine the optimum adsorption refrigeration parameters. In order to estimate the adsorption characteristics and the adsorption capacity of the adsorbent, the adsorption isotherms of that adsorbent, with a specific adsorbate, are carried out. The measured adsorption data were adequately described by the Langmuir equation. The adsorption capacity of the diethyl ether on activated carbon at 26, 35, and 50ºC were 0.0159.0.0220, and 0.0188 mmol/g, respectively. Two kinetic adsorption models namely pseudo-first and second order kinetic models were investigated. The thermodynamic parameters, Delta H degrees, entropy, Delta S degrees, and Gibbs free energy, Delta G degrees, of the adsorption process were also obtained from the gas adsorption experiments at various temperatures. These values were -45.84 kJ/mol, 88.87 J/(mol K), and - 19.27 kJ/mol, respectively. The pseudo-first order model was not applicable in this adsorption system, suggesting that the adsorption process and the rate-limiting step was the pseudo-second order reaction. Therefore, the dominant mechanism might be a chemisorption process between the diethyl ether molecules and the activated carbon surface. The k(2), however, decreased as the initial diethyl ether pressure increased. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Refrigeration, Bone Char, Cadmium Ions, Capacity, Carbon, Characteristics, Characterization, Chemisorption, Data, Design, Diethyl Ether, Dyes, Effluent, Energy, Entropy, Ether, Experiments, Gibbs Free Energy, Heat-Pump Systems, Isotherms, Kinetic, Kinetic Adsorption, Kinetic Models, Kinetics, Langmuir, Langmuir Equation, Mass Transfer, Mechanism, Model, Models, Pressure, Pseudo First Order, Pseudo Second Order, Pseudo-First and, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Refrigeration, Removal, Rights, Second Order, Second-Order, Sorption, Surface, Thermodynamic, Thermodynamic Parameters

? Feng, Y.A., Gong, J.L., Zeng, G.M., Niu, Q.Y., Zhang, H.Y., Niu, C.G., Deng, J.H. and Yan, M. (2010), Adsorption of Cd (II) and Zn (II) from aqueous solutions using magnetic hydroxyapatite nanoparticles as adsorbents. *Chemical Engineering Journal*, **162** (2), 487-494.

Full Text: [2010\Che Eng J162, 487.pdf](2010/Che%20Eng%20J162,%20487.pdf)

Abstract: Magnetic hydroxyapatite nanoparticles (MNHAP) adsorbents were synthesized and were used for the removal of Cd2+ and Zn2+ from aqueous solutions. The properties of this magnetic adsorbent were characterized by scanning electron microscopy (SEM), energy dispersive analysis system of X-ray (EDAX), X-ray powder diffraction (XRD) analysis, zeta potential, BET surface area measurements and magnetization curves. Experiments were carried out to investigate the influence of different sorption parameters, such as contact time, initial concentration of metal ions, the dosage of MNHAP, pH value of the solutions and competitive adsorption behavior. Kinetic data are well fitted by a pseudo second-order model and the equilibrium data are analyzed by Langmuir model very well with high correlation coefficient. From the Langmuir isotherms, the maximum adsorption capacities of MNHAP adsorbents towards Cd2+. and Zn2+ are 1.964 and 2.151 mmol g-1, respectively. The results revealed that the most prominent advantage of the prepared MNHAP adsorbents consisted in their separation convenience compared to the other adsorbents. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Behavior, Adsorption Capacities, Analysis, Aqueous Solutions, Behavior, Bet, Bet Surface Area, Binary Oxide Adsorbent, Cadmium, Cd, Cd2+, Competitive, Competitive Adsorption, Concentration, Correlation, Correlation Coefficient, Data, EDAX, Effluents, Electron Microscopy, Energy, Equilibrium, Heavy-Metal Removal, Hydroxyapatite, Ions, Isotherms, Kinetic, Langmuir, Langmuir Isotherms, Langmuir Model, Magnetic, Magnetic Adsorbent, Magnetic Adsorbents, Magnetic Separation, Metal, Metal Ions, Model, Modified Rectorite, Montmorillonite, Nanoparticles, pH, pH Value, Phosphate, Potential, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Removal, Rights, Scanning Electron Microscopy, Second Order, Second-Order, Second-Order Model, SEM, Separation, Single-Metal, Solutions, Sorption, Surface, Surface Area, Value, X-Ray, XRD, Zeta Potential, Zn2+

? Sarı, A., Çıtak, D. and Tuzen, M. (2010), Equilibrium, thermodynamic and kinetic studies on adsorption of Sb(III) from aqueous solution using low-cost natural diatomite. *Chemical Engineering Journal*, **162** (2), 521-527.

Full Text: [2010\Che Eng J162, 521.pdf](2010/Che%20Eng%20J162,%20521.pdf)

Abstract: The equilibrium, thermodynamics and kinetics of antimony(III) adsorption from aqueous solution using low-cost natural diatomite were investigated using batch adsorption parameters such as pH and ionic strength. Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherm models were applied to describe the isotherm models. The maximum adsorption capacity of diatomite for Sb(III) was found to be 35.2 mg/g at pH 6. The percent Sb(III) adsorbed in the presence of 0.001 M NaNO3 at pH 6 was 68%, compared to 56 and 48% and at the same pH but in the presence of 0.01 and 0.1 M NaNO3, respectively. From the D-R model, the mean adsorption energy was calculated as 7.32 kJ/mol, indicating that the adsorption of Sb(III) onto diatomite was physically carried out. The high stability of diatomite permitted a slightly decrease as about 10% in desorption yield and about 3% in adsorption yield after ten times of adsorption/desorption cycles. The calculated thermodynamic parameters (Δ*G*º, Δ*H*º and Δ*S*º) showed that the adsorption of Sb(III) onto diatomite was feasible, spontaneous and exothermic. Evaluation of the experimental data in terms of adsorption kinetics revealed that the adsorption of Sb(III) onto diatomite followed well the pseudo-second-order kinetic model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption, Desorption, Antimony, Antimony, Aqueous Solution, Batch, Batch Adsorption, Biomass Equilibrium, Biosorption, Capacity, Data, Desorption, Diatomite, Energy, Equilibrium, Exothermic, Experimental, Freundlich, Humic-Acid, Ionic Strength, Ionic-Strength, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Low Cost, Metal-Ions, Model, Models, Natural, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solution, Sorption, Stability, Strength, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics

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Full Text: [2010\Che Eng J162, 537.pdf](2010/Che%20Eng%20J162,%20537.pdf)

Abstract: Dyes adsorption on granular particles of lyophilised Cunninghamella elegans was characterized in terms of adsorption isotherm and kinetics. The study refers to dyes of an acid bath for wool: Acid Blue 62, Acid Red 266 and Acid Yellow 49. The dye concentration in model solutions - containing a single dye or the three dyes all together in order to mimic the wastewater - was increased up to about 500 mg/L. Tests showed that the maximum adsorption capacity of the biomass ranges between 300 and 600 mg(dye)/g(DM). Mutual interferences among dyes caused the reduction of the adsorption capacity of the biomass towards the model wastewater. An experimental procedure for the assessment of biosorption kinetics was developed in order to control the effects of the interphase mass transfer on the biosorption rate. The biosorption kinetics were described by both pseudo-first order and pseudo-second order models, depending on the saturation level of the sorbent, and was characterized by a time scale of 1-10 min. The role of the molecular structures of the dyes was discussed. In particular, both kinetics and equilibrium tests confirm that the biomass is more selective towards AR266, probably for the high negative charge density of the -CF3 functional group that can interact with -NHx active sites of the biomass. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Adsorption, Adsorption Capacity, Adsorption Isotherm, Anionic Dyes, Aqueous-Solutions, Assessment, Behavior, Biomass, Biosorption, Biosorption, Biosorption Kinetics, Capacity, Characterization, Charge, Concentration, Control, Decolorization, Dye, Dyes, Effluent, Equilibrium, Experimental, Functional Group, Fungal Biomass, Hybrid, Interferences, Isotherm, Kinetics, Linked Chitosan Beads, Mass Transfer, Model, Models, Particles, Procedure, 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, Reactive Dye, Reduction, Removal, Rights, Role, Saturation, Scale, Solutions, Sorbent, Time Scale, Wastewater

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Full Text: [2010\Che Eng J162, 565.pdf](2010/Che%20Eng%20J162,%20565.pdf)

Abstract: The manganese removal capacity of two purities of crab-shell chitin was evaluated under different pH conditions by means of kinetic tests and sorption isotherms. Demineralized (DM-SC20) and demineralized/deproteinized (DMP-SC20) crab-shell chitin were tested and compared to evaluate the contribution of chitin and its associated proteins to biosorption. The kinetics of manganese adsorption onto both types of solids was well described by the pseudo-second order model. The adsorption rates depended on the pH of system and the type of solid, with faster changes occurring under alkaline conditions and with DMP-SC20 (k(2) = 0.411-0.535 g/mg min) than with DM-SC20 (k(2) = 0.125-0.197 g/mg min). The adsorption equilibrium isotherms were best fit by the Langmuir, rather than Freundlich, model. The maximum sorption capacity (*q*m, mg/g) was found to depend greatly on the pH of the solution, with minimal or no sorption observed at pH <5. At higher pH regimes, *q*m values ranged from 0.165 (at pH 5.4) to 0.981 (at pH 8.7) for “pure” chitin (DMP-SC20) and increased from 0.878 (at pH 5.2) to 5.437 (at pH 8.6) when both chitin and protein were present (DM-SC20). Results clearly suggest that the chitin-associated proteins offer additional sorption sites for manganese. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Mine Drainage, Adsorption, Adsorption, Adsorption Equilibrium, Aqueous-Solutions, Biosorption, Capacity, Changes, Chitin, Constructed Wetlands, Crab Shell Particles, Crab-Shell, Drainage, Equilibrium, Equilibrium Isotherms, Freundlich, Heavy-Metals, Ions, Isotherms, Kinetic, Kinetics, Langmuir, Manganese, Metal Removal, Model, Passive Treatment, pH, Protein, Proteins, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rates, Remediation, Removal, Rights, Shrimp Shells, Solution, Sorption, Sorption Capacity, Sorption Isotherms, Sulfate-Reducing Bacteria, Treatment, Water

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Full Text: [2010\Che Eng J162, 573.pdf](2010/Che%20Eng%20J162,%20573.pdf)

Abstract: A novel inorganic-organic hybrid material silica gel chemically modified by triethylenetetraminomethylenephosphonic acid (denoted as GH-T-P) has been synthesized and characterized. Its adsorption properties GH-T-P for Au(III), Hg(II), Cu(II), Pb(II), Co(II), Zn(II), Ni(II), Cr(III) and Cd(II) have been investigated, and the research results revealed that GH-T-P has the best adsorption capacity for Au(III). Furthermore, the adsorption selectivity results of GH-T-P for Au(III) displayed that GH-T-P had excellent adsorption for Au(III) in binary ions systems, especially in the systems of Au(III)-Zn(II), Au(III)-Ni(II) and Au(III)-Cr(III). Langmuir and Freundlich isotherm models were applied to analyze the experimental data, and the best interpretation for the experimental data was given by the Langmuir isotherm equation. GH-T-P could reach to the saturation adsorption capacity within 2 h, and its excellent adsorption capacity for Au(III) was 266.49 mg/g when the initial solution concentration was 2.0 mmol/L at 35ºC. Moreover, the research revealed that its adsorption kinetics can be modeled by pseudo-second-order rate equation wonderfully, and the thermodynamic parameters ΔG, ΔH and ΔS were -20.79 kJ mol-1, 5.17 kJ mol-1, and 84.37J K-1 mol-1, respectively. Thus, this novel hybrid material silica gel chemically modified by triethylenetetraminomethylenephosphonic acid GH-T-P is favorable and useful for the uptake of Au(III), and the high adsorption capacity and good reproducibility make it a good promising candidate material for the precious metal uptake. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Properties, Amino, Aqueous Solutions, Au(III), Capacity, Cd(II), Co(II), Concentration, Cr(III), Cu(II), Data, Experimental, Freundlich, Freundlich Isotherm, Gel, Gold(III), Hg(II), Hybrid, Ions, Isotherm, Isotherm Models, Kinetics, Langmuir, Langmuir Isotherm, Mesoporous Silica, Metal, Metal Ions, Metal Uptake, Models, Modified, Nanocomposites, Ni(II), Pb(II), Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Removal, Reproducibility, Research, Research Results, Rights, Saturation, Selectivity, Silica, Silica Gel, Solution, Solutions, Sorption, Systems, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Transition Metal Ions, Triethylenetetraminomethylenephosphonic Acid, Uptake, Zn(II)

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Full Text: [2010\Che Eng J162, 591.pdf](2010/Che%20Eng%20J162,%20591.pdf)

Abstract: Batch and dynamic flow adsorption studies were carried out using natural clay for the removal of Acid Red 88 (AR88) dye from aqueous solutions. Adsorption conditions were examined with respect to initial pH, adsorbent amount, contact time, initial dye concentration, column i.d. and flow rate. Adsorption process was better described by the pseudo-second-order kinetic and Langmuir isotherm models. SEM and zeta potential analysis were used to characterize the adsorbent material. 98.10±0.34% of dye could be removed in 15 min at pH 2.0 in the batch mode. The adsorbent exhibits very high rnonolayer dye binding capacity of 1133.10 mg g-1 which was comparable to or higher than those of many sorbent materials. Our results indicate that the suggested natural and low-cost adsorbent material may be useful for the effective removal of contaminating acid dyes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Analysis, Aqueous Solutions, Azo-Dye, Batch, Batch Mode, Binding, Biosorption, Capacity, Clay, Column, Concentration, Dye, Dye Removal, Dyes, Dynamic, Equilibrium, Fixed-Bed Column, Flow, Flow Rate, Isotherm, Isotherm Models, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Low-Cost Adsorbents, Mode, Models, Montmorillonite, Natural, Natural Clay, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Removal, Rights, SEM, Solutions, Sorbent, Sorption, Waste-Water, Zeta Potential

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Full Text: [2010\Che Eng J162, 626.pdf](2010/Che%20Eng%20J162,%20626.pdf)

Abstract: Moringa oleifera leaves (MOL); an agro-waste material has been used as a precursor to prepare a new biosorbent. The leaves were washed with base and citric acid, and obtained new chemically modified MOL biosorbent (CAMOL) for sequestration of Pb(II) from aqueous solution. The biosorbent was characterized by SEM, FTIR spectral and elemental analyses. The effect of experimental parameters such as pH, dose, initial concentration, contact time and temperature on the biosorption was studied. The kinetic data were analyzed using three adsorption kinetic models: the pseudo-first and second-order kinetics and intraparticle diffusion. The equilibrium data were analyzed using Langmuir, Freundlich. Dubinin-Radushkevick and Temkin isotherm models. Langmuir model provided the best correlation with biosorption capacity of 209.54 mg g-1 at 313 K. The thermodynamic properties, ΔGº, ΔHº and ΔSº showed that biosorption of Pb(II) onto CAMOL was spontaneous, endothermic and feasible in the temperature range of 293-313 K. Desorption experiments showed feasibility of regeneration of the biosorbent for further use after treating with dilute HCl. The presence of other common metal ions like Na+, K+, Ca2+ and Mg2+ did not affect the biosorption of lead. Investigations carried out proved that CAMOL is a biosorbent with good potential for removal of lead from the aqueous media. (C) 2010 Published by Elsevier B.V.

Keywords: Adsorption, Adsorption Kinetic, Agrowaste, Analyses, Aqueous Solution, Aqueous Solutions, Aspergillus-niger, Biosorbent, Biosorption, Capacity, Citric Acid, Citric-Acid, Concentration, Correlation, Data, Desorption, Diffusion, Endothermic, Equilibrium, Experimental, Experiments, Feasibility, Freundlich, FTIR, Heavy-Metals, Intraparticle Diffusion, Ions, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Model, Lead, Media, Metal, Metal Ions, Model, Models, Modified, Moringa Oleifera, Na+, Pb(II), pH, Potential, Pseudo-First And, Regeneration, Removal, Rice Husk, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Sem, Sequestration, Solution, Solutions, Sugar-Beet Pulp, Temkin, Temkin Isotherm, Temperature, Thermodynamic, Thermodynamics, Waste

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Full Text: [2010\Che Eng J162, 662.pdf](2010/Che%20Eng%20J162,%20662.pdf)

Abstract: Corynebacterium glutamicum, a full-scale fermentation process waste, showed good performance for the removal of a cationic dye, Basic Blue 3 (BB 3), after chemical modification using citric acid (CA) as an esterifying agent. This study investigated the potential use of immobilized biomass for dye biosorption in batch experiments. The powder form of CA-treated biomass (CAB) was immobilized in three polymer matrices: calcium alginate (CaA), polysulfone (PS) and polyurethane (PU). Three batch experiments were conducted: pH edge, isotherms and kinetics. As shown in the pH edge experiments, the BB 3 removal was favored at pH values greater than 7. The experimental equilibrium data were analyzed using two two-parameter (Langmuir and Freundlich models) and two three-parameter (Redlich-Peterson and Sips models) isotherm models. The experimental data were well described by the Redlich-Peterson isotherm model, followed by the Sips, Langmuir and Freundlich isotherm models. The kinetic data showed that immobilized CAB was slower than free CAB. Of the three diffusion models used to fit the kinetic data, pseudo-first order, pseudo-second order and intra-particle, the first fitted well for free CAB, and the second for immobilized CAB. Regeneration experiments of free and immobilized CAB were carried out for five sorption-desorption cycles, and immobilized CAB showed higher desorption efficiencies (>80%) than the powder form of free CAB, except for CaA-immobilized CAB which was dissolved in the second sorption cycle. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alginate, Aqueous-Solution, Basic Blue 3, Basic Dye, Basic Dye, Batch, Batch Experiments, Biomass, Biosorbents, Biosorption, Biosorption, Blue, Calcium, Calcium Alginate, Cationic Dye, Chemical, Chemical Modification, Citric Acid, Corynebacterium Glutamicum, Corynebacterium-Glutamicum Biomass, Data, Desorption, Diffusion, Dissolved, Dye, Dye Biosorption, Equilibrium, Experimental, Experiments, Fermentation, First, Freundlich, Freundlich Isotherm, Heavy-Metals, Immobilization, Immobilized, Immobilized Biomass, Isotherm, Isotherm Model, Isotherm Models, Isotherms, Kinetic, Kinetics, Langmuir, Model, Models, Modification, Performance, pH, Pollutants, Polymer, Polysulfone, Polyurethane, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Pu, Redlich-Peterson, Regeneration, Removal, Rights, Sorption, Sorption-Desorption, Waste

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Full Text: [2010\Che Eng J162, 677.pdf](2010/Che%20Eng%20J162,%20677.pdf)

Abstract: Fe-modified activated carbon (THAC-Fe) was developed from a low-cost aquatic plant residue, Trapa natans husk, and tested for its ability to remove Cr(VI) from aqueous solutions. The surface characteristics of the carbons before and after modification were measured. The results showed that impregnation with Fe increased the carbon surface area, introduced more acidic functional groups, and improved the adsorption ability by nearly three times as compared to the original activated carbon. The effects of solution pH, adsorbent dose, contact time and initial Cr(VI) concentration on the adsorption of Cr(VI) by THAC-Fe were investigated. The adsorption capacity decreased sharply with the increase of solution pH. The kinetics data followed the pseudo-second-order model and the rate of chromium (VI) uptake was found to be controlled by external mass transfer and intra-particle diffusion throughout the entire adsorption period. Boyd plot confirmed that film diffusion was the rate-limiting step in the adsorption process. Equilibrium data fit well to the Tempkin and Freundlich models. The maximum adsorption capacity was 11.83 mg/g at room temperature as calculated by Langmuir equation. According to the calculated thermodynamic parameters, the adsorption was a spontaneous endothermic process. Since Cr(VI) cannot be easily desorbed using distilled water or NaOH solutions, chemisorption is the likely mode of adsorption. According to these results, THAC-Fe is a promising adsorbent for the removal of Cr(VI) from wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Capacity, Aqueous Solutions, Aqueous-Solution, Arsenic Removal, Boyd Plot, Capacity, Carbon, Cationic Surfactant, Characteristics, Chemisorption, Chromium, Concentration, Cr(VI), Cr(VI), Data, Diffusion, Endothermic, Equilibrium, Fe-Modified Activated Carbon, Film Diffusion, Freundlich, Functional Groups, Hexavalent Chromium, Impregnation, Intra-Particle Diffusion, Intraparticle Diffusion, Iron, Kinetics, Langmuir, Langmuir Equation, Low Cost, Mass Transfer, Mode, Model, Models, Modification, NaOH, pH, Plant, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Limiting Step, Rate-Limiting Step, Removal, Rights, Room Temperature, Solution, Solutions, Surface, Surface Area, Temperature, Thermodynamic, Thermodynamic Parameters, Trapa Natans Husk, Uptake, Waste-Water, Wastewater, Water

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Full Text: [2010\Che Eng J162, 893.pdf](2010/Che%20Eng%20J162,%20893.pdf)

Abstract: Raw agricultural waste is an affordable adsorbent for the removal of industrial contaminants. In the present work, pistachio hull powder (PHP) was investigated for the removal of hexavalent chromium (Cr(VI)) from wastewater. The effects of pH (2-8), PHP concentration (0.5-8 g/L), Cr(VI) concentration (50-200 mg/L), temperature (5-50ºC) and contact time (1-60 min) were studied on the removal of Cr(VI) from aqueous solution. The results revealed that PHP adsorbs over 99% of chromium from solutions containing 50-200 mg/L of Cr(VI) at a pH of 2 and an adsorbent concentration of 5 g/L after 60 min of equilibration. The percent chromium adsorbed from solution increased with an increase in temperature from 5 to 40ºC. Kinetic and isotherm modeling studies demonstrated that the experimental data best fit a pseudo-second order and Langmuir model, respectively. The maximum Langmuir adsorption capacity was 116.3 mg/g. In the second part of the study, the efficacy of PHP was examined by analyzing the removal of Cr(VI) from industrial wastewater. Results revealed that 2 g/L of PHP decreased the Cr(VI) concentration from 25 mg/L to less than 0.05 mg/L after 30 min of equilibration. In summary, biosorption onto PHP is an affordable and simple process for treating Cr(VI)-laden industrial wastewaters. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Agricultural, Agricultural Waste, Aqueous Solution, Aqueous-Solutions, Batch Adsorption, Biomass, Biosorption, Capacity, Chromium, Chromium(VI), Concentration, Contaminants, Cr(VI), Cr(VI) Removal, Data, Efficacy, Equilibration, Equilibrium, Experimental, Fly-Ash, Hexavalent Chromium, Indica, Industrial Wastewater, Isotherm, Isotherm Modeling, Kinetic, Kinetics, Langmuir, Langmuir Model, Model, Modeling, pH, Pistachio Hull, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Solution, Solutions, Temperature, Waste, Waste Biomass, Wastewater, Wastewaters, Work

? Pan, J.M., Zou, X.H., Wang, X., Guan, W., Yan, Y.S. and Han, J.A. (2010), Selective recognition of 2,4-dichlorophenol from aqueous solution by uniformly sized molecularly imprinted microspheres with beta-cyclodextrin/attapulgite composites as support. *Chemical Engineering Journal*, **162** (3), 910-918.

Full Text: [2010\Che Eng J162, 910.pdf](2010/Che%20Eng%20J162,%20910.pdf)

Abstract: In this study, uniformly sized molecularly imprinted microspheres (MIP) using beta-cyclodextrin/attapulgite composites as support were prepared for recognitive adsorption of 2,4-dichlorophenol (2,4-DCP) from aqueous solution. Characterization of MIP were achieved by FT-IR spectra, SEM micrographs, nitrogen adsorption-desorption analysis, EDX measurement and elemental analysis. Equilibrium data, at various temperatures, were described by the Langmuir. Freundlich and Dubinin-Radushkevich isotherm models. The thermodynamics parameters (positive values of ΔHº and ΔSº, negative values of ΔGº) indicated that binding system for MIP was endothermic, entropy gained and spontaneous. Kinetic properties were successfully investigated by pseudo-first-order model, pseudo-second-order model, intraparticle diffusion equation, initial adsorption rate, half-adsorption time and activation energy. A diffusion-controlled process as the essential adsorption rate-controlling step was also proposed. MIP could be reused four times without significant loss in adsorption capacity. The selectivity of MIP also demonstrated higher affinity for target 2,4-DCP over competitive phenolic compounds than that of non-imprinted polymers (NIP). Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: 2,4-Dcp, 2,4-Dichlorophenol, Activated Carbon, Activation, Activation Energy, Adsorption, Adsorption Capacity, Adsorption Rate, Adsorption-Desorption, Analysis, Aqueous Solution, Beta-Cyclodextrin, Attapulgite Composites, Binding, Capacity, Characterization, Competitive, Composites, Data, Diffusion, Dye Adsorption, Edx, Endothermic, Energy, Entropy, Equilibrium, Freundlich, FT-IR, FTIR, Ftir Spectra, Intraparticle Diffusion, Ion, Isotherm, Isotherm Models, Kinetic, Kinetics, Langmuir, Measurement, Methylene-Blue, Microspheres, Model, Models, Nitrogen, Polymers, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Selective Recognition, Selectivity, SEM, Solid-Phase Extraction, Solution, Sorption, Support, Surface-Imprinting Technique, Thermodynamics, Uniformly Sized Molecularly Imprinted Microspheres

? Greluk, M. and Hubicki, Z. (2010), Kinetics, isotherm and thermodynamic studies of Reactive Black 5 removal by acid acrylic resins. *Chemical Engineering Journal*, **162** (3), 919-926.

Full Text: [2010\Che Eng J162, 919.pdf](2010/Che%20Eng%20J162,%20919.pdf)

Abstract: The removal of Reactive Black 5 from aqueous solutions onto the strongly basic acrylic anion exchangers of type 1, namely Amberlite IRA-458 and Amberlite IRA-958 were investigated. According to the results, the equilibrium time was found to be 180 min for each Reactive Black 5-anion exchanger system. Adsorption experiments indicated that the amount of the dye adsorbed on both Amberlite IRA-458 and Amberlite IRA-958 was dependent on the initial dye concentration in the range of 50-500 mg/L. Modeling of kinetic results showed that the sorption process of the dye adsorption on both anion exchangers was best described by the pseudo second-order kinetic model in the entire investigated concentration domain. The effect of temperature on dye removal showed that the maximum capacity was obtained at 318 and 308 K for the dye adsorption on Amberlite IRA-458 and Amberlite IRA-958, respectively. The adsorption isotherm data were fitted well to the Langmuir isotherm and according to this model, Amberlite IRA-458 and Amberlite IRA-958 exhibited the highest monolayer sorption capacity of 1295.93 and 1723.964 mg/g. Various thermodynamic parameters, such as ΔG, ΔH and ΔS were evaluated and revealed that Reactive Black 5 adsorption process on both Amberlite IRA-458 and Amberlite IRA-958 was endothermic and favourable. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Adsorption-Kinetics, Agricultural Waste, Anion Exchangers, Aqueous Solutions, Aqueous-Solution, Base Anion-Exchangers, Capacity, Cationic Dyes, Concentration, Data, Dye, Dye Adsorption, Dye Removal, Endothermic, Equilibrium, Experiments, Fly-Ash, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Malachite-Green, Model, Modeling, Monolayer, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Reactive Black 5, Removal, Resins, Rights, Second Order, Second-Order, Solutions, Sorption, Sorption Capacity, Sorption Kinetics, Sorption Process, Temperature, Textile Dye, Thermodynamic, Thermodynamic Parameters, Thermodynamic Studies, Thermodynamics

? Chakravarty, P., Sen Sarma, N. and Sarma, H.P. (2010), Biosorption of cadmium(II) from aqueous solution using heartwood powder of Areca catechu. *Chemical Engineering Journal*, **162** (3), 949-955.

Full Text: [2010\Che Eng J162, 949.pdf](2010/Che%20Eng%20J162,%20949.pdf)

Abstract: The ability of abundantly available heartwood of Areca catechu to adsorb cadmium(II) ions from aqueous solution has been investigated through batch experiments at room temperature. Various sorption parameters such as contact time, initial concentration of cadmium(II) ion, solution pH and amount of the biomass on the adsorption capacity, were studied. The adsorbent was found to be effective for quantitative removal of cadmium(II) ions in acidic conditions and equilibrium has been achieved in 30 min at pH 6.0. The equilibrium adsorption data were fitted to Langmuir, Freundlich and Dubinin-Radushkevich 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 spectrum analysis revealed that hydroxyl, carboxyl, amide and amine groups were major cadmium(II) binding groups. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Analysis, Aqueous Solution, Areca Catechu, Batch, Batch Experiments, Binding, Biomass, Biosorption, Cadmium(II), Cadmium(II) Ions, Capacity, Cd(II), Concentration, Data, Equilibrium, Experiments, Freundlich, FT-IR, FTIR, Heartwood, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Study, Langmuir, Lead, Model, Models, Peel, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Removal, Removal, Rights, Room Temperature, Solution, Sorption, Spectrum Analysis, Temperature, Waste-Water

? Neagu, V., Vasiliu, S. and Racovita, S. (2010), Adsorption studies of some inorganic and organic salts on new zwitterionic ion exchangers with carboxybetaine moieties. *Chemical Engineering Journal*, **162** (3), 965-973.

Full Text: [2010\Che Eng J162, 965.pdf](2010/Che%20Eng%20J162,%20965.pdf)

Abstract: The synthesis and characterization of two structures of crosslinked polyzwitterionic carboxybetaines based on the 4-vinylpyridine: divinylbenzene macromolecular supports of gel and porous type as well as the evaluation of their retention property of organic and inorganic salts are reported. Ion exchange capacity values, pK(a), FT-IR spectroscopy and ESEM images of their polymeric precursors proved the content of ionic groups, the selectivity for hydrogen atom and the morphology structure of the zwitterionic ion exchangers with positive and negative charges located in the same structural unit and bound by one or two methylene groups. The yielded compounds exhibited retention capacities for divalent and trivalent heavy metals as well as for cefotaxime from aqueous solutions. The values are related to their chemical and morphological structures. The highest retention capacity values of the heavy metals and cefotaxime were obtained when the zwitterionic ion exchanger with two methylene groups as the spacer between the opposite charges and porous structures was used in the investigation studies. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 4-Vinylpyridine, Adsorption, Anions, Aqueous Solutions, Betainization Reaction, Capacity, Carboxybetaine Group, Characterization, Chemical, Copolymers, Divinylbenzene Network, Esem, Evaluation, FT-IR, FTIR, FTIR Spectroscopy, Gel, Heavy Metals, Hydrogen, Immobilized Artificial Membranes, Investigation, Ion Exchange, Ion Exchangers, Ion-Exchange, Liquid-Chromatography, Metals, Mobile-Phase, Morphology, Organic, Pk(A), Polymeric, Polymers, Property, Retention, Rights, Salts, Selectivity, Separation, Solution Behavior, Solutions, Spectroscopy, Stationary Phases, Structure, Synthesis, Water, Zwitterionic Ion Exchanger

? El-Naas, M.H., Al-Zuhair, S. and bu Alhaija, M. (2010), Removal of phenol from petroleum refinery wastewater through adsorption on date-pit activated carbon. *Chemical Engineering Journal*, **162** (3), 997-1005.

Full Text: [2010\Che Eng J162, 997.pdf](2010/Che%20Eng%20J162,%20997.pdf)

Abstract: Experiments were carried out to evaluate the batch adsorption of phenol from petroleum refinery wastewater on a locally prepared date-pit activated carbon (DP-AC). Adsorption equilibrium and kinetics data were determined for the uptake of phenol from real refinery wastewater and from synthetically prepared aqueous phenol solution. The data were fitted to several adsorption isotherm and kinetics models. Sips as well as Langmuir models gave the best fit for equilibrium isotherms, whereas the kinetics data were best fitted by the pseudo-second order model. The enthalpy of adsorption showed an exothermic nature of the adsorption process. Several chemical and thermal techniques were tested for the regeneration of saturated activated carbon; using ethanol was found to be the most effective with more than 86% regeneration efficiency after four regeneration cycles. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Adsorption Equilibrium And Kinetics, Adsorption Isotherm, Agricultural Waste, Aqueous-Solutions, Batch, Batch Adsorption, Carbon, Chemical, Congo-Red, Data, Date-Pit, Degradation, Efficiency, Enthalpy, Enthalpy of Adsorption, Equilibrium, Equilibrium Isotherms, Ethanol, Exothermic, Isotherm, Isotherms, Kinetics, Kinetics Models, Langmuir, Model, Models, Petroleum Refinery Wastewater, Phenol, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Regeneration, Removal, Rights, Solution, Sorption, Surface-Chemistry, Techniques, Thermal Regeneration, Uptake, Wastewater

? Zhou, J.B., Wu, P.X., Dang, Z., Zhu, N.W., Li, P., Wu, J.H. and Wang, X.D. (2010), Polymeric Fe/Zr pillared montmorillonite for the removal of Cr(VI) from aqueous solutions. *Chemical Engineering Journal*, **162** (3), 1035-1044.

Full Text: [2010\Che Eng J162, 1035.pdf](2010/Che%20Eng%20J162,%201035.pdf)

Abstract: Four kinds of pillared montmorillonites were prepared by intercalating poly-hydroxyl iron, poly-hydroxyl iron/zirconium with different Fe/Zr molar ratios (4/1, 1/1) and poly-hydroxyl zirconium into the interlayer space of sodium-saturated montmorillonite (Na-Mt) via ion-exchange, termed Fe-Mt, Fe/Zr-4:1-Mt, Fear) 1-Mt and Zr-Mt, respectively. The obtained materials were characterized by X-ray fluorescence (XRF) spectra, X-ray diffraction (XRD) spectra, Fourier transform infrared (FTIR) spectra, point of zero charge measurement and BET analysis. Batch experiments were conducted to investigate the adsorption behavior of Cr(VI) on selected samples. The results showed that the equilibrium uptake of Cr(VI) was highly pH-dependent with an optimal pH range of 3.0-6.0. The kinetics of Cr(VI) adsorption could be described well by the Pseudo-second-order model. The Langmuir adsorption isotherm provided the best correlation of the equilibrium data, and the estimated maximum equilibrium uptake of Cr(VI) of Fe/Zr-4:1-Mt was 22.35 mg/g at pH 3.0, 25ºC, higher than those of other three samples. Also, the thermodynamic parameters demonstrated that the process of Cr(VI) adsorption onto pillared montmorillonites was spontaneous and exothermic in nature. The presence of phosphate, sulphate and tartrate inhibited markedly the adsorption of Cr(VI), whereas nitrate, chlorate and acetate exhibited no significant effect on Cr(VI) adsorption. The analyses combining characterization results with adsorption data revealed that the removal mechanisms of Cr(VI) by these pillared montmorillonites mainly involved electrostatic interaction and ion-exchange. Overall, the regeneration of Fe/Zr-Mt could be achieved using NaOH solution, enabling a promising application for removing Cr(VI) from aqueous solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acetate, Adsorption, Adsorption Behavior, Adsorption Isotherm, Al, Analyses, Analysis, Application, Aqueous Solution, Aqueous Solutions, Behavior, Bet, Catalytic-Activity, Characterization, Charge, Clay, Correlation, Cr(VI), Cr(VI) Adsorption, Data, Equilibrium, Exothermic, Experiments, Fe, Fluorescence, FTIR, Interaction, Ion Exchange, Ion-Exchange, Ionexchange, Iron, Isotherm, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Measurement, Mechanisms, Model, Modified Activated Carbons, Montmorillonite, NaOH, Nitrate, pH, pH-Dependent, Phosphate, Pillared Clays, Point of Zero Charge, Pseudo-Second-Order, Pseudo-Second-Order Model, Regeneration, Removal, Rights, Solution, Solutions, Surface-Properties, Tartrate, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Uptake, Water, X-Ray, X-Ray Diffraction, XRD, Zirconium

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Full Text: [2010\Che Eng J163, 68.pdf](2010/Che%20Eng%20J163,%2068.pdf)

Abstract: In this work, orange bagasse has been used as an alternative adsorbent for removal of reactive blue 5G dye from an aqueous solution. The influence of the dye solution pH, the biosorbent drying, the dye solution temperature and biosorbent grain size was studied in batch systems, in order to improve the biosorption kinetics and the experimental equilibrium conditions. Batch kinetic experiments were carried out with different dye concentrations at two temperatures. The biosorption kinetic data were well fitted by both pseudo-first and second order models. The equilibrium adsorption data were interpreted by applying widely the isotherm models and a set of six BET isotherm-added-to other ones and their adjustable parameters were determined by the PSO method. The isotherm models with s-shaped behavior, such as the Langmuir-BET combined isotherm, have described satisfactorily the equilibrium data, suggesting that the dye removal is based on an adsorption process of multi-layers onto the orange bagasse. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption-Kinetics, Alternative, Aqueous Solution, Aqueous-Solutions, Bagasse, Batch, Batch System, Behavior, BET, Biosorbent, Biosorption, Biosorption Kinetic, Biosorption Kinetics, Combined Isotherms, Data, Dye, Dye Removal, Egeria-Densa, Equilibrium, Equilibrium Modeling, Experimental, Experiments, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetics, Macrophytes, Mechanism, Modeling, Models, Orange Bagasse, Peel, pH, Pseudo-First and, Pso Method, Removal, Rights, Second Order, Second-Order, Size, Solution, Sorption, Systems, Temperature, Waste-Water, Work

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Full Text: [2010\Che Eng J163, 256.pdf](2010/Che%20Eng%20J163,%20256.pdf); [2010\Che Eng J163, 256-1.pdf](2010/Che%20Eng%20J163,%20256-1.pdf)

Abstract: The film-diffusion and the intraparticle-diffusion models are widely used to analyze the mechanism of adsorption. The plots of these models often have a multi-linear nature, and in general, the graphical method is employed to analyze the data in which the linear segments are determined visually. This method suffers from subjectivity and therefore its estimated diffusion parameters are not very reliable. An alternative statistical method, piecewise linear regression (PLR) is presented and applied to experimental data. The results demonstrate that the use of PLR is practical and leads to diffusion estimates that may be quite different from the graphical method. PLR also determined the exact time periods for each diffusion regime, which opens new possibilities for analyzing and understanding the mechanism of diffusion. In order to encourage the testing and application of PLR, an easy to use Microsoft® Excel™ spreadsheet is made available.

Keywords: Intraparticle-Diffusion, Film Diffusion, Adsorption, Piecewise Linear Regression, Mechanism

? Ponnusami, V., Rajan, K.S. and Srivastava, S.N. (2010), Application of film-pore diffusion model for Methylene blue adsorption onto plant leaf powders. *Chemical Engineering Journal*, **163** (3), 236-242.

Full Text: [2010\Che Eng J163, 236.pdf](2010/Che%20Eng%20J163,%20236.pdf)

Abstract: In the present work kinetics of methylene blue adsorption onto three low-cost adsorbents namely guava leaf powder (GLP), teak leaf powder (TLP) and gulmohar leaf powder (GUL) was predicted using film-pore diffusion model. The model equations were solved numerically by method of lines using Excel. Initial estimates of mass transfer parameters namely external-film transfer coefficient and internal diffusion coefficient were obtained using single resistance models at temperatures 303, 313 and 323 K and for initial dye concentrations 50, 100, 150 and 200 mg dm-3. Film-pore diffusion model was then used to determine the concentration-independent values of these mass transfer coefficients. Thus, external-film transfer coefficients were found to be in the range of 3×10-6 to 35×10-6 m s-1, 1×10-6 to 8×10-6 m s-1 and 1×10-6 to 11×10-6 m s(-1) for guava, teak and gulmohar leaf powders, respectively, in the chosen temperature range. At the same time internal diffusion coefficients were in the range of 0.1×10-12 to 1.9×10-12 m(2) s-1, 0.1×10-12 to 0.6×10-12 m(2) s-1 and 0.2×10-12 to 1.3×10-12 m(2) s-1 for guava, teak and gulmohar leaf powders, respectively. It was evident that film-pore diffusion model could satisfactorily describe kinetics of methylene blue adsorption onto the three low-cost adsorbents used. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorbents, Adsorption, Adsorption Kinetics, Agricultural Waste, Aqueous-Solution, Basic Dye, Cationic Dye, Diffusion, Diffusion Coefficient, Diffusion Coefficients, Diffusion Model, Dye, Estimates, Film-Pore Diffusion Model, Guava Leaf Powder, Internal Diffusion, Kinetics, Low Cost, Low Cost Adsorbents, Low-Cost Adsorbents, Mass Transfer, Methylene Blue, Methylene Blue Adsorption, Model, Models, Plant, Regression-Analysis, Removal, Resistance, Rights, Sorption, Temperature, Transfer Coefficient, Work

? Cabrita, I., Ruiz, B., Mestre, A.S., Fonseca, I.M., Carvalho, A.P. and Ania, C.O. (2010), Removal of an analgesic using activated carbons prepared from urban and industrial residues. *Chemical Engineering Journal*, **163** (3), 249-255.

Full Text: [2010\Che Eng J163, 249.pdf](2010/Che%20Eng%20J163,%20249.pdf)

Abstract: The removal of an analgesic drug (acetaminophen) from water was investigated using activated carbons prepared from different residues, namely urban wastes (post-consumer plastics), and agro-industrial residues (cork powder and peach stones), comparing their adsorption capacity with that of commercially available carbonaceous adsorbents. The prepared carbon samples were evaluated on the basis of their adsorption capacities and kinetic performances, which were linked with their different properties. The samples prepared from chemical activation of the biomass residues show reasonably high removal efficiencies along with fast rate of adsorption, which are in fact comparable to commercial carbons. The analysis of the carbon samples after adsorbing the analgesic showed that adsorbent-adsorbate affinity is stronger in hydrophobic carbons of basic character that contain a well-developed microporosity. These characteristics are however not sufficient for an overall performance of a carbon in acetaminophen removal. The carbon must also have a well interconnected pore network (to facilitate the accessibility of acetaminophen molecules, thus speeding up adsorption kinetics) and an adequate chemical composition, which ultimately leads to a high adsorption capacity. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Activation, Adsorbents, Adsorption, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Kinetics, Analgesic, Analysis, Aqueous-Phase, Biomass, Capacity, Carbon, Characteristics, Chemical, Chemical Activation, Composition, Drug, Hydrophobic, Ibuprofen, Kinetic, Kinetics, Microporosity, Network, Performance, Pharmaceuticals, Pore Structure, Removal, Residues, Rights, Surface-Chemistry, Urban, Waste Materials, Water

? Malash, G.F. and El-Khaiary, M.I. (2010), Piecewise linear regression: A statistical method for the analysis of experimental adsorption data by the intraparticle-diffusion models. *Chemical Engineering Journal*, **163** (3), 256-263.

Full Text: [2010\Che Eng J163, 256.pdf](2010/Che%20Eng%20J163,%20256.pdf)

Abstract: The film-diffusion and the intraparticle-diffusion models are widely used to analyze the mechanism of adsorption. The plots of these models often have a multi-linear nature, and in general, the graphical method is employed to analyze the data in which the linear segments are determined visually. This method suffers from subjectivity and therefore its estimated diffusion parameters are not very reliable. An alternative statistical method, piecewise linear regression (PLR) is presented and applied to experimental data. The results demonstrate that the use of PLR is practical and leads to diffusion estimates that may be quite different from the graphical method. PLR also determined the exact time periods for each diffusion regime, which opens new possibilities for analyzing and understanding the mechanism of diffusion. In order to encourage the testing and application of PLR, an easy to use Microsoft(R) Excel(TM) spreadsheet is made available. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Alternative, Analysis, Application, Basic-Dyes, Data, Diffusion, Estimates, Experimental, Film Diffusion, General, Intraparticle Diffusion, Intraparticle-Diffusion, Kinetics, Linear Regression, Mechanism, Mechanism of Adsorption, Models, Parameter, Piecewise Linear Regression, Regression, Rights, Testing, Tests, Understanding

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Full Text: [2010\Che Eng J163, 317.pdf](2010/Che%20Eng%20J163,%20317.pdf)

Abstract: The present study was conducted to evaluate the feasibility of nano-alumina for nitrate removal from aqueous solutions. The nature and morphology of sorbent was characterized by XRD, FTIR, BET and SEM analysis. Batch adsorption studies were performed as a function of contact time, initial nitrate concentration, temperature, pH and influence of other interfering anions. Nitrate sorption kinetics was well fitted by pseudo-second-order kinetic model. The maximum sorption capacity of nano-alumina for nitrate removal was found to be ca. 4.0 mg g-1 at 25±2ºC. Maximum nitrate removal occurred at equilibrium pH ca. 4.4. The nitrate sorption has been well explained using Langmuir isotherm model. Results from this study demonstrated the potential utility of nano-alumina for nitrate removal from water. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Analysis, Anions, Aqueous Solutions, Aqueous-Solution, Batch Adsorption, Bet, Capacity, Characterization, Competing Anions, Concentration, Denitrification, Drinking-Water, Equilibrium, Feasibility, FTIR, Function, Groundwater, Hydroxide, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetic Modeling, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Model, Morphology, Nano-Alumina, Nitrate, Nitrate Removal, pH, Potential, Powder, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reduction, Removal, Rights, SEM, Solutions, Sorbent, Sorption, Sorption Capacity, Sorption Isotherms, Sorption Kinetics, Sorption Studies, Temperature, Utility, Water, XRD, Zero-Valent Iron

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Full Text: [2010\Che Eng J163, 337.pdf](2010/Che%20Eng%20J163,%20337.pdf)

Abstract: The ability of crab shell to biosorb two rare earth elements (REE), namely cerium(III) and europium(III) from single and binary systems has been studied. Crab shell majorly comprised of calcium carbonate, protein and chitin. Experiments to identify the role of these constituents in REE biosorption revealed that calcium carbonate was mainly responsible for REE removal. Microprecipitation of REE by carbonate ions and subsequent settling on the surface of crab shell was identified as major mechanism responsible for crab shell biosorption performance. At optimum pH of 6, in single component system, crab shell exhibited maximum Ce(III) and Eu(III) uptakes of 144.9 and 49.5 mg/g, respectively, according to the Langmuir model. In binary systems, both Ce(III) and Eu(III) compete with each other resulted in decreased uptake. In an attempt to model the binary biosorption data. Sheindorf-Rebhun-Sheintuch equation provided more accurate prediction of isotherm data compared to extended Langmuir model with constant interaction factor. Kinetic experiments revealed that equilibrium was attained in 60 min, followed by complete saturation in 2 h, for both Ce(III) and Eu(III). Pseudo-first order model better predicted the kinetic data with high correlation coefficients and low % error values than pseudo-second order model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Biosorption, Calcium, Calcium Carbonate, Carbonate, Cerium, Chitin, Chitosan, Correlation, Crab Shell, Crab-Shell, Data, Equilibrium, Error, Europium, Experiments, Humic-Acid, Interaction, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Model, Lanthanide La, Leaf Powder, Mechanism, Model, Multicomponent, Particles, Performance, pH, Prediction, Protein, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rare Earth Elements, Rare Earths, Rare-Earth-Elements, Removal, Rights, Role, Saturation, Selective Biosorption, Surface, Systems, Uptake

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Full Text: [2010\Che Eng J163, 364.pdf](2010/Che%20Eng%20J163,%20364.pdf)

Abstract: Batch sorption experiments were conducted using a PS-EDTA resin as a sorbent to adsorb Cu(II) and Pb(II) ions from single component system. The results showed that both the Cu(II) and Pb(II) ions sorption capacity and efficiency reach a high level at an initial pH value of 6, the adsorption capacity of Cu(II) and Pb(II) ions were 42.1 mg/g and 32.1 mg/g at initial concentration of 100 mg/L, and the maximum efficiency were 99.8% and 99.6% at 5 mg/L, respectively. The equilibrium data for the adsorption of Cu(II) and Pb(II) on PS-EDTA resin were tested with three adsorption isotherm models which were found to be suitable for the two ions’ adsorptions. In addition, the kinetic adsorption fitted well to the pseudo-second-order model and the corresponding rate constants were obtained. Furthermore a higher desorption efficiency of Cu(II) and Pb(II) from the PS-EDTA resin using acid treatment was available. The column capacity for Cu(II) and Pb(II) adsorption for the bed height of 0.15 m, hydraulic loading rate of 2.5 m3/(hm2) and the feed concentration of 50 mg/L and 100 mg/L for 50% breakthrough concentration were found to be 49.8 mg/g, 87.4 mg/g and 48.7 mg/g. 91.2 mg/g, respectively. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Treatment, Acid-Treatment, Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption Mechanism, Aqueous Solution, Breakthrough, Capacity, Column, Column Adsorption, Concentration, Copper(II), Cu(II), Data, Desorption, Efficiency, Equilibrium, Experiments, Feed, Fixed-Bed Column, Heavy Metal, Heavy-Metal Ions, Hydraulic Loading Rate, Industry Waste, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Adsorption, Loading, Low-Cost Adsorbents, Mechanism, Methylene-Blue, Model, Model Parameters, Models, Pb(II), Pb(II) Ions, pH, pH Value, Ps-EDTA Resin, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Constants, Removal, Resin, Rights, Solution, Sorbent, Sorption, Sorption Capacity, Treatment, Value

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Full Text: [2010\Che Eng J163, 373.pdf](2010/Che%20Eng%20J163,%20373.pdf)

Abstract: The activated carbons prepared from cotton stalk with different activation agents (KOH and K(2)CO(3)) under microwave radiation were investigated. The effects of different activation conditions on the adsorption capacities of activated carbons were studied. The frequency test (F-test) was utilized in statistics to analyze the significant effects of the factors. The properties of activated carbons prepared under optimum conditions were investigated using the following measurement: N(2) adsorption isotherms at -196 degrees C, SEM and FTIR. Finally, the samples were used in removal of methylene blue. The results showed that radiation time and radiation power were the greatest impact factor on adsorption capacities of the activated carbon prepared with KOH and K(2)CO(3), respectively. Optimum conditions were different in the two prepared process. Compared with cotton stalk, different functionalities on the carbon surfaces were formed. In addition, chemical activation could develop both microporosity and mesoporosity. KOH generated a greater micropore volume than K(2)CO(3) did. Compared with conventional heating method, microwave heating method could shorten the processing time and reduce the consumption of KOH. The equilibrium data of the adsorption was well fitted to the Langmuir isotherm for both activated carbons. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Cotton Stalk, Activated Carbon, Microwave Radiation, KOH, K2CO3, Chemical Activation, Methylene-Blue, Aqueous-Solutions, Adsorption, Removal, Surface, Oxidation, Waste, Pore, Carbonization

? Uluozlu, O.D., Sarı, A. and Tuzen, M. (2010), Biosorption of antimony from aqueous solution by lichen (*Physcia tribacia*) biomass. *Chemical Engineering Journal*, **163** (3), 382-388.

Full Text: [2010\Che Eng J163, 382.pdf](2010/Che%20Eng%20J163,%20382.pdf)

Abstract: The biosorption characteristics of antimony(III) from aqueous solution using lichen (Physcia tribacia) biomass was investigated in terms of equilibrium, thermodynamics and kinetics. Optimum biosorption conditions were determined with respect to pH, biomass concentration, contact time, and temperature. Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherm models were applied to the equilibrium data. The maximum Sb(III) sorption capacity of P. tribacia was found to be 81.1 mg/g at pH 3, biomass concentration 4 g/L, contact time 30 min, and temperature 20ºC. The calculated mean biosorption energy (10.2 kJ/mol) using D-R model indicated that the biosorption of Sb(III) on the biomass was occurred by chemical ion exchange. The highest desorption efficiency (95%) was achieved using 0.5 M HCl. The biosorption capacity of P. tribacia slightly decreased about 10% after ten times of sorption-desorption process. The calculated thermodynamic parameters showed that the biosorption of Sb(III) onto P. tribacia biomass was feasible, spontaneous and exothermic, respectively. The experimental data was also examined using the Lagergren’s first-order and pseudo-second-order kinetic models. The results revealed that the pseudo-second-order kinetic model provided the best description of the equilibrium data. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Antimony, Aqueous Solution, Biomass, Biosorption, Biosorption Characteristics, Capacity, Characteristics, Chemical, Cladonia-Furcata, Concentration, Data, Desorption, Efficiency, Energy, Equilibrium, Equilibrium, Exothermic, Experimental, First Order, Fly-Ash, Freundlich, Ion Exchange, Ion-Exchange, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Lead, Lichen, Metal-Ions, Model, Models, Modified Diatomite, P, pH, *Physcia tribacia*, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Sb(III), Solution, Sorption, Sorption Capacity, Sorption-Desorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics

? Wen, J., Han, X., Lin, H.F., Zheng, Y. and Chu, W. (2010), A critical study on the adsorption of heterocyclic sulfur and nitrogen compounds by activated carbon: Equilibrium, kinetics and thermodynamics. *Chemical Engineering Journal*, **164** (1), 29-36.

Full Text: [2010\Che Eng J164, 29.pdf](2010/Che%20Eng%20J164,%2029.pdf)

Abstract: Adsorption of heterocyclic sulfur and nitrogen compounds by activated carbon was studied using model diesel fuels, light cycle oils and shale oil. It is observed that the carbon favours adsorption of cyclic nitrogen compounds. This work also investigates the equilibrium, kinetics and thermodynamics of adsorption of nitrogen and sulfur compounds from diesel fractions by activated carbon. Quinoline, indole, and carbazole are typical N compounds while dibenzothiophene and 4,6-dimethyldibenzothiophene are the representatives of refractory S compounds in diesel fractions, were selected as the model compounds. The total N adsorbed by the activated carbon is more than the S compound. Comparing the three nitrogen compounds, quinoline shows a greater removal rate than indole and carbazole. Adsorptive removal kinetics for N/S compounds was monitored by a GC-FID (gas chromatograph coupled with flame ionization detector) technique and was found to follow pseudo second-order kinetics. The external diffusion is not a controlling step in the adsorption process. The isotherm indicates that activated carbon presents a highly heterogeneous surface in the adsorption of DBT, quinoline and indole, while a homogeneous surface is observed in the adsorption of carbazole. Negative adsorption free energy suggests that the adsorption process is favourable and spontaneous for all S/N compounds. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 4,6-Dimethyldibenzothiophene, Activated Carbon, Adsorbents, Adsorption, Adsorptive Removal, Alkyldibenzothiophenes, Carbon, Catalysts, Dibenzothiophene, Diesel Fuel, Diffusion, Energy, Equilibrium, Gas Oil, Heterocyclic Sulfur And Nitrogen, Hydrodesulfurization, Isotherm, Kinetics, Kinetics And Thermodynamics, Mechanism, Model, N, Nitrogen, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-Second-Order, Quinoline, Removal, Rights, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Selective Adsorption, Shale, Sulfur, Surface, Thermodynamics, Thermodynamics of Adsorption, Ultra-Deep Desulfurization, Work

? Zhao, D.L., Yang, X., Zhang, H., Chen, C.L. and Wang, X.K. (2010), Effect of environmental conditions on Pb(II) adsorption on beta-MnO2. *Chemical Engineering Journal*, **164** (1), 49-55.

Full Text: [2010\Che Eng J164, 49.pdf](2010/Che%20Eng%20J164,%2049.pdf)

Abstract: In this study, the adsorption of Pb(II) on beta-MnO2 as a function of various environmental conditions such as contact time, pH, ionic strength, humic acid (HA)/fulvic acid (FA), and temperature was investigated using batch techniques. The results indicated that the adsorption of Pb(II) on beta-MnO2 was obviously dependent on pH but independent of ionic strength. The presence of HA/FA enhanced the adsorption of Pb(II) on beta-MnO2 at low pH, whereas reduced Pb(II) adsorption on beta-MnO2 at high pH. The kinetic adsorption of Pb(II) on beta-MnO2 can be well fitted by the pseudo-second-order rate equation. The thermodynamic parameters (ΔH degrees, ΔS degrees, and ΔG degrees) were also calculated from the temperature dependent adsorption isotherms, and the results suggested that the adsorption of Pb(II) on beta-MnO2 was a spontaneous and endothermic process. The adsorption of Pb(II) on beta-MnO2 was attributed to surface complexation rather than ion exchange. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Aqueous-Solution, Batch, Beta-MnO2, Carbon Nanotubes, Complexation, Desorption Reversibility, Endothermic, Environmental, Foreign Ions, Fulvic Acid, Fulvic-Acid, Function, Humic Acid, Humic-Acid, Ion Exchange, Ion-Exchange, Ionic Strength, Ionic-Strength, Isotherms, Kinetic, Kinetic Adsorption, Mx-80 Bentonite, Nuclear-Magnetic-Resonance, Pb(II), Pb(II)), pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rights, Sorption, Strength, Surface, Surface Complexation, Techniques, Temperature, Thermodynamic, Thermodynamic Parameters

? Chowdhury, S. and Saha, P. (2010), Sea shell powder as a new adsorbent to remove Basic Green 4 (Malachite Green) from aqueous solutions: Equilibrium, kinetic and thermodynamic studies. *Chemical Engineering Journal*, **164** (1), 168-177.

Full Text: [2010\Che Eng J164, 168.pdf](2010/Che%20Eng%20J164,%20168.pdf)

Abstract: In this work the feasibility of employing sea shell powder to remove Basic Green 4 (BC 4), a cationic dye from its aqueous solutions was investigated. Parameters that influence the adsorption process such as particle size, pH, adsorbent dose, initial dye concentration, contact time and temperature were studied in batch experiments. Optimum adsorption of Basic Green 4 took place at pH 8.0. Further, the adsorbent was characterized by Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscopy (SEM). FTIR analysis revealed that -OH, -CO3, and -PO4 functional groups were mainly responsible for the adsorption process. The experimental equilibrium adsorption data fitted well to the Langmuir isotherm model. The maximum monolayer adsorption capacity was found to be 42.33 mg g(-1) at 303K. The kinetic data conformed to the pseudo-second-order kinetic model. Intraparticle diffusion was not the sole rate-controlling factor. The activation energy (E-a) of dye adsorption was determined at 15.71 kJ mol(-1) according to Arrhenius equation which indicated that the adsorption process of Basic Green 4 onto sea shell powder may be physical adsorption. Thermodynamic parameters such as Gibbs free energy (ΔG degrees), enthalpy (ΔH degrees), and entropy (ΔS degrees) were also calculated and it was found that the adsorption of dye by sea shell powder was a spontaneous process. It was concluded that sea shell powder has potential for application as adsorbent for removal of Basic Green 4 from aqueous solution. (C) 2010 Elsevier By. All rights reserved.

Keywords: Activated Carbon, Activation, Activation Energy, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Capacity, Analysis, Application, Aqueous Solution, Aqueous Solutions, Basic Green 4, Batch, Batch Experiments, Capacity, Cationic Dye, Concentration, Data, Diffusion, Dye, Dye Adsorption, Dye Removal, Energy, Enthalpy, Entropy, Equilibrium, Experimental, Experiments, Feasibility, FTIR, FTIR Analysis, Functional Groups, Gibbs Free Energy, Intraparticle Diffusion, Intraparticle-Diffusion, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Malachite Green, Model, Monolayer, Nonlinear Methods, Particle Size, pH, Physical, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Sawdust, Sea Shell Powder, SEM, Size, Solid-Waste, Solution, Solutions, Sorption, Tamarind Fruit Shell, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamic Studies, Thermodynamics, Waste-Water, Work

? Cao, Y.R., Liu, Z.A., Cheng, G.L., Jing, X.B. and Xu, H. (2010), Exploring single and multi-metal biosorption by immobilized spent Tricholoma lobayense using multi-step response surface methodology. *Chemical Engineering Journal*, **164** (1), 183-195.

Full Text: [2010\Che Eng J164, 183.pdf](2010/Che%20Eng%20J164,%20183.pdf)

Abstract: A multi-step response surface methodology was successfully applied to interpret the adsorption characteristics of lead, cadmium and copper ions onto immobilized spent Tricholoma lobayense (ISTL) in single and ternary systems in this study. Firstly, the most significant medium factors, which were pH, biomass loading and contact time, on biosorption of three metals, were determined by Minimum Run Res V Design. Then central composite design followed by mixture design was utilized to identify the affinity and predict the adsorption capacities of three metals onto the biosorbent. The results showed that the preference of ISTL for three metals was in the order of Pb(II) > Cu(II) > Cd(II) and lead ions could still be effectively removed from aqueous solution in the presence of both cadmium and copper while removal of the cadmium and copper ions would be suppressed by lead. Sorption isotherm data were better represented by Freundlich model. The both adsorption and desorption process of three metals followed the pseudo-second-order kinetics model. Scanning electron microscope (SEM) and energy dispersive spectrometry (EDS) analysis testified the obvious change of the surface morphology and the presence of three metals on the biosorbent after metal binding. The ISTL could be regenerated with 1 M HNO3, which allowed the reuse of the biomass in three biosorption-desorption cycles without considerable loss of adsorption capacity. The present work suggests that ISTL as an abundant low-cost biomaterial was an efficient biosorbent for heavy metals removal from wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacities, Adsorption Capacity, Alginate Beads, Analysis, Aqueous Solution, Aqueous-Solution, Binding, Biomass, Biosorbent, Biosorption, Biosorption-Desorption, Ca-Alginate, Cadmium, Cadmium Biosorption, Capacity, Cd(II), Characteristics, Competitive Adsorption, Composite, Copper, Cu(II), Data, Design, Desorption, EDS, Energy, Experimental-Design, Freundlich, Freundlich Model, Fungus Trametes-Versicolor, Heavy Metals, Heavy-Metals, Immobilized, Inhibition, Ions, Isotherm, Kinetics, Kinetics Model, Lead, Loading, Low Cost, Metal, Metals, Metals Removal, Methodology, Model, Morphology, Pb(II), pH, Preference, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Pycnoporus-Sanguineus, Removal, Response Surface Methodology, Reuse, Rights, Saccharomyces-Cerevisiae, Sem, Solution, Sorption, Sorption Isotherm, Spectrometry, Surface, Systems, Tricholoma Lobayense, Waste-Water, Wastewater, Work

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Full Text: [2010\Che Eng J165, 10.pdf](2010/Che%20Eng%20J165,%2010.pdf)

Abstract: Amino-functionalized magnetic mesoporous silica (magMCM-41-NH2) was prepared and adsorption of organic pollutant tannic acid (TA) from aqueous solution on the resulting material was investigated The adsorbent was characterized by elemental analysis X-ray diffraction (XRD) transmission electron microscopy (TEM) N-2 adsorption-desorption IR spectroscopy Zeta potential measurements and vibration sample magnetometer (VSM) Characterization results showed that magMCM-41-NH2 had ordered mesoporous structure with amino group content of 457 wt% BET surface area of 668 m(2)/g and the pore volume of 0 525 cm(3)/g Batch adsorption tests indicated that magMCM-41-NH2 adsorbent exhibited high adsorption affinity towards aqueous TA with a maximum adsorption capacity of 510 2 mg/g The Freundlich model could fit the adsorption isotherm of TA over magMCM-41-NH2 very well implying that adsorption process is heterogeneous TA adsorption on magMCM-41-NH2 could be well described by the pseudo-second-order kinetics Adsorption of TA on the adsorbent was found to be strongly dependent on pH and Ionic strength suggesting that electrostatic interaction played a crucial role in TA adsorption X ray photoelectron spectroscopy (XPS) analysis confirmed the formation of complex compound between TA and surface amino groups of magMCM-41-NH2 upon adsorption (C) 2010 Elsevier B V All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption-Desorption, Amino Functionalization, Analysis, Aqueous Solution, Aqueous-Solutions, Batch Adsorption, BET, BET Surface Area, Capacity, Characterization, Clay, Deposition, Electron Microscopy, Freundlich, Freundlich Model, Humic-Acid, Interaction, Ionic Strength, IR, Isotherm, Kinetics, Magnetic, Magnetic Mesoporous Silica, Mesoporous, Mesoporous Silica, Model, N-2, N2, NOV, Organic, Organic Pollutant, Particles, pH, Pore Volume, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Rights, Role, SBA-15, Silica, Solution, Spectroscopy, Strength, Structure, Surface, Surface Area, Tannic Acid, Tem, Transmission, Vibration, Volume, Water, X-Ray, X-Ray Diffraction, XPS, XRD

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Full Text: [2010\Che Eng J165, 184.pdf](2010/Che%20Eng%20J165,%20184.pdf)

Abstract: Biosorption of Remazol Black B a vinyl sulfone type reactive dye from aqueous solution was investigated to compare the binding capacities of untreated (live) and treated (dried autoclaved acid (H2SO4)-treated base (NaOH)-treated) activated sludge in this study Remazol Black B uptake was strongly affected by the solution pH and optimum adsorption pH value was determined as 2 for all the live and treated activated sludge biosorbents It was seen that the sorption capacity of each biosorbent enhanced with decreasing temperature Dye uptake also increased with increasing initial dye concentration up to 500 mgl(-1) for each biomass type Contrary to assumption it is found that all the treatment methods diminished the dye biosorption capacity of activated sludge Among the five biosorbents live activated sludge had a maximum dye uptake capacity of 134 8 mg g(-1) at 25 C The Langmuir-Freundlich adsorption model described the equilibrium data of each dye-biosorbent system accurately in the concentration and temperature ranges studied The pseudo-second-order adsorption model defined the overall adsorption kinetics of each biosorption process exactly (C) 2010 Elsevier B V All rights reserved.

Keywords: Activated Sludge, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solution, Binding, Binding Capacities, Biomass, Biosorbent, Biosorbents, Biosorption, Capacity, Concentration, Corynebacterium-Glutamicum, Data, Dye, Dye Biosorption, Dye Removal, Equilibrium, Kinetics, Langmuir-Freundlich, Low-Cost Adsorbents, Methods, Model, NOV, pH, pH Value, Pre Treatment, Pseudo Second Order, Pseudo-Second-Order, Reactive Black-5, Reactive Dye, Remazol Black B, Rights, Sludge, Solution, Sorption, Sorption Capacity, Sulfone, Temperature, Textile Dye, Treatment, Uptake, Value, Wastewaters

? Dai, J., Yan, H., Yang, H. and Cheng, R.S. (2010), Simple method for preparation of chitosan/poly(acrylic acid) blending hydrogel beads and adsorption of copper(II) from aqueous solutions. *Chemical Engineering Journal*, **165** (1), 240-249.

Full Text: [2010\Che Eng J165, 240.pdf](2010/Che%20Eng%20J165,%20240.pdf)

Abstract: In this paper poly(acrylic acid) blended chitosan (CS/PAA) hydrogel beads have been prepared by one-step method simply It was found that glutaraldehyde (GLA) cross-linked CS/PAA beads had better stability in lower pH solutions and higher mechanical strength than CS-GLA beads without PAA Results from removal of Copper(Cu) ions from aqueous solutions showed that the adsorption capacity of CS/PAA-GLA beads was greater than that of CS-GLA beads Moreover the adsorption capacity for two types of beads both showed temperature independent Furthermore the adsorption isotherms of various beads at different temperatures were both better fitted for Langmuir equation while the adsorption kinetics was both better described by the pseudo-second order equation Furthermore Fourier transform infrared spectroscopy and X-ray photoelectron spectroscopy have been employed to investigate the adsorption mechanisms from molecular levels It indicated that the efficient effects of CS/PAA-GLA beads on removal of Cu(II) resulted from the fact that carboxyl groups were facile to form bidentate carboxylates with metal ions In addition Cu( II) ions could be desorbed efficiently from both aforementioned beads at pH below 40 and the adsorption capacity of the regenerated beads had no loss until six cycles (C) 2010 Elsevier B V All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Adsorption Mechanisms, Adsorption Of Copper(II), Alginate Beads, Aqueous Solutions, Beads, Capacity, Carboxymethyl-Chitosan Resin, Chitosan, Copper(II), Cross-Linked, Cross-Linking, Cs Gla Beads, Cs, Paa Gla Beads, Cu(II), Cu(II) Ions, Equilibrium, Gla Beads, Glutaraldehyde, Humic-Acid, Hydrogel, Infrared Spectroscopy, Ions, Isotherms, Kinetics, Langmuir, Langmuir Equation, Mechanisms, Metal, Metal Ions, NOV, pH, Poly(Acrylic Acid), Preparation, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Solutions, Spectroscopy, Stability, Strength, Temperature, Waste-Water, X-Ray, X-Ray Photoelectron Spectroscopy

? Gondal, M.A., Chang, X.F. and Yamani, Z.H. (2010), UV-light induced photocatalytic decolorization of Rhodamine 6G molecules over BiOCl from aqueous solution. *Chemical Engineering Journal*, **165** (1), 250-257.

Full Text: [2010\Che Eng J165, 250.pdf](2010/Che%20Eng%20J165,%20250.pdf)

Abstract: The sorption and photocatalytic decolorization (under irradiation of monochromaticitic 355 nm-pulsed-laser) behaviors of Rhodamine 6G (Rh 6G) in presence of BiOCl semiconductor in aqueous solution were studied in this paper The sorption kinetic and isotherm behaviors of Rh 6G over BiOCl catalyst were investigated and discussed through pseudo-second-order/intraparticle diffusion models and Langmuir/Freundlich models respectively The effect of critical parameters such as catalyst dosage initial concentration of Rh 6G and laser pulse energy on the photocatalytic decolorization process was investigated The photocatalytic decolorization and photonic efficiency of BiOCl was compared with standard catalyst (TiO2) and the obtained results were discussed in terms of their band edge position Finally the chemical stability of BiOCl photocatalyst was studied by measuring the X-ray diffraction (XRD) pattern of BiOCl samples after the reaction (C) 2010 Elsevier B V All rights reserved.

Keywords: Aqueous Solution, BiOCl, BR, Catalyst, Chemical, Cl, Concentration, Decolorization, Degradation, Diffusion, Driven, Efficiency, Energy, I Photocatalysts, Induced, Irradiation, Isotherm, Kinetic, Laser, Models, Mulliken Electronegativity, Nanoplate Microspheres, NOV, Pattern, PCP-Na, Photocatalytic, Pulsed Laser, Rhodamine 6g, Rights, Semiconductor, Semiconductor Catalyst, Solution, Sorption, Sorption Isotherm, Sorption Kinetics, Stability, Standard, TiO2, UV Light, Visible-Light, X-Ray, X-Ray Diffraction, XRD

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Full Text: [2010\Che Eng J165, 465.pdf](2010/Che%20Eng%20J165,%20465.pdf)

Abstract: In the present study, we prepared Cr(III) ionic imprinted membrane adsorbents (Cr(III)-PVA/SA) by blending sodium alginate (SA) with polyvinyl alcohol (PVA). In these new membrane adsorbents, polyethylene glycol was used as porogen, and glutaraldehyde was the cross-linking agent. Our new developed membrane adsorbents can be used without centrifugation and filtration. To investigate the adsorption kinetics of Cr(III) ions from aqueous solution onto this newly developed Cr(III)-PVA/SA, we performed a batch of experiments under different conditions by changing the concentration of Cr(III) ions in the Cr(III)-PVA/SA, pH value of the solution, adsorbent close, initial Cr(III) ions concentration, adsorption temperature and contact time. Our Cr(III)-PVA/SA exhibited the maximum Cr(III) ions uptake capacity of 59.9 mg/g under the following conditions: 0.078 wt% of Cr(III) ions in the Cr(III)-PVA/SA, solution pH value of 6.0, adsorbent close of 0.5 g/L, the initial Cr(III) ions concentration of 50 mg/L, at 25ºC. To study the mechanism of adsorption process, we examined the intra-particular diffusion model, Lagergren pseudo-first-order kinetic model and pseudo-second-order kinetic model, and found pseudo-second-order kinetic model exhibited the best correlation with our experimental data. Furthermore, our adsorption equilibrium data could be better described by the Langmuir equation. Competitive adsorption studies of the binary system of Cr(III)/Cu(II), Cr(III)/Cd(II) and the ternary system of Cr(III)/Cu(II)/Cd(II) were also investigated using Cr(III)-PVA/SA, the results indicated that selectively adsorbed amount of Cr(III) ion on Cr(III)-PVA/SA is significantly higher than that of Cu(II) and Cd(II) ions. We also used five times consecutive adsorption-desorption experiments to show that the Cr(III)-PVA/SA has high adsorption and desorption efficiencies. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Adsorption-Desorption, Alcohol, Alginate, Aqueous Solution, Aqueous-Solution, Batch, Biomass, Biosorption, Capacity, Cd(II), Cd(II) Ions, Composite, Concentration, Correlation, Cr(III), Cr(III) Ions, Cr(VI), Crosslinking, Cu(II), Data, Desorption, Diffusion, Diffusion Model, Equilibrium, Experimental, Experiments, Filtration, Glutaraldehyde, Ions, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Equation, Mechanism, Mechanism of Adsorption, Membrane, Model, Pb(II), pH, pH Value, Polyethylene, Polyvinyl Alcohol, Porogen, Preconcentration, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Selective Adsorption, Sodium, Sodium Alginate, Solution, Temperature, Trivalent Chromium, Uptake, Value

? Tian, Y., Ji, C.Y., Zhao, M.J., Xu, M., Zhang, Y.S. and Wang, R.G. (2010), Preparation and characterization of baker’s yeast modified by nano-Fe3O4: Application of biosorption of methyl violet in aqueous solution. *Chemical Engineering Journal*, **165** (2), 474-481.

Full Text: [2010\Che Eng J165, 474.pdf](2010/Che%20Eng%20J165,%20474.pdf)

Abstract: The magnetic baker’s yeast biomass (MB) was prepared by combining baker’s yeast and nano-Fe3O4 using glutaraldehyde as a cross link agent. The MB was successfully used for the biosorption of methyl violet (MV) and was easily recycled by using an applied magnetic field. The mechanism of MV biosorption by MB was investigated by SEM, XRD, MR, zeta potential and potentiometric titration. The results revealed that nano-Fe3O4, with spherical and granular morphology, were distributed on the surface of baker’s yeast biomass. The functional groups such as carboxyl, hydroxyl and amino groups found on the surface of MB may be responsible for MV biosorption. The optimal biosorption conditions were determined as pH 6.0, MV concentration 300 mg/L and contact time 30 min. The biosorption capacity in the optimal conditions was 60.84 mg/g. The biosorption process followed the pseudo-second-order kinetic model and the Langmuir isotherm equation. The thermodynamic parameters ΔGº, ΔHº and ΔSº showed that the biosorption was feasible, spontaneous and endothermic. The desorption and regeneration experiments were investigated and the biosorption/desorption cycles of MV were repeated three times. The MB regeneration efficiency and the MV recovery efficiency were 82.64% and 84.54% respectively in the third cycle by using HAc as an eluent solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Baker’s Yeast, Biomass, Biosorption, Capacity, Characterization, Concentration, Cu(II), Decolorization, Desorption, Distributed, Efficiency, Endothermic, Equilibrium, Experiments, Field, Functional Groups, Glutaraldehyde, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Magnetic, Magnetic Field, Mb, Mechanism, Methyl Violet, Model, Modified, Modified Biomass, Morphology, MR, Nano-Fe3O4, pH, Potential, Potentiometric Titration, Preparation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Recovery, Regeneration, Removal, Rights, Sawdust, SEM, Solution, Surface, Textile-Dye, Thermodynamic, Thermodynamic Parameters, Wastewaters, XRD, Yeast, Zeta Potential

? Qi, F., Xu, B.B., Chen, Z.L., Zhang, L.Q., Zhang, P.Y. and Sun, D.Z. (2010), Mechanism investigation of catalyzed ozonation of 2-methylisoborneol in drinking water over aluminum (hydroxyl) oxides: Role of surface hydroxyl group. *Chemical Engineering Journal*, **165** (2), 490-499.

Full Text: [2010\Che Eng J165, 490.pdf](2010/Che%20Eng%20J165,%20490.pdf)

Abstract: In this investigation, the mechanism of catalyzed ozonation of MIB by aluminum oxides (gamma-AlOOH and gamma- Al2O3) was studied. It was concluded that the roles of surface hydroxyl groups in adsorption and catalyzed ozonation determined catalyzed ozonation mechanism. The removal efficiency of MIB in catalyzed ozonation by gamma-Al2O3 or gamma-AlOOH was 98.4% and 27.5%, respectively. Effect of water pH on catalyzed ozonation indicated that surface hydroxyl group, of which surface net charge was zero, was the active site of catalysts. Radical scavenger experiments results indicated that catalyzed zonation by gamma-Al2O3 followed a hydroxyl radical ((OH)-O-center dot) reaction-pathway and the reaction-pathway of catalyzed ozonation by gamma-AlOOH followed solid surface mechanism. However, both gamma-AlOOH and gamma-Al2O3 can enhance ozone decomposition to generate hydroxyl radical in catalytic ozone decomposition (without MIB). The inconsistent results between radical scavengers and catalytic ozone decomposition were mainly due to the interaction between MIB and surface hydroxyl groups. According to MIB adsorption on gamma-AlOOH or gamma-Al2O3, MIB interacted with surface hydroxyl group by chemical adsorption, and surface hydroxyl group was the main adsorption site. The adsorption capability of gamma-AlOOH was higher than that of gamma-Al2O3. The participation of surface hydroxyl group in adsorption restrained its capability of catalyzed ozone decomposition to generating (OH)-O-center dot. gamma-AlOOH that was covered with more surface hydroxyl groups, adsorbed MIB more stronger and inhibited generation of (OH)-O-center dot in catalyzed ozonation of MIB, resulting in lower removal efficiency of MIB in catalyzed ozonation. In addition, the surface texture and chemical properties of catalyst that can help to understand the catalyzed mechanism. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2-Methylisoborneol, Adsorption, Adsorption, Aluminum, Aluminum Hydroxyl Oxide, Aqueous-Solution, Catalyst, Catalyzed Ozonation, Charge, Chemical, Decomposition, Degradation, Drinking Water, Efficiency, Experiments, Gamma- Al2O3, Generation, Geosmin, Hydroxyl Radical, Interaction, Investigation, Kinetics, Mechanism, Modified Ceramic Honeycomb, Nitrobenzene, Odorous Compounds, Oxidation, Oxides, Ozone, Ozone Decomposition, Participation, pH, Removal, Removal Efficiency, Rights, Site, Surface, Surface Hydroxyl, Water

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Full Text: [2010\Che Eng J165, 554.pdf](2010/Che%20Eng%20J165,%20554.pdf)

Abstract: A hydrogel has been synthesized by ionic crosslinking of chitosan (Ch) with itaconic acid (IA), followed by a free radical polymerization and crosslinking of Ch/IA network by adding methacrylic acid and the crosslinker. The resulting material (Ch/IA/MAA hydrogel) was characterized by spectral (Fourier transform infrared (FTIR)), thermal (thermogravimetric analysis (TGA)) and structural (SEM/EDX and atomic force microscopy (AFM)) analyses. The prepared hydrogel was investigated as potential adsorbent for removal of Cd2+ ions from aqueous solution. The effect of various physico-chemical parameters such as pH, adsorbent dosage, adsorbate concentration and contact time was studied in batch experiments. The results of spectral analyses of Cd-loaded hydrogel have shown that active functional groups are -NH2, -OH and -COOH. SEM/EDX analysis and AFM surface topography and phase images indicated that apart from the adsorption on the surface of the hydrogel, sorption takes place in the bulk, as well. The experimental kinetic and equilibrium data were better fitted by pseudo-second order kinetic model and Langmuir adsorption isotherm. The parameters obtained in thermodynamic studies showed that the adsorption of Cd2+ on Ch/IA/MAA hydrogel was spontaneous and exothermic in nature. Desorption studies were carried out using acid leaching (HNO3) and it has been shown that the regenerated hydrogel can be reused three times without any loss of adsorption capacity. The maximum adsorption of 285.7 mg/g has been obtained at pH 5.5 and the results of adsorption/desorption experiments implies that the Ch/IA/MAA hydrogel may be used as efficient sorbent for removal of Cd2+ ions from aqueous solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption, Desorption, Afm, Analyses, Analysis, Aqueous Solution, Atomic Force Microscopy, Batch, Batch Experiments, Beads, Cadmium, Capacity, Cd2+, Cd2+ Removal, Characterization, Chitosan, Concentration, Crosslinking, Data, Defluoridation, Desorption, Equilibrium, Exothermic, Experimental, Experiments, Force, Free Radical, FTIR, Functional Groups, Heavy-Metal Removal, Hydrogel, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Leaching, Model, Network, pH, Polymerization, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Solution, Sorbent, Sorption, Surface, TGA, Thermodynamic, Thermodynamic Studies, Water

? Eroglu, H., Varoglu, E., Yapıcı, S. and Sahın, A. (2010), An environmentally friendly batch bioadsorption study of the radionuclides 67Ga from aqueous solutions by fibrous tea waste. *Chemical Engineering Journal*, **165** (2), 563-572.

Full Text: [2010\Che Eng J165, 563.pdf](2010/Che%20Eng%20J165,%20563.pdf)

Abstract: The radionuclides Ga-67 is used in nuclear medicine. This paper presents a bioadsorption study of Ga-67 from aqueous solution by solid tea factory waste. The experimental parameters were chosen as temperature, pH, stirring speed, nominal particle size and bioadsorbent dose in the ranges of 10.0-40.0ºC, 2.0-8.0, 300-720 rpm, 0.15-1.4 mm and 1.0-15.0 g/L, respectively. The most effective parameter was determined to be pH, and then temperature, particle size, and bioadsorbent close in decreasing order. Fourier transform infrared spectroscopy was performed for the characterisation of the bioadsorption of Ga-67 on tea waste. The equilibrium results showed that the data exhibited good agreement with the isotherm models of Freundlich, Halsey, and Handerson and Smith. In thermodynamic analysis, ΔG and ΔH values were determined and their values demonstrated that the bioadsorption process was endothermic and spontaneous. Bioadsorption kinetics analysis proved that the rate corresponded to a pseudo second order model, and that the bioadsorption mechanism is governed by intra-particular diffusion. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption-Kinetics, Analysis, Aqueous Solution, Aqueous Solutions, Batch, Bioadsorption, Biosorbent, Biosorption, Cr(VI), Data, Diffusion, Dye, Endothermic, Environmentally Friendly, Equilibrium, Experimental, Freundlich, Gallium, Heavy-Metals, Infrared Spectroscopy, Ions, Isotherm, Kinetics, Mechanism, Medicine, Model, Models, Nuclear Medicine, Particle Size, pH, Pseudo Second Order, Pseudo-Second-Order, Radiation, Radionuclides, Removal, Rights, Second Order, Second-Order, Size, Solution, Solutions, Spectroscopy, Temperature, Thermodynamic, Waste

? Ji, C.N., Song, S.H., Wang, C.R., Sun, C.M., Qu, R.J., Wang, C.H. and Chen, H. (2010), Preparation and adsorption properties of chelating resins containing 3-aminopyridine and hydrophilic spacer arm for Hg(II). *Chemical Engineering Journal*, **165** (2), 573-580.

Full Text: [2010\Che Eng J165, 573.pdf](2010/Che%20Eng%20J165,%20573.pdf)

Abstract: Two novel chelating resins, denoted as PS-DEG-3-AP and PS-TEG-3-AP, were obtained by inserting spacer ethylene oxide and ethylene sulfide, respectively, with 3-aminopyridine (3-AP) into polystyrene-co-divinylbenzene. Fourier transform-infrared spectra (FTIR) and elemental analysis were employed to characterize their structures. The adsorption properties of the resins for Hg(II), Ag(I), Fe(III), Pb(II), Co(II), Cu(II), Ni(II), Cd(II) and Zn(II) had been studied, and the results revealed that the resins had higher adsorption capacities and adsorption selectivity for Hg(II). The adsorption kinetics and adsorption isotherms of the resins for Hg(II) were also investigated. The adsorption data of Hg(II) on the resins were fitted well by the pseudo second-order kinetics. Langmuir and Freundlich models were used to describe Hg(II) adsorption isotherms on both resins. The adsorption mechanisms of PS-DEG-3-AP and PS-TEG-3-AP for Hg(II) were confirmed by X-ray photoelectron spectroscopy (XPS). Furthermore, five consecutive sorption-desorption cycles demonstrated that the resins were suitable for repeated use without considerable change in adsorption capacity. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 3-Aminopyridine, Activated Carbons, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Adsorption Mechanisms, Adsorption Properties, Analysis, Aqueous-Solution, Atomic-Absorption-Spectrometry, Biosorption, Capacity, Cd(II), Chelating Resins, Co(II), Cross-Linked Polystyrene, Cu(II), Data, Equilibrium, Fe(III), Freundlich, FTIR, Functional-Groups, Heavy-Metal Ions, Hg(II), Isotherms, Kinetics, Langmuir, Mechanisms, Mercury, Models, Ni(II), Oxide, Pb(II), Preparation, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-Second-Order, Resins, Rights, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Selective Adsorption, Selectivity, Sorption-Desorption, Spacer Arm, Spacer-Arm, Spectroscopy, Sulfide, X-Ray, X-Ray Photoelectron Spectroscopy, XPS, Zn(II)

? Dong, L.J., Zhu, Z.L., Qiu, Y.L. and Zhao, J.F. (2010), Removal of lead from aqueous solution by hydroxyapatite/magnetite composite adsorbent. *Chemical Engineering Journal*, **165** (3), 827-834.

Full Text: [2010\Che Eng J165, 827.pdf](2010/Che%20Eng%20J165,%20827.pdf)

Abstract: A novel composite adsorbent, hydroxyapatite/magnetite (HAp/Fe3O4). has been prepared for the purpose of removing lead ions from aqueous solution. Varying factors that may affect the adsorption efficiency, including adsorbent dosage, solution pH and coexistent substances such as humic acid and competing cations (Ca2+, Mg2+, K+ and Na+), have been investigated. It is remarkable that using the developed composite absorbent, more than 99% of Pb2+ can be removed under desirable experimental conditions. The maximum adsorption capacity for HAp/Fe3O4 is 598.8 mg/g, which is much greater than that for the previously reported materials. It is found that depending on its concentrations, humic acid affects the efficiency of lead removal, but the coexisting cations, e.g., K+, Ca2+, Na+ and Mg2+, have small influence. Mechanistic studies show that the adsorption data fits the Langmuir and Freundlich isotherm models reasonably well and the adsorption processes obey the pseudo-second-order kinetics model. Based on the experiment results, it is concluded that dissolution/precipitation and the surface complexation are mutually responsible for lead adsorption on HAp/Fe3O4, which should be attributed to the multiple functionalities of the material. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Binding, Cadmium, Composite Adsorbent, Heavy-Metal Cations, Humic Acids, Hydroxyapatite, Ions, Kinetics, Lead Ion, Magnetic Nano-Adsorbent, Magnetite, Nanoparticles, Sorption

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Full Text: [2010\Che Eng J165, 835.pdf](2010/Che%20Eng%20J165,%20835.pdf)

Abstract: The removal of Cu(II), Zn(II), Co(II), Ni(II), Pb(II) and Cd(II) from waters and industrial wastes in the presence of the novel chemical reagent N,N-bis(carboxymethyl)glutamic acid (GLDA) was investigated. The effect of surface properties on the sorption behaviour of studied complexes was investigated by FT-IR/PAS (Fourier transform-infrared photoacoustic spectroscopy) and SEM (scanning electron microscopy). The effects of contact time, concentration of the reagents and equilibrium pH of solution, temperature and presence of interfering ions on sorption of Cu(II), Zn(II), Co(II), Ni(II), Pb(II) and Cd(II) complexes with GLDA on the commercially available ion exchangers Lewatit MonoPlus MP 500, Amberlite IRA 958 and Diaion CR-20 were examined by batch and column techniques. It was found that pH of 9.0 was favourable for the sorption process, which followed the pseudo second-order equation. Of the sorption models used, the Dubinin-Radushkevich (D-R) model was found to be appropriate. The sorption was temperature-dependent as well as dependent on the presence of Ca(II), Mg(II), Cl-, SO42-, NO3- ions. The maximum sorption capacity (q(e,exp)) for Pb(II) complexes with GLDA on the polyacrylate anion exchanger Amberlite IRA 958 was found to be 99.80 mg/g. For the polystyrene anion exchanger Lewatit MonoPlus MP 500 the analogous value for Cu(II) complexes was as 81.62 mg/g. Therefore, it was found that GLDA is effective for the removal of Pb(II) and has the potential application for the purification of waters polluted by heavy metals. In the case of chelating Diaion CR-20, the decomposition of the sorbed complexes in the resin phase should be assumed. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biodegradable Chelating-Agents, Cd(II), Chelating Agents, Cu(II), Dissolvine Gl-38, Edta, Environment, Equilibrium, Glda, Heavy Metal Ions, Iminodisuccinic Acid, Ion Exchangers, Polyacrylate Anion-Exchangers, Separation, Speciation

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Full Text: [2010\Che Eng J165, 874.pdf](2010/Che%20Eng%20J165,%20874.pdf)

Abstract: This study investigates the adsorption potential of clayey soil of Indian origin to remove Malachite Green, a cationic dye from its aqueous solution. To this end, the effect of operational parameters including initial pH, adsorbent dose, contact time, initial dye concentration and temperature were studied in batch adsorption experiments, scanning electron microscopy (SEM) and X-ray diffraction (XRD) analysis were used to characterize the adsorbent material. The experimental equilibrium data were tested by three widely used isotherm models namely, Langmuir, Freundlich and Dubinin-Radushkevich (D-R). It was found that adsorption of Malachite Green on clayey soil correlated well with the Langmuir isotherm model, implying monolayer coverage of dye molecules onto the surface of the adsorbent. The maximum adsorption capacity was found to be 78.57 mg g-1 at 303 K. Kinetics of the adsorption process was tested by pseudo-first-order and pseudo-second-order kinetics, and intraparticle diffusion mechanism. Pseudo-second-order kinetic model provided a better correlation for the experimental data studied in comparison to the pseudo-first-order model. Intraparticle diffusion was not the sole rate-controlling factor. The activation energy of the adsorption process (E-a) was found to be 45.82 kJ mol-1 by using the Arrhenius equation, indicating chemisorption nature of Malachite Green adsorption onto clayey soil. A thermodynamic study showed spontaneous nature and feasibility of the adsorption process. A negative enthalpy (ΔHº) value indicated that the adsorption process was exothermic. The results indicate that clayey soil can be used as an effective and low-cost adsorbent to remove Malachite Green from aqueous solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous-Solutions, Basic-Dyes, Biomass Equilibrium, Biosorption, Clayey Soil, Dye Removal, Equilibrium, Isotherms, Kinetic Model, Kinetics, Malachite Green, Nonlinear Methods, Tamarind Fruit Shell, Thermodynamics, Waste-Water

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Full Text: [2010\Che Eng J165, 907.pdf](2010/Che%20Eng%20J165,%20907.pdf)

Abstract: In a batch equilibrium system, the maximum adsorption capacity of cAMP onto an anion-exchange resin reached 0.1718, 0.1956, 0.2764 and 0.3437 g g-1 at 283, 293, 303 and 313 K, respectively. The adsorption data obtained were well described by the Langmuir isotherm. In the batch kinetic system, Fick diffusion, pseudo first-order and pseudo second-order models were applied to simulate the experimental kinetic data. The results revealed that the Fick model best described the adsorption process, and clearly predicted the intraparticle distribution of the concentration. The effective diffusion coefficients (D-e) for 283, 293, 303 and 313 K were 0.37 x 10(-10), 0.51 x 10(-10), 0.86 x 10(-10) and 1.41 x 10(-10) m(2) s-1, respectively. The thermodynamic parameters such as ΔG(0), which were all negative, indicated that the adsorption of cAMP onto the anion-exchange resin was spontaneous and the positive value of ΔH-0 (+8.66 kJ mol-1) showed that the adsorption was an endothermic reaction. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Camp, Effective Diffusion Coefficient, Fick Model, Kinetics, Langmuir, Lead, Mixtures, Pore, Removal, Water

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Full Text: [2011\Che Eng J166, 40.pdf](2011/Che%20Eng%20J166,%2040.pdf)

Abstract: beta-Cyclodextrin/attapulgite (beta-CD/ATP) composites were prepared for the adsorption of 2,4-didichlorophenol (2,4-DCP) and 2,6-didichlorophenol (2,6-DCP) from aqueous solution. beta-CD/ATP composites mainly possessed mesopores, high surface area and big pore volume which were benefit for the adsorption capacity. The batch mode adsorption experiments with respect to pH, temperature, initial concentration, contact time and binary dichlorophenol solution were investigated. Equilibrium data, at various temperatures, were described by the Langmuir. Freundlich and Dubinin-Radushkevich isotherm models. The Langmuir isotherm model was fitted to the experimental data significantly better than the other models. The kinetic data were well fitted to the intraparticle diffusion equation, which indicated that three steps belonged to the pseudo-second-order adsorption process. Intraparticle diffusion increased with the increase of adsorbate concentrations while film and pore diffusion decreased. The initial adsorption factor, R-i, showed that initial adsorption for 2,4-DCP was intermediate while was strong for 2,6-DCP. The thermodynamics parameters (positive values of ΔHº and ΔSº, negative values of ΔGº) indicated that binding systems between beta-CD/ATP composites and adsorbates (2,4-DCP and 2,6-DCP) were endothermic, entropy gained and spontaneous in nature. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2,4-Dichlorophenol, 2,4-Didichlorophenol, 2,6-Didichlorophenol, Activated Carbon, Adsorption, Attapulgite, Beta-Cyclodextrin, Attapulgite Composites, Chlorophenol, Dye Adsorption, Equilibrium, Heavy-Metal Ions, Intraparticle Diffusion, Isotherm, Kinetics, Langmuir, Methylene-Blue, Sorption, Wood Sawdust

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Full Text: [2011\Che Eng J166, 122.pdf](2011/Che%20Eng%20J166,%20122.pdf)

Abstract: Two seaweeds (*Sargassum muticum*, S.m. and *Gracilaria caudata*, G.c.) collected on the coasts of Cuba have been tested and compared for nickel biosorption. The metal was efficiently bound to the biomass at pH 3 for Sm. and pH 5 for Cc. Sorption isotherms, at the optimum pH, showed that Sm. is more efficient than G.c.: maximum sorption capacity reached about 70 mg Ni g-1 and 45 mg Ni g-1 for S.m. and Cc., respectively. The isotherms were modeled using the Langmuir equation (which fits better experimental data than the Freundlich and Temkin equations). Sorption kinetics were also carried out varying metal concentration, sorbent dosage particle size and temperature. The kinetics were modeled using the pseudo-second order rate equation and the intraparticle diffusion equation. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Algae, Alginate Beads, Aqueous-Solutions, Biomass, Biosorption, Chitosan, Gracilaria, Heavy-Metal Biosorption, Ions, Isotherms, Kinetics, Langmuir, Ni(II), Nickel, Removal, *Rhizopus-arrhizus*, Sargassum, Waste-Water

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Full Text: [2011\Che Eng J166, 168.pdf](2011/Che%20Eng%20J166,%20168.pdf)

Abstract: The adsorption capacity of chitosan hydrogel beads generated by alkali (CB) and sodium dodecyl sulphate (CSB) gelation was investigated after polyethyleneimine (PEI) grafting for adsorption of Reactive Black 5 (RB5) from aqueous solutions. The adsorption capacities of PEI-grafted CB (PEI-CB) and CSB (PEI-CSB) were varied with the amount of PEI used during grafting. The maximum adsorption capacity values of PEI-CB (709.27 mg/g) and PEI-CSB (413.23 mg/g) obtained from the Langmuir isotherm model were higher than those of CB (201.90 mg/g) and CSB (168.07 mg/g), indicating that the adsorption performance of CB and CSB could be highly enhanced by PEI grafting. All of the adsorption systems showed better fits to the Langmuir isotherm model than the Freundlich isotherm model, except PEI-CSB. The kinetic data of the adsorption systems showed better fits to a pseudo-first-order rate model than a pseudo-second-order model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Anionic Surfactant, Biomass, Biosorption, Chitosan Bead, Decolorization, Dye Removal, Effluent, Equilibrium, Grafting, Kinetics, Langmuir, Low-Cost Adsorbents, Polyethyleneimine, Reactive Black 5, Sodium Dodecyl Sulphate, Sorption

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Full Text: [2011\Che Eng J166, 176.pdf](2011/Che%20Eng%20J166,%20176.pdf)

Abstract: Three bentonite modified with organic surfactants were used to remove 2,4-dichlorophenol (2,4-DCP) from aqueous solution. Of the three bentonites studied, DK3, modified with octadecyl dimethyl benzyl ammonium chloride (ODBAC), was found to be most effective and the conditions affecting batch adsorption of 2,4-DCP were evaluated. The adsorption data fit the Langmuir isotherm model well predicting a high adsorption capacity of 281.8 mg/g at 30ºC. A pseudo-second-order model was used to calculate the corresponding rate constant of 10.35 mg/g min-1 at 30ºC. Thermodynamic parameters demonstrated that the overall adsorption process was exothermic and spontaneous. Furthermore. DK3 was characterized by scanning electronic microscopy (SEM), specific surface area (SSA), X-ray powder diffraction (XRD) and Fourier transform infrared (FTIR) spectrometer, which provided evidence of morphological properties and the adsorption of 2,4-DCP onto DK3. Finally. DK3 was used to remove >92% of 2,4-DCP from industrial wastewater having an initial concentration of 10.0 mg/L. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2,4-DCP, Adsorbents, Adsorption, Adsorption, Aqueous-Solution, Characterization, Chloride, Clay, Equilibrium, Langmuir, Montmorillonite, Organic Bentonite, P-Nitrophenol, Phenol, Sorption, Thermodynamics, Wastewater

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Full Text: [2011\Che Eng J166, 454.pdf](2011/Che%20Eng%20J166,%20454.pdf)

Abstract: Amino-functionalized SBA-15 prepared by co-condensation was tested for the removal of copper ions from aqueous solutions under different temperatures, pH, initial concentrations and agitation speeds. The obtained results indicated that the amino-functionalized SBA-15 was very efficient and equilibrium was achieved in less than 30 min at room temperature. The kinetic data was analyzed using four models, namely the first-order, the pseudo first- and second-order and the intraparticle diffusion model. Within the conditions used, the pseudo second-order kinetic model provided the best fit to the experimental data. Applying the intraparticle model showed that the adsorption involved three different stages. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Amine-Functionalized SBA-15, Aqueous-Solution, Co-Condensation, Equilibrium, Heavy Metals Removal, Heavy-Metal Ions, Kinetic Model, Kinetics, Mesoporous Silica, Mesoporous Silica, Removal

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Full Text: [2011\Che Eng J166, 496.pdf](2011/Che%20Eng%20J166,%20496.pdf)

Abstract: A series of “easy-to-prepare” powders was synthesized and their application in the adsorption of Mo ions in 3 mol/L nitric acid solution was investigated. The powders were also calcinated at various temperatures, which effect was investigated as a function of the dissolved Fe concentration in the solution. In addition, the equilibrium sorption isotherm of Mo onto Fe-based adsorbent was analyzed by the Langmuir. Freundlich and Redlich-Peterson sorption models, whereas the adsorption kinetic was analyzed using the intraparticle diffusion model and the pseudo-second order kinetic model. The overall adsorption process was described well by the pseudo-second order kinetic model. It was found that the amount of Mo(VI) ion sorbed at equilibrium was 8.3126 mg/g, with 83% of Mo adsorption occurring the first 10 min and attaining equilibrium was at ca. 150 min. This behavior suggests that the sorption takes place rapidly on the external surface of the adsorbent where the binding may be through interaction with the functional groups located on the surface of the adsorbent. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Extraction, Fe-Based Adsorbent, Hllw, Kinetic Model, Langmuir, Level Liquid Waste, Management, Molybdenum, Nitric Acid Solution, Nuclear-Waste, Oxide, Recovery, Removal, Silica, State, Truex Process

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Full Text: [2011\Che Eng J166, 783.pdf](2011/Che%20Eng%20J166,%20783.pdf)

Abstract: In this work, the removal of a basic dye, methylene blue (MB) from aqueous solution using NaOH-modified rejected tea (N-RT) was investigated. Equilibrium adsorption and kinetics were studied. The results confirmed that the adsorption isotherm data fitted well to Langmuir isotherm with monolayer adsorption capacity of 242.11 mg/g. The kinetics of MB adsorption process was found to follow pseudo-second-order rate expression. The results suggested that the N-RT would be an excellent alternative for the removal of MB by adsorption process. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Agricultural Waste, Basic Dye, Batch, Biosorbent, Equilibrium, Fixed-Bed, Isotherm, Kinetics, Langmuir, Methylene Blue, Modified Rejected Tea, Peanut Hull, Removal, Sorption, Wheat-Straw

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Full Text: [2011\Che Eng J166, 814.pdf](2011/Che%20Eng%20J166,%20814.pdf)

Abstract: Residue of allspice (Pimento dioica L Merrill) obtained as a by-product from the hydro-distillation oil process, has been studied as a low cost biosorbent for removing lead(II) ion from water solution at different temperatures. Batch experiments were performed with aqueous lead solutions of concentration 25 mg L-1, at pH 5 and adsorbent dosage 1.0 g biosorbent per liter of solution. According to pseudo-second order kinetic model, the maximum adsorption capacity was 22.37 mg g-1 of Pb(II) on residue of allspice (RA). This value was reached at 90 min and temperature of 308K. Langmuir, Freundlich and Dubinin-Radushkevich (D-R) adsorption isotherm models were applied as an attempt to mathematically represent adsorption data. These three equations were found to be applicable to this adsorption system, in terms of relatively high regression values. Thermodynamic parameters showed that the adsorption of lead(II) onto RA was feasible, spontaneous, and endothermic under the studied conditions. The elemental analysis from scanning electron microscopy (SEM) before and after the contact showed that lead was adsorbed by RA. Diffusion results, the value of the free energy E(kJ mol-1), XPS and FTIR analysis confirmed that the lead(II) adsorption process onto RA was controlled by chemisorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Aqueous-Solutions, Biosorption, Biosorption, Cadmium Ions, Equilibrium, Freundlich, FTIR, Heavy-Metal, Isotherms, Kinetic Model, Langmuir, Lead, Pb, pH, Pimenta Dioica, Removal, Rice Husk, Sorption, Thermodynamic, Waste-Water, XPS

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Full Text: [2011\Che Eng J167, 67.pdf](2011/Che%20Eng%20J167,%2067.pdf)

Abstract: We report the removal of zinc ions from aqueous solution by raw chicken feathers using both batch and continuous systems. Specifically, kinetic and sorption isotherms have been determined considering the effect of temperature, pH and metal concentration. Batch sorption data were fitted to various sorption models and results indicate that Zn2+ sorption process using raw chicken feathers followed the pseudo-second order rate model, while sorption isotherms were described properly by Sips isotherm. Sorption isotherms show that the experimental maximum sorption capacity of Zn2+ was found to be 4.31 mg/g at 30ºC and pH 5 and that chemisorption may play an essential role in the process. On the other hand, breakthrough curves were obtained for the sorption of Zn2+ ions using fixed bed columns packed with raw chicken feathers at different conditions of feed flow rate, metal concentration and pH. Results show that the characteristics of these breakthrough curves are dependent of the column operating conditions, especially pH and feed flow rate. Thomas model has been used for data fitting of sorption continuous experiments and for determining design parameters useful to characterize the performance of packed bed columns. Overall, results demonstrate that raw chicken feathers should be regarded as a low-cost alternative for the removal of Zn2+ ions from wastewaters. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Biosorption, Breakthrough Curve, Chicken Feathers, Copper, Fixed-Bed Column, Heavy-Metal Ions, Isotherm, Isotherms, Keratin Fiber, Kinetic, Low-Cost Adsorbents, pH, Sorption, Thomas Model, Waste-Water, Water Treatment, Zinc, Zinc Removal

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Full Text: [2011\Che Eng J167, 112.pdf](2011/Che%20Eng%20J167,%20112.pdf)

Abstract: Adsorption of Cr(III) and Fe(III) onto chitosan/attapulgite composites (CTS/ATP) was investigated with respect to pH, temperature, initial concentration and binary solution. Equilibrium data, at various temperatures, were described by the Langmuir, Freundlich isotherm models. The Freundlich isotherm model was fitted to the experimental data significantly better than the Langmuir isotherm. In a binary solution, the combined effect of adsorbing one metal ion in the presence of the other metal ion reduced the adsorption capacity of either metal ion. The kinetic data was well fitted to the intraparticle diffusion equation, which indicated that the three adsorption steps belonged to the pseudo-second-order adsorption process. Intraparticle diffusion increased with the increase in adsorbate concentration while film and pore diffusion decreased. The thermodynamics parameters (positive values of Δ*H*º, Δ*S*º and negative values of Δ*G*º) indicated the binding systems between CTS/ATP and adsorbate were endothermic, entropy gained and spontaneous in nature. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Absorption Spectrometric Determination, Activated Carbon, Adsorption, Cr(III), Cross-Linked Chitosan, CTS, Atp, Dye Adsorption, Equilibrium, Fe(III), Freundlich, Freundlich Isotherm, Intraparticle Diffusion, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Pb(II), pH, Preconcentration, Solid-Phase Extraction, Sorption, Thermodynamics

? Kumar, P.S., Ramalingam, S., Kirupha, S.D., Murugesan, A., Vidhyadevi, T. and Sivanesan, S. (2011), Adsorption behavior of nickel(II) onto cashew nut shell: Equilibrium, thermodynamics, kinetics, mechanism and process design. *Chemical Engineering Journal*, **167** (1), 122-131.

Full Text: [2011\Che Eng J167, 122.pdf](2011/Che%20Eng%20J167,%20122.pdf)

Abstract: The adsorption behavior of nickel(II) from aqueous solution onto agricultural waste such as cashew nut shell (CNS) was investigated as a function of parameters such as solution pH, CNS dose, contact time, initial nickel(II) concentration and temperature. The Langmuir, Freundlich, Temkin and Dubinin-Radushkevich models were applied to describe the equilibrium isotherms using nonlinear regression analysis. The equilibrium data fits well for the both Langmuir and Freundlich adsorption isotherms. The Langmuir monolayer adsorption capacity of CNS was found to be 18.868 mg/g. Thermodynamic parameters such as Δ*G*º, Δ*H*º and Δ*S*º 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 Elovich kinetic models were used to describe the kinetic data and the rate constants were evaluated. The result of the kinetic study shows that the adsorption of nickel(II) could be described by the pseudo-second-order equation, suggesting that the adsorption process is presumably chemisorption. 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 confirmed that external mass transfer is the rate determining step in the sorption process. A single-stage batch adsorber was designed for different CNS dose/effluent volume ratios using the Freundlich equation. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Aqueous-Solution, Cadmium, Cns, Equilibrium, Equilibrium Isotherms, Freundlich, Ions, Isotherms, Kinetic, Kinetics, Langmuir, Lead(II), Ni(II), Nickel(II), Nonlinear, pH, Removal, Sawdust, Sorption, Thermodynamic, Thermodynamics, Waste

? Olgun, A. and Atar, N. (2011), Removal of copper and cobalt from aqueous solution onto waste containing boron impurity. *Chemical Engineering Journal*, **167** (1), 140-147.

Full Text: [2011\Che Eng J167, 140.pdf](2011/Che%20Eng%20J167,%20140.pdf)

Abstract: The main objective of this study was to investigate the possible use of waste containing boron impurity as an adsorbent material for the removal of Cu(II) and Co(II) ions from aqueous solution. Batch experiments were carried out as a function of initial metal ions concentration, initial solution pH, contact time, adsorbent dosage and temperature. Experimental equilibrium data were fitted to the Freundlich and Langmuir isotherms. Adsorption equilibriums of Cu(II) and Co(II) ions were well represented by Langmuir isotherm. The kinetics of the adsorption demonstrated that the fit is in agreement with a pseudo-second-order model with rate constant, k(2), varying from 7.35×10-4 to 1.08×10-3 and 6.10×10-4 to 9.54×10-4 g mg-1 min-1 for copper and cobalt, respectively. Thermodynamics quantities that characterize the adsorption phenomena, i.e., enthalpy. Gibbs free energy and entropy of the adsorption, were calculated leading to conclusion about the efficiency of the adsorbing substrates and the properties of the adsorbent-metal ions systems. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Boron Waste, Cation Removal, Co(II) Ions, Cobalt, Copper, Cu(II), Equilibrium, Freundlich, Freundlich And Langmuir Isotherms, Gel, Heavy-Metal, Isotherm, Isotherms, Kaolinite, Kinetics, Langmuir, Langmuir Isotherm, Mesoporous Silica, Metal-Ion Adsorption, Montmorillonite, Nickel, pH, Removal, Thermodynamics, Waste

? Sari, A., Uluozlü, Ö.D. and Tüzen, M. (2011), Equilibrium, thermodynamic and kinetic investigations on biosorption of arsenic from aqueous solution by algae (*Maugeotia genuflexa*) biomass. *Chemical Engineering Journal*, **167** (1), 155-161.

Full Text: [2011\Che Eng J167, 155.pdf](2011/Che%20Eng%20J167,%20155.pdf)

Abstract: This study is focused on the investigation of the equilibrium, thermodynamics and kinetics of arsenic(III) biosorption from aqueous solution by dead green algae (*Maugeotia genuflexa*) biomass. Optimum biosorptin conditions were determined under the optimum pH, biomass concentration, contact time, and temperature. The equilibrium data were applied to the Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherm models. From the Langmuir model, the maximum monolayer biosorption capacity of the biosorbent was found to be 57.48 mg/g at pH 6, biomass concentration 4 g/L, contact time 60 min, and temperature 20ºC. The calculated mean biosorption energy (10.2 kJ/mol) using D-R model indicated that the biosorption process was carried out via chemical ion-exchange. Biosorbent could be regenerated using 0.5 M HCI solution, with up to 96% recovery and permitted a slightly decrease about 20% in recovery of As(III) ions after repeated ten times sorption-desorption processes. Thermodynamic parameters showed that the biosorption of As(III) onto algal biomass was feasible, spontaneous and exothermic under studied conditions. Kinetic results indicated that the pseudo-second-order kinetic model was well fitted to the experimental data. The performance of the algal biosorbent was also compared with that of many other reported sorbents for arsenic removal and it was observed that the proposed biosorbent is effective in terms of its high sorption capacity. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, As(III), As(III) Removal, As(V), Biosorbent, Biosorption, Chelating Resin, Drinking-Water, Equilibrium, Freundlich, Green-Algae, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, M.Genuflexa, *Oedogonium* sp, pH, Recovery, Sorption, Thermodynamic, Thermodynamics

? Chang, Y., Liu, H.W., Zha, F., Chen, H.K., Ren, X.N. and Lei, Z.Q. (2011), Adsorption of Pb(II) by N-methylimidazole modified palygorskite. *Chemical Engineering Journal*, **167** (1), 183-189.

Full Text: [2011\Che Eng J167, 183.pdf](2011/Che%20Eng%20J167,%20183.pdf)

Abstract: In this study, an efficient adsorbent was synthesized by successfully anchoring N-methylimidazole on activated palygorskite and which was then used to investigate the adsorption behavior of Pb(II) ions from aqueous solutions. The FT-IR, thermal analyses and SEM were done to observe the immobilization of N-methylimidazole onto activated palygorskite. The effects of adsorbent dose. pH, contact time, ionic strength and temperature on the adsorption were investigated. The maximum adsorption capacity is 714.29 mg g-1 at 283 K. The kinetic study indicates that the adsorption is a pseudo-second-order process. The adsorption was well fitted by the Langmuir adsorption isotherm model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Aqueous-Solutions, Cadmium Ions, Equilibrium, FT-IR, FTIR, Heavy-Metal Ions, Humic-Acid, Isotherm, Isotherms, Kaolinite Clay, Kinetic, Kinetics, Langmuir, Lead, Lead(II) Ions, N-Methylimidazole Anchored Palygorskite, Natural Zeolite, Pb(II), pH, Removal

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Full Text: [2011\Che Eng J167, 215.pdf](2011/Che%20Eng%20J167,%20215.pdf)

Abstract: Removal of strontium(II) ions from aqueous solutions by potassium tetratitanate whisker (PTW) and sodium trititanate whisker (STW) was studied by the batch sorption system. Both PTW and STW possessed special lamellar structure, high surface area and strong ability for cation exchange which were all benefit for the sorption process. The batch mode sorption experiments with respect to different pH, ionic strength, temperature, initial concentration and contact time were investigated. The sorption capacity of PTW and STW were both increased with increasing pH, temperature and initial concentration of strontium(II) ions. Moreover, the sorption capacity of STW was more sensitive to the ionic strength than that of PTW. The Langmuir model represented a better fit to the experimental data than Freundlich isotherm model, and the monolayer sorption capacity of PTW was higher than that of STW at the same conditions. The kinetic data were well fitted to the pseudo-second-order kinetic model and the ion-exchange model was important only in the fist 30 min. Intraparticle diffusion increased with the increase of temperature and initial concentration. Three distinct steps were involved in the strontium(II) ions sorption onto PTW and STW, and the whole sorption processes were controlled by the film diffusion. The thermodynamic parameters (positive values Δ*G*º, Δ*H*º and Δ*S*º) confirmed the non-spontaneous, endothermic and entropy gained nature within the temperature range evaluated. (c) 2010 Elsevier B.V. All rights reserved.

Keywords: Behavior, Chitosan, Chromium III, Composites, Design, Dye Adsorption, Equilibrium, Freundlich, Freundlich Isotherm, Intraparticle Diffusion, Ion Exchange, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Lead, pH, Removal, Single-Crystals, Sorption, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics

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Full Text: [2011\Che Eng J168, 35.pdf](2011/Che%20Eng%20J168,%2035.pdf)

Abstract: This paper reports results of the studies on adsorption of nitrobenzene (NB) and humic acid (HA) from aqueous solution onto activated carbon commercial (ACC) grade. Characterization of ACC showed its meso-porous nature. Fourier transform infra-red (FTIR) spectra of the ACC indicated presence of various types of functional groups on its surface. Thermo-gravimetric analysis exhibited the thermal stability of the ACC up to 300ºC. The adsorption kinetics of NB and HA onto ACC could be represented by pseudo-second-order kinetic model. The adsorption processes could be well described by a two-stage diffusion model. Thermal regeneration showed that ACC could be used for five desorption-adsorption cycles with good efficiency for NB and HA in each cycle. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solutions, Ash, Characterization, Desorption, FTIR, Humic Acid, Ions, Kinetic, Kinetic Model, Kinetics, Mechanism, Nitrobenzene, Removal, Sorption, Substances, Waters

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Full Text: [2011\Che Eng J168, 44.pdf](2011/Che%20Eng%20J168,%2044.pdf)

Abstract: In this work, the sorption capacity behavior of copper and cadmium divalent ions in single and binary systems has been investigated. Batch metal sorption experiments to obtain the kinetic and equilibrium data for the dry biomass of the Eichhornia crassipes species were performed under controlled temperature, constant shaking and pH 5. An equilibrium time of 60 min was achieved for both Cu(II) and Cd(II) ions in mono-component system as well as in binary one. It was found that the overall adsorption data were best described by the pseudo second-order kinetic model. Six adsorption isotherms have been tested to fit the mono-component equilibrium data, obtaining the best description by the Langmuir-type one. A modified extended-to-multi-component Langmuir-type isotherm model was applied to predict the binary adsorption data and its adjustable parameters were estimated by the PSO method. Finally, the results have shown that the affinity of each metal ion onto the E. crassipes surface is influenced by the presence of the other one. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Aqueous-Solutions, Batch, Biodegradation Kinetics, Biomass, Biosorption, Biosorption Surface Modeling, Cadmium, Cd(II), Copper, Cu(II), Egeria-Densa, Equilibrium, Heavy-Metal Adsorption, Isotherm, Isotherms, Kinetic, Kinetic Model, Macrophytes, Metal Adsorption Capacity, Multi-Component, Particle Swarm Optimization, pH, Removal, Sorption

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Full Text: [2011\Che Eng J168, 170.pdf](2011/Che%20Eng%20J168,%20170.pdf)

Abstract: Anew biosorbent for removing lead(II) ions from aqueous solutions has been investigated. This new adsorbent is olive tree pruning waste, an agricultural by-product in the Mediterranean region. Removal of lead(II) was studied at pH 5 in a batch system. The pseudo-first-order, pseudo-second-order and Weber and Morris kinetic models were applied to test the kinetic experimental data. The pseudo-second-order kinetic model provided the best correlation of the experimental data, indicating that sorption may be the rate limiting step for lead(II) biosorption by olive tree pruning waste. Equilibrium experimental results were fitted to Langmuir, Freundlich and Sips model isotherms to obtain the characteristic parameters of each model. The Langmuir and Sips isotherms best represented the measured biosorption data. According to an evaluation using the Sips equation, the maximum lead(II) biosorption capacities of olive tree pruning wastes were 26.24, 33.39 and 32.15 mg/g at 25, 40 and 60 CC. Using thermodynamic equilibrium coefficients obtained at different temperatures, various thermodynamic parameters, such as ΔGº, ΔHº and ΔSº, were calculated. The thermodynamics of the investigated lead ion-olive tree pruning system indicate a spontaneous and exothermic process. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agricultural Waste, Batch, Biomass, Biosorbent, Biosorption, Cadmium(II), Cu(II), Equilibrium, Freundlich, Heavy-Metals, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Lead, Modelling, Nickel(II) Ions, Pb(II), pH, Removal, Sorption, Spirulina-Platensis, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Wastewater Treatment

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Full Text: [2011\Che Eng J168, 426.pdf](2011/Che%20Eng%20J168,%20426.pdf)

Abstract: In this study, functionalized silica with mercaptopropyl groups were synthesized. These materials have been characterized by powder X-ray diffraction and FT-IR spectroscopy. We have shown that silica gel (SG) particles with a surface functionalization of thiol group (S-H) are an effective adsorbent material for toxic soft metal ions such as Hg2+, Pb2+ and Cd2+, which effectively bind to the thiol ligands. The ability of the thiol modified silica gel (TMSG) to remove heavy metal ions was studied by the method of continuous variation of two process variables: Initial heavy metal concentration (mg L-1) in distilled water and the contact time of adsorbent and solutions in water and industrial effluent. The experimental data were fitted into three kinetic models: Lagergren, pseudo-second order and Elovich. The experimental isotherm data were analyzed using Langmuir, Freundlich, Sips, Redlich-Peterson and Temkin isotherms. Six error functions were used to treat the adsorption data using nonlinear optimization techniques for evaluating the fit of the model equations. Error analysis showed that the Langmuir and Redlich-Peterson isotherms best fit the ions adsorption data on TMSG and the pseudo-second order kinetic model described the adsorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Adsorption, Error Function, Freundlich, FT-IR, FTIR, Functionalization, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Langmuir, Nonlinear, Optimization, Sorption, Thiol Modified Silica Gel, Toxic Ion Removal, Wastewater Treatment

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Full Text: [2011\Che Eng J168, 553.pdf](2011/Che%20Eng%20J168,%20553.pdf)

Abstract: To remove 2,4-dichlorophenol (2,4-DCP) and 2,4,6-trichlorophenol (2,4,6-TCP) from aqueous solutions, an activated carbon adsorbent was fabricated by phosphoric acid activation of a cattail (Typha orientalis) fiber precursor. According to the BET surface area and the infrared spectrum, the cattail fiber activated carbon (CFAC) has a porous structure with a large surface area of 890.27 m2/g and many functional groups (hydroxyl group, lactone group, carboxyl group, etc.). The effects of experimental parameters such as initial concentration, contact time, solution pH and temperature on the adsorption were investigated. Acidic pH was more favorable for the adsorption process. The adsorption kinetics was best represented by the pseudo-second-order kinetic model. The mechanism of the adsorption process was determined from the intra-particle diffusion model. The adsorption isotherm models fitted the data in the order: Freundlich > Langmuir > Tempkin isotherms. Thermodynamic study showed that the adsorption was a non-spontaneous, exothermic process. (C) 2011 Published by Elsevier B.V.

Keywords: 2,4,6-TCP, 2,4-DCP, 2,4-Dichlorophenol, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Adsorption Kinetics and Isotherms, Adsorptive Removal, Aqueous-Solutions, Cattail Fiber Activated Carbon, Chlorophenols, Coconut Husk, Equilibrium, Freundlich, H3PO4 Activation, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Mechanism, pH, Phosphoric Acid, Phosphoric-Acid, Response-Surface Methodology, Tempkin, Thermodynamic, Thermodynamics, Water

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Full Text: [2011\Che Eng J168, 562.pdf](2011/Che%20Eng%20J168,%20562.pdf)

Abstract: The contamination of water by organic pollutants viz. phenolic compounds (phenol, 2-chlorophenol (2-CPh) and 4-chlorophenol (4-CPh)) is a worldwide environmental problem due to their highly toxic nature. The use of non-living Schizophyllum commune fungus (S. commune fungus) to remove phenol, 2-CPh and 4-CPh from water under equilibrium and column flow experimental conditions was evaluated. The resulting biosorbent was characterized by BET surface area analysis, Fourier transformer infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) techniques. The effect of experimental parameters such as effect of pH, contact time, initial concentration of adsorbate and amount of biosorbent dosage was evaluated. The experimental data were fitted to various isotherm models. The maximum monolayer adsorption capacity of S. commune fungus for phenol, 2-CPh and 4-CPh was found to be 120, 178 and 244 mg/g, respectively, at 25±2ºC according to Langmuir model. The equilibrium time was found to be 2 h for all adsorbates to complete saturation. Kinetic studies showed the adsorption process followed pseudo second-order kinetic model. The column regeneration studies were carried out for three adsorption-desorption cycles. The eluant used for the regeneration of the adsorbent was 0.1 M NaOH. Based on the results obtained such as good uptake capacity, rapid kinetics, and its low cost, S. commune fungus appears to be a promising biosorbent material for the removal of phenolic compounds from aqueous media. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adsorption, Adsorption Isotherms, Aqueous-Solutions, Biosorbent, Biosorption, Chlorinated Phenols, Electron Microscopy, Equilibrium, FTIR, Heavy-Metals, Isotherm, Isotherms, Isotherms Modeling, Kinetic, Kinetic Model, Kinetics, Langmuir, Modeling, Organic Pollutants, P-Chlorophenol, pH, Phanerochaete-Chrysosporium, Phenol, Phenolic Compounds, Schizophyllum Commune Fungus, Sewage-Sludge, Waste-Water, White-Rot Fungi

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Full Text: [2011\Che Eng J168, 577.pdf](2011/Che%20Eng%20J168,%20577.pdf)

Abstract: This work aims to study the treatment (decolorization) of real industrial dyeing effluents originated directly from the dyeing bath, before entering the equalization tank (instead of treating the whole volume of wastewater) using chitosan beads as adsorbents. The addition of amido and imino groups on chitosan backbone through grafting reactions increased the adsorption capacity of adsorbents, while the cross-linking method made them capable of reuse for ten cycles at least without significant loss of their capacity (similar to 5%). The imino grafted derivative with a dosage of 5 g/L resulted in a residual dye content < 1 mg/L, which is in accordance with the limitations of legislation. Swelling experiments demonstrated low swelling percentages (similar to 35%) for the prepared adsorbents. Equilibrium data were successfully fitted to the Langmuir-Freundlich model (L-F). Kinetic data were fitted to a proposed detailed mathematical model, based on the chemical structure of chitosan and on a valid single-component adsorbate approximation, resulting in diffusion coefficients of dyes in the triple dye mixture (both in simulated/synthetic and real effluents). A commercial form of activated carbon was used, to compare and confirm the high adsorption capacity and easy/successful regeneration of the prepared chitosan derivatives (through adsorption-desorption experiments in real effluent). (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Industrial Dyeing Effluents, Kinetic Modeling, Reactive Dyes, Decolorization, Adsorption, Chitosan Adsorbents, Highly Porous Chitosan, Textile Waste-Water, Aqueous-Solutions, Basic-Dyes, Palm Ash, Removal, Sorption, Derivatives, Decolorization, Technologies

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Full Text: [2011\Che Eng J168, 620.pdf](2011/Che%20Eng%20J168,%20620.pdf)

Abstract: A lignin resulting from acid hydrolysis of sugarcane bagasse in the process of bioethanol production from biomass (M-w = 1890g mol-1) was purified and carboxy-methylated to obtain a macromolecule (CML), soluble in water at pH >= 4.5, with a degree of substitution (DS) of 0.46±0.01 relative to C-9 - the basic unit of lignins. This modified lignin was complexed with the Fe3+ ion (CML-Fe) and used as an adsorbent for the successful removal of Brilliant Red 2BE textile dye from aqueous solutions. The adsorbent was characterised by infrared spectroscopy and scanning differential calorimetry. The effects of pH, adsorbent dosage and shaking time on adsorption capacity were studied. In pH 2.0 the adsorption of the dye was maximum. The contact time to obtain equilibrium at 298 K was fixed at 12 h for the CML-Fe adsorbent. The Avrami fractional-order kinetic model provided the best fit to the experimental data compared with pseudo-first-order or pseudo-second-order kinetic adsorption models. For Brilliant Red 2BE dye, the equilibrium data were best fitted to the Sips isotherm model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solution, Azo-Dye, Biosorbent, Biosorption, Biosynthesis, Brilliant Red 2BE Dye, Copper Determination, Dye, Equilibrium, Isotherm, Kinetic, Kinetic Model, Kinetics, Lignin, Nonlinear Isotherm Fitting, pH, Pine-Fruit Shell, Removal

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Full Text: [2011\Che Eng J168, 665.pdf](2011/Che%20Eng%20J168,%20665.pdf)

Abstract: The removal of fluoride from aqueous solution using the original and non-thermal plasma (NTP) modified CeO2/Al2O3 composites was systematically studied. The adsorption was investigated in batch adsorption system, including both equilibrium and kinetics. Equilibrium adsorption data were analyzed using Langmuir, Freundlich and Dubinin-Radushkevich isotherm models. In order to understand the mechanism of adsorption, thermodynamic parameters such as Δ*G*(theta), Δ*S*-theta, Δ*H*-theta and E-a were calculated. Results showed that the adsorption data were found to be well described by Langmuir model. The pseudo-first-order, pseudo-second-order and intraparticle diffusion models were applied to test the kinetic data, and the results revealed that the pseudo-second-order kinetic reaction as the “surface reaction” was dominated and controlled adsorption stage. The thermodynamic parameters were changed using NTP modified adsorbents. For the Δ*S*-theta increased from 78.42 J/mol K to 93.42 J/mol K, the E-a decreased from 57.52 kJ/mol to 54.60 kJ/mol and the Δ*G*(theta) (363 K) decreased from -6.82 kJ/mol to -8.06 kJ/mol. The negative value of Δ*G*(theta) indicates that the adsorption occurs via a spontaneous process, the decrease in the value of E-a indicates that the adsorption of fluoride on NIP modified adsorbents is more favourable. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solution, Catalyst, CeO2, Al2O3, Chitosan, Clay, Equilibrium, Freundlich, Glow-Discharge Plasma, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Mechanism, Methane, Non-Thermal Plasma, Parameters, Surface Modification, Thermodynamic, Thermodynamic Parameters, Thermodynamics

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Full Text: [2011\Che Eng J168, 691.pdf](2011/Che%20Eng%20J168,%20691.pdf)

Abstract: Recently polymeric adsorbents have been emerging as highly effective alternatives to activated carbons for pollutant removal from industrial effluents. Poly(methyl methacrylate) (PMMA), polymerized using the atom transfer radical polymerization (ATRP) technique has been investigated for its feasibility to remove phenol from aqueous solution. Adsorption equilibrium and kinetic investigations were undertaken to evaluate the effect of contact time, initial concentration (10-90 mg/L), and temperature (25-55ºC). Phenol uptake was found to increase with increase in initial concentration and agitation time. The adsorption kinetics were found to follow the pseudo-second-order kinetic model. The intra-particle diffusion analysis indicated that film diffusion may be the rate controlling step in the removal process. Experimental equilibrium data were fitted to five different isotherm models namely Langmuir, Freundlich, Dubinin-Radushkevich, Temkin and Redlich-Peterson by non-linear least square regression and their goodness-of-fit evaluated in terms of mean relative error (MRE) and standard error of estimate (SEE). The adsorption equilibrium data were best represented by Freundlich and Redlich-Peterson isotherms. Thermodynamic parameters such as Δ*G*º and Δ*H*º indicated that the sorption process is exothermic and spontaneous in nature and that higher ambient temperature results in more favourable adsorption. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous Solution, Aqueous-Solutions, Dyes, Equilibrium, Freundlich, FTIR, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Nickel, Nonlinear, Phenol, Pollutant, Poly(Methyl Methacrylate), Polymeric Adsorbent, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Thermodynamics

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Full Text: [2011\Che Eng J168, 707.pdf](2011/Che%20Eng%20J168,%20707.pdf)

Abstract: Sorption of Cu(II) ions on dried red alga Pterocladia capillacea and its activated carbon have been studied. The sorption equilibrium was determined as a function of contact time at several Cu(II) ion concentrations and the effect of adsorbent concentration was also investigated. The pseudo second-order kinetic model provided the best correlation for the experimental data in compared to the pseudo-first order kinetic. Ion exchange was occurred in the initial reaction period. The experimental results were fitted to the Langmuir, Freundlich and Redlich-Petrson isotherms to obtain the characteristic parameters of each model. Both the Langmuir and Redlich-Peterson equations were significantly better for dried red alga biomass. On the other hand, Freundlich and Redlich-Peterson equation were significantly better than Langmuir for the activated carbon prepared from dried red alga. Error functions have been used to determine the alternative single component parameters by non-linear regression analysis. The error function method provided the best parameters for the isotherm equation in this system and is demonstrated for error comparison purposes. Red alga biomass and its activated carbon may be evaluated as an environmentally friendly and extra economic treatment. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Aqueous-Solutions, Copper, Copper Sorption, Cu(II), Equilibrium, Error Functions, Fixed-Bed Column, Freundlich, Heavy-Metals, Ion Exchange, Ion Exchange Model, Ion-Exchange, Ions, Isotherm, Isotherms, Kinetic, Kinetic Model, Langmuir, Mechanisms, Metal Biosorption, Nonlinear, Pretreated Biomass, Pterocladia Capillacea, Red Algae, Removal, Sorption

? Huang, J.H., Wang, G. and Huang, K.L. (2011), Enhanced adsorption of salicylic acid onto a beta-naphthol-modified hyper-cross-linked poly(styrene-co-divinylbenzene) resin from aqueous solution. *Chemical Engineering Journal*, **168** (2), 715-721.

Full Text: [2011\Che Eng J168, 715.pdf](2011/Che%20Eng%20J168,%20715.pdf)

Abstract: A series of novel beta-naphthol-modified hyper-cross-linked poly(styrene-co-divinylbenzene) resins were synthesized and the adsorption behaviors of the synthesized resins towards salicylic acid from aqueous solution was investigated. Among the synthesized five resins. HJ-G02 possessed the largest adsorption capacity towards salicylic acid. The molecular form of salicylic acid was favorable for the adsorption and mono-anion of salicylic acid can also be adsorbed by the resin. Low concentration of phenol posed a positive effect while high concentration of phenol posed a negative effect on the adsorption. The isotherms could be fitted by Freundlich model and the kinetic data could be characterized by pseudo-second-order rate equation. The breakthrough point of HJ-G02 towards salicylic acid was 108.8 BV and HJ-G02 could be regenerated by 1% of sodium hydroxide solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Charcoal, Freundlich, Hyper-Cross-Linked, Isotherm, Isotherms, Kinetic, Kinetics, Phenol, Phenols, Poly(Styrene-Co-Divinylbenzene) Resin, Polymeric Adsorbents, Removal, Resin, Resins, Sorption, Styrosorb, Water, XAD-4

? Vargas, A.M.M., Cazetta, A.L., Kunita, M.H., Silva, T.L. and Almeida, V.C. (2011), Adsorption of methylene blue on activated carbon produced from flamboyant pods (Delonix regia): Study of adsorption isotherms and kinetic models. *Chemical Engineering Journal*, **168** (2), 722-730.

Full Text: [2011\Che Eng J168, 722.pdf](2011/Che%20Eng%20J168,%20722.pdf)

Abstract: The adsorption of methylene blue (MB) onto activated carbon produced from flamboyant pods (*Delonix regia*) and obtained under optimized conditions (AC(op)) was carried out in this work. The experimental equilibrium data were analyzed using the isotherms of Langmuir, Freundlich, Jovanovic, Harkins-Jura, Tempkin, Redlich-Peterson, Toth, Radke-Prausnitz, Sips, Vieth-Sladek, and Brouers-Sotolongo. The adsorption kinetics of pseudo-first order, pseudo-second order, and Avrami were used for the kinetic studies. For the Toth isotherm, the value of maximum adsorption capacity (Q(m) =889.58 mg g-1) was close to the experimental value (Q(m) = 890 mg g-1), and the correlation coefficient (R-2) was 0.9836. The experimental data fitted very well to Avrami kinetic model. The Fourier-transform infrared spectroscopy spectra and the scanning electron microscopy images showed the presence of MB adsorbed onto AC(op). Several possible mechanisms of interaction that can occur in the MB-AC(op) system are discussed. AC(op) is a fast and effective adsorbent for removing MB from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2-Parameter, Activated Carbon, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solution, Cationic Dye, Chemical Activation, Electron Microscopy, Equilibrium, Flamboyant Pods, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Methylene Blue, Parameters, Peel, Surface-Chemistry, Tempkin, Thermodynamics, Toth, Waste

? Xu, M., Zhang, Y.S., Zhang, Z.M., Shen, Y., Zhao, M.J. and Pan, G.T. (2011), Study on the adsorption of Ca2+, Cd2+ and Pb2+ by magnetic Fe3O4 yeast treated with EDTA dianhydride. *Chemical Engineering Journal*, **168** (2), 737-745.

Full Text: [2011\Che Eng J168, 737.pdf](2011/Che%20Eng%20J168,%20737.pdf)

Abstract: Magnetic Fe3O4 baker’s yeast biomass (FB) was prepared by combining baker’s yeast biomass and nano-Fe3O4 using glutaraldehyde as a cross-link agent, and was chemically treated with ethylenediaminetetraacetic dianhydride (EDTAD). The EDTAD-treated magnetic Fe3O4 baker’s yeast biomass (EFB) was investigated by Fourier transform infrared spectroscopy (FTIR), potentiometric titration, zeta potential, and magnetic response analysis. The results revealed that the EFB possessed not only the superparamagnetic characteristic of nano-Fe3O4, but its surface also had plenty of carboxyl and amino groups introduced by the EDTA molecules. The adsorption properties of EFB for Pb2+, Cd2+, and Ca2+ ions were also evaluated. The results showed that the uptakes of EFB for the three metal ions were higher than that of FB, and the adsorption capability of Pb2+, Cd2+, and Ca2+ ions increased with an increase in pH. The adsorption process was followed by the pseudo-second-order kinetic model and Langmuir isotherm equation. The maximum adsorption capacities of 99.26 mg/g for Pb2+ at pH 5.5, 48.70 mg/g for Cd2+ at pH 6.0, and 33.46 mg/g for Ca2+ at pH 6.0 were observed at 30ºC. The regeneration experiments showed that the EFB could be successfully reused. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agricultural Waste, Aqueous-Solution, Baker’s Yeast, Bakers-Yeast, Chemically Treated, EDTA, EDTA, FTIR, Heavy-Metals, Hexavalent Chromium, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Lead Ions, Low-Cost Adsorbents, Magnetic, Nano-Fe3O4, Pb(II) Biosorption, pH, *Saccharomyces-cerevisiae*, Super-Paramagnetic, Waste Brewery Biomass

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Full Text: [2011\Che Eng J168, 909.pdf](2011/Che%20Eng%20J168,%20909.pdf)

Abstract: The adsorbent modified from corn stalks was synthesized after the reaction between epichlorohydrin and triethylamine by using diethylenetriamine (DETA) as modifying agent in the presence of N,N-dimethylformamide (DMF). The performance of the modified corn stalks (MCS) was characterized by BET. SEM, zeta potential, FTIR and thermogravimetric analysis. The adsorption of Cr(VI) from aqueous solutions with MCS which contained amine groups was studied at varying adsorbent dose, initial Cr(VI) concentration, pH, contact time and temperature. Results showed that the Cr(VI) adsorption depended insignificantly on pH but significantly on temperature. The batch equilibrium data fitted well to the Langmuir isotherm. Maximum adsorption capacity of MCS for Cr(VI) was 200.00 mg/g at 303 K which was relatively large compared to some adsorbents as reported. Kinetic data were best fitted with the pseudo-second-order kinetic model. The intra-particle diffusion model was applied to investigate the adsorption mechanisms. The obtained thermodynamic parameters showed that the adsorption of Cr(VI) onto the adsorbent was an spontaneous and endothermic process. These results showed that the anion exchanger could be considered as a potential adsorbent for the removal of Cr(VI) ions from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Agricultural By-Products, Anion Exchanger, Aqueous Solution, Batch, Biosorbents, Capacity, Chromium(VI), Cone Biomass, Cr(Vi), Equilibrium, FTIR, Ions, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Modified Corn Stalks, pH, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2011\Che Eng J168, 994.pdf](2011/Che%20Eng%20J168,%20994.pdf)

Abstract: Sorption properties of strongly basic polystyrene and polyacrylate anion exchangers towards Cu(II),Zn(II), Cd(II) and Pb(II) in the presence of the green chelating agent of a new generation ethylenediamine-N,N’-disuccinic acid (EDDS) were investigated in the batch and column systems. Batch sorption experiments were performed using commercial forms of Amberlite IRA 402, Lewatit MonoPlus MP 500, Amberlite IRA 458 and Amberlite IRA 958. The amount of resin, e.g. the anion exchanger dose (0.1-1.0 g), the initial solution pH (2-12), the initial concentration of sorbed complexes in the M(II)-EDDS = 1:1 system (2×10-3 to 1.5×10-2 M), temperature (293-333 K) as well as the contact time (1-120min) were changed. The sorption capacities of these anion exchangers increased with the increasing initial solution pH, temperature and concentration of complexes. Levels of sorption rapidly approached an equilibrium state within 20-30 min. The equilibrium data of the experiments show that Amberlite IRA 402 and Lewatit MonoPlus MP 500 are good anion exchangers for the removal of EDDS complexes. The sorption characteristics of metal complexes with EDDS onto these anion exchangers were based on the Langmuir and Freundlich isotherms. However, the values of correlation coefficients (R-2) higher than 0.99 show that in the studied concentration range the data were more suitable for the Langmuir model. The maximum sorption capacities (q(0)) were 104.17, 62.11. 119.54, 134.93 mg/g for Cu(II), Zn(II), Cd(II) and Pb(II) complexes with EDDS on Amberlite IRA 402, respectively. For Lewatit MonoPlus MP 500 the obtained values were almost analogous. The values of calculated thermodynamic parameters (ΔG(-), ΔH- and ΔSº) indicate that the sorption process is endothermic and spontaneous. The sorption kinetic of studied anion exchangers fitted well to the pseudo second-order model. These data were also evaluated based on the Boyd equation. Furthermore, the anion exchangers were characterized by Fourier transform infrared (FT-IR) and scanning electron microscope (SEM). (C) 2011 Elsevier By. All rights reserved.

Keywords: Acid Edds, Activated Carbon, Anion Exchange, Anion Exchanger, Aqueous-Solution, Batch, Biodegradation, Cation-Exchange, Cd(II), Competitive Adsorption, Cu(II), Equilibrium, Ethylenediaminedisuccinic Acid, Ethylenediaminedisuccinic Acid, Freundlich, FT-IR, FTIR, Heavy Metals, Isotherms, Kinetic, Langmuir, Low-Cost Adsorbents, Pb(II), pH, Resin, Sorption, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Che Eng J168, 1055.pdf](2011/Che%20Eng%20J168,%201055.pdf)

Abstract: Waste water containing 2,4,6-trinitrotoluene (TNT) in industrial production has caused many serious environmental problems worldwide. In this paper, a novel modified lignin adsorbent for TNT, aminated lignin (AmL) was synthesized by a two-step approach. The characterization using FTIR, SEM and XPS suggested that modification of the lignin was successful. Batch adsorption experiments of AmL for TNT were performed on factors of contact time, temperature, initial TNT concentration, initial pH and adsorbent dosage. The results show that the adsorption equilibrium can be achieved in 24h and the adsorption kinetics is well described by pseudo-second-order model. It was found that the equilibrium data was better represented by the Freundlich isotherm model and the saturated adsorption capacities reach a maximum of 55.7 mg/g at pH 7.0. Thermodynamic parameters were also evaluated and their values indicated that adsorption of TNT on AmL is an endothermic process and spontaneous in nature. The pH plays a key role in TNT adsorption capacity using AmL. The reusability characteristic has been also investigated and more than 95% recovery was obtained after 8 desorption-adsorption cycles for ethanol eluent. The results showed that the synthesized material is a promising sorbent of TNT in water. (C) 2011 Elsevier BY. All rights reserved.

Keywords: 2,4,6-Trinitrotoluene, Adsorption, Adsorption, Adsorption Kinetics, Aqueous-Solution, Batch, Batch Adsorption, Characterization, Degradation, Equilibrium, Exposures, Freundlich, Freundlich Isotherm, FTIR, Granular Activated Carbon, Isotherm, Kinetics, Modified Lignin, pH, Recovery, Regeneration, Thermodynamic, Thermodynamic Parameters, TNT, Toxicity, Trinitrotoluene, Water, XPS

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Full Text: [2011\Che Eng J168, 1103.pdf](2011/Che%20Eng%20J168,%201103.pdf)

Abstract: Industrial waste lignin was used to prepare activated carbons by zinc chloride activation by using different impregnation methods (with and without microwave treatment) at 500-800ºC. Effect of impregnation ratio was also studied. The textural properties of the samples were investigated by means of SEM, cryogenic N-2 adsorption, whereas, surface chemistry was probed through FTIR and modified Boehm’s titration method. Textural properties and surface chemistry of activated carbons were found to be strongly depending on the activation temperature, impregnation ratio and impregnation method. BET surface area, total pore volume, micropore volume and micropore area increased with increase in activation temperature up to 600ºC and then decreased on further increase in temperature. Maximum surface area of 1172.2 m2/g, total pore volume 0.640 cm3/g, and total oxygen surface functional groups 3.14 meq/g was observed in case of microwave treated sample at activation temperature 600ºC and impregnation ratio 1:1.5 whereas, for the sample obtained by simple impregnated method the above said values are 917.5 m2/g, 0.506 cm3/g and 2.66 meq/g respectively, using same precursor and conditions. The adsorption of Cu2+ from aqueous solution on samples could be favorably described by Langmuir isotherm, and the adsorption kinetics was well fitted in pseudo-second-order model. Results revealed usefulness of microwave treatment in influencing BET surface area, micropore surface area and type and extent of surface oxygen functional groups and ultimately greater uptake capacity. (C) 2011 Elsevier BM. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solutions, BET Surface Area, Chemical Activation, Chloride, Cu(II), FTIR, Isotherm, Kinetics, Kraft Lignin, Langmuir, Langmuir Isotherm, Lignin, Metal-Ions, Micropore Volume, Microwave, Pore Structure, Porosity, Removal, Sorption, Waste, Water

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Full Text: [2011\Che Eng J168, 1120.pdf](2011/Che%20Eng%20J168,%201120.pdf)

Abstract: In this paper, the wheat straw materials have been simply modified by carboxymethylation to prepare a kind of new adsorbent. The adsorption of methylene blue (MB) from aqueous solutions onto modified straw has been studied. It was found that the adsorption capability of straw increased dramatically after modification. The investigation of pH effects indicated that the adsorbents had better adsorption performances in neutral and alkaline conditions. The adsorption isotherms were best fitted by the Langmuir equation while the adsorption kinetics was well described by both pseudo-second order equation and the Elovich equation. The adsorption behavior in a fixed-bed system followed Thomas model. It indicated that the adsorption behavior was a monolayer chemical adsorption and the rate-limiting step might be ion exchange reaction. Interestingly, after adsorption of MB, the disused adsorbents were not recovered for recycle as usual, but tried to remove another dye matter of methylene orange (MO) from aqueous solutions directly. It was proved that the MB loaded adsorbents were stable enough at pH > 6.0. and effective in the secondary adsorption of MO for altered surface structures of the straw based adsorbents after adsorption of MB. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Adsorption Mechanism, Adsorption of Dyes, Batch, Biosorption, Column Study, Copper, Degradation, Dye, Dyes, Effluents, Equilibrium, Ion Exchange, Isotherms, Kinetics, Langmuir, Methylene Blue, Methylene-Blue Adsorption, pH, Removal, Rice Straw, Secondary Adsorption, Straw, System, Thomas Model, Wheat-Straw

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Full Text: [2011\Che Eng J168, 1234.pdf](2011/Che%20Eng%20J168,%201234.pdf)

Abstract: Adsorption of Reactive Black 5 (RB5) in aqueous solution by peanut hull was studied by using Placket-Burman (PB) and Central Composite Design (CCD). Four out of the 7 factors (initial dye concentration, initial solution pH, amount of adsorbent, temperature, particle size, shaking speed and contact time) studied by PB design influenced the adsorption of dye. A CCD was used to develop mathematical model equation. Analysis of variance (ANOVA) showed a high coefficient of determination value (R-2=0.95). Linear and quadratic effects of the initial dye concentration and linear effect of peanut hull quantity were demonstrated to be very significant (P < 0.05) for RB5 adsorption. The interaction between peanut hull dose and initial dye concentration showed remarkable effect on adsorption process. The equilibrium adsorption data of RB5 on peanut hull were analyzed by Langmuir and Freundlich models. The monolayer adsorption capacity (*q*m) increased from 50 to 55.55 mg/g with the increase in temperature from 20ºC to 60ºC. The kinetic data were analyzed using the pseudo-first-order and pseudo-second-order adsorption kinetic models. According to these models, the rate constants were calculated for different initial dye concentrations. It can be concluded that the experimental data are well defined with pseudo-second-order kinetic model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Aqueous Solution, Basic Dye, Biomass, Composite, Dye, Equilibrium, Freundlich, Heavy-Metals, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Optimization, Peanut Hull, pH, RB5, Reactive Black 5, Reactive Dye, Remazol-Black-B, Removal, Response Surface Methodology, Response-Surface Methodology, Waste-Water

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Full Text: [2011\Che Eng J168, 1279.pdf](2011/Che%20Eng%20J168,%201279.pdf)

Abstract: Ibuprofen (iBu) is one of the most prescribed and consumable global non-steroidal anti-inflammatory drugs (NSAIDs). Consequently it has been ranked as one of the most noticed pharmaceuticals in the environment, having distressing concentrations up to microgram per litre in water. A gas chromatography-mass spectrometry method was performed to analyze acidic pharmaceutical iBu quantification and were enriched with liquid-liquid extraction followed by derivatisation with N,O-bis(trimethylsilyl) trifluoroacetamide. The fundamental perspective of ibuprofen adsorption was evaluated by isotherm, thermodynamic and kinetic details. Equilibrium profile was discussed by two-parameter and three-parameter isotherm models. The best fitting model was chosen according to the statistical criteria. The experimental results substantiated the correctness of the Radke-Prausnitz model and reinforced the conclusion of correlated thermodynamic parameters for iBu binding. Adsorption of iBu was increased with an increase in temperature. Reaction pathways to attain equilibrium were in good correlation with pseudo second order rate kinetics. The excellent mesoporosity and high surface area of microwave-assisted developed adsorbent was one of the key contributors for iBu uptake apart from coulombic attraction between adsorbate-adsorbent system at acidic pH value. Adsorption mechanism was plausibly explained by spectroscopic techniques. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acidic Pharmaceuticals, Adsorption, Adsorption Mechanism, Aquatic Environment, Aqueous-Solution, Characterization, Chromatography-Mass-Spectrometry, Drinking-Water Treatment, Equilibrium, Human Pharmaceuticals, Isotherm, Kinetic, Kinetics, Mechanism, Mesoporosity, Metal-Ions, Microwave, Nsaids, pH, Radke-Prausnitz, Removal, Risk-Assessment, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Che Eng J169, 20.pdf](2011/Che%20Eng%20J169,%2020.pdf)

Abstract: Surface reaction methodology was implicated in the optimization of hexavalent chromium removal onto lignin with respect to the process parameters. The influence of altering the conditions for removal of chromium(VI), for instance; solution pH, ionic strength, initial concentration, the dose of biosorbent, presence of other metals (Zn and Cu), presence of salts and biosorption-desorption studies, were investigated. It was found that the biosorption capacity of lignin depends on solution pH, with a maximum biosorption capacity for chromium at pH 2. Experimental equilibrium data were fitted to five different isotherm models by non-linear regression method, however, the biosorption equilibrium data were well interpreted by the Freundlich isotherm. The maximum biosorption capacities (q(max)) obtained using Dubinin-Radushkevich and Khan isotherms for Cr(VI) biosorption are 31.6 and 29.1 mg/g. respectively. Biosorption showed pseudo second order rate kinetics at different initial concentrations of Cr(VI). The intraparticle diffusion study indicated that film diffusion may be involved in the current study. The percentage removal of chromium on lignin decreased significantly in the presence of NaHCO3 and K2P2O7 salts. Desorption data revealed that nearly 70% of the Cr(VI) adsorbed on lignin could be desorbed using 0.1 M NaOH. It was evident that the biosorption mechanism involves the attraction of both hexavalent chromium (anionic) and trivalent chromium (cationic) onto the surface of lignin. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Biosorbent, Biosorption, By-Products, Chromium, Cr(VI), Cr(VI) Biosorption, Cr(VI) Removal, Desorption, Diffusion, Electroplating Waste-Water, Equilibrium, Freundlich, Freundlich Isotherm, Heavy-Metals, Hexavalent Chromium, Hexavalent Chromium, Ionic Strength, Isotherm, Isotherms, Kinetics, Lignin, Mechanism, Nonlinear, Optimization, pH, Reduction, Removal, Sawdust, Sorption

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Full Text: [2011\Che Eng J169, 180.pdf](2011/Che%20Eng%20J169,%20180.pdf)

Abstract: In this study, an oil palm empty fruit bunch-based activated carbon was modified using ammonia aqueous solution. The effect of the chemical modification on the adsorption capacity of modified activated carbon (MAC) for 2,4-dichlorophenol (2,4-DCP) adsorption was investigated. The monolayer adsorption capacity of MAC was 285.71 mg/g at 30ºC. Adsorption isotherm fitting revealed that Langmuir model was applicable for the MAC. The adsorption kinetics of 2,4-DCP onto MAC was described by the pseudo-second-order kinetic model. The surface modification of the activated carbon using ammonia was shown to be able to increase its adsorption capacity for 2.4-DCP. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4-Dcp, 2,4-Dichlorophenol, Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Ammonia, Aqueous Solution, Aqueous-Solutions, Co2 Adsorption, Dye, Enhancement, Isotherm, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Oil Palm Empty Fruit Bunch, Phenol, Removal, Temperature, Water

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Full Text: [2011\Che Eng J169, 231.pdf](2011/Che%20Eng%20J169,%20231.pdf)

Abstract: Layered double hydroxide (LDH) with hydrotalcite-like structure containing Mg(II) and Fe(III) in the layers and its calcined form were prepared at different Mg/Fe molar ration by co-precipitation method at fixed pH = 10 and followed by calcination at 500ºC (denoted CLDH). The obtained materials were characterized by powder X-ray diffraction (PXRD), FT-IR spectroscopy, and TGA. The prepared LDH and CLDH were used for Orange G (Acid Orange 10) dye removal from aqueous solutions. Batch studies were carried out to address various experimental parameters such as contact time, pH, sorbent dose and temperature. The sorption kinetics data fitted the pseudo-second order model. The isotherms were established and the parameters calculated. The sorption data fitted the Langmuir model with good values of the correlation coefficient. The sorption capacity of CLDH was found to be almost independent on initial pH of solution in the range 3-13 and approximately 5 times higher than that of LDH. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acidic Dye, Activated Carbons, Adsorption, Anionic Clay, Aqueous Solution, Basic-Dyes, Batch, Characterization, Dye, Dye Removal, Fe(III), FT-IR, FTIR, Hydrotalcite, Isotherms, Kinetic-Model, Kinetics, Langmuir, Mg-Fe LDH, Orange G, pH, Pollutants, Removal, Rice-Husk, Sorbent, Sorption, Sorption Kinetics, Synthesis, Temperature, Thermal-Decomposition, Waste, X-Ray Diffraction

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Full Text: [2011\Che Eng J170, 1.pdf](2011/Che%20Eng%20J170,%201.pdf)

Abstract: The ability of non-living biomass of Penicillium citrinum has been explored for the removal and recovery of uranium from aqueous solutions. The biosorbent was characterized by SEM, EDS and FT-IR. The influences of different experimental parameters such as initial solution pH, initial uranium concentration, contact time, biomass dosage and temperature on adsorption were investigated. The P. citrinum exhibited the highest uranium sorption capacity at an initial pH of 6.0 and at 5 h. Biosorption capacity increased from 103.1 to 127.3 mg g-1 with an increase in temperature from 298 to 318K at an initial uranium concentration of 50 mu g/mL. Adsorption kinetics was better described by the pseudo-second-order model and adsorption process could be well defined by both the Langmuir and Freundlich isotherms, however, Freundlich isotherm displayed a better fitting model than Langmuir isotherm. The thermodynamic parameters: Delta G degrees (308 K), Delta H degrees, and Delta S degrees for sorption process were determined to be -20.48 kJ mol-1, 10.76 kJ mol-1, and 101.43 J mol-1 K-1, respectively. The results presented in this study showed that the P. citrinum offered great potential as a biosorbent to remove uranium ions from aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Beads, Biosorption, Chitosan, Equilibrium, Hydrogel, Ion, Kinetics, Model, Penicillium Citrinum, Pseudo-Second-Order, Removal, Sorption, Thermodynamic Parameters, Uranium, Wastewaters

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Full Text: [2011\Che Eng J170, 21.pdf](2011/Che%20Eng%20J170,%2021.pdf)

Abstract: A chemically modified Typha angustifolia biomass (CMTAB) material with abundant carboxyl groups was prepared using thionyl chloride (SOCl(2)) activated ethylenediaminetetraacetic acid (EDTA) as a modification reagent. The CMTAB was characterized by back titration, elemental analysis, FTIR and SEM. The results show that EDTA is effectively grafted to the biomass matrix and the carboxyl group content of the biomass sharply increases almost 3 times after chemical modification. A series of adsorption experiments were carried out using CMTAB as an adsorbent. The adsorption equilibrium can be reached within 20 min and the kinetic data are fitted well to the pseudo-second-order model with a correlation coefficient (R2) of 0.998. The CMTAB exhibits a favorable performance for Pb adsorption and its maximum adsorption capacity calculated by Langmuir model is 263.9 mg g-1. The chemical states of the elements involved in the adsorption were analyzed by X-ray photoelectron spectroscopy (XPS). The results demonstrate that the adsorption mechanism of CMTAB involves Na-Pb ion-exchange and carboxyl group dominated surface complexation. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Biosorption, Chemical Modification, Lead, Model, Pseudo-Second-Order, Typha Angustifolia, XPS

? Deniz, F. and Karaman, S. (2011), Removal of Basic Red 46 dye from aqueous solution by pine tree leaves. *Chemical Engineering Journal*, **170** (1), 67-74.

Full Text: [2011\Che Eng J170, 67.pdf](2011/Che%20Eng%20J170,%2067.pdf)

Abstract: The potential of pine leaves as a low-cost biosorbent was investigated for removal of Basic Red 46 (BR 46) from aqueous solution. Various physico-chemical parameters were studied such as solution pH, biosorbent dosage, biosorbent size, dye concentration, temperature, contact time and ionic strength. Equilibrium data fitted well with the Langmuir isotherm model. The monolayer sorption capacity was found as 71.94 mg g(-1). Kinetic data were best described by the pseudo-second order model. Thermodynamic studies indicated that biosorption reactions were favourable and endothermic. Activation energy was calculated as 38.39 kJ mol-1. These results demonstrated that the pine leaves could be used as a natural biosorbent for removal of BR 46 from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Azo-Dye, Basic Red 46, Biosorbent, Biosorption, Color Removal, Elovich Equation, Equilibrium, Kinetics, Malachite-Green, Methylene-Blue, Model, Pine Leaves, Pseudo-Second Order, Pseudo-Second-Order, Textile Dye, Thermodynamic, Wood Sawdust

? Yao, Y.J., He, B., Xu, F.F. and Chen, X.F. (2011), Equilibrium and kinetic studies of methyl orange adsorption on multiwalled carbon nanotubes. *Chemical Engineering Journal*, **170** (1), 82-89.

Full Text: [2011\Che Eng J170, 82.pdf](2011/Che%20Eng%20J170,%2082.pdf)

Abstract: The adsorption of methyl orange onto multiwalled carbon nanotubes (MWCNTs) from aqueous solutions was studied, in which the influence of contact time, dosage, temperature, pH, and methyl orange concentration in the solution were investigated. The equilibrium adsorption data were analyzed using three common adsorption models: Langmuir. Freundlich and Temkin. The results revealed that Langmuir isotherm fit the experimental results well. Kinetic analyses were conducted using pseudo-first and second-order models and the intra-particle diffusion model. The regression results showed that the adsorption kinetics was more accurately represented by pseudo-second-order model. Values of activation parameters such as Standard free energy changes (Delta G(0)), standard enthalpy change (Delta H(0)), and standard entropy change (Delta S(0)) were calculated using adsorption equilibrium constants obtained from the Langmuir isotherm at different temperatures. All Delta G(0) values were negative; the (Delta H(0)) values and (Delta S(0)) values of MWCNTs were 19.39 kJ/mol and 0.1015 kJ/mol K, respectively, indicating that the adsorption was feasible, spontaneous and endothermic process in nature. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solution, Behavior, Blue Adsorption, Carbon Nanotube, Chitosan, Dyes, Kinetics, Langmuir Isotherm, Methyl Orange, Model, Phenolic-Compounds, Powder, Pseudo-Second-Order, Removal, Sepiolite, Thermodynamics, Thermodynamics

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Full Text: [2011\Che Eng J170, 120.pdf](2011/Che%20Eng%20J170,%20120.pdf)

Abstract: Two montmorillonites modified with organic surfactant hexadecyltrimethylammonium bromide via ion exchange were used as adsorbents to remove 2,4,5-trichlorophenol (2,4,5-TCP) from aqueous solution in a batch system. Due to their organophilic nature, exchanged montmorillonites are able to adsorb 2,4,5-TCP at a very high extents. The maximum capacity at 20 degrees C and pH 4 was 368 and 303 mg/g for organo-montmorillonite (MtC16) and acid-activated-organo-montmorillonite (AMtC16) respectively. Experiments were showed that lower pH increased the amount of adsorbed TCP which reached a maximum at pH 4. The adsorption kinetics was found to follow the pseudo-second-order kinetic model. The non-linear Langmuir model provided the best correlation of experimental data. Isotherms were also used to obtain the thermodynamic parameters. The negative values of Delta G degrees and Delta H degrees indicated the spontaneous and exothermal nature of the processes. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4,5-Trichlorophenol, Adsorbent, Adsorption, Adsorption Kinetics, Bentonite, Cationic Surfactant, Clay, Exchanged Montmorillonite, Granular Activated Carbon, Isotherm, Isotherms, Kinetics, Model, Organo-Clays, Phenolic-Compounds, Pseudo-Second-Order, Removal, Sorption, Thermodynamic, Thermodynamic Parameters

? Akhtar, J., Amin, N.S. and Aris, A. (2011), Combined adsorption and catalytic ozonation for removal of sulfamethoxazole using Fe2O3/CeO2 loaded activated carbon. *Chemical Engineering Journal*, **170** (1), 136-144.

Full Text: [2011\Che Eng J170, 136.pdf](2011/Che%20Eng%20J170,%20136.pdf)

Abstract: Treatment of sulfamethoxazole (SMX) in terms of total organic carbon (TOC) by combined adsorption and catalytic ozonation by commercial activated carbon (PAC) and Fe(2)O(3)/CeO(2) loaded activated carbon (MOPAC) has been investigated. Adsorbent dosage of 2g/L, initial pH similar to 6.5 and contact time = 50 min were found optimum for adsorption studies. Among various models, experimental data was well fitted by pseudo second-order model while Langmuir isotherm model represented equilibrium adsorption of SMX on both adsorbents. Adsorption of SMX was influenced by surface and intraparticle diffusion. The change in enthalpy (Delta H degrees) and entropy (Delta S degrees) for adsorption of SMX onto PAC and MOPAC were estimated as 105 kJ/mol and 396 J/mol K; and 21 kJ/mol and 131 J/mol K, respectively. The values of Delta G degrees decreased slightly as a function of temperature that showed spontaneity of adsorption process. According to ozonation study, the removal of SMX was higher in MOPAC/O(3) combination compared to PAC/O(3) combination for low pH values. However, the effect of catalyst type was minimal at pH values of 7.5. Similarly, mechanism study suggested the enhancement in removal of SMX in the presence of MOPAC/O(3) combination. Ozone consumption experiments also confirmed better consumption of ozone gas in case of MOPAC/O(3) combination. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Abatement, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Advanced Oxidation, Aqueous-Solution, Cerium, Kinetics, Manganese, Mechanism, Model, Ozonation, Ozone Consumption Efficiency, Ozone Decomposition, Pseudo-Second-Order, Sulfamethoxazole, Water-Treatment

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Full Text: [2011\Che Eng J170, 145.pdf](2011/Che%20Eng%20J170,%20145.pdf)

Abstract: In this paper, gambit was chemically modified into insoluble adsorbent (GA). The GA was characterized by FTIR, pH(zpc), SEM, and BET. The effects of pH, adsorbent dosage, initial concentration of Cu(2+) solution and contact time were studied. Batch experiments were performed with aqueous copper solutions of concentration 10 mg/L, at pH 5.0 and 0.30 g adsorbent. The experimental data was analyzed using pseudo-first order, pseudo-second order and Elovich kinetic models. The correlation coefficient calculated from pseudo-second order equation was higher than pseudo-first order and Elovich kinetic equations, indicating that equilibrium data fitted well with pseudo-second order model where adsorption process was chemisorptions. The adsorption equilibrium was well described by Langmuir isotherm model. The maximum adsorption capacity was found to be 9.950 mg/g at 333 K. The Gibbs free energy change, Delta G degrees, values were negative indicating that the process of Cu2+ ions adsorbed onto GA was spontaneous. The positive values of Delta H degrees and Delta S degrees suggested that the process of adsorption was endothermic at high temperature. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Biosorption, Biosorption, Chitosan Beads, Copper, Cu(II) Ions, Gibbs Free Energy, Heavy-Metals, Kinetics, Langmuir Isotherm, Leaves Powder, Mechanism, Metal-Ions, Model, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Thermodynamic, Waste-Water

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Full Text: [2011\Che Eng J170, 154.pdf](2011/Che%20Eng%20J170,%20154.pdf)

Abstract: In this work, coffee husk based activated carbon (CHAC) was prepared by physicochemical activation for the removal of Remazol Brilliant Orange 3R (RBO3R) dye from aqueous solution. The effects of dye initial concentration, contact time, solution temperature and pH on RBO3R adsorption were investigated. Result showed that the adsorption of RBO3R was favorable at acidic pH. The adsorption uptake was found to increase with increase in initial RBO3R concentration, contact time and solution temperature. Langmuir isotherm model fitted well the adsorption equilibrium data with monolayer saturation capacity of 66.76 mg/g at 303 K. The adsorption kinetic was found to follow the pseudo-second-order kinetic model. Boyd plot indicated that the adsorption of RBO3R on CHAC was controlled by film diffusion. The adsorption process was found to be endothermic with the reaction mechanism follows a physisorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Coffee Husk, Kinetics, Model, Pseudo-Second-Order, Reactive Dye, Remazol Brilliant Orange 3R, Removal, Sorption, Thermodynamic, Waste-Water

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Full Text: [2011\Che Eng J170, 162.pdf](2011/Che%20Eng%20J170,%20162.pdf)

Abstract: Silica-based adsorbent was prepared by radiation-induced grafting of dimethylaminoethyl methacrylate (DMAEMA) onto silanized silica (SS). The SS was pre-irradiated by electron beam (EB) and then reacted with DMAEMA solution at various conditions. The FTIR and TG-DTA spectra manifested that DMAEMA was successfully grafted onto the SS surface. Three kinds of typical hazardous metal ions (Cr (VI), As (V) and Hg (II)) were used to evaluate the adsorption properties of the resultant silica-based adsorbent. The adsorbent possessed sound Cr (VI) and As (V) adsorption ability as anion ion-exchange resin, and a particular selective adsorption for Hg (II) ions was found among other divalent cationic metal ions. The adsorptions of Cr (VI), As (V) and Hg (II) fitted with Langmuir mode, and their adsorption kinetics fitted well with pseudo-second-order model. These results suggested that SS-g-DMAEMA adsorbent has potential application for the removal of hazardous metal pollutants from wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Cr(VI) Adsorption, Dimethylaminoethyl Methacrylate, Equilibrium, Gel, Hazardous Metal Ions, Kinetics, Model, Monomers, Ni(II), Pb(II), Polymerization, Preconcentration, Pseudo-Second-Order, Radiation Grafting, Silanized Silica, Solid-Phase Extraction, Surface

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Full Text: [2011\Che Eng J171, 1.pdf](2011/Che%20Eng%20J171,%201.pdf)

Abstract: The potential of lotus leaf for the removal of methylene blue (MB) from aqueous solution was investigated. The experiments were performed under various conditions including contact time, adsorbent dose, initial MB concentration, solution pH, salt ionic strength and temperature. The Langmuir, Freundlich and Koble-Corrigan isotherm models were employed to discuss the adsorption behavior. The results of analysis indicated that the equilibrium data were perfectly represented by Koble-Corrigan isotherm. The maximum monolayer adsorption capacity of lotus leaf was found to be 221.7 mg g(-1) at 293 K. Thermodynamic parameters such as Delta G, Delta H and Delta S were calculated. The kinetic studies indicated that adsorption process followed the pseudo second-order mode, suggesting that the adsorption might be a chemisorption process. FTIR analysis indicated that a large number of carbonyl and hydroxyl groups were included on the surface of the material. The present study implied that lotus leaf was a promising candidate as low cost biosorbent for the removal of MB from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Anionic Dyes, Aqueous-Solutions, Basic Dye, Cationic Dyes, Equilibrium Isotherm, Fly-Ash, Isotherm, Kinetic Adsorption, Kinetics, Lotus Leaf, Methylene Blue, Pseudo-Second-Order, Reactive Dyes, Thermodynamic, Wheat-Straw

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Full Text: [2011\Che Eng J171, 152.pdf](2011/Che%20Eng%20J171,%20152.pdf)

Abstract: In the present work, poly(aryl ether ketone) containing pendant carboxyl groups (PEK-L) is prepared to develop efficient adsorbent for heavy metal ions, Cu(II), Pb(II), Co(II), Ni(II), and Cd(II), from aqueous solution. The property of PEK-L is investigated by using FT-IR and XRD analysis. Effects of pH and contact time, kinetics, adsorption isotherms, and thermodynamics are examined in batch experiments. Kinetic experiments indicate that the processes can be simulated by a pseudo-second-order model. Langmuir. Freundlich, and Tempkin models are applied to analyze the experimental data, and the best interpretation for the experimental data is given by the Freundlich isotherm equation. Thermodynamic parameters, the Gibbs free energy change (Delta G degrees), enthalpy change (Delta H degrees), and entropy change (Delta S degrees), are calculated and show that adsorption of heavy metals on PEK-L is spontaneous and endothermic in nature. The regeneration study indicates that PEK-L can be used repeatedly without significantly changed their adsorption capacities and desorption percentage. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Environmental-Samples, Flame Atomic Absorption Spectrometry (FAAS), Gibbs Free Energy, Heavy Metal Ions, Interpretation, Kaolinite Clay, Kinetics, Metal-Ions, Model, Pb(II), Pek-L, Preconcentration, Pseudo-Second-Order, Removal, Separation, Solid-Phase Extraction, Thermodynamic, Trace-Metals, Water

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Full Text: [2011\Che Eng J171, 167.pdf](2011/Che%20Eng%20J171,%20167.pdf)

Abstract: The adsorption behavior of Pb(II) by Mg2Al layered double hydroxide (Mg2Al LDH) was studied as a function of contact time, pH, ionic strength, foreign ions, humic substances and temperature under ambient conditions. The results showed that the kinetic adsorption could be described by a pseudo-second order model very well. The adsorption of Pb(II) on Mg2Al LDH was strongly dependent on pH and ionic strength. The presence of HSs enhanced the adsorption of Pb(II) on Mg2Al LDH at low pH, whereas reduced Pb(II) adsorption at high pH. The Langmuir model fitted the adsorption isotherms of Pb(II) better than the Freundlich model at three different temperatures of 303.15. 323.15 and 343.15 K. The thermodynamic parameters (Delta H degrees, Delta S degrees and Delta G degrees) calculated from the temperature dependent adsorption isotherms indicated that the adsorption process of Pb(II) on Mg2Al LDH was endothermic and spontaneous. The results show that Mg2Al LDH is a promising material for the preconcentration and separation of pollutants from large volumes of aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Carbon Nanotubes, Foreign Ions, Fulvic-Acid, Humic-Acid, Hydrotalcite-Like Compounds, Ionic-Strength, Metal-Ions, Mg(2)Al Ldh, Mg-Al, Model, Pb(II), Pseudo-Second Order, Pseudo-Second-Order, Thermodynamic Parameters, Zn-Al

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Full Text: [2011\Che Eng J171, 400.pdf](2011/Che%20Eng%20J171,%20400.pdf)

Abstract: The present studies investigate the use of a local environmentally friendly biosorbent material, i.e., powdered straw from Triticum aestivum (WS) for the removal of Cd(II) ions, one of three most toxic heavy metal ions (cadmium, mercury and lead). The straw has been modified with urea under the effect of microwave radiation. The FTIR spectra indicated the presence of hydroxyl, carboxyl and amino functional groups. A greater BET surface area was observed in modified wheat straw (MWS) than in WS. The biosorption of Cd(II) by WS was found to follow Freundlich model whereas that by MWS followed Langmuir model with maximum biosorption capacity (*q*max) of 39.22 mg g-1. The effect of experimental parameters like pH, time of contact and temperature was optimized. The maximum sorption occurred at pH of 6 by both the materials. Biosorption by MWS was faster (equilibrium time 10 min) than by WS (equilibrium time 20 min). Elovich, pseudo first order and pseudo second order models were used to study the kinetics of the process. Biosorption of Cd(II) by both materials followed pseudo second order kinetic model. Boundary layer diffusion was found as the rate limiting step. For both materials, the sorption increased with increase in temperature. The changes in the values of standard free energy (ΔGº) and standard enthalpy (ΔHº) indicated the spontaneous, feasible and endothermic nature of sorption process. The capacities of WS and MWS have also been compared with certain other biosorbents. MWS has been found a better biosorbent for Cd(II) than simple WS. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Bet Surface Area, Biomass, Biosorbent, Biosorbents, Biosorption, Bone Char, Cadmium, Cd(II), Diffusion, Equilibrium, Fixed-Bed, Freundlich, FTIR, Heavy-Metals, Kinetic, Kinetic Model, Kinetics, Langmuir, Lead, Mercury, Microwave, Modified Wheat Straw, pH, Radiation, Removal, Saccharomyces-Cerevisiae, Second-Order Kinetics, Sorption, Sorption Capacity, Sugarcane Bagasse, Temperature, Triticum Aestivum, Urea, Waste-Water

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Full Text: [2011\Che Eng J171, 431.pdf](2011/Che%20Eng%20J171,%20431.pdf)

Abstract: Two low-cost adsorbents, iron-doped activated alumina (Al2O3/Fe) and lotus stalk-based activated carbon (LAC) were employed to remove norfloxacin from aqueous solutions. Sorption of norfloxacin to both Al2O3/Fe and LAC showed a strong pH-dependent behavior. The maximum sorption capacity (21.58 mu mol/g and 922.70 mu mol/g) occurred at pH 6.5 and 5.5, respectively for Al2O3/Fe and LAC, which is near the pHpzc of the sorbent. While the equilibria adsorption isotherm data on LAC fit well to the Langmuir equation, both Langmuir and Freundlich models correlated the isotherm data on Al2O3/Fe quite well. The sorption kinetics of both sorbents followed the pseudo-second order model. Several possible mechanisms for the adsorption systems were proposed. For the sorption on Al2O3/Fe, surface complexation and cation bridging were dominant mechanisms responsible for norfloxacin removal, while hydrophobic interaction, cation exchange and pi-electron-donor-acceptor interaction were likely important mechanisms for the sorption on LAC. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Alumina, Antibiotics, Cation Exchange, Ciprofloxacin, Complexation, Equilibria, Fluoroquinolone Antibacterial Agents, Freundlich, Ions, Iron-Doped Activated Alumina, Isotherm, Isotherms, Kinetics, Lac, Langmuir, Langmuir And Freundlich Models, Mechanism, Mechanisms, Norfloxacin, Oxides, pH, Removal, Sorbent, Sorption, Sorption Kinetics, Water

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Full Text: [2011\Che Eng J171, 448.pdf](2011/Che%20Eng%20J171,%20448.pdf)

Abstract: Phosphorus removal was a crucial aspect in controlling eutrophication problem of water pollution. Zirconium oxide was a suitable adsorbent for phosphate removal due to its good adsorption efficiency, but it suffered from the separation inconvenience. In this paper, magnetic Fe-Zr binary oxide was synthesized and used as adsorbent for removing phosphate from aqueous solution. The adsorbent was characterized by energy dispersive analysis system of X-ray, scanning electron microscopy (SEM), infrared spectrum (IR), X-ray powder diffraction (XRD) analysis and BET surface area measurements. The results showed that kinetic data followed a pseudo-second-order model and equilibrium data were well fitted by the Langmuir model. The maximum adsorption capacity was 13.65 mg P/g at pH 4. The adsorption mechanism was mainly derived from ion-exchange of zirconium species and partly originated from magnetite species of Fe-Zr binary oxide. The main advantages of magnetic Fe-Zr binary oxide adsorbent consisted in its separation convenience and highly efficient reusability compared to the other adsorbents. Crown Copyright (C) 2011 Published by Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous Solution, Bet Surface Area, Electron Microscopy, Equilibrium, Fe-Zr Binary Oxide, Fly-Ash, Ion Exchange, Ion-Exchange, Iron-Oxide, Kinetic, Langmuir, Layered Double Hydroxides, Magnetic, Mechanism, pH, Phosphate, Phosphorus, Pollutants, Red Mud, Removal, SEM, Separation, Slag, Waste-Water, Water, Zirconium

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Full Text: [2011\Che Eng J171, 502.pdf](2011/Che%20Eng%20J171,%20502.pdf)

Abstract: Waste tea activated carbon (WTAC) was prepared through chemical activation with a novel activating agent, potassium acetate and used for the sorption of Acid Blue 25 (AB25) dye. Batch adsorption studies were carried out with the consideration of factors such as initial dye concentration (50-350 mg/L), temperature (30, 40, 50ºC), contact time and initial pH (2-12). This was done to enable the determination of kinetics and isotherms behaviour. Langmuir, Freundlich, Temkin and Dubinin-Radushkevich (D-R) isotherm models were tested and the adsorption of AB25 dye on WTAC was best fitted to Langmuir and the maximum monolayer of WTAC was 203.34 mg/g. Pseudo-second order kinetic model was found to adequately describe the adsorption process. The adsorbent, WTAC gave 97.88% adsorption of AB25 dye. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Blue 25, Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, And Isotherms, Aqueous-Solution, Batch, Batch Adsorption, Chemical Activation, Cotton Stalk, Dye, Equilibrium, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, pH, Pore Structure, Pseudo-Second Order, Reactive Dyes, Removal, Rice-Husk, Sorption, Surface Modification, Temperature, Waste, Waste Tea

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Full Text: [2011\Che Eng J171, 510.pdf](2011/Che%20Eng%20J171,%20510.pdf)

Abstract: The adsorption of malachite green (MG) dye onto rambutan peel-based activated carbon (RPAC) was carried out in this work. The effects of different reaction parameters such as the initial MG concentration, contact time, solution temperature and initial pH on MG adsorption were investigated. MG adsorption uptake was found to increase with increase in initial concentration, contact time and solution temperature. The adsorption equilibrium data were best represented by the Freundlich model. Adsorption kinetic was found to follow the pseudo-second-order kinetic model. The mechanism of the adsorption process was determined from the intraparticle diffusion model. Boyd plot indicated that the MG adsorption on the RPAC was controlled by film diffusion. Thermodynamic parameters ΔGº, ΔHº, ΔSº and E(a) were also determined. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetic, Aqueous Solution, Blue, Diffusion, Dye, Equilibrium, Freundlich, Isotherms, K2CO3, Kinetic, Kinetic Model, Leaf Powder, Malachite Green, Mechanism, Mg, Orange, Palm Shell, pH, Rambutan Peel, Removal, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake, Waste

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Full Text: [2011\Che Eng J171, 603.pdf](2011/Che%20Eng%20J171,%20603.pdf)

Abstract: Magnetic molecularly polymers (MMIPs) based on kaolinite/Fe3O4 composites were successfully synthesized for the selective adsorption and separation of bisphenol A (BPA) from aqueous solutions. During polymerization, the modified kaolinite/Fe3O4 (KLT/Fe3O4) not only was used as supporter but also functional monomer. The properties of MMIPs were characterized by scanning electron microscopy (SEM), Fourier transform infrared (FT-IR) analysis, and thermogravimetric analysis (TGA) and so on. The SEM graphs showed that much of KLT/Fe3O4 was successfully coated by the imprinted layer, TGA analysis suggested the grafting yield of imprinted layer to KLT/Fe3O4 was 72.51 wt%. The effects of pH, initial BPA concentration, contact time and temperature of the medium on the adsorption were studied by the batch mode experiment. The equilibrium data was well described by the Langmuir isotherm model. The kinetics of adsorption followed the pseudo-second-order model and the rate constant decreased with the increase of temperature, indicating exothermal nature of adsorption process. For desorption studies, the highest desorption efficiency (95.75%) was obtained using methanol and acetic acid as eluting solution (v:v = 8:2). Moreover, the selectivity of MMIPs was further demonstrated through HPLC analysis of the stimulant water samples, the result showed that MMIPs could effectively recognize BPA in mixed solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Aqueous Solution, Bisphenol A, Bisphenol-A, Carbon Nanotubes, Desorption, Electron Microscopy, Equilibrium, FT-IR, FTIR, Isotherm, Kaolinite, Fe3O4, Kinetics, Langmuir, Langmuir Isotherm, Magnetic, Magnetic Molecularly Imprinted Polymers, Magnetic Nanoparticles, Part I, Particles, pH, Removal, Selective, Selective Adsorption, Selectivity, SEM, Separation, Sorption, Surface, Temperature, Water

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Full Text: [2011\Che Eng J171, 703.pdf](2011/Che%20Eng%20J171,%20703.pdf)

Abstract: A new ion-imprinted thiocyanato-functionalized silica gel sorbents was synthesized by the combination of a surface imprinting technique with a hydrothermal-assisted sal-gel process with Cd(II) as the template, 3-thiocyanatopropyltriethoxysilane (TCPTS) as the functional monomer, and epichlorohydrin as the cross-linking agent (IIP-TCPTS/SiO2) for the selective removal of Cd(II) from aqueous solution. The Cd(II)-imprinted thiocyanato-functionalized silica sorbents was characterized by FTIR, SEM, nitrogen adsorption and the static adsorption-desorption experiment method. The results showed that the maximum static adsorption capacity of IIP-TCPTS/SiO2 sorbents prepared by hydrothermal heating method was 2.3 times as much as the conventional heating method. The IIP-TCPTS/SiO2 sorbents offered a fast kinetics for the adsorption and desorption of Cd(II). The static uptake capacity and selectivity coefficient of IIP-TCPTS/SiO2 sorbents were higher than those of the non-imprinted sorbents. IIP-TCPTS/SiO2 sorbents had a substantial binding capacity in the range of pH 4.2-8.6 and could be used repeatedly. The Langmuir adsorption model was more favorable than the Freundlich adsorption model. Kinetic studies indicated that the adsorption followed a pseudo-second-order model. Various thermodynamic parameters such as ΔGº, ΔHº and ΔSº were evaluated with results indicating that this system was a spontaneous and endothermic process. The results showed that IIP-TCPTS/SiO2 sorbents could be employed as an effective material for the selective removal of Cd(II) from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 3-Thiocyanatopropyltriethoxysilane, Adsorption, Aqueous Solution, Beads, Cadmium, Cd(II), Desorption, Freundlich, FTIR, Functionalized Silica, Hydrothermal-Assisted, Ion Imprinted Polymer, Kinetic, Kinetics, Langmuir, Particles, pH, Phase Extraction, Preconcentration, Removal, Selective, Selectivity, SEM, Separation, Silica, Silica Gel, Soils, Sol-Gel, Sorption, Thermodynamic, Thermodynamic Parameters, Uptake, Uranyl-Ion

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Full Text: [2011\Che Eng J171, 951.pdf](2011/Che%20Eng%20J171,%20951.pdf)

Abstract: A series of novel toluene-modified hyper-cross-linked poly(styrene-co-divinylbenzene) resins were synthesized and the adsorption behaviors of the synthesized resins toward phenol were investigated from aqueous solution. Among the synthesized five resins, HJ-L15 possessed the largest adsorption capacity toward phenol. The phenol adsorption onto HJ-L15 is combination of the surface adsorption and the absorption due to skeleton swelling. The molecular form of phenol was favorable for the adsorption. The isotherms could be fitted by Freundlich model and the adsorption was shown to be an exothermic process. The kinetic curves could be characterized by pseudo-second-order rate equation and the intra-particle diffusion was the rate-limiting step at the initial stage. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Absorption, Activated Carbons, Adsorption, Aqueous Solution, Aqueous-Solution, Diffusion, Dyes, Exchange Character, Extraction, Freundlich, Hyper-Cross-Linked, Hypercrosslinked Polymer, Isothermal, Isotherms, Kinetic, Kinetics, Monoliths, Phenol, Poly(Styrene-Co-Divinylbenzene) Resin, Polystyrene, Resin, Resins, Separation, Sorption

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Full Text: [2011\Che Eng J171, 1004.pdf](2011/Che%20Eng%20J171,%201004.pdf)

Abstract: In this study, a strategy has been provided for the preparation of silica nano hollow spheres and its functionalization with the thiol group. Scanning electron microscopy, energy dispersive spectroscopy, X-ray diffraction, N(2) adsorption and Fourier transform infrared spectroscopy have been used to characterize the structure of nanoparticles before and after functionalization. This new synthesized nano hollow sphere was applied to remove heavy toxic metals such as Hg(2+), Pb(2+) and Cd(2+) from water samples. The effect of initial concentration of heavy metals and interaction time were investigated in batch mode. In order to determine the best fit model for each system, non-linear regressions was carried out. For this, three error functions were applied to predict the optimum model. The goodness of fit of experimental data was observed with Sips and Redlich-Peterson isotherms. The pseudo-second order kinetic model represented our experimental data very well. Adsorption data showed that the adsorption capacity of thiol functionalized silica nano hollow sphere (thiol-SNHS) for Hg(2+) is higher than Pb(2+) and Cd(2+). (c) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Carbon-Dioxide, Characterization, Electron Microscopy, Error Analysis, Functionalization, Heavy Metals, Hg(II) Adsorption, Isotherm Models, Isotherms, Kinetic, Kinetic Model, Kinetics, Mesoporous Silica, Model, Nonlinear, Novel Adsorbent, Removal, Silica, Silica Nano Hollow Sphere, Sorption, Synthesis, Thiol Functionalized, Water, X-Ray Diffraction

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Full Text: [2011\Che Eng J171, 1027.pdf](2011/Che%20Eng%20J171,%201027.pdf)

Abstract: Boehmite and goethite were synthesized and characterized to compare their adsorptive properties for Cd(II) from aqueous solutions. The influences of different parameters, such as contact time, initial cadmium concentration, pH and temperature, on the adsorption processes were investigated. It was found that the Cd(II) adsorption on boehmite was higher than that for goethite, according to the adsorption isotherms. Kinetic studies also showed that the relative adsorption rate of boehmite was similar to that of goethite, and the adsorption processes was described by the pseudo-second-order kinetic model. In both cases, equilibrium was reached within 24h. and the uptake was affected by intraparticle diffusion. Furthermore, the Cd(II) adsorption behaviors on both of the oxy-hydroxide adsorbents were described reasonably well by the Freundlich isotherm model. For both adsorbents, the Cd(II) adsorption was maximized with basic pH values and was negligible with acid pH values when equilibrium was reached. Lastly, the thermodynamic parameters (ΔH0. ΔG0 and ΔS0) showed that Cd(II) adsorption by both materials was endothermic and spontaneous. (c) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Aqueous-Solution, Boehmite, Cadmium, Cadmium (II), Cadmium(II) Ions, Cd(II), Diffusion, Efficient Removal, Equilibrium, Freundlich, Freundlich Isotherm, Goethite, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Oxide, pH, Radiotracer, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Thermodynamics, Uptake, Water

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Full Text: [2011\Che Eng J171, 1124.pdf](2011/Che%20Eng%20J171,%201124.pdf)

Abstract: The cordierite monolith was successfully modified to carbonaceous material termed as carbon coated monolith (CCM). Surface studies showed about 65% of the total pore volume falls in mesopore range with acidic functionality dominating over the surface. Batch adsorption experiments were carried out to study the applicability of CCM for the removal of methyl orange (MO) from aqueous solution. Different parameters such as effect of MO concentration, contact time, initial pH, regeneration and desorption potential of CCM were studied. Optimum adsorption of MO on CCM was observed at pH 6 (27.2 mg/g). The increase in initial MO concentration from 50 to 500 mg/L leads to increase in adsorption capacity from 15.99 to 88.5 mg/g. The observed equilibration time ranged in between 5000 and 5800 min. Linear and non-linear isotherm studies showed better applicability of Freundlich model. Kinetics studies showed better fitting for pseudo-second-order model. The Weber and Morris model showed multi-linearity indicating two or more steps were involved to describe the adsorption process. Desorption studies showed maximum recovery of MO when alkaline NaOH solution was used as an eluent. The regeneration studies showed decrease in adsorption capacity from 47.93 to 23.76 mg/g after three cycles. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Batch, Batch Adsorption, Carbon, Carbon Coated Monolith, Complex, Desorption, Dye Waste-Water, Equilibrium, Freundlich, Isotherm, Isotherms, Kinetics, Mesoporous Material, Methyl Orange, Nonlinear, pH, Recovery, Regeneration, Removal, Sorption, Surface

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Full Text: [2011\Che Eng J171, 1132.pdf](2011/Che%20Eng%20J171,%201132.pdf)

Abstract: In this study, sepiolite (SEP) was modified by acid and heat treatment (AH-SEP), and organic treatment (OAH-SEP). Then, polyethersulfone (PES)/AH-SEP and PES/OAH-SEP hybrid particles were prepared by using a liquid-liquid phase separation technique, and then used for the removal of environmental toxins. The morphology structure of the particle was characterized by scanning electron microscopy (SEM). Detailed studies on the adsorption for ethidium bromide (EB, ionic toxin) and bisphenol A (BPA, non-ionic toxin) by the PES/modified-SEP (PES/mSEP) hybrid particles were carried out. The results indicated that the PES/AH-SEP hybrid particles had good adsorbability for ionic toxin, while the PES/OAH-SEP hybrid particles were more suitable for adsorbing non-ionic toxin. In addition, three simplified kinetic models (pseudo-first-order, pseudo-second-order and intraparticle diffusion model) and adsorption isotherms (Langmuir and Freundlich) were used for the analysis of the EB and BPA adsorption processes, respectively. It was found that the diffusion in macro-pores was significant at the initial period for EB adsorption; while, the boundary layer diffusion was dominant at the beginning for BPA adsorption. For both EB and BPA adsorption, the intraparticle diffusion controlled the adsorption rate at the final stage. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption-Kinetics, Aqueous-Solutions, Bisphenol A, Bisphenol-A, Diffusion, Electron Microscopy, Equilibrium, Ethidium Bromide, Freundlich, Granular Activated Carbon, Isotherms, Kinetic, Kinetic Models, Langmuir, Mechanism, Methylene-Blue, Modified Sepiolite, Montmorillonite, Polyethersulfone, Removal, SEM, Separation, Sepiolite, Sorption, Waste-Water

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Full Text: [2011\Che Eng J171, 1143.pdf](2011/Che%20Eng%20J171,%201143.pdf)

Abstract: Zeolitic tuff was used for the adsorption of phenol from aqueous solutions at different temperatures in a batch process. The adsorption characteristics, i.e., kinetics, mechanism, isotherms, and thermodynamics, of phenol from water onto zeolite were studied. Three different kinetic models, viz., pseudo-first-order, pseudo-second-order, and intraparticle diffusion were used to fit the kinetics data. The pseudo-second-order model best described the experimental data. Concerning the mechanism, the results indicated that the intraparticle diffusion is not the rate limiting step in the phenol adsorption process. The adsorption isotherms at different temperatures were determined and modeled using four different models. The best-fitted adsorption isotherm models were found to be in the order: Freundlich > Redlich-Peterson > Langmiur > Temkin for temperature range 25-45ºC. The Langmiur model fitted well the experimental data with a maximum adsorption capacity of 34.5, 24.9, 23.8, and 23.3 mg/g at 25, 35, 45, and 55ºC. Thermodynamically, it was determined that the adsorption of phenol onto zeolite is physical in nature and enthalpy driven with ΔHº = -10.2 kJ/mol. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Adsorption Thermodynamics, Chlorophenols, Degradation, Desorption, Diffusion, Dyes, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Low-Cost Adsorbents, Mechanism, Oxidation, Phenol, Removal, Sorption, Temperature, Thermodynamics, Water, Zeolite, Zeolitic Tuff

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Full Text: [2011\Che Eng J171, 1150.pdf](2011/Che%20Eng%20J171,%201150.pdf)

Abstract: Anion-cationic, anionic and cationic surfactants modified montmorillonite (MMT) are prepared by incorporating cationic surfactants cetyl trimethyl ammonium bromide (CTMAB), anionic surfactants sodium stearate (SSTA) and their mixture to montmorillonite. The modified samples are characterized by X-ray diffraction (XRD), Fourier transform infrared (FT-IR) spectroscopy and Thermogravimetry-differential thermal analysis (TG-DTA). XRD result shows that both the anionic and cationic surfactants can be intercalated into the MMT, making the interlayer spaces of MMT expand. TG-DTA studies indicate the organic carbon contents of anion-cationic surfactants modified MMT are higher than the montmorillonite modified by anionic or cationic surfactants solely. The adsorption experiments indicate that CTMAB/10SSTA-MMT had the largest adsorption capacity compared with CTMAB-MMT and 10SSTA-MMT due to the formation of a highly effective partition medium by anion-cationic surfactant micelle. The adsorption kinetic of methyl orange onto the modified MMT samples can be best described by the pseudo-second-order model, and the adsorption isotherm is in good agreement with the Langmuir equation. The activation energy, change of free energy, enthalpy and entropy of anion-cationic modified MMT are also evaluated for the adsorption of methyl orange. Thermodynamic results indicate that the adsorption is a spontaneous and exothermic process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Isotherm, Ammonium, Aqueous-Solution, Bentonite, Characterization, Clay, Decolorization, FT-IR, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Modification, Montmorillonite, Organic-Compounds, Removal, Smectite, Sorption Behavior, Surfaces, Surfactant, Thermodynamic, Waste-Water, X-Ray Diffraction

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Full Text: [2011\Che Eng J171, 1159.pdf](2011/Che%20Eng%20J171,%201159.pdf)

Abstract: This study examined the applicability of the natural zeolite for simultaneous removal of ammonia and humic acid, two of the most encountered concurrent contaminants in the surface waters. The influence of various operating parameters including pH (2-10), concentrations of zeolite (1-10 g/L), initial concentration of ammonia (10-100 mg/L) and/or humic acid (2-20 mg/L), contact time (5-90 min), and temperature (20-50ºC) was investigated on the removal of target contaminants from water through different experimental runs. The results indicated that zeolite had best performance for simultaneous removal of ammonia and humic acid at the pH close to that of natural waters. The adsorption of humic acid was found to be improved in the presence of ammonia. The removal of ammonia and humic acid as single or binary components using natural zeolite was indicated to be a rapid process, following the pseudo-second-order kinetic model. The temperature positively influenced the removal of target contaminant both as single and binary components, although with greater influence for lower concentrations of zeolite. Equilibrium adsorption of ammonia and humic acid onto natural zeolite had best fitness with the Freundlich isotherm at all temperatures ranging from 20 to 50ºC. The maximum experimental adsorption capacities of ammonia and humic acid as binary components were 49.7 and 10.5 mg/g. respectively. It was understood from the results of this study that adsorption onto natural zeolite is an efficient in performance, simple to operate, and economical process and thereby affordable technology for simultaneous removal of ammonia and humic acid from the contaminated water source. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Ammonia, Aqueous-Solution, Binary Component, Clinoptilolite, Environmental Application, Equilibrium, Freundlich, Freundlich Isotherm, Humic Acid, Ion-Exchange, Ion-Exchange, Isotherm, Kinetic, Kinetic Model, Mechanism, Natural Waters, pH, Removal, Sorption, Temperature, Tuff, Waste-Water, Water, Zeolite

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Full Text: [2011\Che Eng J171, 1209.pdf](2011/Che%20Eng%20J171,%201209.pdf)

Abstract: This paper presents a study of the adsorption of ammonium and phosphate ions from aqueous solution using a new fertilizer controlled release agent (FCRA) which is produced through graft copolymerization with wheat straw, acrylic acid (AA), acrylic amide (AM) and dimethyl diallyl ammonium chloride (DMDAAC). A series of batch experiments were conducted to examine the effects of solution pH, adsorbent dosage, the initial concentration of adsorbate and contact time. The findings indicated that the new fertilizer controlled release agent had a significant effect on the adsorption of ammonium and phosphate ions. The adsorption could reach equilibrium through 4 h reaction, and had the best adsorption amount at the pH values from 4 to 8. The adsorption amount increased with the increasing initial concentration of adsorbate. The adsorption amount of NH(4)(+) decreased with the increasing of adsorbent dosage while the adsorption of PO(4)(3-) showed the opposite trend. Kinetic analysis showed that the adsorption of ammonium and phosphate ions on the new fertilizer controlled release agent followed the pseudo-second-order model well. Equilibrium isotherm data of adsorption of NH(4)(+) were well fitted to the linear Langmuir and Freundlich models, while the data of adsorption of PO(4)(3-) were well fitted to the Freundlich model. The desorption experiments also showed that the desorption of NH(4)(+) and PO(4)(3-) on FCRA could reach saturation at the time of 5 h and 4 h, respectively. And the pH had a large effect on desorption. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Ammonium, Ammonium Removal, Anion-Exchangers, Aqueous Solution, Aqueous-Solutions, Chloride, Desorption, Equilibrium, Equilibrium Isotherm, Fertilizer Controlled Release Agent, Freundlich, Graft Copolymerization, Ion-Exchange, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir and Freundlich Models, Methylene-Blue, pH, Phosphate, Phosphate Removal, Phosphorus Removal, Removal, Waste-Water, Water, Zeolite

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Full Text: [2011\Che Eng J171, 1218.pdf](2011/Che%20Eng%20J171,%201218.pdf)

Abstract: This study describes the development of meso-structured zirconium phosphate (MZrP) for removal of fluoride from drinking water. The synthesized material was characterized and kinetics of fluoride removal from aqueous solution was studied by batch mode. The influences of pH of solution, initial fluoride concentration, material quantity, and temperature on the kinetic of fluoride removal have been tested in detail. The results of four kinetic models fitted to the experimental data show that the pseudo-second order model gave a better description for the uptake process. Thermodynamic parameters such as enthalpy (ΔH) and entropy (ΔS) factors were evaluated to be 44.79 kJ mol-1 and 0.223 kJ mol-1 K-1, respectively. The value of ΔG was found to be negative indicating feasibility and spontaneity of adsorption. MZrP can be regenerated for further use which was tested up to five cycles of operation. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorption, Adsorption, Aqueous Solution, Aqueous-Solution, Drinking Water, Equilibrium, Fluoride, Impregnated Chitosan, Ions, Kinetic, Kinetic Models, Kinetics, Mesoporous, pH, Phosphate, Removal, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake, Water, Zirconium, Zirconium Phosphate

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Full Text: [2011\Che Eng J171, 1246.pdf](2011/Che%20Eng%20J171,%201246.pdf)

Abstract: Waste activated sludge (WAS) from palm oil mill effluent (POME) treatment plant was used to adsorb Methylene Blue (MB) in a batch system. The WAS was prepared at lower temperature compared to the previous studies. Parameters such as initial MB concentration, pH, and temperature were studied for their effects on the adsorption process. Results showed that the uptake of MB increased with an increase in both the initial MB concentration and the pH. and decreased with an increase in temperature. Both the Langmuir and the Freundlich Isotherms are fit to explain the MB adsorption on WAS. The maximum monolayer adsorption capacity of WAS was found to be 66.23 mg/g at 30ºC. The kinetic data for this study fit well the pseudo-second-order kinetic with a R2 more than 0.95. Thermodynamic analysis was performed by evaluating the Gibbs Free Energy (ΔGº), enthalpy (ΔHº), and entropy (ΔSº) of the process. The evaluation showed that the MB adsorption process onto WAS is an exothermic process and is spontaneous in nature. Hence, this work reveals that the use of POME WAS is an innovative application of a local waste product as an adsorbent for MB removal. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous-Solution, Behaviors, Biosorption, Carbon, Equilibrium, Freundlich, Isotherms, Kinetic, Langmuir, MB Adsorption, Methylene Blue, pH, POME, Reactive Dye, Removal, Shell, Temperature, Thermodynamic, Thermodynamics, Uptake, Waste, Waste Activated Sludge

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Full Text: [2011\Che Eng J171, 1446.pdf](2011/Che%20Eng%20J171,%201446.pdf)

Abstract: The paper presents advantages and limitations of microwave heating in preparation of lotus stalk-based activated carbon by comparing the characteristic and adsorption properties of carbons with microwave (Mic-LSAC) and conventional (LSAC) heating methods employing H3PO4 as chemical agent. Mic-LSAC was produced with radiation power of 700W and radiation time of 15 min. LSAC was allowed by single step to get carbonized at 450ºC in a muffle furnace for 1 h. Both produced carbons showed typical Type IV nitrogen adsorption isotherms. Mic-LSAC had large surface area of 1434 m2/g and micropore volume of 1.337 cm3/g, while LSAC had surface area of 1220 m2/g and micropore volume of 1.191 cm3/g. Moreover, Mic-LSAC had higher portion of mesopores than LSAC. Boehm’s titration results and Fourier transform infrared spectra indicated that Mic-LSAC possessed smaller acidic oxygen functionalities. Mic-LSAC had higher pHpzc, more ordered stacking of layer compared to LSAC. For both adsorbents, the adsorption kinetics followed the pseudo-second-order model and the adsorption equilibrium data were very well represented by the Langmuir isotherm. The maximum adsorption capacities obtained at pH 2.80 were 564.97 mg/g and 537.63 mg/g for Mic-LSAC and LSAC, respectively. The differences of textual and chemical characteristics caused by heating method were related to adsorption capacity. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Adsorption, Adsorption Behavior, Adsorption Isotherms, Adsorption Kinetics, Antibiotics, Aqueous-Solutions, Characterization, Equilibrium, Isotherm, Isotherms, K2CO3 Activation, Kinetics, Langmuir, Langmuir Isotherm, Microwave, Nanotubes, Oxytetracycline, pH, Products, Radiation, Removal, Surface-Chemistry, Tetracycline, Waste

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Full Text: [2011\Che Eng J172, 122.pdf](2011/Che%20Eng%20J172,%20122.pdf)

Abstract: The biosorption of Au(III) from an aqueous solution using Bacillus subtilis was investigated under various experimental conditions: pH, biomass concentration, contact time and temperature. The optimum pH value was determined to be 2.0, and Au(III) uptake reduced with the increase of temperature to within the range of 298-323 K. Au(III) adsorption proceeded very rapidly in the first 10 min and subsequently tended to achieve equilibrium. Au(III) biosorption was found to better fit the Freundlich model, and the Freundlich model provided a maximal Au(III) uptake capacity at 355 mg/g for B. subtills. Moreover, a pseudo-second-order kinetic model provided a better correlation for the experimental data. The thermodynamic parameters free energy (ΔGº), enthalpy (ΔHº) and entropy (ΔSº) were then calculated from an obtained experimental data source, which revealed this biosorption to be exothermic and spontaneous. Finally, Fourier transform infrared (FT-IR) spectroscopy examined the functional groups that might participate in the interaction between Au(III) and B. subtilis. which illustrated that the working functional groups were the amino, carboxyl and hydroxyl groups. These results indicate that B. subtilis can be used as an effective biosorbent to remove Au(III) from an aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Aqueous-Solution, Bacillus Subtilis, Basic-Dyes, Biomass, Biosorbent, Biosorption, Equilibrium, Freundlich, FT-IR, FTIR, Gold, Heavy-Metals, Kinetic, Kinetic Model, Kinetics, Linked Chitosan Resin, Metal Biosorption, Methylene-Blue, pH, Pseudo Second Order, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Uptake, Waste-Water

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Full Text: [2011\Che Eng J172, 158.pdf](2011/Che%20Eng%20J172,%20158.pdf)

Abstract: The feasibility of cassava peel waste for Ni-sorption is evaluated in this work. The biosorbents are characterized by Boehm titration, Fourier transform-infra red (FTIR) spectroscopy, Nitrogen sorption, scanning electron microscopy-energy dispersive X-ray (SEM-EDX) analysis (e.g. elemental mapping) and X-ray photoelectron spectroscopy (XPS). Adsorption experiments are performed in batch mode at 30ºC (303.15K). 45ºC (318.15 K) and 60ºC (333.15 K). The performance of several temperature dependence forms of isotherm models e.g. Langmuir, Freundlich, Sips and Toth to represent the adsorption equilibrium data is evaluated and contrasted. Sips model demonstrates the best fitting with the maximum uptake capacity for Ni(II) ions of 57 mg/g (0.971 mmol/g) at pH 4.5. For kinetic data correlation, pseudo-second order model shows the best representation. The chemisorption mechanism and thermodynamics aspect are also discussed. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biosorbent, Biosorbents, Biosorption, Biosorption, Carbon, Cassava Peel, Cu(II), Equilibrium, Freundlich, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Mechanism, Ni(II), Ni(II) Ions, Nickel, pH, Pseudo Second Order, Removal, Sorption, Temperature, Thermodynamics, Toth, Uptake, Waste, XPS

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Full Text: [2011\Che Eng J172, 191.pdf](2011/Che%20Eng%20J172,%20191.pdf)

Abstract: Surface imprinting technique combined with a sacrificial support process was established to synthesize DBT-imprinted polymer in which TiO2 acts as the sacrificial support material (H-MIP). The synthetic samples were characterized by the techniques of Fourier transmission infrared spectrometry, transmission electron microscopy. X-ray diffractometer and nitrogen sorption. Then batch experiments were performed to evaluate the adsorption kinetics, adsorption isotherms, and selective recognition of H-MIP. The adsorption behavior followed the pseudo-second-order kinetic model, indicating that the adsorption process was chemically carried out. Two adsorption isotherm models were applied to analyze the equilibrium data, obtaining the best description by Freundlich isotherm model. Thermodynamic parameters revealed the spontaneity and endothermic nature of adsorption. The absorption abilities of DBT from noctane solutions followed the order H-MIP > T-MIP > H-NIP > TiO2. H-MIP also could selectively recognize DBT over similar compounds. Finally, the method was applied to the desulfurization and determination of trace DBT in gasoline sample, and the adsorbent could be regenerated. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Dibenzothiophene, Electron Microscopy, Equilibrium, Freundlich, Freundlich Isotherm, Ion, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Molecularly Imprinted Polymer, Nanoparticles, Particles, Pseudo Second Order, Selective, Sorbent, Sorption, Spheres, Surface, Template, Thermodynamic, Thermodynamic Parameters, Titanium Dioxide

? Kismir, Y. and Aroguz, A.Z. (2011), Adsorption characteristics of the hazardous dye Brilliant Green on Saklıkent mud. *Chemical Engineering Journal*, **172** (1), 199-206.

Full Text: [2011\Che Eng J172, 199.pdf](2011/Che%20Eng%20J172,%20199.pdf)

Abstract: In this work, the adsorption capacity of Saklıkent mud as low-cost adsorbent, for the removal of hazardous dye, Brilliant Green, from aqueous solution was studied. The adsorptive properties of Saklıkent mud was investigated in terms of temperature, initial dye concentration and contact time. The results obtained from the experiments were compared for kinetic and thermodynamic parameters. The kinetic data for the adsorption of Brilliant Green on Saklıkent mud supports the pseudo-first-order kinetic model and the intra-particle model at 25º C. However, the highest values of r2 (>0.99) were obtained from the second order adsorption model for the adsorption of Brilliant Green at higher temperatures. From the kinetic data it was found that the calculated values of the maximum adsorption capacity (*q*e,calc) are very close to the maximum adsorption capacity (*q*e,exp) obtained experimentally. The experimental adsorption capacity of the Saklikent mud changed from 9.2 mg g-1 to 9.7 mg g-1 by increasing temperature from 25º C to 55ºC. The equilibrium adsorption data were discussed using the Langmuir isotherm model. To reveal the adsorptive capacity of Saklikent mud the BET surface area and the pore volume were found and its chemical composition was analyzed by X-ray fluorescence spectrometry. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetic, Aqueous Solution, Aqueous-Solution, Basic Dye, BET Surface Area, Brillant Green Dye, Brilliant Green, Congo-Red, Dye, Equilibrium, Equilibrium Isotherm, Fly-Ash, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Low-Cost Adsorbent, Low-Cost Adsorbents, Methylene-Blue, Removal, Saklıkent Mud, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Che Eng J172, 207.pdf](2011/Che%20Eng%20J172,%20207.pdf)

Abstract: A study on the adsorption of Cr(VI) onto raw and modified activated carbons was conducted and the process parameters were optimized using Response Surface Methodology (RSM). Apricot stones have been converted to microporous activated carbon with considerably high surface area (1462 m2 g-1) by phosphoric acid activation. Produced carbons have been characterized by using different physicochemical methods. In order to determine the effects of process parameters namely temperature (20-60º C), initial solution pH (2-6) and initial Cr(VI) concentration (30-60 mg L-1) on Cr(VI) uptake from aqueous solution, a three-level, three-factor, Box-Behnken design has been employed. The second order mathematical model was developed by regression analysis of the experimental data obtained from 17 batch runs. The optimum pH, temperature and initial concentration were found to be 2.0, 60ºC, and 60 mg L. respectively. Cr(VI) adsorption capacity was 262 mg g-1 at the optimum combination of process parameters. The enthalpy change of Cr(VI) adsorption was found to be 54.05 kJ mol-1. Dynamic adsorption data were applied to pseudo-first-order and pseudo-second-order rate equations. Pseudo-second-order kinetic model well expressed Cr(VI) adsorption onto activated carbon. The results of both thermodynamic and kinetic study indicated the chemical interaction between Cr(VI) species and surface functional groups on carbon surface. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Aqueous Solution, Aqueous-Solutions, Biosorption, Box-Behnken Response Surface, Chromium Removal, Cr(VI), Cr(VI) Adsorption, Equilibrium, Experimental Design, Hexavalent Chromium, Kinetic, Kinetic Model, Kinetics, Methodology, Models, Optimization, pH, Phosphoric Acid, Process Optimization, Pseudo Second Order, Pseudo-Second-Order, Removal, Temperature, Thermodynamic, Uptake, Water, Zinc-Chloride

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Full Text: [2011\Che Eng J172, 219.pdf](2011/Che%20Eng%20J172,%20219.pdf)

Abstract: Four samples of ceria incorporated manganese oxide (NCMO) were prepared by co-precipitation-calcinations and sol-gel methods, and characterized by X-ray diffraction, scanning electron microscopy, transmission electron microscopy, atomic force microscopy. BET surface area etc. The synthetic samples were nanoparticle agglomerates with irregular surface morphology (Ce:Mn = 1:1). The NCMO-1b sample, prepared by the calcination of metal hydroxide at 573 K for 3.0 h, was a nano-crystalline (70-90 nm) and hydrated material having high BET surface area (116.96 m2 g-1). The arsenic(V)-sorption by the samples at pH 7.0 (±0.2) and 30ºC showed that the NCMO-1b is a most efficient material. Optimum pH range for the arsenic(V) sorption is 3.0-7.0 at 303 (±1.0) K. Kinetics and equilibrium data obtained (pH = 7.0±0.2, T = 303±1.0 K and I = 0.01 M) had described the pseudo-second order kinetics and the Freundlich isotherm models well, respectively. Thermodynamics of the sorption reaction showed that the changes of enthalpy (ΔHº), entropy (ΔSº) and Gibbs free energy (ΔGº), respectively, were +23.901 kJ mol-1, +0.175 kJ mol-1 K-1 and -25.737 to 32.753 kJ mol-1 at T = 283-323 K. Estimation of the sorption energy (E = 17.15 kJ mol-1) indicated that the arsenic(V) was chemisorbed on NCMO-1b. The phosphate only reduced the arsenic(V) removal efficiency of NCMO-1b. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Arsenate Adsorption, Arsenic(V), As(V), Bet Surface Area, Binary Mixed-Oxide, Catalysts, Ceria Associated Manganese Oxide, Characterization, Characterizations, Electron Microscopy, Equilibrium, Fe, Freundlich, Freundlich Isotherm, Granular Ferric Hydroxide, Isotherm, Kinetics, Mn, Nanoparticle, pH, Phosphate, Pseudo Second Order, Removal, Sol-Gel, Sorption, Synthesis, Thermodynamics, Wet Oxidation, X-Ray Diffraction

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Full Text: [2011\Che Eng J172, 326.pdf](2011/Che%20Eng%20J172,%20326.pdf)

Abstract: Adsorbents, including cotton stalk (CS), sulphuric acid treated cotton stalk (SCS) and phosphoric acid treated cotton stalk (PCS), were used for removing methylene blue (MB) from aqueous solutions. Compared with the CS prepared activated carbons, less specific surface area and more functional groups on these adsorbents were found. The adsorption capacity was in the order of SCS > PCS > CS. It was identified that initial pH of aqueous solution had little effect on the adsorption capacity of SCS and PCS while having a great impact on the removal efficiency of CS. Maximum dye was sequestered from the solution within 120 min after the beginning of each experiment. The equilibrium data tend to fit Freundlich isotherm model for SCS and Langmuir isotherm model for PCS and CS. The kinetic data of all adsorbents followed closely by the pseudo-second-order equation and the adsorption processes are all involved in more than one single kinetic stage. The comparative study indicated that PCS and CS could be considered as potential adsorbents, and SCS as one of the best adsorbents for MB removal from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Treatment, Activated Carbons, Adsorbent, Adsorption, Agricultural Waste, Aqueous Solution, Aqueous-Solution, Basic Dye, Batch, Chemical Activation, Color Removal, Cotton, Cotton Stalk, Cs, Dye, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Leaf Powder, Methylene Blue, pH, Phosphoric Acid, Pseudo Second Order, Removal, Sawdust

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Full Text: [2011\Che Eng J172, 361.pdf](2011/Che%20Eng%20J172,%20361.pdf)

Abstract: Dairy manure compost (DMC) was used to be one efficient biosorbent for the removal of heavy metals from simulated acid mine drainage. Single and competitive adsorption of Pb, Cu and Zn by DMC were studied. The adsorption isothermal data fit the Langmuir isotherm better than the Freundlich isotherm model. The maximum adsorption capacities calculated by applying the Langmuir isotherm were 0.460 mmol/g for Pb, 0.428 mmol/g for Cu, and 0.237 mmol/g for Zn at pH 4.0. The single and competitive adsorption studies showed that the adsorption affinity order of the three heavy metals was Pb > Cu > Zn. The rate of adsorption of the three metals was fast, which reached equilibrium in 60 min, and followed the pseudo-second-order model well. Adsorption efficiency of the heavy metals was pH dependent and the maximum adsorption was found to occur at around 3.5 for Pb, 4.5 for Cu, 5.5 for Zn. An increase of ionic strength caused a decrease in adsorption capacity for Zn and Cu, while negligible effect for Pb. The regeneration experiments showed that the adsorbent could be regenerated and reused at least three cycles without significant decrease in adsorption capacity. The results showed DMC could have great potential in treating heavy metals in acid mine drainage. Finally, ion exchange was found to be the primary mechanism of adsorption. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Efficiency, Apple Wastes, Aqueous-Solutions, Biosorbent, Biosorption, Cd2+ Ions, Competitive Adsorption, Cu(II), Dairy Manure Compost, Desorption, Equilibrium, Freundlich, Freundlich Isotherm, Heavy Metal, Heavy Metals, Heavy-Metals, Ion Exchange, Ion-Exchange, Ionic Strength, Isotherm, Langmuir, Langmuir Isotherm, Mechanism, Pb, Pb(II), pH, Pseudo Second Order, Removal, Sorption, Waste-Water

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Full Text: [2011\Che Eng J172, 623.pdf](2011/Che%20Eng%20J172,%20623.pdf)

Abstract: The sorption of Cr(III) and Cu(II) ions from aqueous solutions with the Diphonix resin in the sodium form have been investigated. Irreversible ion-exchange equilibrium isotherms were obtained for each pair metal/resin and well described by the Langmuir and Langmuir-Freundlich models. The maximum exchange capacities, which are temperature dependent, were estimated to be 2.73 and 3.74 meq/g (dryresin) for Cr(III) at 25 and 50ºC, respectively. For Cu(II), those values were 2.45 and 3.17 meq/g (dryresin). The effects of resin dosage, initial chromium concentration and initial pH on the uptake rate of Cr(III) were studied. The pseudo-second-order rate, pore diffusion and shrinking core models were applied for describing the kinetic data. The shrinking core model, based on non-steady state intraparticle diffusion, enabled a more realistic prediction of the evolution of concentrations of chromium and sodium in solution with time. By fitting the model equations to experimental data, the effective pore diffusivities of Cr(III), D(pef) = 2.66×10-11 m2/s for initial metal concentrations of 250 and 500 mg/L and, D(pef) = 5.31×10-11 m2/s for initial concentration of 750 mg/L were evaluated. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Chromium, Chromium And Copper, Chromium(III), Cr(III), Cu(II), Diffusion, Diphonix Resin, Equilibrium, Equilibrium And Kinetics, Equilibrium Isotherms, Ion Exchange, Ion-Exchange, Ion-Exchange-Resins, Isotherms, Kinetic, Langmuir, Metal-Ions, Modeling, pH, Polymeric Adsorbents, Pore Diffusion Model, Pseudo Second Order, Reaction Fronts, Recovery, Removal, Resin, Shrinking Core Model, Shrinking-Core Model, Sorption, Temperature, Uptake, Waste-Water

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Full Text: [2011\Che Eng J172, 713.pdf](2011/Che%20Eng%20J172,%20713.pdf)

Abstract: In this paper, a novel chelating resin with high adsorption selectivity for Au (III), polystyrene-supported 3-amino-1,2-propanediol (PS-APD), was prepared simply by the reaction of chloromethylated polystyrene with 3-amino-1,2-propanediol. Its structure was characterized by infrared spectroscopy (IR), scanning electron microscope (SEM) and porous structure analysis. The adsorption capabilities of PS-APD for Pb(II), Hg(II), Cu(II), Ni(II) and Au(III) ions were investigated. The results suggested that PS-APD resin possessed much better adsorption capability for Au(III) than for other metal ions. A comparison of the kinetic models on the overall adsorption rate showed that adsorption system was best described by the pseudo second-order kinetics. The adsorption equilibrium data fitted best with the Langmuir isotherm and thermodynamic parameters including ΔG. ΔH and ΔS were calculated. The adsorption mechanism of PS-APD for Au(III) was confirmed by SEM. IR and X-ray photoelectron spectroscopy (XPS), which showed that reclox reaction occurred between 3-amino-1,2-propanediol group and Au(III) ions. Adsorption selectivity experiments indicated that PS-APD resin possessed excellent adsorption property to Au(III) ions, offering potential applications in recovery of Au(III) from multi-ionic aqueous systems. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Au(III), Behavior, Characterization, Chelating Resin, Chelating Resins, Cross-Linked Chitosan, Cu(II), Equilibrium, Gold, Gold(III) Ions, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Metal-Ions, Ni(II), Pb(II), Polystyrene-Supported 3-Amino-1,2-Propanediol, Preparation, Pseudo Second Order, Recovery, Resin, Selectivity, SEM, Separation, Thermodynamic, Thermodynamic Parameters, XPS

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Full Text: [2011\Che Eng J172, 721.pdf](2011/Che%20Eng%20J172,%20721.pdf)

Abstract: Aluminium doped nano manganese copper ferrite (average size of 13 nm) was synthesized by the chemical co-precipitation method and nanocomposite was prepared by doping this ferrite in methacrylate, vinyl acetate and acrylic acid polymer through slow heating process. This nanocomposite was used as an adsorbent for the removal of arsenic from aqueous solution.The equilibrium data was fitted to Freundlich, Langmuir, Dubinin Rudushkevish and Flory Huggins models. The maximum adsorption capacity (*q*m) of arsenic on the nanocomposite was found to be 0.053 mg g-1 which is higher than that of many other adsorbents reported in literature. Mean sorption energy obtained from DR isotherm was 40.98 kJ mol-1 indicating chemical nature of the adsorbate-adsorbent interactions. The pseudo-second order kinetic model gave a better fit to the experimental data indicating involvement of both the external as well as internal mass transfer. Bangham’s model and intraparticle diffusion model were applied to investigate mechanism of the adsorption process. Non linear Bangham plot and significant value of intercept obtained from intraparticle diffusion model showed the film diffusion as well as pore diffusion to be the rate limiting steps. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Aqueous-Solution, Arsenic, Arsenic Removal, Bagasse-Fly-Ash, Composite, Copper, Diffusion, Dyes, Equilibrium, Equilibrium Isotherm Analyses, Freundlich, Groundwater, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Magnetic-Properties, Malachite Green, Mechanism, Nanocomposite, Nanoferrite, Pseudo Second Order, Removal, Sorption

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Full Text: [2011\Che Eng J172, 783.pdf](2011/Che%20Eng%20J172,%20783.pdf)

Abstract: The treatment of Be-contaminated wastewater has been paid little attention, although beryllium (Be) and its compounds are of high toxicity. In this research, aerobic granule was for the first time introduced to remove Be from aqueous solution. Influencing factors including reaction time, initial Be concentration, pH, biosorbent dosage, and coexistent metal ions (Cd, Cu, and Fe) were investigated in batch experiments. The aerobic granule, characterized by element analysis and CLSM, was abundant in carboxyl, phosphoryl, amine and hydroxyl groups. Potentiometric titration experiment demonstrated that the pH effect on biosorption depended on the surface charge of granule (pHzpc = 2.4) and the species of Be (Be2+, Be(OH)+, and Be(OH)2) in solution. The coexistent metal ions would either inhibit Be uptake through competitive biosorption or promote Be uptake via coprecipitation, depending on the K(sp) of coexistent metals. Kinetic and isotherm modeling studies revealed that the experiment data could be well described by pseudo-second-order model and Langmuir isotherm, respectively. The maximum biosorption capacity obtained in this experiment was 14.0 mg/g. The sequential extraction test and XPS analysis suggested that precipitation and ion exchange were the dominant mechanisms under the experimental conditions, and FTIR analysis revealed that functional groups like carboxyl and hydroxyl played an important role in the biosorption of Be. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aerobic Granule, Aqueous Solution, Beryllium, Biosorbent, Biosorption, Cu(II) Biosorption, Equilibrium, Extracellular Polymeric Substances, FTIR, FTIR Analysis, Heavy-Metals, Ion Exchange, Ion-Exchange, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Mechanism, Modeling, Ni2+ Biosorption, pH, Ph Effect, Pseudo Second Order, Sludge, Sorption, Strength, Toxicity, Uptake, Wastewater, XPS

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Full Text: [2011\Che Eng J172, 817.pdf](2011/Che%20Eng%20J172,%20817.pdf)

Abstract: In the present paper, a polymer inclusion membrane (PIM) containing 50% polyvinyl chloride (PVC), and 50% bis-(2-ethylhexyl) phosphate (D2EHPA) as extracting agent is used for the removal of Pb(II) ions from aqueous acid solution, by using the batch extraction technique. The optimal PIM composition was discussed both in correlations with the PIM’s morphology, and also with the sorption mechanism. The characterization of PIM, realized by atomic force microscopy (AFM), and differential scanning calorimetry (DSC), highlighted the membrane morphology and the plasticizing role of the sorption agent D2EHPA, respectively. The sorption kinetics was well described by the pseudo-second order model, and the adsorption isotherm was best fitted by the Redlich-Peterson equation. The kinetic experiments confirm that the sorption process of Pb(II) into the optimal 50%D2EHPA/50%PVC RIM is a chemisorption. The Pb(II) sorption into the RIM occurs by a “relay mechanism”. The experimentally determined maximum sorption capacity of PIM for Pb(II) ions was found to be 60.785 mg/g, and it is among the highest values reported in literature. Moreover, the desorption of Pb(II) ions, as well as the regeneration of RIM can be achieved at least five times by using 0.5 M HNO3. We consider that this membrane (50%D2EHPA/50%PVC) is a good candidate to be used as solid sorbent, due its lower price comparing to the plasticized PIMs, high sorption capacity, and good regeneration properties, with the regeneration process simultaneous with the metal recovery. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Aqueous-Solutions, Atomic-Absorption-Spectrometry, Cadmium, Characterization, Chloride, Correlations, D2ehpa, Desorption, Heavy-Metals, Ion-Exchange, Isotherm, Isotherms, Kinetic, Kinetics, Lead, Mechanism, Metal Recovery, Modeling, Pb(II), Phosphate, PIM, Poly(Vinyl Chloride), Pseudo Second Order, Recovery, Removal, Solid-Phase Extraction, Sorbent, Sorption, Sorption Kinetics, Transport

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Full Text: [2011\Che Eng J172, 847.pdf](2011/Che%20Eng%20J172,%20847.pdf)

Abstract: Based on polyaniline/silica gel composites (PAS) as support and functional monomer, the surface imprinted polymers (MIP-PAS) were synthesized for the selective adsorption of 2,6-dichlorophenol (2,6-DCP) from aquatic environment. The MIP-PAS was characterized by FTIR spectroscopy, scanning electron microscopy, nitrogen adsorption-desorption analysis, particle-size and EDX analysis. The effects of pH, initial analyte concentration, contact time and temperature of medium on the adsorption were studied. Equilibrium data, at various temperatures, can be described well by the Langmuir isotherm model. Kinetic can be described by the pseudo-first-order model, pseudo-second-order model, and by an intra-particle diffusion equation. A diffusion-controlled process as the essential adsorption rate-controlling step was also obtained. Moreover, intraparticle diffusion coefficient (k(i)) and pore diffusion coefficient (D(2)) for MIP-PAS elevated with the increased of 2,6-DCP concentration and temperature of medium, while increase in 2,6-DCP concentration was found to reduce film diffusion. Furthermore, the values of film diffusion coefficient (D(1)) were lower than those of D(2), indicating the diffusion process was controlled by film diffusion. Thermodynamics parameters (positive values for ΔHº and ΔSº, negative values of ΔGº) indicated that the process is endothermic and spontaneous. The selectivity of the imprint also demonstrates high affinity for 2,6-DCP over related phenolic compounds and over non-imprinted polymers (NIP). Crown Copyright (C) 2011 Published by Elsevier By. All rights reserved.

Keywords: 2,4-Dichlorophenol, 2,6-Dichlorophenol, Adsorption, Aqueous-Solutions, Degradation, Diffusion, Diffusion Equation, Electron Microscopy, Equilibrium, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Methylene-Blue, Modeling, pH, Polyaniline, Silica Gel Composites, Pseudo Second Order, Recognition, Removal, Selective, Selective Adsorption, Selectivity, Separation, Silica-Gel, Solid-Phase Extraction, Sorption, Surface Imprinted Polymers, Temperature, Thermodynamics

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Full Text: [2011\Che Eng J172, 856.pdf](2011/Che%20Eng%20J172,%20856.pdf)

Abstract: Significant adsorption performance of a modified lignin, lignin-graft-acrylic acid (L-g-AA) for aniline removal was investigated through batch experiments. The results showed that L-g-AA possesses strong adsorption ability for aniline with interaction of hydrogen bond and electrostatic interaction. The equilibrium adsorption data was well represented by the Freundlich isotherm model and the saturated adsorption capacity could reach a maximum of 79.1 mg/g at 15ºC. The adsorption process was found to follow pseudo-second-order kinetics. The activation energy (E(a)) was found to be 8.09 kJ/mol. Increasing the adsorption temperature would result in lower adsorption capacity. The significant thermodynamic parameters such as Gibbs free energy (ΔG), enthalpy change (ΔH) and entropy change (ΔS) were calculated. The negative value of ΔH and positive value of ΔG show the exothermic and non-spontaneous nature of adsorption respectively. It was also observed that L-g-AA possessed excellent reusability for aniline removal after 8 adsorption-desorption cycles in 0.1 mol/L hydrochloric acid which acted as a desorption medium. The work demonstrates that L-g-AA developed in the present study is a promising sorbent of aniline in water. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acrylic Acid, Activated Carbon, Adsorbent, Adsorption, Adsorption, Aniline, Aqueous Solution, Desorption, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Kinetics, Lignin, Malachite Green, Oxidation, Photocatalysis, Pillared Montmorillonite, Pseudo Second Order, Removal, Sorbent, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water, Water

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Full Text: [2011\Che Eng J172, 906.pdf](2011/Che%20Eng%20J172,%20906.pdf)

Abstract: Adsorption studies of Cr(VI) were conducted on 623 K or 723 K carbonized pineapple leaves as well as the dried one. Thermo Gravimetric/Differential Thermal Analysis (TG-DTA) of raw pineapple leaves reveals two main peaks indicating the change in structure of the material with increasing temperature. Some important parameters such as pH, contact time and solution temperature were evaluated and the results show their high dependence with Cr(VI) anions uptake. The removal rate of 90.1% and the maximum adsorption capacity of 18.77 mg/g were registered for 723 K carbonized pineapple leaves. Consistent with an endothermic reaction, the mechanism was found to be chemisorption and the system was well described by the pseudo-second order kinetic model. The intraparticle diffusion model, on the other hand, indicated that the system is governed by both film diffusion and intraparticule diffusion. Adsorption isotherm data were described by both Langmuir and Freundlich models. The calculated value of Gibbs free energy suggested that the reaction is spontaneous. Moreover, the Fourier Transform Infrared Spectrometer studies point out the carboxylate ion, aliphatic group and unsaturated group like alkene as responsible for Cr(VI) binding process. The results notice that the selected materials are appropriate for removing Cr(VI) anions from wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Activation Energy, Adsorbents, Adsorption, Adsorption Isotherm, Aqueous Solution, Biosorption, Carbonization, Chromium(Vi), Cr(Vi), Diffusion, Freundlich, Hydrogen Bonding, Intraparticle, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir And Freundlich Models, Mechanism, Organic Waste, pH, Pseudo Second Order, Removal, Sorption, Temperature, Uptake, Wastewater

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Full Text: [2011\Che Eng J173, 36.pdf](2011/Che%20Eng%20J173,%2036.pdf)

Abstract: Clay-based adsorbents were synthesized by incorporating anionic surfactants sodium dodecylbenzenesulfonate (SDBS), into calcined magnesium aluminum layered double hydroxide (MgA1-C) via ion exchange. The sample has been characterized by powder X-ray diffraction, FT-IR spectroscopy and B.E.T measurement. The result shows that SDBS adsorption on the calcined phase is enhanced by reconstruction of a matrix hydrotalcite intercalated by the dodecylbenzenesulfonate with basal spacing of 30 angstrom, which is larger than that of MgA1-CO3. The product which is an organophilic layered double hydroxide or organo-LDH (MgA1-SDBS) was examined for their ability to adsorb organic pollutant. The adsorption of 2,4,5-trichlorophenol (TCP) from aqueous solutions by MgA1-SDBS hydrotalcite was investigated in a batch mode. The influence of solution pH, initial TCP concentration and temperature has been tested in kinetic runs. The results showed that the kinetic adsorption could be described by a pseudo-second order model very well. The equilibrium isotherm for TCP uptake was fitted to the Langmuir model with correlation coefficient R2 of 0.998 at low concentrations and 0.992 for all concentrations. Its maximum adsorption amount is 240.5 mg/g from this model, while the real amount is 160 mg/g at 298 K and pH 4. The negative value of ΔGº and the positive value of ΔHº indicate the spontaneous and endothermic nature of the process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4,5-Trichlorophenol, 2,4-Dichlorophenol, Adsorption, Adsorption-Isotherms, Aqueous-Solutions, Clays, Equilibrium, FT-IR, FTIR, Granular Activated Carbon, Hydrotalcite, Ion Exchange, Ion-Exchange, Isotherm, Kinetic, Kinetics, Langmuir, Mg-Al-CO3 Hydrotalcite, Mga1-Sdbs, Models, pH, Phenol, Pollutant, Pseudo Second Order, Removal, Sorption, Temperature, Thermodynamic, Uptake, X-Ray Diffraction

? Wang, C., Feng, C., Gao, Y.J., Ma, X.X., Wu, Q.H. and Wang, Z. (2011), Preparation of a graphene-based magnetic nanocomposite for the removal of an organic dye from aqueous solution. *Chemical Engineering Journal*, **173** (1), 92-97.

Full Text: [2011\Che Eng J173, 92.pdf](2011/Che%20Eng%20J173,%2092.pdf)

Abstract: A graphene-based magnetic nanocomposite was synthesized and used as an adsorbent for the removal of a dye from aqueous solutions. The morphology and inner structure of the magnetic adsorbent were characterized by both scanning electron microscopy and X-ray diffraction. The adsorption characteristics of the graphene magnetic nanocomposite adsorbent were examined using an organic dye fuchsine as the adsorbate. The adsorption kinetics, adsorption capacity of the adsorbent, and the effect of the adsorbent dosage and solution pH on the removal efficiency of fuchsine were investigated. Freundlich model and Langmuir model were used to study the adsorption isotherms. The resultant kinetic data were well fitted by a pseudo second-order model. The graphene magnetic nanocomposite proved to be a highly efficient adsorbent and could be easily used for separation purposes. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solution, Carbon, Composite, Dye, Electron Microscopy, Freundlich, Fuchsine, Graphene, Graphene Magnetic Nanocomposite, Isotherms, Kinetic, Kinetics, Langmuir, Magnetic Separation, Oxide, pH, Preparation, Pseudo Second Order, Removal, Rise, Separation, X-Ray Diffraction

? Liu, F.Q., Li, L.J., Ling, P.P., Jing, X.S., Li, C.H., Li, A.M. and You, X.Z. (2011), Interaction mechanism of aqueous heavy metals onto a newly synthesized IDA-chelating resin: Isotherms, thermodynamics and kinetics. *Chemical Engineering Journal*, **173** (1), 106-114.

Full Text: [2011\Che Eng J173, 106.pdf](2011/Che%20Eng%20J173,%20106.pdf)

Abstract: A newly synthesized IDA (iminodiacetic acid)-chelating resin has been obtained and applied to explore the adsorption isotherms, thermodynamics, kinetics and mechanisms for the removal of heavy metal ions from aqueous solutions. Langmuir model can availably fit the isotherm data from which the obtained adsorption capacity follows the order of Cu(II) > Pb(II) > Cd(II). The thermodynamic constants indicate the spontaneous and endothermic nature. Adsorption kinetic data can be satisfactorily described by the pseudo-second-order equation. The first hydrolysis constant [log K(OH)] of metal ion is extremely relevant with the adsorption capacity. The coordinate conformation and interaction mechanism are further explored by Mass Spectrum and Thermo Gravimetric Analysis. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetic, Adsorption Performances, Biosorption, Cd(II), Complexes, Copper(II), Cu(II), Equilibrium, Heavy Metal Ions, Heavy Metals, Ida-Chelating Resin, Interaction Mechanism, Ions, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Lead, Mechanism, Newly Synthesized, Pb(II), Pseudo Second Order, Removal, Resin, Sorption, Structural Characterization, Thermodynamic, Thermodynamics

? Wang, J.H., Han, X.J., Ma, H.R., Ji, Y.F. and Bi, L.J. (2011), Adsorptive removal of humic acid from aqueous solution on polyaniline/attapulgite composite. *Chemical Engineering Journal*, **173** (1), 171-177.

Full Text: [2011\Che Eng J173, 171.pdf](2011/Che%20Eng%20J173,%20171.pdf)

Abstract: Polyaniline/attapulgite composite (ATP-PANI) was prepared by in situ chemical oxidation and characterized by FITR, XRD, and TEM. Characterized results showed that polyaniline (PANI) was successfully encapsulated on the surface of attapulgite (ATP). Humic acid (HA) adsorption onto ATP-PANI was investigated by batch experiments and adsorption kinetic tests. In contrast with the low HA adsorption amount on ATP, substantially enhanced HA adsorption onto ATP-PANI was observed. Adsorption isotherms of HA can be well described by Langmuir model and the maximum adsorption amounts were found to be 43.01, 52.91, 61.35 mg/g at 15, 25, and 35ºC, respectively. HA adsorption increased with rise in temperature indicating of an endothermic process of HA adsorption onto ATP-PANI. Pseudo-second order kinetic equation can fit HA adsorption very well and the adsorption rate decreased with increasing initial HA concentration. HA adsorption decreased monotonously with increasing solution pH. Co-existed cations (Na+, K+, Ca2+) in aqueous solution improved HA adsorption amount on ATP-PANI, and the augment of HA adsorption amount was order as Ca2+ > K+ > Na+. Results of HA adsorption onto ATP-PANI showed that the electrostatic interaction between amine and imine groups of the adsorbents and HA molecules in solution may account for the enhanced HA adsorption. The HA molecules adsorbed on ATP-PANI can be effectively desorbed in 2 M NaOH solution, and regenerated adsorbent can be repeatedly used in the subsequently four adsorption-regeneration cycles with little loss of HA adsorption amount. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherms, Aminated Polyacrylonitrile Fibers, Aqueous Solution, Attapulgite, Bentonite, Cations, Coated Granules, Composite, Desorption, FITR, Fly-Ash, Humic Acid, Isotherms, Kinetic, Langmuir, Mechanisms, Metal-Ions, Modified Attapulgite Clay, pH, Polyaniline, Polyaniline, Attapulgite Composite, Pseudo-Second Order, Pseudo-Second-Order, Removal, Temperature, Water

? Ferreira, L.S., Rodrigues, M.S., de Carvalho, J.C.M., Lodi, A., Finocchio, E., Perego, P. and Converti, A. (2011), Adsorption of Ni2+, Zn2+ and Pb2+ onto dry biomass of *Arthrospira* (*Spirulina*) *platensis* and *Chlorella* *vulgaris*. I. Single metal systems. *Chemical Engineering Journal*, **173** (2), 326-333.

Full Text: [2011\Che Eng J173, 326.pdf](2011/Che%20Eng%20J173,%20326.pdf)

Abstract: Adsorption of Ni2+, Zn2+ or Pb2+ by dry biomass of *Arthrospira* (*Spirulina*) *platensis* and *Chlorella vulgaris* was studied as a function of contact time and initial metal concentration. The zero point of charge calculated for these biosorbents (pH(zpc) 4.0 and 3.4, respectively) and additional pH tests suggested the use of pH in the range 5.0-5.5 for the experiments. The equilibrium isotherms were evaluated in terms of maximum sorption capacity and sorption affinity. The pseudo first and second order kinetic models were considered to interpret the experimental data, and the latter best described the adsorption system. Both the Freundlich and Langmuir models were shown to well describe the sorption isotherms, thus suggesting an intermediate mono/multilayer sorption mechanism. Compared to A. platensis (*q*e = 0.354, 0.495 and 0.508 mmol g-1 for Ni2+, Pb2+ and Zn2+, respectively), *C*. *vulgaris* behaved as a better biosorbent because of higher equilibrium sorption capacity (*q*e = 0.499, 0.634 and 0.664 mmol g-1, respectively). The removal efficiency decreased with increasing metal concentration, pointing out a passive adsorption process involving the active sites on the surface of the biomasses. The FT-IR spectroscopy evidenced that ions removal occurred mainly by interaction between metal and carboxylate groups present on both the cell walls. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Active, Adsorption, *Arthrospira* (*Spirulina*) *Platensis*, Biosorbent, Biosorbents, Biosorption, Cadmium, Chlorella Vulgaris, Equilibrium, Equilibrium Isotherms, Freundlich, Freundlich and Langmuir Models, FT-IR, FT-IR Spectroscopy, FTIR, Heavy Metals Sorption, Heavy-Metals, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Lead, Mechanism, Mechanisms, Nickel(II) Ions, Parameters, pH, Removal, Sorption, Sorption Isotherms

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Full Text: [2011\Che Eng J173, 334.pdf](2011/Che%20Eng%20J173,%20334.pdf)

Abstract: Babassu coconut (*Orbignya speciosa*) epicarp (BCE) was used as biomass to remove textile dyes from aqueous solution. Physical characteristics of the BCE were investigated using infrared spectroscopy (IR), point of zero charge (pH(pzc)), surface area, pore volume and diameter. A batch system was applied to study the sorption of Blue Remazol R160 (BR 160), Rubi S2G (R S2G), Red Remazol 5R (RR 5). Violet Remazol 5R (VR 5) and Indanthrene Olive Green (IOG) dye solutions by BCE. The effects of contact time and concentration on the sorption of the textile dyes onto the BCE were investigated. The interactions were assayed with respect to the pseudo-first-order, pseudo-second-order and the Elovich kinetic models by linear and non-linear regression methods, and were found to follow closely the pseudo-second-order. The ability of babassu coconut epicarp to sorb dyes gave the ordered set BR 160>VR 5>RR 5>R S2G >IOG. Equilibrium data also were fitted by linear and non-linear regression methods through the Langmuir, the Freundlich, the Temkin and the Dubinin-Radushkevich isotherm models. The equilibrium data were best represented by the Dubinin-Radushkevich, showing physical interactions between the species. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption Characteristics, Aqueous Solution, Babassu Coconut Epicarp, Basic-Dyes, Dubinin-Radushkevich Isotherm, Dye, Dye Removal, Dyes, Equilibrium, Freundlich, Hazardous Dye, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Low-Cost Sorbents, Metal-Ions, Nonlinear, Pseudo Second Order, Reactive Dyes, Regression-Analysis, Removal, Sorption, Sorption Isotherms, Waste Materials

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Full Text: [2011\Che Eng J173, 361.pdf](2011/Che%20Eng%20J173,%20361.pdf)

Abstract: Date seed (DS), an abundant and inexpensive natural resource in Iraq, was used to prepare DS activated carbon (DSAC) by physiochemical activation with potassium hydroxide (KOH) and carbon dioxide (CO2) as the activating agents at 850ºC for 3 h and 37 min. The adsorption kinetics and equilibrium of bentazon and carbofuran onto DSAC were examined in batch process. Adsorption studies were conducted in the pesticides initial concentration range of 25-250 mg/L, temperature of 30ºC and pH of 5.5. The pH studies were undertaken in the pH range 2-12. The adsorption kinetic data were analyzed by non-linear fitting using the pseudo-first-order and pseudo-second-order models. The adsorption of bentazon and carbofuran was better described by the pseudo-second-order equation. The experimental equilibrium data were analyzed by non-linear fitting using Langmuir and Freundlich isotherm models. Equilibrium data fitted better with the Freundlich model for both pesticides. DSAC showed higher adsorption in the case of carbofuran than for bentazon. Desorption of the used DSAC was studied using ethanol as solvent and percent desorption efficiencies of 84.1 and 82.2% were obtained after three cycles for bentazon and carbofuran, respectively. The high adsorption capacity of DSAC obtained for both pesticides showed that DS is a good precursor for the preparation of activated carbon for the adsorptive removal of bentazon and carbofuran. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4-D, Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Desorption, Equilibrium, Freundlich, Freundlich Isotherm, Functional Groups, Isotherm, Isotherms, Kinetic, Kinetics, Koh, Langmuir, Mechanism, Model, Nonlinear, Pesticides, Pesticides, pH, Pseudo Second Order, Removal, Shell, Stones, Surface-Area, Temperature, Water

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Full Text: [2011\Che Eng J173, 391.pdf](2011/Che%20Eng%20J173,%20391.pdf)

Abstract: Corncob activated carbon (CCAC) was prepared and its ability to remove 2,4-dichlorophenoxyacetic acid (2,4-D) from aqueous solutions was studied. The BET surface area, Langmuir surface area and cumulative pore volume of CCAC were 1273.91 m/g, 2010.12 m2/g and 0.900 cm3/g, respectively. The adsorption kinetics was best represented by the pseudo-second-order model. The superiority of the Freundlich isotherm model in describing the equilibrium adsorption data was shown by the adjusted correlation coefficients (R(adj)(2)) and root-mean squared error (RMSE) values. High percent removal of 69.10, 69.58 and 73.86% were achieved for 2,4-D initial concentration of 400 mg/L at 30,40 and 50ºC, respectively. Activation energy, E(a) for the adsorption was determined to be 39.87 kJ/mol and a diffusion-controlled process indicating physisorption mechanism was proposed. From the thermodynamic parameters determined, the adsorption was found to be spontaneous and endothermic in nature. Intraparticle diffusion and Boyd kinetic models confirmed film diffusion as the rate-controlling step. A single-stage batch adsorber was designed to obtain the mass of CCAC required to achieve desired percent removal of 2,4-D from effluent solutions of different volumes using the Freundlich equation. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4-D, Activated Carbon, Activation Energy, Adsorption, Adsorption Kinetics, Aqueous-Solution, Bet Surface Area, Carbofuran Pesticides, Characterization, Chemical Activation, Corncob, Degradation, Diffusion, Equilibrium, Equilibrium, Freundlich, Freundlich Isotherm, Herbicide, Intraparticle, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Mechanism, Pesticide, Physisorption, Preparation, Pseudo Second Order, Removal, Sorption, Surface-Area, Thermodynamic, Thermodynamic Parameters, Water

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Full Text: [2011\Che Eng J173, 422.pdf](2011/Che%20Eng%20J173,%20422.pdf)

Abstract: In this study, bacterial strains were investigated in order to determine their heavy metal tolerance. The bacterial strains were identified as Bacillus cereus and Bacillus pumilus. in the batch system, the effects of operating variables such as solution pH, initial metal concentration, contact time, and adsorbent dosage were investigated. Both isolates were highly resistance to copper and lead in comparison with the control strain examined. The adsorption capacities of B. cereus and B. pumilus were found to be 22.1 mg/g and 28.06 mg/g, respectively. The biosorption follows pseudo-second order kinetics and the isotherm fits well to the Langmuir isotherm model. In column experiments, the biosorption was fitted well by the Thomas model. The breakthrough and exhaustion capacity of each biosorbent decreased with increasing flow rate. In the fixed-bed system, the biosorption capacities of, B. cereus and B. pumilus were observed to be higher than that of the batch system. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Bacillus Cereus, Bacillus Pumilus, Bacteria, Biomass, Biosorbent, Biosorption, Carbon, Copper, Corynebacterium-Glutamicum, Effluent, Equilibrium, Heavy Metal Resistance, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lead, pH, Pseudo Second Order, Removal, Soil, Thomas Model, Waste

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Full Text: [2011\Che Eng J173, 446.pdf](2011/Che%20Eng%20J173,%20446.pdf)

Abstract: A novel spherical composite of polyvinyl alcohol (PVA) and attapulgite (ATP) with macroreticular structure, i.e. MR-PVA/ATP composites, was prepared as an adsorbent for some contaminations from aqueous environment, which would hold the advantages of PVA and ATP in the same time. The resulting adsorbents hold uniform and rich aperture with good mass transfer property, processing properties and stability. It has been proved with easy separation and excellent adsorption for methylene blue and lead in aqueous solution, and the adsorption rate will be accelerated when increasing porogen in its preparation. The adsorption process of methylene blue and lead on it includes both chemo-adsorption and physical adsorption. The adsorption process all fits the pseudo second order kinetics very well with rapid initial adsorption rate. The addition of attapulgite increased the adsorption capacity of lead ions significantly. By further graft functional groups on the ATP, it has potential to prepare various adsorbents to satisfy specific requirements. Such kind of adsorption material will perform a wide application prospect in the purification treatment for wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous Solution, Attapulgite, China, Clays, Composite, Dyes, Dyes Adsorption, Heavy Metal Removal, Hg(II), Ion, Iron, Kinetics, Lead, Methylene Blue, Palygorskite, Preparation, Pseudo Second Order, PVA, Removal, Separation, Wastewater, Water-Pollution

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Full Text: [2011\Che Eng J173, 494.pdf](2011/Che%20Eng%20J173,%20494.pdf)

Abstract: Magnetic cellulose/Fe3O4/activated carbon composites (m-Cell/ Fe3O4/ACCs) were prepared successfully and characterized by X-ray diffraction (XRD), Brunauer-Emmett-Teller (BET), thermogravimetric analysis (TGA), scanning electron microscopy (SEM) and vibrating sample magnetometer (VSM). The adsorption of congo red onto the novel m-Cell/Fe3O4/ACCs was studied as a function of contact time, initial concentration of congo red, adsorbent dosage, and pH of solution. The saturated magnetization of m-Cell/Fe3O4/ACCs reached 48.2 emu g(-1) and the magnetic adsorbent showed characteristics of super-paramagnetism, which indicated that m-Cell/Fe3O4/ACCs could be separated from treated solution by a magnetic process. A comparison of kinetic models showed that the overall adsorption process was best described by pseudo-second-order kinetic model. Thermodynamic analysis indicated an exothermic nature of adsorption and a spontaneous and favorable process. The m-Cell/Fe3O4/ACCs might be a promising candidate of high efficiency, low cost and convenient separation under magnetic field. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activated Carbon, Adsorbent, Adsorption, Anionic Dyes, Aqueous-Solutions, Azo Dye, Cellulose, Cellulose, Composite, Congo Red, Dye Waste-Water, Electrochemical Treatment, Electron Microscopy, Equilibrium, Fly-Ash, Kinetic, Kinetic Model, Kinetic Models, Magnetic, Magnetic Material, Methylene-Blue, Nanocomposite, pH, Pseudo Second Order, Recovery, Removal, SEM, Separation, Thermodynamic, X-Ray Diffraction

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Full Text: [2011\Che Eng J173, 511.pdf](2011/Che%20Eng%20J173,%20511.pdf)

Abstract: A novel porous composite membrane adsorbent GA-HA/SA was prepared by glutaraldehyde (GA) crosslinked humic acid (HA) immobilized sodium alginate (SA) and used to remove Cu(II) ions from wastewater. Compared with traditional centrifugation or filtration methods for separating adsorbent from solution, the Cu-HA/SA can be used more conveniently. The physico-chemical properties of GANA/SA before and after adsorption were investigated by FT-IR, SEM and EDX methods. To investigate the effects of experimental parameters on adsorption behavior, a batch of experiments were performed by changing the concentration of porogen polyethylene glycol in the GA-HA/SA, solution pH, ionic strength, initial Cu(II) ions concentration and contact time. The GA-HA/SA showed the maximum uptake of 63.1 mg/g under the optimal adsorption condition. Based on adsorption experiment, it can be found that uptake capacity of the GA-HA/SA for Cu(II) ions decreased with an increasing of ionic strength, and solution pH decreased until the adsorption equilibrium. Kinetics experiments indicated the pseudo-second-order model displayed the best correlation with adsorption kinetics data. The Crank model showed that the intraparticle solute diffusion is the rate-controlling adsorption step. Besides, adsorption experimental data could be better described by the Freundlich isotherm model. (C) 2011 Published by Elsevier B.V.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Mechanism, Alginate, Aqueous Solution, Biosorption, Coadsorption, Composite, Copper(II), Cu(II), Desorption, Diffusion, Equilibrium, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Goethite, Hollow-Fiber Membranes, Humic Acid, Ionic Strength, Isotherm, Kinetics, Mechanism, Membrane, pH, Pseudo Second Order, Removal, SEM, Sodium Alginate, Sorption, Uptake, Waste-Water, Wastewater

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Full Text: [2011\Che Eng J173, 520.pdf](2011/Che%20Eng%20J173,%20520.pdf)

Abstract: Chitosan (CS) was used for the adsorption of Cu(II), Zn(II), Cd(II) and Pb(II) complexes with the ‘green’ chelating agent - polyaspartic acid (DS) from waste water effluents. CS samples were characterized using FT-IR spectroscopy and AFM analysis. Among different factors that influence the sorption process, the following were studied in detail: solution pH, initial concentration, phase contact time, temperature and effect of competitive ions. The most important factor affecting the effectiveness of sorption is pH and concentration. From the Langmuir adsorption model, the adsorption capacity of CS for Cu(II), Zn(II), Cd(II) and Pb(II) complexes was equal to: 85.21 mg/g, 46.82 mg/g, 89.58 mg/g and 79.05 mg/g, respectively. The results showed that the pseudo second-order model was more suitable to describe the sorption kinetics on CS. The rate constant (k2) decreases with the increasing metal complexes concentration, whereas the equilibrium sorption capacity (q2) and the initial sorption rate (h) increase. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Properties, Aqueous-Solutions, Beads, Biodegradable, Biopolymers, Cd(II), Chelating-Agents, Chitosan, Cs, Cu(II), Cu(II) Ions, Derivatives, Equilibrium, FT-IR, FT-IR Spectroscopy, FTIR, Kinetics, Langmuir, N-Succinyl-Chitosan, Pb(II), pH, Pseudo Second Order, Removal, Sorbent, Sorption, Sorption Kinetics, Temperature, Waste, Waste-Water, Water

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Full Text: [2011\Che Eng J173, 773.pdf](2011/Che%20Eng%20J173,%20773.pdf)

Abstract: The goal of this paper is to study the effectiveness of the weakly (Amberlite IRA 67) and strongly (Amberlite IRA 458) basic gel anion exchangers of polyacrylic matrix in Direct Red 75 (DR75) removal from aqueous solutions and wastewaters. The monolayer sorption capacities Q(0) determined from the Langmuir isotherm model for the weakly and strongly basic anion exchangers were found to be 994.9 and 430.8 mg/g, respectively. For comparison, a low cost sorbent prepared from orange peels exhibited low affinity for the dye, Q(0) equals 74.1 mg/g. The presence of inorganic salts such as NaCl. Na2CO3 and Na2SO4 as well as the non-ionic surfactant exhibited only minor effects on the dye sorption. The uptake of DR75 was remarkedly reduced in the presence of the cationic surfactant. The sorption of DR75 on the anion exchangers was pH independent. The kinetics fitted the pseudo-second order rate expression. With the decreasing particle sizes of anion exchangers, the increase in dye loading was observed. Almost 60% of dye can be desorbed from Amberlite IRA 67 using 1 M NaOH in 40% methanol. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Anion Exchangers, Direct Dyes, Dye Removal, Effluents, Isotherm, Kinetic-Models, Kinetics, Langmuir, Methylene-Blue, pH, Reactive Dyes, Resins, Sorbents, Sorption, Wood Sawdust

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Full Text: [2011\Che Eng J173, 782.pdf](2011/Che%20Eng%20J173,%20782.pdf)

Abstract: The use of iron based waterworks sludge as an adsorbent for the removal of cationic (Basic Violet 16), anionic (Direct Blue 71, Acid Blue 40, and Reactive Blue 29) and non-ionic (Disperse Brown 19) was investigated. Initial adsorption studies demonstrated that Direct Blue 71 and Disperse Brown 19 were adsorbed poorly by the sludge. Data obtained from further batch studies were applied to commonly used isotherm models. Among them, Langmuir isotherm model were found to be the best fitted one and based on Langmuir isotherm model adsorption capacities were 625 mg/g for Direct Blue 71, 833.34 mg/g for Acid Blue 40, and 3333.34 mg/g for Basic Violet Blue 16. Kinetic examinations were also performed for all dye tested and it was found that adsorption kinetic was best described by pseudo second-order kinetic model. Gibbs free energy values of the dye-sludge system were calculated and the negative values were found for Direct Blue 71, Acid Blue 40 and Basic Violet 16 indicating the spontaneity of the adsorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Alum Sludge, Basic Dye, Colour Removal, Congo Red, Decolorization, Equilibrium, Ferric Sludge, Isotherm, Kinetic, Langmuir, Methylene-Blue, Reactive Dyes, Removal, Sorption, Waste-Water

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Full Text: [2011\Che Eng J173, 792.pdf](2011/Che%20Eng%20J173,%20792.pdf)

Abstract: Ammonium citrate modified spent *Lentinus edodes* was investigated as a novel adsorbent for Pb(II) removal from aqueous solution. The results of Fourier transform infrared (FTIR) spectroscopy and scanning electron microscopy (SEM) analysis showed that modification by ammonium citrate obviously changed the property of spent L. edodes that enhanced the adsorption capacity. In batch studies, pH, initial Pb(II) concentration and adsorbent dose were found to significantly affect Pb(II) removal by a two-level Plackett-Burman design. The effects of foreign substances (ion strength, inorganic ions (anions, cations) and surfactants) on Pb(II) removal were studied. The adsorption process was well described by the pseudo-second-order model. The adsorption equilibrium data followed the Langmuir model and gave the maximum adsorption capacity of 59.17 mg/g at 35°C. The adsorption mechanism was found to be dominated by ion exchange and electrostatic attraction on exterior, accompanying with the intraparticle diffusion transporting adsorbed Pb(II) from exterior to interior. The adsorbent could be regenerated by 0.1 M HNO3, which led only a tiny decrease in adsorption capacity after three adsorption-desorption cycles. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Biomass, Biosorption, By-Product, Carbon Nanotubes, Cd(II), Divalent Lead, FTIR, Langmuir, Mechanism, Pb(II) Ions, pH, Plackett-Burman Design, Removal, Single Metal Solutions, Spent Lentinus Edodes, Succinic Anhydride, Waste-Water

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Full Text: [2011\Che Eng J173, 855.pdf](2011/Che%20Eng%20J173,%20855.pdf)

Abstract: Pristine, oxidized, ethylenediamine, diethylenetriamine and triethylenetetramine modified multi-walled carbon nanotubes (raw-MWCNT, o-MWCNT, e-MWCNT, d-MWCNT and t-MWCNT, respectively) were employed as adsorbents in order to study individual and competitive adsorption characteristics of Pb2+ and Cd2+ ions. In batch tests, the influence of functionalization, pH, contact time, initial metal ion concentration and temperature, on the ion adsorption on MWCNTs was studied. Adsorption of Pb2+ and Cd2+ on MWCNTs strongly depends on pH. Time dependent Pb2+ adsorption and adsorption data can be described by pseudo-second-order kinetic model and by Langmuir isotherm, respectively. The maximum adsorption capacities of Pb2+ and Cd2+ on d-MWCNT were 58.26 and 31.45 mg g-1 at 45°C. respectively. The competitive adsorption studies showed that the metal order affinity with respect to d-MWCNT and e-MWCNT is Pb2+ > Cd2+. Thermodynamic parameters showed that the adsorption of Pb2+ on appropriate nanotubes was spontaneous and endothermic. According to desorption studies, regenerated MWCNT can be reused over five times with minimal loss of adsorption capacity. Comparison of obtained results with capacities and affinities of other adsorbents indicates suitability of amino-functionalized MWCNT application for removal of Pb2+ and Cd2+ from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Mechanism, Amino-Functionalization, Aqueous-Solution, Carbon Nanotubes, Heavy-Metals, Isotherm, Langmuir, Lead, Membranes, Metal-Ions, Pb(II), Pb2+, pH, Removal, Sorption, Surface-Chemistry, Thermodynamic, Thermodynamic Parameters

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Full Text: [2011\Che Eng J174, 18.pdf](2011/Che%20Eng%20J174,%2018.pdf)

Abstract: Ethylenediamine grafted cellulosic fibers (ED-cotton) were synthesized by the reaction of chlorodeoxycellulose (CDC) with (ED). The performance of the modified materials was characterized by Fourier transform-infrared (FTIR), atomic force microscopy (AFM) and elemental analysis of nitrogen. The prepared ED-cotton support was assessed for the removal of copper ions from aqueous solutions using a batch process. The effects of pH, copper initial concentration and contact time were investigated. The kinetic adsorption was found to follow the pseudo-second-order kinetic model. Results revealed the formation of a 1:1 complex as proved by the adsorption limit. The binary system [Cu(II)/ED-cotton] was then tested in a bed fixed column for the adsorption of Acid Blue 25, as ligand in the metal-coordinating process. The effects of various experimental conditions, such as the flow rate, bed height and internal diameter, were studied. The Bed Depth Service Time (BDST) model was found suitable for the description of breakthrough curves at all experimental conditions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Adsorption, Afm, Amidoximated Cellulose, Anionic Residual Dyes, Cotton, Dyes, Fixed Bed Adsorption, Fixed-Bed, Ftir, Heavy Metal, Ion-Exchanger, Kinetics, Metal-Ions, Methylene-Blue, Modeling, pH, Preparation, Rice Husk, Waste-Water

? Salman, J.M., Njoku, V.O. and Hameed, B.H. (2011), Batch and fixed-bed adsorption of 2,4-dichlorophenoxyacetic acid onto oil palm frond activated carbon. *Chemical Engineering Journal*, **174** (1), 33-40.

Full Text: [2011\Che Eng J174, 33.pdf](2011/Che%20Eng%20J174,%2033.pdf)

Abstract: Adsorption of 2,4-dichlorophenoxyacetic acid (2,4-D) from aqueous solution onto activated carbon derived from oil palm frond (PFAC) was investigated using batch and column systems. The effects of contact time, initial concentration of 2,4-D, temperature and pH on the adsorption were studied using the batch technique. The adsorption kinetic data were analyzed using the pseudo-first- and pseudo-second-order models and the results showed that the pseudo-second-order model best described the adsorption kinetics. The adsorption isotherms of 2,4-D on PFAC were analyzed using the Langmuir and Freundlich isotherm models and the results showed that a better fit was achieved with the Langmuir model. The determined thermodynamic parameters, ΔG degrees, ΔH degrees and ΔS degrees showed that the adsorption of 2,4-D onto PFAC was feasible, spontaneous and exothermic under the examined conditions. For the column studies, the effects of initial concentration of 2,4-D, bed-height and flow rate on the adsorption of 2,4-D onto PFAC were investigated. The highest bed capacity of 45 mg/g at 150 mg/L 2,4-D initial concentration, 10 mL/min flow rate and 3 cm PFAC bed-height was obtained. Three models, namely Bohart-Adams. Thomas and Yoon-Nelson, were applied to predict the breakthrough curves and to determine the characteristic parameters. The average relative error met hod was used to determine the model with the best fit and it was found that the Bohart-Adams model best described the continuous adsorption of 2,4-D onto PFAC. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4-D, Adsorption, Aqueous-Solutions, Basic Dye, Breakthrough Characteristics, Carbofuran Pesticides, Chemical Activation, Column Studies, Equilibrium, Isotherm, Kinetics, Kinetics, Langmuir, Pesticide, pH, Removal, Surface-Area, Waste

? Salman, J.M., Njoku, V.O. and Hameed, B.H. (2011), Adsorption of pesticides from aqueous solution onto banana stalk activated carbon. *Chemical Engineering Journal*, **174** (1), 41-48.

Full Text: [2011\Che Eng J174, 41.pdf](2011/Che%20Eng%20J174,%2041.pdf)

Abstract: Activated carbon was prepared from banana stalk by potassium hydroxide (KOH) and carbon dioxide (CO2) activation and its ability to remove the pesticides, 2,4-dichlorophenoxyacetic acid (2,4-D) and bentazon was explored. The banana stalk activated carbon (BSAC) was characterized by Fourier transform infrared spectroscopy (FT-IR) analysis. The adsorption kinetic data were analyzed using two kinetic models: the pseudo-first-order and pseudo-second-order models. The adsorption kinetics was better represented by the pseudo-second-order model. The equilibrium adsorption data obtained at 30, 40 and 50 degrees C were analyzed by Langmuir and Freundlich isotherm models and results showed that it was better described by the Freundlich model. Higher adsorption capacity observed for 2,4-D than bentazon were attributed to the presence of electron-withdrawing -Cl groups on the aromatic ring and smaller molecular size of 2,4-D. The thermodynamic parameters, ΔG degrees, ΔH degrees and ΔS degrees determined, showed that the adsorption of 2,4-D and bentazon onto BSAC was feasible, spontaneous and exothermic. The results showed that BSAC is an efficient adsorbent for the adsorptive removal of 2,4-D and bentazon from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4-D, 2,4-Dichlorophenoxy Acetic-Acid, 2,4-Dichlorophenoxyacetic Acid, Activated Carbon, Activation, Adsorption, Bentazon, Bentazon, Carbofuran Pesticides, Chemical Activation, Degradation, Equilibrium, Ftir, Isotherm, Kinetic, Kinetics, Langmuir, Removal, Sepiolite, Surface-Area, Thermodynamic, Waste-Water

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Full Text: [2011\Che Eng J174, 49.pdf](2011/Che%20Eng%20J174,%2049.pdf)

Abstract: Activated carbon derived from avocado kernels (AAC) was evaluated for its ability to remove phenol. The Brunauer-Emmett-Teller (BET) surface area of the AAC was 206 m2 g-1 and the total pore volume was 0.100 cm3 g-1. The kinetic of the adsorption process was described by a pseudo-second-order rate model. The maximum uptake was obtained at pH values between 4 and 8.5. The optimum adsorbent dose obtained was 0.1 g. The thermodynamic parameters exhibited the feasibility and the spontaneous nature of the adsorption process. Adsorption isotherms showed that the interaction of phenol with AAC surface was described by a localized monolayer adsorption. The adsorption mechanism was discussed based on experimental results, and the pi-pi interactions were considered to be an important parameter in the adsorption process. The adsorbent regeneration was investigated using several types of desorbing agents, but no agent show any promising result. The results showed that the prepared activated carbon was an effective adsorbent for phenol removal from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Isotherms, Avocado Kernel, Beet Pulp, Bet, Chemistry, Equilibrium, Models, pH, Phenol, Porosity, Sawdust, Surface-Properties, Water

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Full Text: [2011\Che Eng J174, 68.pdf](2011/Che%20Eng%20J174,%2068.pdf)

Abstract: Via encapsulation of attapulgite/Fe3O4 magnetic particles (ATP/Fe3O4), the magnetic molecularly imprinted polymers (MMIPs) were synthesized for the selective recognition of 2,4-dichlorophenol (2,4-DCP). MMIPs were characterized by X-ray diffraction (XRD), Fourier transform infrared (FT-IR) analysis, thermogravimetric analysis (TGA), vibrating sample magnetometer (VSM), transmission electron microscopy (TEM), nitrogen adsorption-desorption analysis and Raman spectroscopy. MMIPs were demonstrated claviform shape with an imprinted polymer film (thickness of about 16 nm), and exhibited magnetic property (M(s) = 5.67 emu g-1) and thermal stability. Batch mode adsorption studies were carried out to investigate the specific binding capacity, binding kinetics and recognition specificity. The Langmuir isotherm model was fitted to the equilibrium data better than the other models, and the monolayer adsorption capacity of MMIPs were 145.79 mg g-1 at 298 K. The kinetic properties of MMIPs were well described by the pseudo-second-order equation, initial adsorption rate and half-adsorption time. The selective recognition experiments demonstrated high affinity and selectivity towards 2,4-DCP over structurally related phenolic compounds. In addition, MMIPs could be regenerated, and their adsorption capacity in the fifth use was about 7.53% loss in 2,4-DCP solution. The MMIPs as-prepared were successfully applied to the separation of 2,4-DCP from environmental water samples. Crown Copyright (C) 2011 Published by Elsevier B.V. All rights reserved.

Keywords: 2,4-Dichlorophenol, Adsorption, Aqueous-Solution, Attapulgite, Fe3O4 Magnetic Particles, Beta-Cyclodextrin, Attapulgite Composites, Ftir, Isotherm, Kinetics, Langmuir, Magnetic Susceptibility, Microspheres, Nanoparticles, Polymerization, Removal, Selective Recognition, Separation, Surface Imprinted Polymers, Thermodynamics

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Full Text: [2011\Che Eng J174, 117.pdf](2011/Che%20Eng%20J174,%20117.pdf)

Abstract: Activated carbons (ACs) of coconut shell produced by NaOH activation at impregnation ratios of NaOH:char (w/w) equal to 1:1 (AC-1), 2:1 (AC-2) and 3:1 (AC-3) were prepared. The properties of these carbons, including BET surface area, pore volume, pore size distribution, and pore diameter, were characterized from N2 adsorption isotherms. It was found that the ACs are essentially microporous and that the BET surface area was in order of 783 m2 g-1 for AC-1, 1842 m2 g-1 for AC-2, and 2825 m2 g-1 for AC-3. Scanning electron microscopy images showed a high pore development while Boehm method and Fourier-transform infrared spectroscopy spectra indicated the presence of acid functional groups which was confirmed by pH drift method. The adsorption equilibrium and kinetics of methylene blue (MB) onto AC-3 were carried out. Experimental data were fitted to the four isotherm models (Langmuir, Freundlich, Toth and Redlich-Peterson), and was found that Langmuir model presented the best fit, showing maximum monolayer adsorption capacity of 916 mg g-1. The kinetic studies showed that experimental data follow pseudo-second-order model. The mechanism of the adsorption process was described from the intraparticle diffusion model. The AC-3 has a high surface area and showed to be an efficient adsorbent for removal of MB from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activation, Adsorption, Aqueous-Solutions, Basic Dye, BET, Chemical Activation, Coconut Shell, Delonix-Regia Pods, Heavy-Metal, Husk, Isotherm, Kinetics, KOH-Activation, Langmuir, Methylene Blue, NaOH-Activated Carbon, pH, Removal, Waste

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Full Text: [2011\Che Eng J174, 151.pdf](2011/Che%20Eng%20J174,%20151.pdf)

Abstract: In the present work the potential of Parthenium (P. hysterophorus L.) weed to remove Cr(VI) ions from aqueous solution was reported. FTIR was used to study the functional groups present on the surface of the biosorbent and it was found that carboxyl, amine and alkane groups were the leading Cr binding groups. Effect of various parameters such as contact time, temperature, pH, agitation speed, biosorbent dose and initial Cr(VI) concentration on the biosorption was investigated by batch process. The equilibrium data was well described by both Langmuir and Freundlich isotherms. The biosorption capacity of Parthenium weed for Cr(VI) was found to be 24.5 mg g-1 at pH 1.0, 0.1 g biomass dose, 200 rpm, 160 min equilibrium time and 20 degrees C. The study of thermodynamic parameters confirmed that the biosorption of Cr(VI) onto Parthenium weed was feasible, spontaneous and exothermic within 20-60 degrees C. The magnitude of heat of biosorption was calculated as 7.83 kJ mol-1 which confirmed that biosorption followed the physical process. Kinetic evaluation of experimental data showed that biosorption of Cr(VI) closely followed pseudo-second-order kinetics and surface diffusion was found to be the rate controlling step. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Biomass, Biosorption, Copper(II), Cr(Vi), Equilibrium, Ftir, Hexavalent Chromium, Ions, Kinetic, Kinetics, Langmuir, Mechanism, Metals, Parameters, pH, Removal, Thermodynamics, Waste, Waste Biomass, Wastewater Treatment

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Full Text: [2011\Che Eng J174, 221.pdf](2011/Che%20Eng%20J174,%20221.pdf)

Abstract: The rattle-type gamma-Fe2O3/mesoporous silica spheres (gamma-Fe2O3/mSiO2 spheres) were synthesized with a facial and selectively etching strategy. The prepared particles were characterized by FT-IR, XRD,TEM, SEM, VSM, Raman spectroscopy and nitrogen adsorption-desorption analysis, and the results indicated that gamma-Fe2O3/mSiO2 spheres exhibited magnetic property (M(s) = 14.43 emu g-1) and composed of mesoporous silica (mean diameter, thickness and pore size was 660 nm, 60 nm, and 2.29 nm, respectively). Then the gamma-Fe2O3/mSiO2 spheres were employed as sorbents to remove tetracycline (TC) and sulfamethazine (SMZ) in both single and binary aqueous solutions. The adsorption kinetics of gamma-Fe2O3/mSiO2 spheres were well-described by the pseudo-second-order equation, initial adsorption rate, and half-adsorption time. The Langmuir isotherm model was fitted to the equilibrium data better than that for Freundlich model, and the monolayer adsorption capacity of gamma-Fe2O3/mSiO2 spheres for TC and SMZ were 0.0791 mmol g-1 and 0.0342 mmol g-1 at 298K, respectively. In binary systems, SMZ adsorption onto gamma-Fe2O3/mSiO2 spheres was more affected by the simultaneous presence of competitive antibiotics than that for TC. In addition, the reusability of the material without obviously deterioration in performance was observed at least four repealed cycles. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Dye Adsorption, Ftir, Gamma-Fe2O3, Msio2 Spheres, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Nanoparticles, Removal, Soils, Sorption, Sulfamethazine, Tetracycline, Wood Sawdust

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Full Text: [2011\Che Eng J174, 310.pdf](2011/Che%20Eng%20J174,%20310.pdf)

Abstract: Chestnut (C) and mimosa (M) tannins immobilized on chrome shavings (CS) as an adsorbent have been proposed to be an efficient and economical alternative in hexavalent chromium removal from aqueous solutions. The adsorption of hexavalent chromium onto chrome shavings-tannin (CS-T) adsorbents was performed using batch equilibrium technique at 25 +/- 2 degrees C. The effect of pH is highly important especially in the case of high concentrations of hexavalent chromium. The maximum chromium uptake was obtained at pH 4. Two hours of contact time are enough to reach equilibrium. Sorption of chromium on CS-T was found to follow a pseudo-second order kinetic model (with correlation coefficients greater than 0.999). The adsorption equilibrium data fitted the Langmuir model well. The maximum adsorption capacity, of dry immobilized tannin adsorbent with 11.6% polyphenol, reached 42 mg Cr/g and 38 mg Cr/g in the case of chestnut and mimosa tannins, respectively. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous-Solutions, Chrome Shavings, Cr(VI), Heavy-Metal, Hexavalent Chromium, Immobilization, Ions, Langmuir, Leather Industry, Membrane, Natural Condensed Tannin, pH, Solid-Wastes, Sorption, Tannins

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Full Text: [2011\Che Eng J174, 326.pdf](2011/Che%20Eng%20J174,%20326.pdf)

Abstract: Bamboo charcoal-based, iron-containing adsorbent (Fe-BC) was developed by using bamboo charcoal (BC) as a supporting medium for ferric iron that was impregnated by Fe2(SO4)3 and H2SO4 simultaneous treatment, followed by microwave heating. The low-cost composite was characterized and used as an adsorbent for Cr(VI) removal from water. The results showed that the BET specific surface area, total pore volume, and average mesoporous diameter of Fe-BC all decreased with iron impregnation. As an adsorbent, Fe-BC showed an excellent adsorption capability for Cr(VI), the adsorption process followed the Langmuir model, and the adsorption kinetic followed pseudo-second-order model. The adsorption of Cr(VI) onto Fe-BC was spontaneous and exothermic under the studied conditions. Column adsorption experiment with Fe-BC showed that Cr(VI) could be removed to below 0.05 mg/L within 360 bed volumes at empty bed contact time 2 min when the groundwater containing approximately 0.12 mg/L of Cr(VI) was treated. The spent Fe-BC adsorbent could be readily regenerated for reuse by dilute NaOH solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Aqueous-Solutions, Arsenic Removal, Bamboo Charcoal, BET, Cr(VI), Drinking Water, Granular Activated Carbon, Heavy Metal, Hexavalent Chromium Reduction, Hydrous Ferric-Oxide, Langmuir, Low-Cost Adsorbents, Scrap Iron, Water, Zero-Valent Iron

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Full Text: [2011\Che Eng J174, 510.pdf](2011/Che%20Eng%20J174,%20510.pdf)

Abstract: Weakly basic anion (WBA) exchange resins applicability in palladium(II) removal from the acidic solution systems was tested. Equilibrium experiments, kinetics, effects of phase contact time, acids and sodium chloride concentrations on Pd(II) sorption were studied by means of both batch and fix-bed column methods. In this paper the analysis of the data obtained for Amberlite IRA-92, Amberlite IRA-95, Amberlite IRA-96, Dowex 66, Varion ADAM and Lewatit MP-62 was discussed and compared to those obtained for Amberlyst A-23, Amberlyst A-24, Dowex WGR-2 and Amberlyst A-21. The sorption capacity as high as 121.48 mg/g for Varion ADAM was found. The sorption process of Pd(II) on the weakly basic anion exchange resins was fast and the sorption capacities were found to be influenced by the acids and sodium chloride addition. The studies of Pd(II) uptake using the fix-bed columns confirm the greater affinity of Varion ADAM for Pd(II) than of the other weakly basic anion exchangers. Kinetics of Pd(II) follows the pseudo-second order kinetic equation. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Chloride Solutions, Equilibrium, Kinetic, Kinetics, Linked Chitosan Resin, Palladium, Pd(II), Platinum, Precious Metals, Removal, Separation, Sorption, Sorption, Trace Amounts, Weakly Basic Anion Exchanger

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Full Text: [2011\Che Eng J174, 556.pdf](2011/Che%20Eng%20J174,%20556.pdf)

Abstract: An adsorption gel was prepared by crosslinking the persimmon tannin with concentrated sulfuric acid and adsorption behavior of Au(III) from acidic chloride media on the crosslinked gel as well as crude persimmon tannin powder was evaluated. The crosslinked gel exhibited 100% adsorption of Au(III) over a whole concentration range of MCI from 0.1 to 6.0 M (M=mol dm-3) while crude persimmon tannin powder achieved 100% adsorption only in the low concentration region of HCl. The maximum adsorption capacity of the crosslinked gel for Au(III) was evaluated as high as 7.7 mol/kg whereas it was only 5.8 mol/kg for the crude tannin powder. The phenomenon of adsorption coupled reduction is considered to be responsible for the high adsorption of Au(III). The reduction of Au(III) to its elemental form was confirmed by XRD and digital micrograph of the adsorbents after the adsorption of Au(III). The reaction kinetics at different temperatures for both adsorbents was evaluated in terms of pseudo-first-order and pseudo-second-order kinetic models. As revealed by the high activation energy (E(d)) value, adsorption of Au(III) on both the adsorbents was found to be a chemical phenomenon. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acidic Chloride Media, Activation, Adsorbent, Adsorption, Adsorption, Aqueous-Solutions, Au(III), Crosslinking, Gel, Gold, Gold Recovery, Gold(III), Hydrochloric-Acid, Kinetic, Kinetic Models, Kinetics, Linked Chitosan Resin, Natural Condensed Tannin, Palladium(II), Persimmon Tannin Extract, Recovery, Reduction, Waste

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Full Text: [2011\Che Eng J174, 571.pdf](2011/Che%20Eng%20J174,%20571.pdf)

Abstract: The present study investigated the feasibility of using modified attapulgites for the sorptive removal of beta-blocker propranolol. The attapulgites were modified by different reagents including hydrochloric acid, silane coupling agent and chotosan. And the modified attapulgites were characterized by N2 sorption-desorption, Fourier transform infrared spectroscopy, zeta potential measurements, and X-ray diffraction technique. The as-made attapulgites were applied to removing propranolol from aqueous solution, and the effects of pH, ionic strength. sorbent dosage, and humic acid on sorption were investigated by batch experiments. The sorption capacity of the as-made attapulgites was compared with that of natural attapulgite, powdered activated carbon and other reported sorbent. The results suggested that the acid-activated attapulgite had a higher sorption capacity for propranolol than the other sorbents involved. The sorption kinetics and equilibrium isotherms of propranolol onto acid-activated attapulgite were also studied. The sorption process followed the pseudo-second order equation and the sorption data were fitted well with the Langmuir isotherm equations. Both physisorption and chemisorption played important roles for propranolol sorption onto acid-activated ATP. Owing to its high sorption capacity and low cost, acid-activated attapulgite has potential value in the removal of propranolol from sewage and natural waters in engineering application. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid-Activated Attapulgite, Adsorption, Grafted Attapulgite, Humic-Acid, Ionic-Strength, Isotherm, Kinetics, Langmuir, Methylene-Blue, pH, Pharmaceuticals, Propranolol, River, Sewage-Treatment Plants, Sorption, Sorption Mechanisms, Surface Waters, Waste-Water Effluent

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Full Text: [2011\Che Eng J174, 579.pdf](2011/Che%20Eng%20J174,%20579.pdf)

Abstract: Native, acid and alkali pretreated dried *Potamogeton crispus* (*P. crispus*) was used for adsorption of Reactive Red 198 from aqueous solution. Effects of physicochemical environment on adsorption were investigated. The surface charge of the native, acid and alkali treated biomass were determined to be zero at pH 4.6, 3.8 and 4.1 +/- 0.1, respectively. Adsorption capacity of native biomass was increased with alkali treatment against native and acid pretreated biomass. The maximum adsorption capacities (*q*max) at 20°C of native. acid and alkali pretreated biomass were determined as 14.3, 26.8 and 44.2 mg g-1, respectively. FT-IR analysis shows that P. crispus has many functional groups such as COO, S=O, C-N, N-H. These functional groups can react with dye molecule in solution. Pseudo-second-order and intraparticle diffusion kinetic models are applicable adsorption of RR198 by P. crispus since adsorption of RR198 is complex and involves more than one mechanism. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Azo-Dye, Biosorption, Blue, Decolorization, Dried Activated-Sludge, Dye Adsorption, Equilibrium, FTIR, Kinetic, Kinetic Models, Kinetics, Kinetics, Malachite Green, pH, Potamogeton Crispus, Reactive Red 198, Removal, Sorption

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Full Text: [2011\Che Eng J174, 586.pdf](2011/Che%20Eng%20J174,%20586.pdf)

Abstract: In this paper, chitosan hydrogel beads (CS) have been modified by etherization reaction with the etherification agent of chloroacetic acid. The surface carboxymethylated chitosan beads (CMC) provide not only enhanced but also improved selective adsorption for copper(II) (Cu(II)) ions from lead (Pb(II)) and magnesium (Mg(II)) ions in aqueous solutions. The fundamental Cu(II) ions adsorption behaviors of CMC, including the effect of pH, temperature, adsorption equilibrium, and kinetics, were investigated. The adsorption isotherms of CMC closely follow Langmuir model and the adsorption kinetics are well described by the pseudo-second order equation, which indicate that the adsorption behaviors are a monolayer chemical adsorption. X-ray photoelectron spectroscopy (XPS) investigations further reveal that the carboxyl groups are facile to form bidentate carboxylates with metal ions. Furthermore, the adsorbent could be easily regenerated at lower pH and reused almost without any loss of adsorption capacity. Moreover, the Cu(II) ions loaded CMC are stable enough at higher pHs, and suitable to be applied as a new adsorbent for phosphate adsorption, of which the maximal uptakes is around 58.0 mgPg-1 achieved at pH about 5.0. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Mechanisms, Aqueous-Solution, Cu(II), Equilibrium, Gla Beads, Heavy-Metals, Itaconic Acid, Kinetics, Langmuir, Lead, Methacrylic-Acid, pH, Phosphate, Removal, Reuse of Adsorbents, Selective Adsorption, Sorption, Surface Carboxymethylated Chitosan Hydrogel Beads, Wastewaters

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Full Text: [2011\Che Eng J174, 619.pdf](2011/Che%20Eng%20J174,%20619.pdf)

Abstract: Recently several kinds of low-cost adsorbents were developed for the extreme environmental and waste treatment processes. The adsorption capacity and physico-mechanical properties of adsorbent are basically affected by mixing ratio of the used materials. These requirements cause to apply the technique of experiment to optimize mentioned properties. In the present investigation commercial zeolite, bentonite and kaolin were used in experimental design algorithm due to their abilities in removal of heavy metal ions. Different amounts of used powders were mixed according to mixture design algorithm and shaped by extrusion technique in the form of Raschig ring. The test rings were calcined at 600 and 700°C after drying in laboratory oven and characterized by determining porosity, diametrical compressive strength and adsorption capacity. In order to manufacture applicable adsorbent, the response surface analysis method was used to optimize mixing ratio of materials. The investigation was concluded that the strength and adsorption capacity can be simultaneously optimized by the addition of 66.67, 29.17 and 4.16 wt.% zeolite, bentonite and kaolin respectively. In the next part of work, the kinetics and adsorption isotherm of lead on selected composition was mathematically investigated. The Langmuir isotherm and pseudo second order kinetic model showed the acceptable accuracy in prediction of adsorption data. The possibility of lead immobilization by fabricated rings can be useful in industrial practice. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous-Solutions, Clinoptilolite, Copper, Equilibrium, Heavy-Metals, Ion-Exchange, Isotherm, Kinetic, Kinetics, Langmuir, Lead Removal, Low-Cost Adsorbent, Pb(II), Raschig Ring, Removal, Selection, Zeolite

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Full Text: [2011\Che Eng J175, 1.pdf](2011/Che%20Eng%20J175,%201.pdf)

Abstract: A type of graphene nanosheet/δ-MnO2 (GNS/MnO2) composite was synthesized by a microwave-assisted method. The Ni (II) removal potential of GNS/MnO2 from solution was investigated. Microstructure measurements show that nanoscale Δ-MnO2 particles deposit on the surfaces of GNS well. The adsorption characteristics had been examined with respect to pH effect, removal kinetic data, equilibrium isotherms and thermodynamic data in batch experiments. The equilibrium data are fitted well by the pseudo-second-order kinetics, suggesting that a chemical sorption process plays a significant role in Ni (II) ions adsorption. Adsorption isotherm can be described by the Langmuir model. The saturate adsorption capacity of Ni (II) onto GNS/MnO2 is 46.6 mg g-1 at room temperature, which is 1.5 and 15 times higher than those of pure Δ-MnO2 and GNS, respectively. The positive values of both Δ*H* and Δ*S* suggest an endothermic reaction and increase in randomness at the solid-liquid interface during Ni(II) adsorption process. The negative Δ*G* values indicate a spontaneous adsorption process and GNS/MnO2 can be reused for 5 times with high recovery rate of 91%. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Isotherm, Aqueous-Solution, Biosorption, Carbon Nanotubes, Cd(II), Copper, Cu(II), GNS, MnO2, Isotherm, Kinetic, Kinetics, Langmuir, Microwave-Assisted, MnO2, Ni (II) Removal, Ni(II), Pb(II), pH

? Liu, R.P., Gong, W.X., Lan, H.C., Gao, Y.P., Liu, H.J. and Qu, J.H. (2011), Defluoridation by freshly prepared aluminum hydroxides. *Chemical Engineering Journal*, **175**, 144-149.

Full Text: [2011\Che Eng J175, 144.pdf](2011/Che%20Eng%20J175,%20144.pdf)

Abstract: The exposure to fluoride via drinking water is a great issue globally. This study investigates the adsorptive capability of the freshly prepared aluminum hydroxide, i.e., in-situ Al2O3 center dot xH2O, towards fluoride. The maximum adsorption of above 110 mg F/g Al is observed in pH ranges from 5.0 to 7.2. The adsorption equilibrium is achieved within 120 min, and pseudo-second-order model may well describe the adsorption kinetics (R2 = 0.999), indicating the involvement of chemisorptions in. The characteristics of low particle diameter, high surface area, and the surface reactivity of the amorphous in-situ Al2O3center dot xH2O enables its superior to remove fluoride for the in-situ Al2O3 center dot xH2O. pH impacts the distribution of Al species and the quantity of solid-state Al available for fluoride. The ratios of monomeric Al, i.e., Al(a), are below 4% in pH from 6 to 8, and then increase to 19.2% at pH 4 and to 28.9% at pH 10. Al(c), showing adverse trends to Ala, is the main species for fluoride removal. In cases that the amount of in-situ Al2O3 center dot xH2O available is the same, surface charge is dominant to affect the removal of fluoride. FTIR indicates the replacement of surface hydroxyl groups by fluoride. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorption, Al Species Distribution, Aluminum, Defluoridation, Electrocoagulation, Fluoride Removal, FTIR, In-Situ Al2O3 Center Dot XH2O, Kinetics, pH, Solid-Phase ALC, Water, Zeta Potential

? Li, Z.J., Qu, J.H., Li, H.F., Lim, T.C. and Liu, C.H. (2011), Effect of cerium valence on As(V) adsorption by cerium-doped titanium dioxide adsorbents. *Chemical Engineering Journal*, **175**, 207-212.

Full Text: [2011\Che Eng J175, 207.pdf](2011/Che%20Eng%20J175,%20207.pdf)

Abstract: In this study, three titanium dioxide (TiO2) adsorbents doped with Ce(III) (Ce3), Ce(IV) (Ce4) and H2O2 oxidized Ce(III) (Ce3O), respectively, were prepared and the effect of cerium valence on arsenate (As(V)) adsorption was investigated. The Ce3, Ce4 and Ce3O adsorbents all existed in amorphous form and Ce3 exhibited a higher micropore surface area and micropore volume than both Ce4 and Ce3O. The adsorption capacity of As(V) on Ce4 and Ce3O decreased significantly when the solution pH was increased, while the adsorption capacity of As(V) by Ce3 was higher and more stable at pH values ranging between 3.7 and 7.0. The adsorption kinetics of As(V) on Ce3 was better fit to pseudo-second order model while both the pseudo-second order and the pseudo-first order model described the adsorption of As(V) on Ce4 and Ce30 well. The equilibrium adsorption data for As(V) on Ce3 was well fit by the Langmuir model, and the adsorption of As(V) on Ce4 and Ce3O was described well by both the Langmuir and Freundlich models. FUR analysis indicated that the hydroxyl groups on the three adsorbents' surfaces were involved in As(V) adsorption. The results suggested that the dominant chemical state of cerium valence plays an important role in affecting the adsorption behavior of As(V) by cerium-doped TiO2 adsorbents. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorption, Aqueous-Solution, Arsenate, Arsenate, Arsenic(V) Removal, As(III), Cerium, Freundlich, Kinetics, Langmuir, Mechanism, Nanoparticles, pH, Polyvinyl-Alcohol, Ti Oxide Adsorbent, Titanium Dioxide, Water

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Full Text: [2011\Che Eng J175, 233.pdf](2011/Che%20Eng%20J175,%20233.pdf)

Abstract: Waste tea activated carbon (WTAC) was produced at optimum conditions for adsorption of both anionic and cationic dyes. The VVTAC was produced through chemical activation with potassium acetate for adsorption of Methylene Blue (MB) and Acid Blue 29 (AB29) dyes. Response surface methodology statistical technique was used to optimize the preparation conditions which were activation temperature. activation time and chemical impregnation ratio (IR); with percentage yield and removal as the targeted responses. The optimal conditions obtained for good percentage yield and removal of the two dyes were at 800°C, IR 1.4 and 120 min. The high surface area of 854.30 m2/g and mesoporous adsorbent prepared gave good adsorption capacities of 453.12 and 554.30 mg/g for AB29 and MB, respectively. Adsorption data were modeled using Langmuir, Freundlich and Temkin adsorption isotherms; the adsorption of MB and AB29 on WTAC both obeyed Langmuir model and, pseudo-second-order kinetics was the order that best described the two adsorption processes. The WTAC produced can be used effectively to salvage pollution problems posed by both anionic and cationic dyes in the environment. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activation, Adsorbent, Adsorption, Aqueous-Solution, Bentonite, Competitive Adsorption, Equilibrium, Freundlich, Isotherm, Kinetics, Langmuir, Low-Cost Adsorbent, Malachite Green, Optimization, Reactive Dyes, Removal, Shell, Sorption, Thermodynamics

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Full Text: [2011\Che Eng J175, 251.pdf](2011/Che%20Eng%20J175,%20251.pdf)

Abstract: Functionalized poly(vinyl alcohol)/tetraethyl orthosilicate (PVA/TEOS) hybrid membranes with 3-mercaptopropyltrimethoxysilane (TMPTMS) groups have been prepared by sal-gel method and studied for the removal of cadmium and nickel ions from the aqueous solutions. The prepared membranes were characterized by FTIR, SEM and BET analyses. The influence of several variables such as TEOS content, TMPTMS content, pH, contact time, initial concentration and temperature was studied in a batch mode. The kinetic data were found to follow the pseudo-second-order model for both metal ions. The equilibrium data were well described by the Freundlich isotherm model for cadmium and nickel ions, respectively. The selectivity of cadmium and nickel sorption onto the membrane was in order of Cd(II)>Ni(II). The maximum monolayer capacity of the hybrid membrane was found to be 61.43 and 10.29 mg g-1 for cadmium and nickel ions, respectively, at 45°C. Thermodynamic parameters were evaluated to understand the nature of adsorption process for both metal ions. The reusability of the membrane was also determined after five sorption-desorption cycles. 2011 Elsevier B.V. All rights reserved.

Keywords: 3-Mercaptopropyltrimethoxysilane, Adsorption, Adsorption, Batteries, Bet, Biomass, Cadmium, Cadmium, Cd(II), Cyanex-272, Extraction, Freundlich, FTIR, Heavy-Metals, Hybrid Membrane, Ion-Exchange Membranes, Isotherm, Kinetic, Mechanism, Mesoporous Silica, Nickel, pH, Removal, Sol-Gel, Thermodynamic, Thermodynamic Parameters

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Full Text: [2011\Che Eng J175, 298.pdf](2011/Che%20Eng%20J175,%20298.pdf)

Abstract: Modified granular activated carbon was prepared by coating quaternary ammonium-containing polymer [3-(methacryloylamino)propyl]-trimethylammonium chloride, onto granular activated carbon (GAC) to remove nitrate and Cr(VI) from aqueous solution. The removal efficiencies for nitrate and Cr(VI) increased as the concentration of the cationic polymer used for modification increased to 0.25%, but those decreased slightly when the polymer concentration further increased to 2.5%. Kinetics experiments indicated the adsorption was a fast process, reaching equilibrium in 90 and 120 min for nitrate and Cr(VI) adsorption, and the maximum equilibrium uptake of nitrate and Cr(VI) were about 26 and 81 mg g-1, respectively. The adsorption of both anions was well described by pseudo-second-order kinetics model and Langmuir isotherm model. There was a linear relationship between the amounts of desorbed chloride and adsorbed nitrate and Cr(VI), suggesting the main effect of modification was enhancement of ion exchange capacity of GAC. The thermodynamic data showed that adsorption process would be thermodynamically favorable, spontaneous, and exothermic nature. The adsorption capacity for Cr(VI) decreased continuously with an increase in initial solution pH from 3 to 8 but such an effect was less significant for nitrate. The nitrate and Cr(VI) adsorption decreased the most in the presence of sulfate, followed by chloride and phosphate. The overall results demonstrated the potential utility of a cationic polymer for enhancement of performances of GAC-based materials for anions removal from aqueous solutions. (C) 2011 Elsevier BM. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Arsenate, Cationic Polymer, Chloride, Chromium, Chromium(VI), Cr(VI), Granular Activated Carbon, Groundwater, Isotherm, Kinetics, Langmuir, Nitrate, Perchlorate Removal, pH, Phosphate, Trimethlyammonium Chloride, Ultrafiltration, Waste-Water, Zero-Valent Iron

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Full Text: [2011\Che Eng J175, 376.pdf](2011/Che%20Eng%20J175,%20376.pdf)

Abstract: The present investigation highlights the effectiveness of surfactant modified chitosan bead for adsorption of Cu(II), Ni(II) and Zn(II) from aqueous solution. An ideal experimental model was developed using fractional factorial and central composite design (CCD) based on response surface methodology (RSM). Among the experimental parameters viz. pH, adsorbent dose, concentration of metal, agitation time and temperature the most effective influencing parameters and their interactions were identified by a fractional factorial design. The optimal conditions for the three effective parameters, thus identified, were found to be: adsorbent dose. 0.5 g dm-3, temperature 313K for all the metals and pH, 5.4, 7.3 and 6.5 for Cu(II). Ni(II) and Zn(II) respectively from CCD. Analysis of variance (ANOVA) showing high coefficient of determination (R2 ≥ 0.8326) and low probability values signifies the validity of the predicted second order model for metal adsorption. Langmuir isotherm is found to be the most suitable one compared to the Freundlich and Tempkin model tested. The process is feasible, endothermic and spontaneous as revealed by the values of negative free energy change, positive enthalpy and entropy change. Kinetic data were analyzed using pseudo-first-order, pseudo-second-order to find the particular rate law. The diffusion phenomena were analyzed from the Weber and Morris equation plot. (C) 2011 Published by Elsevier B.V.

Keywords: Acid, Adsorbent, Adsorption, Aqueous-Solutions, Biosorption, Cu(II), Efficiency, Equilibrium, Freundlich, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Metal Biosorption, Metals, Pb(II), pH, Removal, Response Surface Methodology, Solid-Phase Extraction, Sorption, Surfactant Modified Chitosan Bead

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Full Text: [2011\Che Eng J178, 26.pdf](2011/Che%20Eng%20J178,%2026.pdf)

Abstract: Multi-walled carbon nanotubes (MWCNTs) were used for the sorption of tetracycline (TC) from aqueous solution. A systematic study of the adsorption process was performed by varying pH, ionic strength, sorbent amount, sorption time and temperature. The adsorption mechanism is probably the non-electrostatic pi-pi dispersion interaction and hydrophobic interaction between TC and MWCNT. The adsorption efficiency could reach 99.8%, suggesting that MWCNT is excellent adsorbents for TC removal from water. TC adsorption kinetics were found that the equilibrium was reached within 20 min following the pseudo-second-order model with observed rate constants (k2) of 0.026-0.032 g mg-1 min-1 (at varied temperatures). The whole rate process appeared to be influenced by both intraparticle diffusion and boundary layer diffusion. The sorption data could be well interpreted by the Langmuir model with the maximum adsorption capacity of 269.54 mg g-1 (293 K) of TC on MWCNT. The mean energy of adsorption was calculated to be 0.029 kJ mol-1 (293 K) from the Dubinin-Radushkevich adsorption isotherm. Moreover, the thermodynamic parameters for the adsorption were estimated, and the ΔHº and ΔGº values indicated the endothermic and spontaneous nature of the sorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Kinetics, Aqueous-Solution, Dubinin-Radushkevich, Equilibrium, Isotherm, Kinetic-Models, Kinetics, Langmuir, Mechanism, Methylene-Blue, Multi-Walled Carbon Nanotubes, pH, Polycyclic Aromatic-Hydrocarbons, Removal, Solution Chemistry, Sorption, Temperature, Tetracycline, Thermodynamic, Thermodynamics, Thermodynamics

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Full Text: [2011\Che Eng J178, 34.pdf](2011/Che%20Eng%20J178,%2034.pdf)

Abstract: In this study, removal of phosphate from aqueous solutions was examined using calcined waste eggshell (CWE). The pore properties including the BET surface area, pore volume, pore size distributions were characterized. In the batch mode adsorption studies, the effects of calcinations temperature of eggshell, contact time, temperature, initial phosphate concentration of solution, adsorbent dosage, initial pH and other ions on the phosphate adsorption by the CWE have been studied. A comparison of kinetic models applied to the adsorption of phosphate onto CWE was evaluated for the pseudo-first order and pseudo-second order kinetic model. The experimental data fitted very well the pseudo-second order kinetic model. In the isotherm studies, the Langmuir, Freundlich and Dubinin-Radushkevich (DR) isotherm models were applied. The results indicate that Freundlich equation is well described with the phosphate adsorption. Desorption and recovery of phosphate studies were carried out. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, BET, Carbon, Coir Pith, Concentration, Desorption, Dubinin-Radushkevich, Eggshell, Environment, Equilibrium, Fly-Ash, Freundlich, Isotherm, Isotherm Models, Kinetic, Kinetic Models, Kinetics, Langmuir, Mechanism, pH, Phosphate, Red Mud, Removal, Solutions, Sorption, Temperature, Water

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Full Text: [2011\Che Eng J178, 60.pdf](2011/Che%20Eng%20J178,%2060.pdf)

Abstract: A novel macroporous bead adsorbents based on poly(vinyl alcohol)/chitosan (PVA/CS beads) were prepared, characterized and were used for the adsorption of heavy metal ions from aqueous solution. The resulting PVA/CS beads were perfectly spherical in shape and exhibited good mechanical strength and chemical stability. PVA/CS beads with macroreticular structure had been proved with easy separation and excellent adsorption for heavy metal ions. PVA/CS beads adsorbed heavy metal ions in the following order: Cu2+ > Pb2+ > Cd2+ > Zn2+. The equilibrium data of Cu2+, Pb2+ and Cd2+ conformed to the Freundlich isotherm, while those of Zn2+ were best described by Langmuir isotherm. The presence of NaNO3 (0-0.137 mol/L) had little effect on Cu2+ adsorption, but the adsorption of Pb2+, Zn2+ and Cd2+ decreased significantly in the same conditions. The competitive adsorption showed that PVA/CS beads had higher adsorption selectivity for Cu2+ with the coexistence of Pb2+, Zn2+ or Cd2+. The adsorption kinetics of Cu2+, Pb2+, Zn2+ and Cd2+ were found to follow the pseudo-second-order kinetic model. Various thermodynamic parameters were calculated and the results showed that the adsorption of all metal ions onto PVA/CS beads was feasible and endothermic in nature. The results from the sequential adsorption-desorption cycles showed that PVA/CS bead adsorbents held good desorption and reusability, which would be a potential application in the fixed-bed continuous-flow column for the removal of heavy metals. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Kinetics, Adsorption Properties, Adsorption-Desorption, Biosorption, Cadmium Adsorption, Cd2+, Chelating Resin, Competitive Adsorption, Cu, Cu2+ Adsorption, Cu(II), Desorption, Equilibrium, Freundlich, Heavy Metal, Heavy Metals, Heavy Metals Removal, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Lead, Metal Ions, Metals, Mr Bead, Preparation, Pva, Cs Bead Adsorbents, Removal, Stability, Thermodynamic, Waste-Water, Zn2+

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Full Text: [2011\Che Eng J178, 108.pdf](2011/Che%20Eng%20J178,%20108.pdf)

Abstract: In this paper, a new hyper-crosslinked polystyrene adsorbent WJN-101 for removal of Cu2+ from the water was prepared and its adsorption capacity was tested by using the commercial resins IRC-84 and D-110 as references. The higher uptake capacity of Cu2+ by WJN-101 was achieved at higher pH values, and the lower uptake capacity was observed in an acidic medium. When the temperature was raised within the range of 278-308 K, the adsorption enthalpy changes of WJN-101 were about from 22.24 to 28.89 kJ mol-1, and the free energy changes were about from -5.71 to -5.90 kJ mol-1. The batch kinetic study indicated that the adsorption of Cu2+ could be well fitted by the pseudo-second-order equation, suggesting intra-particle diffusion process as the rate-limiting step of the adsorption process. By using the Elovich equation, the initial adsorption rates of Cu2+ onto three investigated resins were calculated, which was 11.50. 2.46, and 9.88 mg (g min)-1 of WJN-101, IRC-84 and D-110, respectively. The column adsorption data of Cu2+ on WJN-101 could be well fitted by the Thomas model, and it could be employed for the designing of adsorption columns over a range of feasible flow rates and resin bed height successfully. 2% HCl solution could be used as effective eluant to desorb the Cu2+ adsorbed by WJN-101. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Aqueous-Solution, Batch, Column, Cu2+, Cu(II), Enthalpy, Equilibrium, Hyper-Crosslinked Polystyrene Adsorbent, Kinetic, Kinetics, Metal Ions, Ni(II) Ions, pH, Removal, Resin, Resins, Temperature, Thomas Model, Uptake, Water

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Full Text: [2011\Che Eng J178, 122.pdf](2011/Che%20Eng%20J178,%20122.pdf)

Abstract: The adsorption of Congo Red (CR) by ball-milled sugarcane bagasse was evaluated in an aqueous batch system. CR adsorption capacity increased significantly with small changes in bagasse surface area. CR removal decreased with increasing solution pH from 5.0 to 10.0. Maximum adsorption capacity was 38.2 mg/g bagasse at a CR concentration of 500 mg/L. The equilibrium isotherm fitted the Freundlich model and the adsorption kinetics obeyed pseudo-second order equation. CR adsorption obeyed the intra-particle diffusion model very well with bagasse surface area in the range of 0.58-0.66 m2/g, whereas it was controlled by multi-adsorption stages with bagasse surface area in the range of 1.31-1.82 m2/g. Thermodynamic analysis indicated that the adsorption process is an exothermic and spontaneous process. Fourier transform infrared analysis of bagasse containing adsorbed CR indicated interactions between the carboxyl and hydroxyl groups of bagasse and CR function groups. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Ash, Concentration, Congo Red, Dye, Equilibrium, Equilibrium Isotherm, Freundlich, Isotherm, Kinetics, Low-Cost Adsorbents, pH, Powder, Removal, Rice Husk, Sugarcane Bagasse, Textile Waste-Water, Thermodynamic

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Full Text: [2011\Che Eng J178, 168.pdf](2011/Che%20Eng%20J178,%20168.pdf)

Abstract: The aim of the present work concerns the feasibility of using Mauritanian clays through encapsulation with alginate for the removal of water pollutants e.g. copper and 4-nitrophenol. Results were compared to those obtained with commercial Volclay bentonite and activated carbon. Four raw clays were selected from sites around Rosso and Nouakchott (Mauritania) with kaolinite and illite as main minerals. A Mauritanian clay (ZS 26) was selected from its higher rate of smectite and gel-like beads were obtained as a result of the cross-linking between sodium alginate and this clay. In agreement with previous works, the pseudo-second order equation fits well with the kinetic data and the diffusion coefficients obtained (4-8 x 10(-7) cm2/s) are within the ranges reported in other works. Adsorption isotherms were analyzed using Langmuir model and non-linear regression. Adsorption of Cu2+ was in the following order SA > composite microbeads > clays, activated carbon; adsorption of 4-NP was favourized onto activated carbon and the order was AC > AC/SA > Na-mont > Na-ZS26/SA, Na-mont/SA. The sorption capacities of Cu2+ and 4-NP by Na-ZS 26/SA microbeads are in the range reported in a previous work for the commercial clay. Further insights were provided and the removal of 4-NP by encapsulated clays or clays (ZS 26 or commercial bentonite) was greatly affected by the presence of Cu2+. In conclusion, this work has developed a simple, eco-friendly and practical method for the production of a low cost composite Mauritanian clay/alginate beads which can be used for the removal of inorganic and organic pollutants. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 4-Nitrophenol, Activated Carbon, Activated Carbon, Adsorption, Adsorption Isotherms, Alginate, Aqueous-Solution, Bentonite, Calcium Alginate Beads, Clay, Clays, Competition, Copper, Diffusion Coefficients, Encapsulated Magnetic Sorbent, Encapsulation, Gel Beads, Heavy-Metals, Isotherms, Kaolinite, Kinetic, Kinetics, Laminaria-Digitata, Langmuir, Mauritania, Phenol Adsorption, Pillared Clays, Smectite, Sorption, Waste-Water

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Full Text: [2011\Che Eng J178, 317.pdf](2011/Che%20Eng%20J178,%20317.pdf)

Abstract: In this work, natural clays of Iran including perlite, dolomite and diatomite have been used as an adsorbent for removing lead from aqueous solution in a batch system. The BET analysis of clays showed that the pore size, surface area and pore volume of diatomite are greater than those of perlite and dolomite. The effect of several variables like pH. contact time, initial concentration and temperature on lead sorption by perlite, dolomite and diatomite was investigated. Kinetic data were analyzed using pseudo-first-order, pseudo-second-order and double-exponential models. The equilibrium experimental data were tested with Freundlich, Langmuir and Dubbin-Radushkevich (D-R) isotherm models. It was observed that the maximum lead adsorption capacity of lead of natural clays followed the order of diatomite (25.01 mg g-1) > dolomite (19.69 mg g-1) > perlite (8.906 mg g-1). Thermodynamic parameters showed that the lead sorption onto the dolomite and diatomite is endothermic and lead sorption by perlite is exothermic. The results indicated that the lead sorption by studied adsorbents is spontaneous and thermodynamically feasible. Because of low-cost and local availability of natural clays, these adsorbents have suitable potential for removal of lead ions in practical process. Published by Elsevier B.V.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption, Aqueous-Solutions, BET, Cadmium, Concentration, Diatomite, Dolomite, Equilibrium, Freundlich, Heavy-Metal Ions, Isotherm, Isotherm Models, Kinetic, Langmuir, Lead, Lead Adsorption, Lead Ions, Mesoporous Silica, Oxides-Modified Diatomite, Pb(II), Perlite, pH, Recovery, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Che Eng J178, 461.pdf](2011/Che%20Eng%20J178,%20461.pdf)

Abstract: The cocoa shell (CS) flake was ground, sieved and pressed into pellets. The pellets were carbonized at 800ºC and subjected to activation at 850ºC under a flow of CO2 for several activation burn off. The cocoa shell-based activated carbon (CSAC) showed moderate surface area (248 m2 g-1), a low rnesoporosity ratio with a pore size in the range between 2 and 4 nm. CSAC also displays the presence of aliphatic, aromatic hydrocarbons, C=O and a near absence of C-O. CSAC was evaluated for its ability to adsorb 4-nitrophenol (4-NP). The adsorption time and initial dye concentration study on adsorption performance was carried out in a batch system. The results indicate that the Freundlich, Temkin and Langmuir isotherms fit well (R2 > 0.9). The results from the kinetic study show that 4-NP adsorption follows pseudo-second-order and Boyd models. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 4-Nitrophenol (4-Np), Activated Carbon, Activation, Adsorption, Agricultural Waste, Ash, Boyd, Co, Cocoa (Theobroma Cacao) Shell, Concentration, Equilibrium, Freundlich, Isotherms, Kinetic, Kinetics, Langmuir, P-Nitrophenol, Pore Structure, Sawdust, Sorption, Substituted Phenols, Waste-Water

# Title: The Chemical Engineering Journal and the Biochemical Engineering Journal

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McKay, G. (1983), The adsorption of dyestuffs from aqueous solution using activated carbon: Analytical solution for batch adsorption based on external mass transfer and pore diffusion. *The Chemical Engineering Journal*, **27** (3), 187-196.

Full Text: [C\The Che Eng J27, 187.pdf](C/The%20Che%20Eng%20J27,%20187.pdf)

Abstract: A two-step resistance model has been developed for the adsorption of dyes on carbon. The model is based on external mass transfer and pore diffusion and an analytical solution is possible based on the assumption of a pseudo-irreversible isotherm. The diffusion coefficient and external mass transfer for Telon Blue are 8.0×l0-7 cm2 s-1 and 4.0×10-3 cm s-1 respectively and for Deorlene Yellow are 1.0×10-7 cm2 s-1 and 2.0×10-3 cm s-1 respectively. The model enables the performance of an agitated batch adsorber to be predicted. A single diffusivity and external mass transfer coefficient is sufficient, for each dye-carbon system, to predict the concentration decay curve when the initial dye concentration is varied and also when the ratio of the carbon mass to the solution volume is varied.

McKay, G. (1984), The adsorption of dyestuffs from aqueous solutions using the activated carbon adsorption model to determine breakthrough curves. *The Chemical Engineering Journal*, **28** (2), 95-104.

Full Text: [C\The Che Eng J28, 95.pdf](C/The%20Che%20Eng%20J28,%2095.pdf)

Abstract: A series of breakthrough curves for the adsorption of Deorlene Yellow and Telon Blue on carbon have been used to test a kinetic model. The model is based on the unreacted core theory and assumes resistances due to external mass transfer and pore diffusion, and irreversible adsorption. The experimental and theoretical data are well correlated by the model at low dye flow rates, but the model was modified at high dye flow rates. The effective diffusivities are 4.0×10-10 m2 s-1 and 3.0×10-10 m2 s-1 for Deorlene Yellow and Telon Blue respectively.

Al-Duri, B. and McKay, G. (1988), Basic dye adsorption on carbon using a solid-phase diffusion model. *The Chemical Engineering Journal*, **38** (1), 23-31.

Full Text: [C\The Che Eng J38, 23.pdf](C/The%20Che%20Eng%20J38,%2023.pdf)

Abstract: A solid diffusion mass transport model, essentially a two-resistance model consisting of an external resistance followed by internal solid diffusion resistance, has been developed and applied to three basic dye-carbon adsorption systems, namely Basic Blue 69, Basic Yellow 21 and Basic Red 22 in their single-component solutions. The equilibrium data are described by the Redlich-Peterson formula.

A single mass transfer coefficient kf and a single solid diffusivity Ds described each dye-carbon system successfully. The kf values were 2.8×10-3, 2.7×10-3 and 2.0×10-3 cm s-l for Basic Blue 69, Basic Yellow 21 and Basic Red 22 respectively. Ds values were 0.20×10-10, 2.3×10-10 and 0.85×10-10 cm2 s-1 for Basic Blue 69, Basic Yellow 21 and Basic Red 22 respectively.

An investigation into the influence of carbon particle size on the solid phase diffusivity has been undertaken and Ds has been found to vary with dp according to the functions 1 6×10-10 dp0.89, 2.7×10-9 dp1.25 and 2.0×10-9 dp1.13 for Basic Blue 69, Basic Yellow 21 and Basic Red 22 respectively.

McKay, G. (1988), Fluidized bed adsorption of pollutants on to activated carbon. *The Chemical Engineering Journal*, **39** (2), 87-96.

Full Text: [C\The Che Eng J39, 87.pdf](C/The%20Che%20Eng%20J39,%2087.pdf)

Abstract: The ability of fluidized beds of activated carbon to remove pollutants from aqueous solutions has been studied. The pollutants were phenol, p-chlorophenol and sodium dodecyl sulphate, and the effects of the flow rate of the solution and of the pollutant concentration have been studied. Correlations between the external mass transfer coefficient K*F* and the liquid-phase Reynolds number have been developed according to the general equation K*F* = A*ReL*B

The equilibrium isotherms were determined for the three systems and the data were analysed using a Langmuir equation.

McKay, G. and Al-Duri, B. (1989), Prediction of multicomponent adsorption equilibrium data using empirical correlations. *The Chemical Engineering Journal*, **41** (1), 9-23.

Full Text: [C\The Che Eng J41, 9.pdf](C/The%20Che%20Eng%20J41,%209.pdf)

Abstract: In this study, extended empirical Langmuir, Freundlich and Redlich-Peterson formulate have been applied for the calculation of multicomponent adsorption equilibrium data for all combinations of three basic dye systems: Basic Blue 69 (B), Basic Red 22 (R) and Basic Yellow 21 (Y) on Activated Carbon (F400).

Extended Langmuir application yielded average variances (σσ2) of 3.3%, 589%, 51% and 47% for RY, RB, YB and RYB system components respectively. The Redlich-Peterson relationship gave σ2 of 8%, 62%, 50% and 44% respectively.

Introducing an interaction term (η) lowered σ2 to 0.5%, 23%, 16% and 11% for RY, RB, YB and RYB system components respectively for the Langmuir formula and to 0.4%, 21.3%, 15% and 11% respectively for the Redlich-Peterson equation.

The Freundlich empirical extended formula for bisolute systems produced variances of 0.69%, 9.1% and 8.8% for RY, RB and YB system components respectively. The latter formula is the most accurate for bisolute systems as it is obtained by single and multisolute correlation of all constants in the formula.

? Aitken, M.D. (1993), Waste treatment applications of enzymes: Opportunities and obstacles. *The Chemical Engineering Journal*, **52** (2), B49-B58.

Full Text: [1993\The Che Eng J52, B49.pdf](1993/The%20Che%20Eng%20J52,%20B49.pdf)

Abstract: The use of enzymes in waste treatment processes has been proposed by a number of investigators. However, most of this work has focused on demonstrating the disappearance of target pollutants and has not considered the engineering issues that will ultimately determine the process feasibility. The conditions that occur in most waste treatment situations are very different from the conditions that exist in chemical manufacturing processes, so the technical concerns in implementing enzyme technology cannot be extrapolated directly from experience in the manufacturing sector. The waste treatment situations that may be appropriate for enzyme technology are presented, along with criteria for enzymes that may be of near-term applicability. Previous work on the waste treatment applications of enzymes is reviewed and the technical issues that must be considered in feasibility determinations are discussed.

Keywords: Fungus Phanerochaete-Chrysosporium, Licheniformis Alpha-Amylase, Soil-Related Adsorbents, Polyphenol Oxidase, Hydrogen-Peroxide, Organic-Solvents, Substituted Phenols, Sodium-Azide, Immobilized Phosphotriesterase, Organophosphate Insecticides

? Casillas, J.L., Martinez, M., Addoyobo, F. and Aracil, J. (1993), Modeling of the adsorption of cephalosporin-c on modified resins in a stirred-tank. *Chemical Engineering Journal and the Biochemical Engineering Journal*, **52** (3), B71-B75.

Full Text: [1993\Che Eng J Bio Eng J52, B71.pdf](1993/Che%20Eng%20J%20Bio%20Eng%20J52,%20B71.pdf)

Abstract: It has been shown that over the range of concentration used, the adsorption of Cephalosporin C can be characterized by a single linear adsorption constant. Additionally, the kinetics has been modelled successfully using both the linear adsorption isotherm and a single effective internal diffusion coefficient. The modelling work showed that the observed insensitivity of the goodness of fit to the effective Sherwood number was due to the fact that the method of agitation employed in the experiments was effective. The results hold in spite of the twofold variation in adsorption concentration in the liquid phase and the threefold variation in the square of the particle radius.

Keywords: Adsorption, Adsorption Isotherm, Concentration, Diffusion, Isotherm, Kinetics, Modelling, Particle, Range

Chu, K.H. and Hashim, M.A. (1995), Simulated countercurrent adsorption processes: A comparison of modeling strategies. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **56** (2), 59-65.

Full Text: [C\Che Eng J Bio Eng J56, 59.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J56,%2059.pdf)

Abstract: The behaviour of simulated countercurrent adsorption processes may be modelled using two different approaches. The first method, known as the moving-bed approach, treats the simulated countercurrent process as equivalent to a true countercurrent system. The second technique, known as the fixed-bed approach, considers the simulated countercurrent process as a series of fixed beds and incorporates the actual flow switching of the process at fixed time intervals. In this work, theoretical predictions of the two approaches have been computed numerically by the method of orthogonal collocation. The moving-bed approach, although less realistic, gives results that are very similar to those obtained from the fixed-bed approach for the description of the final steady state behaviour of a Sorbex-type four-section simulated countercurrent process. However, in the case of a three-section simulated countercurrent process, there is significant deviation between the predictions calculated from the two approaches. This difference arises as a result of the flow switching procedure implemented in the three-section process, a feature that cannot be accounted for by the idealized moving-bed approach. The validity of the moving-bed approach is thus seen to be limited to the four-section type of simulated countercurrent process.

Keywords: Separation Processes, Bed

Fernández, A., Díaz, M. and Rodrigues, A. (1995), Kinetic mechanisms in ion exchange processes. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **57** (1), 17-25.

Full Text: [C\Che Eng J Bio Eng J58, 17.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J58,%2017.pdf)

Abstract: The kinetic mechanisms for cationic and chelating ion exchange were investigated. The applicability of kinetic equations to fit experimental results was demonstrated using the pore diffusion and unreacted core models and two different experimental systems: K+-Na+ in sulphonic resins and metal-Na+ in iminodiacetic chelating resins. Microscopic observations of intraparticle profiles in the case of metal-Na+ exchange show that the unreacted-core model is adequate for describing such a process, allowing the calculation of intraparticle diffusivities.

Srinivasan, R., Auvil, S.R. and Schork, J.M. (1995), Mass transfer in carbon molecular sieves: An interpretation of Langmuir kinetics. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **57** (2), 137-144.

Full Text: [C\Che Eng J Bio Eng J57, 137.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J57,%20137.pdf)

Abstract: In this paper, the Langmuir kinetics rate expression, which has gained currency in modeling O2/N2 mass transfer in carbon molecular sieve adsorbents, is derived, starting from a “surface barrier” model of diffusion under a chemical potential gradient; this provides a physical basis for the use of mass-action rate laws to describe diffusion processes.

Keywords: Adsorption, Diffusion, Kinetics, Multicomponent, Mass Transfer

Sağ, Y. and Kutsal, T. (1995), Copper(II) and nickel(II) adsorption by *Rhizopus-arrhizus* in batch stirred reactors in series. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **58** (3), 265-273.

Full Text: [C\Che Eng J Bio Eng J58, 265.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J58,%20265.pdf)

Abstract: In this research, the adsorption of copper(II) and nickel(II) ions on *Rhizopus arrhizus*, a filamentous fungus, was investigated in three batch stirred reactors operated in series. The adsorption in multistage reactors can be considered as multistage equilibrium operation, which depends on two constraints: that of equilibrium and that of mass balance. The sorption phenomenon was expressed by the Freundlich adsorption isotherm developed for optimum adsorption conditions. At a given ratio V0/X0 of volume of waste water containing heavy metal ions to quantity of fungus, this expression was used to calculate the residual metal ion concentration Ceq, Cr or adsorbed metal ion concentration Ceq, Cr at equilibrium in the solution leaving each stage. Experimental Ceq, C-r and Ceq, Cr values were compared with calculated values. High metal ion quantities per unit mass of dried biomass were removed by using low V0/X0 ratios. When aqueous solutions containing copper(II) at a concentration of 99.9 mgl-1 and nickel(II) at a concentration of 97.9 mgl-1 were fed to the first reactor, 65.7 mg of copper per gram of dried biomass and 90.2 mg of nickel per gram of dried biomass were removed in the solution, leaving a third reactor, at a chosen V0/X0 ratio of 1.00.

Keywords: Alga *Chlorella-Vulgaris*, *C. Vulgaris*, *Z. Ramigera*, Biosorption, Cadmium, Mechanism, Uranium, Thorium, Zinc, Waste Water, Microorganisms, Adsorption, Stirred Reactor

De Kock, F.P. and Vandeventer, J.S.J. (1995), Stochastic-model for equilibrium adsorption onto activated carbon. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **59** (3), 205-220.

Full Text: [C\Che Eng J Bio Eng J59, 205.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J59,%20205.pdf)

Abstract: Most models used in describing adsorption equilibria onto activated carbon give good predictions under well-defined conditions of adsorption from organic vapours, or from dilute aqueous solutions. However, these models fail to give accurate predictions if less ideal substances such as dissociated compounds or ionic complexes are present, for example in industrial streams. Empirical equations are usually the only method that can be used to describe adsorption of these systems, but unfortunately no conclusions can be drawn from the parameters of these equations. Therefore, an improved understanding of adsorption is required, so that models can be extrapolated to new combinations of species.

To alleviate the shortcomings of existing models, a new model based on statistical thermodynamic principles and particularly the Monte Carlo method is proposed. With the use of this new model, classical non-ideal behaviour such as lateral interactions, heterogeneous carbon surfaces, selective adsorption due to steric interactions as well as irreversible adsorption can be modelled. Many of these influences have been mentioned by other authors but have not usually been included in equilibrium predictions. All the parameters used in the new method have some physical meaning and describe only a single characteristic of the adsorption system.

This method was applied successfully to two example systems, i.e. the more classic ideal system containing p-bromophenol and p-nitrophenol, as well as the adsorption of gold and silver cyanide complexes. Some insight into the adsorption reactions taking place in these systems can be gained if the method is used as a diagnostic tool. A sensitivity analysis was also conducted to demonstrate the behaviour of the model under various non-ideal conditions.

Keywords: Activated Carbon, Statistical Thermodynamics, Competitive Adsorption, Nonideal, Vacancy Solution Theory, Adsorbed Solution Theory, Multicomponent Adsorption, Aqueous-Solutions, Gas-Mixtures, Prediction, Equation, Simulation, Isotherm, Binary

Sağ, Y. and Kutsal, T. (1995), Biosorption of heavy metals by *Zoogloea Ramigera*: Use of adsorption isotherms and a comparison of biosorption characteristics. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **60** (1-3), 181-188.

Full Text: [C\Che Eng J Bio Eng J60, 181.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J60,%20181.pdf)

Abstract: The biosorption of lead(II), copper(II), nickel(II) and iron(III) ions on *Zoogloea Ramigera*, an activated sludge bacterium, was studied with respect to adsorption pH and temperature in order to determine the optimum conditions for heavy metal removal. Optimum initial pH for the biosorption of lead(II), nickel(II) and copper(II) ions by *Z. Ramigera* was determined as 4.0-4.5 whereas higher biosorptive uptake of iron(III) ions by *Z. Ramigera* was obtained at pH 2.0. Maximum biosorption rates of nickel(II) and copper(II) ions by *Z. Ramigera* were obtained at 25°C, while the initial biosorption rates and the adsorptive capacity of the biomass for lead(II) and iron(III) ions increased with increasing temperatures in the range 25-45°C. The adsorption isotherms were developed for optimum conditions and it was seen that the adsorption equilibrium data fit both Freundlich and Langmuir isotherms within the metal ion concentrations studied (25-200 mg1-1). The adsorption constants for lead(II) and iron(III) were higher than those for nickel(II) and copper(II) for both Langmuir and Freundlich models.

Keywords: Alga *Chlorella-Vulgaris*, *C. Vulgaris*, Cadmium, Ions, Accumulation, Uranium, Zinc, Biomass, Waste Water, Adsorption, Micro-Organisms, Stirred Reactor

Mutlu, M., Sağ, Y. and Kutsal, T. (1997), The adsorption of copper(II) by *Z-ramigera* immobilized on *Ca-alginate* in packed bed columns: A dynamic approach by stimulus-response technique and evaluation of adsorption data by moment analysis. *The Chemical Engineering Journal and the Biochemical Engineering Journal*, **65** (1), 81-86.

Full Text: [C\Che Eng J Bio Eng J65, 81.pdf](C/Che%20Eng%20J%20Bio%20Eng%20J65,%2081.pdf)

Abstract: In this study, Cu-II adsorption by Z. ramigera immobilized on Ca-alginate was investigated in a packed bed column test circuit using a stimulus-response technique. The mathematical model was described and solved using “parameter estimation by cybernetic moment technique”, and the adsorption rate constant of Cu-II ions on Z. ramigera immobilized on Ca-alginate was calculated. The Peclet numbers, which reflect the column flow characteristics in the cases of no diffusion and/or no adsorption, were calculated. The diffusional effects inside the pores of biomass immobilized on Ca-alginate matrices were investigated. The moment technique was used far evaluation of stimulus-response data of heavy metal-biosorbent interactions, to determine the process parameters.

Keywords: Cu-II Adsorption, Immobilized *Z-Ramigera*, Ca-Alginate Matrix, Stimulus-Response Analysis, Moment Technique

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Keywords: Efficiency

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# Title: Chemical Engineering Progress

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Keywords: Correlation.

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McConvey, I.F. and McKay, G. (1985), Mass transfer model for the adsorption of basic dyes on woodmeal in agitated batch adsorbers. *Chemical Engineering Processing*, **19** (5), 267-275.

Full Text: [C\Che Eng Pro19, 267.pdf](C/Che%20Eng%20Pro19,%20267.pdf)

Abstract: The adsorption of three basic dyes, Basic Blue 3, Basic Blue 69 and Basic Orange 2, onto woodmeal has been studied in batch adsorbers. The effects of initial dye concentration and mass of woodmeal have been studied.

A two-resistance mathematical model has been developed based on external mass transfer, pore diffusion and the assumption of an irreversible isotherm for operating conditions lying on the monolayer of observed Langmuir isotherms. The model, which has an analytical solution, predicts theoretical concentration decay curves which show good agreement with observed experimental decay curves.

McKay, G. and McConvey, I.F. (1985), Adsorption of acid dye onto woodmeal by solid diffusional mass transfer. *Chemical Engineering Processing*, **19** (6), 287-295.

Full Text: [C\Che Eng Pro19, 287.pdf](C/Che%20Eng%20Pro19,%20287.pdf)

Abstract: The adsorption of Telon Blue (Acid Blue 25) dye onto wood has been studied using an agitated batch adsorber. The variables studied include agitation, initial dye concentration, wood mass, wood particle size and dye solution temperature. Isotherms were measured and the isotherm parameters were determined.

A mathematical model has been developed using the basis of the model proposed by Mathews and Weber Jr. This model is based on external mass transfer and solid-phase diffusion, and has been used to generate theoretical concentration––time decay curves. The results of the model were adjusted to the experimental data using a ‘best fit’ approach. The external mass transfer coefficient was found to vary with the degree of agitation, and consequently all other variables were considered at a constant agitation speed of 400 rev min-1. A good agreement between the theoretical generated and the experimental concentration––time decay curves was achieved using a constant external mass transfer coefficient, 0.30×10-3 cm -1, and a constant solid-phase diffusivity, 0.200×10-8 cm2 s-1, for varying initial dye concentrations as well as wood mass. In experiments where the particle diameter was varied, a constant external mass transfer coefficient was sufficient to describe the system, but a decreasing diffusivity was required with increasing particle size. To simulate the effect of varying temperature, both external mass transfer coefficient and diffusivity were varied.

McKay, G. (1987), Mass transport processes for the adsorption of dyestuffs onto chitin. *Chemical Engineering and Processing*, **21** (1), 41-51.

Full Text: [C\Che Eng Pro21, 41.pdf](C/Che%20Eng%20Pro21,%2041.pdf)

Abstract: The adsorption of four dyestuffs onto chitin has been studied. A model has been developed to explain the mass transport of dyestuffs onto chitin. The two-resistance mass transfer model is based on external film mass transfer and pore diffusion. Two solutions are presented: the first is a rapid analytical model which may be applied to adsorption systems in which the operating lines and tie lines terminate on the monolayer of the isotherm, assumed pseudo-irreversible; the second is a model which can be applied for any operating conditions but necessitates differentiation of the experimental concentration decay curve.

McKay, G. and Al-Duri, B. (1987), Simplified model for the equilibrium adsorption of dyes from mixtures using activated carbon. *Chemical Engineering and Processing*, **22** (3), 145-156.

Full Text: [C\Che Eng Pro22, 145.pdf](C/Che%20Eng%20Pro22,%20145.pdf)

Abstract: Adsorption isotherms have been determined experimentally for the single-component adsorption of three dyes, namely, Basic Red 22, Basic Yellow 21, and Basic Blue 69 onto carbon. In addition, the three possible bisolute isotherms and the one trisolute isotherm for these three dyes were determined. In each case the Langmuir, Freundlich and Jossens isotherm constants were determined and the Langmuir data were then used to correlate and predict the multicomponent isotherm data from single-component data in a simplified manner.

McKay, G. and Al-Duri, B. (1988), Branched-pore model applied to the adsorption of basic dyes on carbon. *Chemical Engineering and Processing*, **24** (1), 1-13.

Full Text: [C\Che Eng Pro24, 1.pdf](C/Che%20Eng%20Pro24,%201.pdf)

Abstract: The branched-pore adsorption model, expressed by an external mass transfer coefficient *k*f, a solid diffusivity *D*s, a lumped micropore diffusion rate parameter *k*b, and the fraction of macropores *f*, describes kinetic data from initial contact of adsorbent-adsorbate to the long-term (> 24 hours) adsorption stages with reasonable accuracy.

In this work the model is applied for three basic dye systems, namely Basic Red 22, Basic Yellow 21 and Basic Blue 69, all on carbon. A single value of each parameter describes each dye system. The *k*f values are 0.18×10-2±28%, 0.3×10-2±17% and 0.2×10-2 ±20% cm s-1, the *D*s values are 0.33×10-9 21%, 0.72×10-9 ±9% and 0.72×10-9 ±9% cm2 s-1, the *k*b values are 0.65×10-6 ±7.7%, 1.8×10-6 0.2×10-6 1% s-1, while the *f* values are 0.55 ±9%, 0.60 ±10 % and 0.18 ±11%, each for Basic Red 22, Basic Yellow 21 and Basic Blue 69 respectively.

The model is based on the internal structure of the carbon particle being divided into a macropore and a micropore region. The latter has an upper-bound capacity of 241, 245 and 656 mg g-1 for Basic Red 22, Basic Yellow 21 and Basic Blue 69 respectively. A sensitivity analysis for each parameter has been carried out.

McKay, G. and Al-Duri, B. (1991), Extended empirical Freundlich isotherm for binary systems: A modified procedure to obtain the correlative constants. *Chemical Engineering and Processing*, **29**, 133-138.

Full Text: [C\Che Eng Pro29, 133.pdf](C/Che%20Eng%20Pro29,%20133.pdf)

Abstract: In the present work the adsorption equilibriubm data of the binary combinations of three basic dyes, namely, Basic Blue 69, Basic Red 22 and Basic Yellow 21, onto activated carbon are obtained. The extended empirical Freundlich isotherm for binary systems was used, together with an additional assumption. Compared with previous works, this modification leads to a procedure that requires much less experimental and mathematical work. Through more restricted, the present method has been found to yield accurate results.

Mellah, A., Silem, A., Boualia, A. and Kada, R. (1992), Adsorption of organic matter from a wet phosphoric acid using activated carbon: Equilibrium study. *Chemical Engineering and Processing*, **31** (3), 191-194.

Full Text: [C\Che Eng Pro31, 191.pdf](C/Che%20Eng%20Pro31,%20191.pdf)

Abstract: Organic matter removal from dark green industrial phosphoric acid is essential to avoid foaming and emulsions that strongly obstruct the recovery of uranium in liquid-liquid extraction. The purpose of this paper is to report the equilibrium adsorption isotherms of organic matter contained in industrial phosphoric acid adsorbed onto activated carbon and the Langmuir, Freundlich and Redlich-Peterson constants obtained.

Germerdonk, R. and Wang, A. (1993), Pollution adsorption during activated carbon and steam regeneration in technical columns (experiments, modelling). Part 1: Influence of radial maldistribution in activated carbon beds during adsorption and desorption of air pollutants. *Chemical Engineering and Processing*, **32** (6), 359-367.

Full Text: [C\Che Eng Pro32, 359.pdf](C/Che%20Eng%20Pro32,%20359.pdf)

Abstract: Adsorption experiments in activated carbon columns of technical scale show that, with fresh carbon, the radial maldistribution –– caused by higher bed porosity near the wall than in the bulk –– influences the local exit concentrations of pollutants, especially at environmentally relevant low concentrations. This effect leads to an earlier pollutant breakthrough near the wall thus increasing the median exit pollutant concentrations markedly even at columns diameters ≥100 particle diameter.

The modelling of pollutant adsorption, including the maldistribution effects in an activated carbon bed, correlates well with measured values. Yet the same maldistribution effects lead, during pollutants desorption with saturated steam, to better desorption of the wall-near zone compared with the bulk, so that local pollutant breakthrough during the following adsorption step occurs later in the wall-near zone.

If the upper part of the carbon bed is preheated before desorption and in addition, superheated steam is taken for desorption, the residual pollutant concentration becomes so low all over the cross section that, during the following adsorption step, local pollutant breakthrough can occur earlier in the wall-near zone again.

Germerdonk, R. and Wang, A. (1993), Pollution adsorption during activated carbon and steam regeneration in technical columns (experiments, modelling). Part 2: Influence of process parameters during steam regeneration of activated carbon beds on pollutant exit concentration. *Chemical Engineering and Processing*, **32** (6), 369-377.

Full Text: [C\Che Eng Pro32, 369.pdf](C/Che%20Eng%20Pro32,%20369.pdf)

Abstract: Experiments in activated carbon columns of technical scale with upstream adsorption and downstream steam regeneration showed that pollutant exit concentration of waste gas can be markedly decreased if the upper zone of the fixed bed is preheated to ≥120 °C before desorption and, additionally, if the bed is desorbed with superheated steam with a temperature ≥150 °C. With this improved steam regeneration technique a decrease in pollutant exit concentration is achieved: for example, from 20 to 3 mg m−3 toluene. An increase in adsorption time before pollutant breakthrough from 12 to 19 h is also noted.

During regeneration of a cold bed of activated carbon with saturated steam the particles will become wetted with condensate outside and adsorbed steam inside. These water condensation/adsorption effects are markedly reduced by preheating the particles to temperatures so far above that of steam condensation that steam adsorption is prevented too. Additionally the regeneration steam is superheated so that the temperature drop caused by heat of pollutant desorption is not so great that steam adsorption occurs.

The whole desorption-adsorption cycle in a technical scale bed, including the effects of Steam condensation/ adsorption, flux and suction of condensate, hetero-azeotropic pollutant distillation and evaporation of condensate was modelled.

Radial maldistribution effects (discussed in part 1 of this paper, Chem. Eng. Proc., 32 (1993) 359) have not been taken into account here.

The calculated flux rates of pollutant in the gas mixture leaving the bed during desorption and the pollutant breakthrough curves at the following adsorption step correlate quite well with experimental results.

Menoud, P., Cavin, L. and Renken, A. (1998), Modelling of heavy metals adsorption to a chelating resin in a fluidized bed reactor. *Chemical Engineering and Processing*, **37** (1), 89-101.

Full Text: [C\Che Eng Pro37, 89.pdf](C/Che%20Eng%20Pro37,%2089.pdf)

Abstract: Adsorption to a chelating resin is a method for recovering heavy metals from wastewater containing very light quantities of heavy metals (<0.3 molm-3, which approximately corresponds to 20 ppm). A thermodynamical study in a closed vessel showed that equilibrium is well represented by a Langmuir isotherm. Adsorption kinetics in a continuous stirred tank reactor were also conducted. Experiments were simulated by a global kinetics model comprising mass transfer in a liquid film around the resin particles, with diffusion through the pores and reaction on the adsorption sites. Kinetics has been found to be limited by film mass transfer for all metals studied (Cu2+, Ni2+, Co2+ and Zn2+). The mass transfer coefficient k (L) was found to be around 10-4 m s-1. Adsorption of heavy metals was then carried out at mini-pilot scale. Problems due to a decrease in particles mean radius during the adsorption prompted us to use a fluidized bed. It is also possible with this reactor to treat solutions containing suspended solids which would clog fixed beds. The decrease in particle radius (or increase in apparent density of the resin) produces a contraction of the fluidized bed: unloaded particles remain at the top of the bed and a density gradient appears throughout the column, leading to a stabilization of the fluidized bed, The measured phenomenon is well described by a liquid plug flow model with immobile resin in the column. As for the adsorption in the continuous stirred tank, the Langmuir model and the kinetics limited by film mass transfer were considered. The mass transfer coefficient k (L) was adjusted to a value around 10-5 m s-1.

Keywords: Impregnated Macroporous Resins, Particle Diffusion Kinetics, Ion-Exchange, Solid Particles, Mass-Transfer, Liquid, Sorption, Chelating Resin, Heavy Metal, Langmuir Isotherm, Adsorption Kinetics, Fluidized Bed, Stratification

Frimmel, F.H., Assenmacher, M., Sörensen, M., Abbt-Braun, G. and Gräbe, G. (1999), Removal of hydrophilic pollutants from water with organic adsorption polymers. Part I. Adsorption behaviour of selected model compounds. *Chemical Engineering and Processing*, **38** (4-6), 601-610.

Full Text: [C\Che Eng Pro38, 601.pdf](C/Che%20Eng%20Pro38,%20601.pdf)

Abstract: The adsorbability of 2-aminonaphthalene-1-sulfonate, diuron, l-naphthol and natural organic matter (NOM) onto an organic polymer resin and onto activated carbon was investigated. Isotherms with the substances alone and in the presence of dissolved NOM were measured. There was a good adsorbability of diuron and l-naphthol on both sorbents. At low initial concentrations of the compounds the activated carbon showed higher adsorptivity, whereas for high initial concentrations the polymer resin showed an equal or better adsorption behaviour. 2-Aminonaphthalene-1-sulfonate and the NOM showed favorable adsorption behaviour to activated carbon but was only poorly adsorbed on the polymer resin. In the presence of NOM, the adsorbability of the single compounds decreased significantly on activated carbon. Nearly no influence was found for the adsorption of the pollutants on the resin. For the polymer resin, additionally, the breakthrough behaviour of the substances was investigated. The results obtained in the batch experiments for the single substances were confirmed. However, in the presence of NOM the breakthrough occurred at shorter times for all three substances. Regeneration of the resin with isopropanol proved to be a good cleaning method. A recovery of 92-96% of the substances was reached. (C) 1999 Elsevier Science S.A. All rights reserved.

Keywords: Humic Substances, Activated Carbon, Adsorption, Organic Adsorber Polymer Resin, Hydrophilic Pollutants, Humic Substances, Drinking Water Treatment

Susu, A.A. (2000), Mathematical modelling of fixed bed adsorption of aromatics and sulphur compounds in kerosene deodorisation. *Chemical Engineering and Processing*, **39** (6), 485-497.

Full Text: [C\Che Eng Pro39, 485.pdf](C/Che%20Eng%20Pro39,%20485.pdf)

Abstract: A mathematical model that adequately predicts the effluent concentration and breakthrough profiles of aromatic and sulphur compounds in kerosene deodorisation has been developed. The contributions of radial transport (pore and surface diffusion) were incorporated in the mathematical formulations. Thus, the final model took into account the overall effect of both the solid and liquid phase mass transfer resistances. The resulting model expressions were coupled partial differential equations which were resolved into first order ordinary differential equations using the orthogonal collocation technique. The roots of the Jacobi orthogonal polynomials (PNα,β) with N=8 and α=β=0 were taken as the interior collocation points while the exterior points were ζ=1, z=0 and z=1. The fourth-order Runge Kutta method was then used to integrate the 4N differential equations and the resulting functions were solved simultaneously to obtain the effluent and breakthrough profiles. Theoretical predictions from the model were compared with column adsorption data to ascertain the authenticity of the model. The agreement was good for both cases of aromatics and sulphur breakthroughs. The experimental breakthrough time of 8 h was predicted by the model. The breakthrough profiles also confirmed the formation of multiple adsorption layers.

Keywords: Kerosene Deodorization, Radial Transport, Mathematical Modeling

Adhoum, N. and Monser, L. (2002), Removal of cyanide from aqueous solution using impregnated activated carbon. *Chemical Engineering and Processing*, **41** (1), 17-21.

Full Text: [C\Che Eng Pro41, 17.pdf](C/Che%20Eng%20Pro41,%2017.pdf)

Abstract: Impregnated activated carbons are carbonaceous adsorbents which have silver and nickel distributed on their surface. The impregnation optimises the existing properties of the activated carbon giving greater cyanide removal capacity to the carbon. This facilitates the cost-effective removal of cyanide impurities from aqueous effluent. The adsorption isotherms of the impregnating elements (Ag and Ni) from aqueous solutions on plain activated carbon was measured. The amount of adsorbed silver on plain carbon reached 45.7 mg g−1 carbon and for nickel was 4.3 mg g−1 carbon. These impregnated materials were packed in fixed bed columns and used for cyanide removal from aqueous solutions. The adsorbed capacity was monitored from the breakthrough, which indicates that the carbon is not longer adsorbing effectively. The results indicates that carbon–Ag impregnation was shown to have a cyanide removal capacity of nearly two times that of carbon–Ni impregnation and of four times that of plain activated carbon. These suggest that cyanide was probably eliminated in the forms Ag(CN)2− and Ni(CN)4 complexes. However, calcination of impregnated activated carbon under nitrogen at 300°C showed similar results to impregnated non-calcinated ones.

Keywords: Activated Carbon, Impregnated Activated Carbon, Fixed Bed Columns, Cyanide

Akbari, A., Remigy, J.C. and Aptel, P. (2002), Treatment of textile dye effluent using a polyamide-based nanofiltration membrane. *Chemical Engineering and Processing*, **41** (7), 601-609.

Full Text: [C\Che Eng Pro41, 601.pdf](C/Che%20Eng%20Pro41,%20601.pdf)

Abstract: Experiments were run with seven dyes and a Desal 5DK membrane (cut-off, 150-300 g/mole). The effects of concentration, pH and salt on flux and retention were studied. The cut-off of the membrane explains that the retention of the relative high molecular weight dyes (as direct red 80 or direct yellow 8) is always almost 100%. For anionic dyes as acid orange 10 or acid red 4, the amphoteric nature of polyamide explains the lower retention at pH 3 than 6. This effect is more pronounced and reversed for basic blue 3, a cationic dye. The membrane is sensitive to fouling since most of the dyes are used for polyamide textile dying. Moreover, the presence of salt leads to a further decrease in flux. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Nanofiltration, Textile Dyes, Fouling, Polyamide, Waste-Water, Dyehouse Effluents, Plant Effluent, Reuse

Kopaç, T. and Kocabaş, S. (2002), Adsorption equilibrium and breakthrough analysis for sulfur dioxide adsorption on silica gel. *Chemical Engineering and Processing*, **41** (3), 223-230.

Full Text: [C\Che Eng Pro41, 223.pdf](C/Che%20Eng%20Pro41,%20223.pdf)

Abstract: In this work, the adsorption equilibrium and adsorption rate of sulfur dioxide were investigated on silica gel. A packed bed adsorber 0.1 m in length and 0.0095 m in diameter was used for the adsorption experiments. The adsorption equilibrium experiments were carried out at 473 K constant temperature with an initial sulfur dioxide concentration in the range 430-3400 Langmuir p.p.m. in nitrogen carrier gas. The experimental adsorption isotherms were compared with the Freundlich, Langmuir, and the linearized form of the Brunauer-Enunett-Teller and the Dubinin-Radushkevitch-Kaganer models by the nonlinear least-squares estimate method. The Freundlich model gave the best fit with a correlation coefficient greater than 0.98, suggesting a surface adsorption mechanism for sulfur dioxide adsorption on silica gel. The deactivation model was applied to the adsorption rate data. It was found that the adsorption rate data fitted well with the deactivation model. Observed adsorption rate constants and the first-order deactivation rate constants were obtained from the model. The nonlinear least-squares analysis technique was used to estimate the parameters appearing in the deactivation model. The breakthrough experiments were repeated at 1610 p.p.m. constant initial sulfur dioxide concentration in a temperature range of 323-473 K, and the effect of initial sulfur dioxide concentration and the effect of temperature were investigated on the model results. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Sulfur Dioxide Adsorption, Silica Gel, Adsorption Isotherms, Deactivation Model, Deactivation Model, Activated Carbon, SO2, Removal

? Benaïssa, H. and Elouchdi, M.A. (2007), Removal of copper ions from aqueous solutions by dried sunflower leaves. *Chemical Engineering and Processing*, **46** (7), 614-622.

Full Text: [2007\Che Eng Pro46, 614.pdf](2007/Che%20Eng%20Pro46,%20614.pdf)

Abstract: In the present work, the potential use of dried sunflower leaves to remove copper ions from aqueous solutions was evaluated. Kinetic data and equilibrium sorption isotherm were measured in batch conditions. The influence of some parameters such as: contact time, initial metal concentration, initial pH of solution and copper salt nature on the metal removal kinetics has been studied. Copper uptake was time contact, initial copper concentration, initial pH solution and copper salt type dependent. The sorption of copper increased as contact time, initial metal concentration, initial pH of solution increased. Maximum copper sorption was found to occur at around initial pH 5–6. Three simplified kinetic models including a first-order equation, pseudo-second-order and second-order equations were selected to follow the sorption process. The process follows a pseudo-second-order kinetics. Langmuir and Freundlich models were used to describe sorption equilibrium data at natural pH of solution. Results indicated that the Langmuir model gave an acceptable fit to the experimental data than the Freundlich equation. Maximum copper uptake obtained was *q*m = 89.37 mg/g (1.41 mmol/g).

Keywords: Adsorption Characteristics, Agricultural By-Products, Cadmium Biosorption, Cations, Concentration, Copper, Dried Sunflower Leaves, Equilibrium, Freundlich, Heavy-Metal Removal, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Leaves, Marine-Algae, Metal, Metal Removal, Model, Models, Natural, Parameters, pH, Process, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Sorption, Sorption Equilibrium, Sorption Isotherm, Sorption Isotherms, Uptake, Waste-Water

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Full Text: [2007\Che Eng Pro46, 1020.pdf](2007/Che%20Eng%20Pro46,%201020.pdf)

Abstract: The efficiency of waste acom of Quercus ithaburensis (WAQI) as an adsorbent for removing Cr(VI) ions from synthetic wastewater has been studied. Batch adsorption experiments were carried out as a function of pH, adsorbent mass, Cr(VI) ion concentration, agitation rate and temperatures. Maximum metal sorption was found to occur at initial pH 2.0. The adsorption capacity of WAQI was found to be 31.48 mg g-1 for initial Cr(VI) concentration of 400 mg L-1 at 25°C. Batch adsorption models, based on the assumption of the pseudo first-order, pseudo second-order mechanism and Elovich equation were applied to examine the kinetics of the adsorption. The results showed that kinetic data were followed fitting the pseudo second-order model than the pseudo first-order and Elovich equation. Thermodynamic parameters such as ΔH°, ΔS°and ΔG° were calculated. The adsorption process was found to be endothermic and spontaneous. The results were analyzed by the Langmuir, Freundlich, Dubinin-Radushkevich (D-R), Temkin, Frumkin, Harkins-Jura, and Smith equation using linearized correlation coefficient at different temperature. The characteristic parameters for each isotherm have been determined. Models and the isotherm constant were evaluated depending on temperature. Langmuir and Freundlich equation is found to best represent the equilibrium data for Cr(VI) ions-waste acorn systems. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Models, Adsorption Process, Agitation, Aqueous-Solutions, Batch, Batch Adsorption, Biomass, Biosorption, Capacity, Characteristic, Chromium, Concentration, Correlation, Cr(VI), Cr(VI) Ion, Cr(VI) Ions, Efficiency, Elovich, Elovich Equation, Endothermic, Equilibrium, Equilibrium Data, Experiments, First Order, Fitting, Freundlich, Freundlich Equation, Function, G, Hexavalent Chromium, Ion, Ions, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Mass, Mechanism, Metal, Metal Sorption, Model, Models, Parameters, pH, Process, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo Second-Order Model, Pseudo-First-Order, Pseudo-Second-Order, Quercus, Quercus Ithaburensis, Rate, Removal, Removing, Second Order, Sorption, Spontaneous, Synthetic, Synthetic Wastewater, Tea Factory Waste, Temperature, Temperatures, Ulothrix-Zonata, Waste, Waste Acorn, Wastewater, Water

? El-Naas, M.H., Abu Al-Rub, F., Ashour, I. and Al-Marzouqi, M. (2007), Effect of competitive interference on the biosorption of lead(II) by *Chlorella vulgaris*. *Chemical Engineering and Processing*, **46** (12), 1391-1399.

Full Text: [2007\Che Eng Pro46, 1391.pdf](2007/Che%20Eng%20Pro46,%201391.pdf)

Abstract: Batch experiments were carried out to asses the effect of Cu(II) and Zn(II) on the biosorption of lead(II) ions by non-living *Chlorella vulgaris*. The uptake of Pb(II) was examined for single, binary and ternary solutions at different initial concentrations and different pH values. The experimental results showed that the uptake increased with increasing pH from 3.0 to an optimum value of 5.0. The biosorption of Pb(II) was found to be adversely affected by the presence of Cu(II) ions, while Zn(II) ions seemed to have negligible effect on the process. The equilibrium data were fitted to four isotherm models: Langmuir, Freundlich, Sips and Dubinin–Radushkevich; the Sips isotherm gave the best fit for the data. Modeling of the controlling mechanisms indicated that both intrinsic kinetics and mass transfer played major roles in controlling the process. A new dimensionless parameter, *Ψ*, was defined to asses the relative contributions of the two mechanisms to the biosorption of lead(II). Mass transfer seemed to be the dominant mechanism at low initial lead(II) concentrations, while intrinsic kinetics dominates at high concentrations.

Keywords: Biosorption, Competitive Adsorption, Lead(II), Modeling, Controlling mechanisms, Preferential Adsorption

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Full Text: [2008\Che Eng Pro47, 31.pdf](2008/Che%20Eng%20Pro47,%2031.pdf)

Abstract: This study focuses on adsorption of Pb(II) and Hg(II) on nonviable activated sludge biomass at both batch and continuous-flow operational conditions. The raw biomass was supplied from a nearby municipal wastewater treatment plant activated sludge aeration unit. First, optimum pHs for Pb(II) and Hg(II) adsorption was investigated on raw biomass. Optimum pH for Pb(II) and Hg(II) were found to be 3.5 and 5.8, respectively. Successively raw biomass was conditioned by 12 different methods and the method yielding highest adsorption capacity, at the predetermined optimum pHs, was investigated for sorption kinetics and isotherm modeling. Among the methods tested, the type of biosolids conditioned by holding the biosolids in NaOH solution for 15 min followed by autoclaving at 18 psi at 121°C for 30 min (Type 4) yielded the highest biosorption capacity. The sorption kinetics and isotherm model fitting studies, applying pseudo-first and -second order rate models as well as long-familiar Langmuir and Freundlich isotherm models, demonstrated that data fit well to pseudo-second order kinetics and Langmuir isotherm models. The highest adsorption equilibrium, optimum pH and temperature for Pb(II) were 0.387 mmol g-1 at 1.206 mM initial concentration test run at pH of 3.5 and 30°C while the same parameters for Hg(II) were found out to be 0.097 mmol g-1 at 0.099 mM initial concentration test run at pH of 5.8 and 20°C, respectively. Continuous-flow tests were conducted in downflow operational mode using immobilized filter-matrix and the resulting data fitted well to Thomas kinetics model. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Sludge Biomass, Adsorption, Adsorption Equilibrium, Aqueous-Solutions, Aspergillus-Niger, Biosorption, Cadmium, Equilibrium, Heavy-Metal Biosorption, Hg(II) Biosorption, Ions, Isotherm, Kinetics, Lead Removal, Pb(II), Sorption, Sorption Isotherm Modeling, Sorption Kinetics Modeling, Zinc

? Srivastava, V.C., Mall, I.D. and Mishra, I.M. (2008), Adsorption of toxic metal ions onto activated carbon. Study of sorption behaviour through characterization and kinetics. *Chemical Engineering and Processing*, **47** (8), 1275-1286.

Full Text: [2008\Che Eng Pro47, 1275.pdf](2008/Che%20Eng%20Pro47,%201275.pdf)

Abstract: This paper presents the physico-chemical characteristics of coconut-based activated carbon of commercial grade (ACC) and the sorption behaviour and kinetics of adsorption of toxic metal ions onto ACC. The proximate and CHN analysis of the ACC showed the presence of ∼41% carbon, ∼16% hydrogen and ∼2% nitrogen in ACC. Bulk density and heating value of ACC were found to be 599.32 kg/m3 And 18.81 MJ/kg, respectively. The BET surface area was 171.05 m2/g whereas the BET average pore diameter was 31.03 Å. The meso-porous surface area was found to be 76% and the micro-porous surface area was 24% of the total pore surface area. The polar groups present on the ACC surface impart considerable cation exchange capacity to it. ACC worked as a very good adsorbent at an optimum initial pH (pH0) of 6.0 and at a dose of 20 g/dm3 for the adsorption of cadmium (Cd(II)), nickel (Ni(II)) and zinc (Zn(II)) metal ions at a concentration of 100 mg/dm3. The adsorption of metal ions onto ACC was found to be a gradual process and the quasi-equilibrium condition reached in 5 h. The adsorption followed pseudo-second-order kinetics. The effective diffusion coefficient was of the order of 10-12 m2/s. © 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Analysis, Aqueous-Solution, Bagasse Fly-Ash, Behaviour, BET, BET Surface Area, Cadmium, Capacity, Carbon, Cation, Cation Exchange, Characterization, Competitive Adsorption, Diffusion, Diffusion Coefficient, Equilibrium, Functional Groups, Hydrogen, Isotherm, Kinetics, Kinetics of Adsorption, Liquid-Phase Adsorption, Mesoporous, Metal, Metal Ions, Nickel, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Rights, Sorption, Surface Area, Surface Fractal Dimension, X-Ray Diffraction, Zinc, Zn(II)

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Full Text: [2008\Che Eng Pro47, 1426.pdf](2008/Che%20Eng%20Pro47,%201426.pdf)

Abstract: The purpose of this work was to investigate the potential of macroporous resins, YPR-II and D1300, in adsorbing solanesol. The dependence of the adsorption of solanesol on solvent and temperature was studied in batch experiments. It was found that lower alkanols and low temperature were advantageous to present adsorption process. Adsorption isotherm was modeled by Freundlich and Langmuir equations. The correlation coefficient indicated that Langmuir model fitted better to the experimental data. The thermodynamic parameters such as enthalpy, Gibbs free energy and entropy changes were calculated and these values showed that solanesol adsorption process was exothermic and spontaneous. Kinetic aspects of the adsorption of solanesol by macroporous resins were studied in packed column and investigated using Adams-Bohart model. Breakthrough studies showed a good correlation between the experimental data and calculated data by the Adams-Bohart model. Thus, the Adams-Bohart model was employed to determine characteristic parameters, useful for process design, such as adsorption rate constant, saturation adsorption capacity. At last, the effects of adsorption rate constant and saturation adsorption capacity on breakthrough were predicted by reformed Adams-Bohart model. The predicted results showed that the time required to reach breakthrough point increased with increasing adsorption rate constant and saturation adsorption capacity. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Solanesol, Macroporous Resins, Equilibrium, Thermodynamics, Breakthrough Studies, Aqueous-Solution, Dynamic Removal, Coenzyme Q(10), Packed-Column, Heart-Failure, Ions, Acid, Purification, Adsorbents, Kinetics

? Hamdaoui, O. (2009), Removal of cadmium from aqueous medium under ultrasound assistance using olive leaves as sorbent. *Chemical Engineering and Processing*, **48** (6), 1157-1166.

Full Text: [2009\Che Eng Pro48, 1157.pdf](2009/Che%20Eng%20Pro48,%201157.pdf)

Abstract: In this work, the leaves of olive tree (Olea europaea) are proposed as a novel low-cost non-conventional sorbent for the removal of cadmium from aqueous solutions with and without the assistance of ultrasound and by associating simultaneously ultrasonic irradiation and stirring. Sorption kinetics and isotherms were investigated. The operating variables studied were initial cadmium concentration, sorbent dosage, temperature and ultrasonic power. The sorption was significantly increased in the presence of ultrasound. The amount of cadmium sorption with the assistance of ultrasound was improved with the increase of sorbate initial concentration and temperature, and with the decrease of sorbent dosage. The acoustic power was an important factor for the enhancement of the removal of cadmium. The combination of stirring and ultrasound leads to an intensification of the removal of cadmium. Sorption isothermal data could be well simulated by Freundlich model. and then Temkin and Langmuir models. Langmuir simulation showed that the monolayer sorption capacities of olive leaves were 42.19, 55.87 and 64.94 mg g-1 for the conventional method, the ultrasound-assisted method and the combined method, respectively. The kinetic data fitted very well the pseudo-second-order kinetic model. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Medium, Aqueous Solutions, Cadmium, Combined Method, Concentration, Conventional, Data, Desorption, Equilibrium, Freundlich, Freundlich Model, Granular Activated Carbon, Intensification, Irradiation, Isothermal, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Low Cost, Metal-Ions, Model, Models, Monolayer, Olive Leaves, P-Chlorophenol, Power, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Simulation, Solutions, Sonochemistry, Sorbate, Sorbent, Sorption, Sorption, Sorption Kinetics, Temperature, Ultrasonic, Ultrasound, Waste-Water, Wheat Bran, Work

? Sarıcı-Özdemir, Ç. and Önal, Y. (2010), Study to investigate the importance of mass transfer of naproxen sodium onto activated carbon. *Chemical Engineering and Processing*, **49** (10), 1058-1065.

Full Text: [2010\Che Eng Pro49, 1058.pdf](2010/Che%20Eng%20Pro49,%201058.pdf)

Abstract: In the present study the adsorption of naproxen sodium onto activated carbons (BK4 obtained from white polymeric waste and SK4 obtained from black polymeric waste) was investigated by calculating the parameters of pH contact time the concentration of naproxen sodium and the temperature The adsorption data of naproxen sodium onto activated carbon follows the Langmuir isotherm model and its kinetic processes were described by various kinetic adsorption models It was determined that the pseudo-second-order model was the best choice among all the available kinetic models to describe the adsorption behaviour of naproxen sodium onto activated carbon During the present study the intra-particle diffusion rate constant the external mass transfer coefficient and the film and pore diffusion coefficient were evaluated at various temperatures In addition the thermodynamic parameters of the adsorption of naproxen sodium onto activated carbon were also calculated Crown Copyright (C) 2010 Published by Elsevier B V All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption-Kinetics, Carbon, Carbons, Contact Time, Data, Diffusion, Diffusion Coefficient, Dye, Equilibrium, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Adsorption, Kinetic Models, Langmuir, Langmuir Isotherm, Malachite Green, Mass Transfer, Materials-Bottom Ash, Model, Models, pH, Pharmaceuticals, Pharmaceuticals, Pore, Processes, Pseudo Second Order, Pseudo-Second-Order, Rate Constant, Removal, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Water

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Abstract: Carboxymethyl Chitosan (NOCC) was prepared from the reaction between chitosan and monochloroacetic acid under alkaline conditions. It has numerous desirable features. It is water soluble, derived from a naturally occurring polysaccharide and is biodegradable. NOCC provides a valuable use for crustacean shells e.g. crabs, lobsters and shrimps which are waste materials and pollutants in many parts of the world.

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Full Text: [2003\Che Eng Res Des81, 585.pdf](2003/Che%20Eng%20Res%20Des81,%20585.pdf)

Abstract: In this study, surface functional groups on the oil-palm-shell adsorbents prepared by phosphoric acid (H3PO4) and potassium hydroxide (KOH) activation were detected using Fourier transform infrared (FTIR) spectroscopy. Oil-palm shell is an abundantly available carbonaceous by-product from palm-oil processing mills in some tropical countries like Malaysia, Indonesia and Thailand. Preparation of adsorbents from oil-palm shell is an economical and environmentally friendly utilization of these solid wastes. To develop more specialized and effective adsorbents from oil-palm shell, studies were carried out to investigate the effects of impregnation conditions on the textural and chemical characteristics of the prepared adsorbents. Adsorption and desorption tests of nitrogen dioxide (NO2) and ammonia (NH3) gases were used to evaluate the adsorptive capacities of the oil-palm-shell adsorbents. From the experimental results, it was found that surface functional groups, which were determined by the concentration of impregnation solution and the soaking time, had a significant influence on the adsorptive capacity due to the occurrence of chemisorption. Moreover, mechanisms of chemical activation of oil-palm shell using H3PO4 and KOH for the evolution of porosity and the formation of surface functional groups were also proposed based on the phenomena observed.

Keywords: Activation, Adsorbent, Adsorbents, Adsorption, Ammonia, Area, Capacity, Carbons, Chemical Activation, Chemisorption, Chemistry, Coconut Shell, Desorption, Evolution, Fourier Transform Infrared, Fourier Transform Infrared Spectroscopy, FTIR, Gas-Phase Adsorption, H3PO4, Infrared, Malaysia, Mechanisms, NH3, Nitrogen, Oil Palm Shell, Oil-Palm Shell, Phosphoric-Acid, Porosity, Preparation, Stones, Surface Functional Group

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Full Text: [C\Che Eng Res Des81, 1323.pdf](C/Che%20Eng%20Res%20Des81,%201323.pdf)

Abstract: The sorption of cadmium and copper ions onto bone char has been studied. The equilibrium data have been analysed using the Langmuir and the Sips isotherm equations. A series of fixed bed sorption studies have been undertaken for the two single component systems to study the effects of various system parameters, including initial metal ion concentration, solution flowrate and bone char particle size. A new mass transfer model has been developed based on external mass transfer and surface diffusion. This model has been tested using both isotherms and incorporating a variable surface coverage. Both metal ion systems have been correlated using this diffusion model and the experimental breakthrough curves with good agreement.

Keywords: Adsorption, Mass Transfer Model, Concentration-Dependent Surface Diffusivity, Metal Ion, Bone Char, Liquid-Phase Adsorption, Activated Carbon, Bone Char, Metal-Ions, Zinc Ions, Model, Cadmium, Copper, Acid, Peat

Saha, B., Tai, M.H. and Streat, M. (2003), Adsorption of transition metals from aqueous solutions by modified activated carbons. *Chemical Engineering Research & Design*, **81** (A10), 1343-1353.

Full Text: [C\Che Eng Res Des81, 1343.pdf](C/Che%20Eng%20Res%20Des81,%201343.pdf)

Abstract: Samples of a wood-based activated carbon, Ceca BGP, have been modified by acid and air oxidation. The physical and chemical characterizations of these samples in the form of scanning electron micrographs (SEM), Brunauer-Emmett-Teller (BET) and Langmuir surface area measurements, Fourier transform infra red spectroscopy (FTIR) analysis, sodium capacity determination, pH titration and zeta potential measurements have been conducted to determine their performance as sorbents for trace transition metal removal. Density functional theory (DFT) has been used to analyse the pore size distribution data. The adsorption of transition metal ions (Cu, Zn, Ni and Cd) from aqueous solution onto these sorbents has been studied in batch equilibrium experiments. The influence of pH on metal sorption capacity has been examined. The kinetic performance of acid oxidized samples has been assessed and the results have been analysed by a particle diffusion model. The breakthrough experiments have been conducted in mini-columns to study the selectivity towards the desired metal ion. Results indicated that sorption capacity has been markedly enhanced by modification due to addition of weakly acidic functional groups to the surface of the carbons. The BGP OxII sample showed about 100 times higher copper capacity than conventional Ceca BGP. The metal sorbed carbons have been regenerated using 0.1 M hydrochloric acid solution. Both modified samples demonstrated good regeneration efficiencies with 100% of the copper recovered with 0.1 M HCl solution during elution cycles compared to the amount of metal removed during the sorption experiments.

Keywords: Activated Carbon, Adsorption, Copper, Ions, Kinetic, Langmuir, Metal Sorption, Metals, Nitric-Acid, Oxidation, Oxidation, Regeneration, Sorption, Sorption Performance, Subsequent Treatment, Surface Characterization, Surface Complexes, Waste Treatment

? Saha, B., Tai, M.H. and Streat, M. (2003), Adsorption of transition metals from aqueous solutions by modified activated carbons. *Chemical Engineering Research & Design*, **81** (A10), 1343-1353.

Full Text: [2003\Che Eng Res Des81, 1343.pdf](2003/Che%20Eng%20Res%20Des81,%201343.pdf)

Abstract: Samples of a wood-based activated carbon, Ceca BGP, have been modified by acid and air oxidation. The physical and chemical characterizations of these samples in the form of scanning electron micrographs (SEM), Brunauer-Emmett-Teller (BET) and Langmuir surface area measurements, Fourier transform infra red spectroscopy (FTIR) analysis, sodium capacity determination, pH titration and zeta potential measurements have been conducted to determine their performance as sorbents for trace transition metal removal. Density functional theory (DFT) has been used to analyse the pore size distribution data. The adsorption of transition metal ions (Cu, Zn, Ni and Cd) from aqueous solution onto these sorbents has been studied in batch equilibrium experiments. The influence of pH on metal sorption capacity has been examined. The kinetic performance of acid oxidized samples has been assessed and the results have been analysed by a particle diffusion model. The breakthrough experiments have been conducted in mini-columns to study the selectivity towards the desired metal ion. Results indicated that sorption capacity has been markedly enhanced by modification due to addition of weakly acidic functional groups to the surface of the carbons. The BGP OxII sample showed about 100 times higher copper capacity than conventional Ceca BGP. The metal sorbed carbons have been regenerated using 0.1 M hydrochloric acid solution. Both modified samples demonstrated good regeneration efficiencies with 100% of the copper recovered with 0.1 M HCl solution during elution cycles compared to the amount of metal removed during the sorption experiments.

Keywords: Activated Carbon, Adsorption, Air, Analysis, Batch Equilibrium, Capacity, Carbon, Chemical, Copper, Determination, Diffusion, Distribution, Equilibrium, FTIR, Functional Groups, HCl, Hydrochloric Acid, Ion, Ions, Kinetic, Measurements, Metal Sorption, Metals, Model, Nitric-Acid, Oxidation, Oxidation, Particle, Performance, pH, Pore Size Distribution, Regeneration, Selectivity, SEM, Size Distribution, Sodium, Sorbed, Sorption, Sorption Capacity, Sorption Performance, Spectroscopy, Subsequent Treatment, Surface Area, Surface Characterization, Surface Complexes, Titration, Transition Metal, Transition Metals, Waste Treatment, Zeta Potential

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Full Text: [2004\Che Eng Res Des82, 667.pdf](2004/Che%20Eng%20Res%20Des82,%20667.pdf)

Abstract: The adsorption of p-xylene, o-xylene and ethylbenzene on ion-exchanged fuajasite type zeolite has been studied in liquid phase at 30, 50, 80, 120 and 180degreesC. The single adsorption isotherms have been measured in a batch mode. The Langmuir and Sips isotherm have been used to describe the experimental adsorption isotherm data. The Sips equation fits the experimental isotherm data better than the Langmuir model. The saturation adsorption capacity of the adsorbent was similar for all components (around 1 mol kg-1). The p-xylene is the more strongly adsorbed component followed by ethylbenzene and o-xylene. The heat of the adsorption was 27.2 kJ/mol for p-xylene, 20.3 kJ/mol for ethylbenzene and 18.5 kJ/mol for o-xylene. The kinetics of adsorption of p-xylene, o-xylene and ethylbenzene was also studied. The xylene uptake curves have been described by a mathematical model that accounts for the macropore and/or micropore diffusion as rate controlling mechanisms. It was found that, for temperatures lower than 80degreesC in the case of p-xylene and lower than 50degreesC for o-xylene and ethylbenzene, both macropore and micropore diffusion contribute to the rate of adsorption. At higher temperatures macropore diffusion is the rate-controlling mechanism.

Keywords: Xylenes, Faujasite Zeolite, Adsorption, Equlibrium, Kinetics, Modeling, Y-Zeolites, Separation, Hydrocarbons, Paraxylene, Counterdiffusion, Diffusion, Sorption, Mixtures

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Full Text: [2004\Che Eng Res Des82, 961.pdf](2004/Che%20Eng%20Res%20Des82,%20961.pdf)

Abstract: The removal of copper(II) from aqueous solution was investigated using thermally processed dolomitic sorbents. It was found that dolomite charred for long periods caused a rise in solution pH with subsequent bulk precipitation of the copper from solution. Dolomite charred for 6 h produced a sorbent that did not increase the solution pH as readily, but that still removed significant amounts of copper from solution. SEM analysis indicated that the most likely removal process for low pH contacting is by surface precipitation, a hypothesis that proved to be in agreement with work of previous researchers. Furthermore, the kinetics of the removal were also investigated and indicated that the process can be described by an elementary second-order chemical reaction-type rate process.

Keywords: Dolomite, Dolomitic Sorbents, Kinetic Sorption Studies, Water Treatment, Calcite, Adsorption, Surfaces, Precipitation, Chemisorption, Kinetics, Water

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Full Text: [2010\Che Eng Res Des88, 487.pdf](2010/Che%20Eng%20Res%20Des88,%20487.pdf)

Abstract: Removal of sulfur from diesel fuel by adsorption on a commercial activated carbon and 13X type zeolite was studied in a batch adsorber. Kinetic characterization of the adsorption process was performed applying Lagergren’s pseudo-first order, pseudo-second order and intraparticle diffusion models using data collected during experiments carried out to determine the sulfur adsorption dependency on time. The experiments investigating adsorption efficiency regarding initial sulfur concentration were also performed and the results were fitted to Langmuir and Freundlich isotherms, respectively. Activated carbon Norit SXRO PLUS was found to have much better adsorption characteristics. The process of sulfur adsorption on the fore mentioned activated carbon was further studied by statistically analyzing data collected during experiments which were carried out according to three-factor two-level factorial design. Statistical analysis involved the calculation of effects of individual parameters and their interactions on sulfur adsorption and the development of statistical models of the process. (C) 2009 The Institution of Chemical Engineers. Published by Elsevier B.V. All rights reserved.

Keywords: 13x, Activated Carbon, Adsorbents, Adsorption, Analysis, Batch, Calculation, Carbon, Characteristics, Characterization, Concentration, Data, Deep Desulfurization, Dependency, Design, Desulfurization, Development, Diesel Fuel, Diffusion, Efficiency, Equilibrium, Experiments, Freundlich, Granular Activated Carbon, Intraparticle Diffusion, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Mechanism, Models, Plus, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Selective Adsorption, Statistical Models, Sulfur, Sulfur Removal, Y-Zeolites, Zeolite

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Full Text: [2011\Che Eng Res Des89, 641.pdf](2011/Che%20Eng%20Res%20Des89,%20641.pdf)

Abstract: Mesoporous carbon, CMK-3, was prepared using hexagonal Al-SBA-15 mesoporous silica, instead of SBA-15, as a template. The synthesized materials were examined via X-ray diffraction and N(2)-adsorption. The mesoporous carbon was studied for its adsorption of dibenzothiophene (DBT) from petroleum fuels. The performance of this adsorbent was compared with SBA-15 and Al-SBA-15, through which CMK-3 showed higher sulfur adsorption capabilities due to a larger mesopore volume and a higher specific surface area. The uptake capacity for DBT followed the order CMK-3 > Al-SBA-15 > SBA-15. The results confirmed the importance of the adsorbent pore size and its surface chemistry for the adsorption of DBT from liquid phase. Langmuir and Freundlich isotherm models were used to fit equilibrium data for CMK-3. The equilibrium data were best represented by the Langmuir isotherm. Kinetic studies were carried out and showed the sorption kinetics of dibenzothiophene was best described by a pseudo-second-order kinetic model. (C) 2010 The Institution of Chemical Engineers. Published by Elsevier B.V. All rights reserved.

Keywords: Adsorption, Cell Applications, Cmk-3, Deep Desulfurization, Desulfurization, Dibenzothiophene, Diesel Fuel, Gasoline, Jet Fuel, Kinetics, Langmuir Isotherm, Mesoporous, Model, PAHs, Pi-Complexation, Pseudo-Second-Order, Removal, Selective Adsorption, Sulfur, Transportation Fuels

? Moussavi, G. and Khosravi, R. (2011), The removal of cationic dyes from aqueous solutions by adsorption onto pistachio hull waste. *Chemical Engineering Research & Design*, **89** (10A), 2182-2189.

Full Text: [2011\Che Eng Res Des89, 2182.pdf](2011/Che%20Eng%20Res%20Des89,%202182.pdf)

Abstract: The efficacy of pistachio hull powder (PHP) prepared from agricultural waste was investigated in this study as a novel adsorbent for the elimination of dye molecules from contaminated streams. Removal of methylene blue (MB) as a cationic model dye by PHP from aqueous solution was studied under different experimental conditions. The selected parameters were solution pH (2-10), PHP dosage (0.5-3 g/L), MB concentrations (100-400 mg/L), contact time (1-70), and solution temperature (20-50ºC). The experimental results indicated that the maximum MB removal could be attained at a solution pH of 8. The dosage of PHP was also found to be an important variable influencing the MB removal percentage. The removal efficiency of MB improved from 94.6 to 99.7% at 70 mm contact time when the MB concentration was decreased from 300 to 100 mg/L at a pH and PHP dosage of 8 and 1.5 g/L, respectively. The kinetic analysis showed that the pseudo-second-order model had the best fit to the experimental data. The Langmuir equation provided the best fit for the experimental data of the equilibrium adsorption of MB onto PHP at different temperatures. In addition, the maximum adsorption capacity increased from 389 to 602 mg/g when the temperature was increased from 20 to 50ºC. The thermodynamic evaluation of MB adsorption on PHP revealed that the adsorption phenomenon under the selected conditions was a spontaneous physical process. Accordingly, pistachio hull waste was shown to be a very efficient and low-cost adsorbent, and a promising alternative for eliminating dyes from industrial wastewaters. (C) 2011 The Institution of Chemical Engineers. Published by Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Batch, Cationic Dye, Dye, Dyes, Equilibrium, Kinetic, Kinetics, Langmuir, Low-Cost Adsorbent, Mb Adsorption, Methylene Blue, Methylene-Blue Adsorption, Peel, pH, Pistachio Hull, Pseudo Second Order, Removal, Temperature, Thermodynamic, Violet, Waste, Waste Materials

# Title: Chemical Engineering Science

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Notes: highly cited

? Danckwerts, P.V. (1953), Continuous flow systems: Distribution of residence times. *Chemical Engineering Science*, **2** (1), 1-13.

Full Text: [-1959\Che Eng Sci2, 1.pdf](-1959/Che%20Eng%20Sci2,%201.pdf)

Abstract: When a fluid flows through a vessel at a constant rate, either “piston-flow” or perfect mixing is usually assumed. In practice many systems do not conform to either of these assumptions, so that calculations based on them may be inaccurate. It is explained how distribution-functions for residence-times can be defined and measured for actual systems. Open and packed tubes are discussed as systems about which predictions can be made. The use of the distribution-functions is illustrated by showing how they can be used to calculate the efficiencies of reactors and blenders. It is shown how models may be used to predict the distribution of residence-times in large systems.

Résumé: Quand, dans un récipient, on introduit, à vitesse constante, un fluide donné, on suppose généralement soit un mélange parfait, soit un “écoulement frontal parfait.” En pratique, de nombreux systèmes s’écartent de l’une ou l’autre de ces hypothèses simplificatrices et les calculs qui en résultent sont plus ou moins inexacts. L’auteur expose, pour des systèmes réels, comment l’on peut définir et mesurer des fonctions de distribution pour la “durée de séjour”: ceci peut s’appliquer à des tubes vides ou munis de garnissages. Par emploi de ces fonctions de distribution, l’auteur montre comment on peut calculer l’efficacité des réacteurs ou des mélangeurs. Des modèles peuvent être utilisés pour prévoir la répartition des “durées de séjour” dans des systèmes de grandes dimensions.

Keywords: England, SCI, Science

Heertjes, P.M., Holve, W.A. and Talsma, H. (1954), Mass transfer between isobutanol and water in a spray-column. *Chemical Engineering Science*, **3** (3), 122-142.

Full Text: [C\Che Eng Sci3, 122.pdf](C/Che%20Eng%20Sci3,%20122.pdf)

Abstract: A study of the rate of mass transfer across a liquid boundary between a discontinuous and a continuous phase, using a binary mixture and a droplet system has been made.

Because of differences in density and movement of the drops the continuous phase appeared to be thoroughly mixed. This resulted in a nearly constant concentration independent of the height of the column.

For the continuous phase a relation for the partial mass transfer coefficient *kc* in the form *kcdd*/*D* = *Sh* = *h* *Red*1/2 *Scc*1/2 has been used.

Satisfactory correlation of the experimental results could be obtained with this equation. The constant *x* in the above relation appeared to be a function of the relative interfacial velocity which in turn is a function of the viscosities of the drops and the surrounding fluids. Following the concept of Hadamard this function is taken as η*c*/η*c*+η*d*.

This picture of the mechanism is representative of the situation, when the circulation in the drop is not restricted by interfacial tension.

For transfer to the discontinuous phase the unsteady state equation of Kronig and Brink, considering the occurrence of internal droplet circulation, was shown to express fairly adequately the experimental results for free rise of isobutanol droplets. Water drops showed a divergence from the Kronig-line possibly due to the “floating” effect of water droplets in isobutanol.

Notes: highly cited

? van Deemter, J.J., Zuiderweg, F.J. and Klinkenberg, A. (1956), Longitudinal diffusion and resistance to mass transfer as causes of nonideality in chromatography. *Chemical Engineering Science*, **5** (6), 271-289.

Full Text: [-1959\Che Eng Sci5, 271.pdf](-1959/Che%20Eng%20Sci5,%20271.pdf)

Abstract: The mechanisms of band broadening in linear, nonideal chromatography are examined. A development is presented of a rate theory for this process, wherein nonideality is caused by: axial molecular diffusion; axial eddy diffusion; finiteness of transfer coefficient.

The correspondence with the plate theory is given, so that the results can also be expressed in heights equivalent to a theoretical plate. The plate theory has been extended to the case of a finite volume of feed ; the requirement for this feed volume to be negligible has been examined and a method is presented for evaluating concentration profiles obtained with a larger volume of feed. An analysis is given of experimental results, whereby the relative contributions to band broadening for various cooperating mechanisms could be ascertained.

Résumé: Une étude a été faite des mécanismes de l’élargissement des bandes dans la chromatographie linéaire non-idéale. On a développé une théorie sur la vitesse de ce processus, selon laquelle la non-idéalité est causée par:

la diffusion moléculaire axiale ;

la diffusion turbulente axiale ;

le fait que le coefficient de transfert a une valeur finie.

La correspondance établie entre cette théorie et celle des plateaux permet d’exprimer les résultats obtenus aussi en termes de la hauteur de colonne équivalente à un étage théorique. La théorie des plateaux a été rendue applicable sur le cas d’un échantillon de volume fini ; les conditions dans lesquelles le volume de cet échantillon est négligeable ont été étudiées et on présente une méthode pour interpréter les profiles de concentration obtenus avec des échantillons plus grands. Une analyse des résultats expérimentaux a permis de déterminer les contributions relatives des différents mécanismes en question à l’élargissement des bandes.

Keywords: England, SCI, Science

Calderbank, P.H. and Korchinski, I.J.O. (1956), Circulation in liquid drops (A heat-transfer study). *Chemical Engineering Science*, **6** (2), 65-78.

Full Text: [C\Che Eng Sci6, 65.pdf](C/Che%20Eng%20Sci6,%2065.pdf)

Abstract: The process of material and heat transfer to and from liquid drops moving through another continuous fluid has been examined. Continuous phase heat-transfer coefficients have been measured for the system mercury-aqueous glycerol solutions in which the mercury constituted the disperse phase. These data are in good agreement with those previously reported for solid spheres up to a Reynolds number of about 200, at which point drop oscillation commences.

The resistance to heat transfer of the disperse phase, expressed as an effective thermal diffusivity, has also been measured, for the system bromobenzene-aqueous glycerol solutions. These results were found to be in general agreement with much reported work and with the mathematical model of Kronig and Brink which applies to liquid drops undergoing internal circulation.

Some observations concerning the rigid, circulating, and oscillating behaviour of drops are made. The conclusion is reached on both experimental and theoretical grounds that circulation within a liquid drop results in an effective mass or thermal diffusivity of 2.25 times the molecular value. This result applies for the whole régime of circulation which exists between rigid sphere and oscillating behaviour. The onset of drop oscillation results in a considerable increase in this factor. Some effective diffusivities are reported for the oscillating régime which has not however been sufficiently studied to enable firm conclusions to be drawn.

Drag coefficients for falling liquid drops in the above-mentioned systems are also reported and reveal the limitations of recent correlations in this field.

Maxwell, R.W. and Storrow, J.A. (1957), Mercury vapour transfer studies: I. *Chemical Engineering Science*, **6** (4-5), 204-214.

Full Text: [C\Che Eng Sci6, 204.pdf](C/Che%20Eng%20Sci6,%20204.pdf)

Abstract: Preliminary tests have demonstrated the valuable versatility of mercury evaporation as a technique for the study of mass transfer systems. The use of a sensitive ultra-violet absorptiometer for measuring the concentration of mercury vapour in gas streams enables studies to be made of systems with hydrodynamic control, the results agreeing with published correlations. The sensitivity of the detector allows measurements of transfer from very small surfaces, leading to surveys of positional effects. The choice of copper alloys as backgrounds for amalgamation gives great versatility in the study of transfer from any selected shape and also provides the possibility of introducing selected interfacial reaction kinetics into the process.

Thoenes, Jr., D. and Kramers, H. (1958), Mass transfer from spheres in various regular packings to a flowing fluid. *Chemical Engineering Science*, **8** (3-4), 271-283.

Full Text: [C\Che Eng Sci8, 271.pdf](C/Che%20Eng%20Sci8,%20271.pdf)

Abstract: Mass transfer coefficients have been determined for fluids flowing around single spheres, which were part of a regular arrangement of similar, but inactive spheres. Eight different kinds of packing were used. The experiments were carried out with solid spheres dissolving into a stream of water, and with porous spheres soaked with a liquid, which evaporated into a stream of gas. The results are tentatively explained on the assumption that the total mass transfer from the sphere surface is the sum of three different contributions: one for laminar convective transfer, one for turbulent convection transfer and one for diffusion in the stagnant regions near the contact points with adjacent spheres. The latter contribution would only be important for gas flow at not too high Reynolds numbers (*Re* < 500).

Garner, F.H. and Keey, R.B. (1958), Mass-transfer from single solid spheres: I Transfer at low Reynolds numbers. *Chemical Engineering Science*, **9** (2-3), 119-129.

Full Text: [C\Che Eng Sci9, 119.pdf](C/Che%20Eng%20Sci9,%20119.pdf)

Abstract: A low-speed water-tunnel is described to enable dissolution rates of pelleted organic acid spheres to be measured. Results are obtained for the overall and local mass-transfer rates from 3/4 in. diameter benzoic acid spheres to water at 30.0°C between Reynolds numbers of 2.3 and 255. Comparison with similar data enables the upper limit to be extended to 900. Results show that the bulk flow depresses the mass-transfer rate over a certain flow range and that free-convective effects are not entirely absent until *NRe* = 750. This effect is the more pronounced in downflow. At Reynolds numbers greater than 250 the overall transfer results tend towards the theoretical relationship *NSh* = 0.94 *NRe*1/2 *NSc*1/3.

Scriven, L.E. (1959), On the dynamics of phase growth. *Chemical Engineering Science*, **10** (1-2), 1-13.

Full Text: [C\Che Eng Sci10, 1.pdf](C/Che%20Eng%20Sci10,%201.pdf)

Abstract: The equations governing spherically symmetric phase growth in an infinite medium are first formulated for the general case and are then simplified to describe growth controlled by the transport of heat and matter. All assumptions and restrictions are recounted. Exact solutions of the equations are obtained for conditions typical of bubble growth in the nucleate boiling of (a) pure materials, and (b) binary mixtures. The effect of radial convection resulting from unequal phase densities is established and the regions of applicability of previously reported approximate solutions are determined.

Linton, M. and Sutherland, K.L. (1960), Transfer from a sphere into a fluid in laminar flow. *Chemical Engineering Science*, **12** (3), 214-229.

Full Text: [C\Che Eng Sci12, 214.pdf](C/Che%20Eng%20Sci12,%20214.pdf)

Abstract: Boundary layer theory and experimental results for the transfer of heat and mass from spheres in forced flow are compared over the range of conditions: 1 < Re < 1.8×105, 0.5 < Pr < 106, 2 < Nu < 540.

The overall and local solution rates of 3/8 in. diameter spheres of benzoic acid were measured in uniform flow in a water tunnel at 490 < Re < 7580. The overall transfer was correlated by Nu = 0.582 Re1/2 Pr1/3

The relative distribution of local transfer rates over the front half of the sphere was in fair agreement with theory and other workers but the absolute local values at the front stagnation point were about 40 per cent lower than theory and differed considerably among other workers. The discrepancies may in part be due to a gradual transition from viscous flow to potential flow outside the boundary layer as *Re* increases from 1 to 105. The relative transfer from the rear half of the sphere was observed to increase with *Re*. The angle of separation θ*s* found experimentally varies approximately according to θ*s* = 83 + 191 Re-1/3

The average transfer rate over the front of the sphere is theoretically proportional to Re1/2 Pr1/3. Over the whole sphere 0.5 < Nu Re-1/2 Pr- < 1.0 for 102 < Re < 105. The approximation is only rough because of the factors dependent on *Re* mentioned above, and the following secondary factors: a lower limit to transfer rate set by diffusion or conduction, density convection unless Gr << Re2, turbulence and/or non-uniformity of the free stream, interference from sphere supports, influence of duct walls, uncertainty in transfer properties of fluids, variation of fluid properties with concentration or temperature, and dust accumulation on the sphere.

Griffith, R.M. (1960), Mass transfer from drops and bubbles. *Chemical Engineering Science*, **13** (3), 198-213.

Full Text: [C\Che Eng Sci13, 198.pdf](C/Che%20Eng%20Sci13,%20198.pdf)

Abstract: Herein are reported experimental values and semi-theoretical formulae for the rates of solution of drops and bubbles under forced convection conditions. The effect of surface active agents on the mass transfer rate is discussed and pertinent experimental data are presented. The following data obtained incidentally to the main study are also given: (1) velocity profiles in the entrance regions of pipes, and (2) diffusivities and other property value data for four water-organic systems.

Tien, C. and Thodos, G. (1960), Ion exchange kinetics: The removal of oxalic acid from glycol solutions. *Chemical Engineering Science*, **13** (3), 120-129.

Full Text: [C\Che Eng Sci13, 120.pdf](C/Che%20Eng%20Sci13,%20120.pdf)

Abstract: The kinetics for the removal of oxalic acid from glycol solutions through the use of the ion exchange resin, Permutit SKB, has been studied. The mechanism was found to be controlled by the combined resistances of both the liquid and resin phases. The equilibrium relationship of the system was determined experimentally and the results were found to fit a Freundlich type of equation. Liquid film mass transfer coefficients were established and correlated with the variables of this system. Simple experimental procedures together with the diffusion equation enabled the determination of the diffusion coefficient for the resin phase. This information in conjunction with the proper mathematical developments has made possible the prediction of the break-through curve which has been found to be in agreement with experimental results.

Yagi, S. and Kunii, D.(1961), Fluidized-solids reactors with continuous solids feed: II Conversion for overflow and carryover particles. *Chemical Engineering Science*, **16** (3-4), 372-379.

Full Text: [C\Che Eng Sci16, 372.pdf](C/Che%20Eng%20Sci16,%20372.pdf)

Abstract: Based upon the simple model of particles which keep their diameters almost constant during reaction with the gas flowing in the fluidized bed, and applying the exit age-distribution functions obtained in Part I, equations for the conversion of product particles were derived.

For chemical reaction controlling:

For gas diffusion through solid phase controlling:

where *y* is the conversion of particles of diameter *x*, small phi, Greekis the ratio of time required for complete conversion of one particle of diameter *x* to the average residence time of the particle.

The above equations are applicable to both overflow and carryover particles, hence the conversion for overflow particles must be equal to that for carryover particles for a given particle size.

The mean value of the conversion *y* can be given as follows: for overflow stream

for carryover stream

where *K*1(*x*) and *K*2(*x*) represent the size frequency distribution functions for the overflow and carryover particles respectively.

Wakao, N. and Smith, J.M.(1962), Diffusion in catalyst pellets. *Chemical Engineering Science*, **17** (11), 825-834.

Full Text: [C\Che Eng Sci17, 825.pdf](C/Che%20Eng%20Sci17,%20825.pdf)

Abstract: A theory is proposed for predicting diffusion rates at constant pressure through bi-disperse porous media. The total rate is the sum of separate contributions for diffusion through macropores, micropores and a series path. To apply the theory requires a knowledge of the pore volume-pore radius distribution for the porous material.

Experimental diffusion measurements are reported for five high-area alumina pellets of different densities made from the same Boehmite powder. The results show that for the least dense pellets macropore diffusion is dominant. In contrast the micropore contribution controls the diffusion rate in the most dense pellet. The theory predicts rates in good agreement with the data over the pressure range investigated, 1–12 atm. Comparison with other diffusion data is hindered by the lack of pore-volume-distribution information. However, such data are available for a silver catalyst and for a low-area alumina. For these different materials the theory also predicts reliable diffusion rates.

Beek, W.J. and Kramers, H. (1962), Mass transfer with a change in interfacial area. *Chemical Engineering Science*, **17** (11), 909-921.

Full Text: [C\Che Eng Sci17, 909.pdf](C/Che%20Eng%20Sci17,%20909.pdf)

Abstract: In this paper the diffusional transport between a free surface and an adjoining medium is studied for cases where there is a flow towards the surface (expansion of the surface) or away from it (contraction0. A distinction is made between the non-steady surface (Section 2) and the steady surface (Section 3). For both cases a crude theory of mass transfer can be set up where only the surface-time and the surface-age history respectively is taken into account. With this crude theory the rate of mass transfer is overestimated by at most 20 per cent for the exchange between a growing spherical cavity and its surroundings (Section 2). For the case of the steady surface a more approximate and general theory is derived in Section 3. It is applied to mass transfer near a stagnation point and between a bubble or drop and its surroundings, and to gas absorption by a liquid film flowing over a sphere. From this it appears that this approximate theory may be useful for the solution of similar problems.

Finlayson, B.A. and Scriven, L.E. (1965), The method of weighted residuals and its relation to certain variational principles for the analysis of transport processes. *Chemical Engineering Science*, **20** (5), 395-404.

Full Text: [C\Che Eng Sci20, 395.pdf](C/Che%20Eng%20Sci20,%20395.pdf)

Abstract: The approximation scheme entitled method of weighted residuals is extended to *systems* of differential equations and *vector* differential equations. The variational principles proposed by Rosen, Chambers and Biot for unsteady-state heat transport are all shown to be applications of the method of weighted residuals. The von-Kármán––Pohlhausen method and the method of moments are also shown to be special cases. The method is illustrated by application to the problem of unsteady heat transfer to a fluid in ideal stagnation flow.

Myers, A.L. and Prausnit, J.M. (1965), Prediction of adsorption isotherm by principleof corresponding states. *Chemical Engineering Science*, **20** (6), 549-556.

Full Text: [C\Che Eng Sci20, 549.pdf](C/Che%20Eng%20Sci20,%20549.pdf)

Abstract: The principle of corresponding states is used to predict the adsorption isotherms of gases possessing small, nearly spherical molecules. Adsorption data for argon on graphitized carbon black are used to predict adsorption isotherms for nitrogen, neopentane and carbon tetrachloride on the same adsorbent; the predictions are in excellent agreement with experimental results. The parameters required for the prediction are Henry’s constants, or initial slopes of the adsorption isotherms, and the critical properties of the gas. The results are restricted to the case of monolayer physical adsorption on a homogeneous surface.

Villadsen, J.V. and Stewart, W.E. (1967), Solution of boundary-value problems by orthogonal collocation. *Chemical Engineering Science*, **22** (11), 1483-1501.

Full Text: [C\Che Eng Sci22, 1483.pdf](C/Che%20Eng%20Sci22,%201483.pdf)

Abstract: New collocation methods are given for solving symmetrical boundary-value problems. Orthogonality conditions are used to select the collocation points. The accuracy obtained is comparable to that of least squares or variational methods and the calculations are simpler. Applications are given to one-dimensional eigenvalue problems and to parabolic and elliptic partial differential equations, encountered in problems of viscous flow, heat transfer and diffusion with chemical reaction.

Marcussen, L. (1970), The kinetics of water adsorption on porous alumina. *Chemical Engineering Science*, **25** (9), 1487-1499.

Full Text: [C\Che Eng Sci25, 1487.pdf](C/Che%20Eng%20Sci25,%201487.pdf)

Abstract: This paper deals with a theoretical and experimental investigation of adsorption kinetics. The theoretical calculations of the mass transfer rates are based on a model, which considers a nonlinear adsorption isotherm and simultaneous resistance to mass transfer in the pore system of the solid and in a film surrounding the particle. Numerical solutions to the model are calculated for Freundlich and Langmuir isotherms. This model is in close agreement with results from the experiments, which were performed by sending an airstream with constant velocity, humidity and temperature through a single layer of alumina spheres. The adsorption rates were measured by weighing at definite times. Experiments were carried out with different values of gas velocity, humidity and particle radius.

A comparison between theory and experiments allows a determination of both the effective diffusion coefficient *D*eff in the pore system and the gas film resistance as a function of gas velocity. The results in

Larionov, O.G. and Myers, A.L. (1971), Thermodynamics of adsorption from nonideal solutions of nonelectrolytes. *Chemical Engineering Science*, **26** (7), 1025-1030.

Full Text: [C\Che Eng Sci26, 1025.pdf](C/Che%20Eng%20Sci26,%201025.pdf)

Abstract: The thermodynamics of nonideal adsorbed solutions is extended to the case of mixtures of molecules of unequal size. Experimental data for the adsorption of three liquid pairs (benzene + isooctane, carbon tetrachloride + isooctane, benzene + carbon tetrachloride) on aerosil at 20°C are compared with the theory. Two solutions show ideal behavior or the adsorbed phase; data for the third solution (benzene + isooctane)cannot be explained by adsorbed-phase nonidealities.

Ruckenstein, E., Vaidyanathan, A.S. and Youngquist, G.R. (1971), Sorption by solids with bidisperse pore structures. *Chemical Engineering Science*, **26** (9), 1305-1318.

Full Text: [C\Che Eng Sci26, 1305.pdf](C/Che%20Eng%20Sci26,%201305.pdf)

Abstract: A bidisperse model for transient diffusion in porous systems consisting of small spherical particles is presented. Such a model describes sorption in pelletized particles and in some types of molecular sieves and ion exchange resins.

Experimental sorption rates in ion exchange resins obtained by the authors and those available in the literature are interpreted by means of the proposed theoretical equation.

Notes: highly cited

? Soave, G. (1972), Equilibrium constants from a modified Redlich-Kwong equation of state. *Chemical Engineering Science*, **27** (6), 1197-1203.

Full Text: [1960-80\Che Eng Sci27, 1197.pdf](1960-80/Che%20Eng%20Sci27,%201197.pdf)

Abstract: A modified Redlich-Kwong equation of state is proposed. Vapor pressures of pure compounds can be closely reproduced by assuming the parameter a in the original equation to be temperature-dependent. With the introduction of the acentric factor as a third parameter, a generalized correlation for the modified parameter can be derived. It applies to all nonpolar compounds. With the application of the original generalized mixing rules, the proposed equation can be extended successfully to multicomponent-VLE calculations, for mixtures of nonpolar substances, with the exclusion of carbon dioxide. Less accurate results are obtained for hydrogen-containing mixtures.

Keywords: England, Equilibrium, SCI, Science

Ikeda, K., Ohya, H., Kanemits, O. and Shimomur, K. (1973), Breakthrough curve of fixed-bed adsorption for favorable isotherm. *Chemical Engineering Science*, **28** (1), 227-239.

Full Text: [C\Che Eng Sci28, 227.pdf](C/Che%20Eng%20Sci28,%20227.pdf)

Abstract: Theoretical solutions were found for the breakthrough curve taking into account the axial dispersion in the fixed bed and two transfer mechanisms for the resistance to adsorption. A numerical solution was obtained for a Langmuir isotherm and an analytical solution for a favourable isotherm represented by two straight lines. With the help of an electronic computer we compared the breakthrough curves for these two types of adsorption isotherms. For a favourable isotherm it was found that the theoretical equation of the breakthrough curve can be represented with sufficient accuracy by a simple expression proposed by ourselves. Various experiments were carried out in order to compare the theoretical predictions obtained with the experimental results of the breakthrough curve. The agreement between the two results was found to be excellent.

Ruthven, D.M., Loughlin, K.F. and Holborow, K.A. (1973), Multicomponent sorption equilibrium in molecular sieve zeolites. *Chemical Engineering Science*, **28** (3), 701-709.

Full Text: [C\Che Eng Sci28, 701.pdf](C/Che%20Eng%20Sci28,%20701.pdf)

Abstract: The statistical thermodynamic model, which has been successfully applied to the analysis of equilibrium isotherms for the sorption of non-polar species in molecular sieve zeolites, is extended to the sorption of binary mixtures. The model provides a simple method of predicting multi-component sorption equilibria from the Henry constants for the pure components. The limited comparisons possible with available experimental data appear to support the theory which, for sorbates of equal molecular volume, reduces to the ideal solution model of Myers and Prausnitz. The approximations involved in the analysis and their limitations are briefly discussed.

Kyte, W.S. (1973), Non-linear adsorption in fixed beds: The Freundlich isotherm. *Chemical Engineering Science*, **28** (10), 1853-1856.

Full Text: [C\Che Eng Sci28, 1853.pdf](C/Che%20Eng%20Sci28,%201853.pdf)

Abstract: Solutions have been obtained relating the breakthrough curve to bed parameters for the case of adsorption in fixed beds where the adsorption isotherm is of the non-linear Freundlich type and where the overall rate of adsorption is controlled by the rate of mass transfer across the gas-film surrounding each particle. The solutions, which are presented in graphical form, have been obtained independently by integrating the relevant differential equations both by analogue and digital computation.

Carter, J.W. and Husain, H. (1974), The simultaneous adsorption of carbon dioxied and water vapour by fixed beds of molecular sieves. *Chemical Engineering Science*, **29** (1), 267-273.

Full Text: [C\Che Eng Sci29, 267.pdf](C/Che%20Eng%20Sci29,%20267.pdf)

Abstract: In an isothermal fixed bed absorption system for constant inlet flowrate of inert gas and concentrations of two adsorbates the more strongly adsorbed component will displace the weaker one and effect its breakthrough characteristics. A small scale technique was used to study this phenomenon for the adsorption of water vapour and carbon dioxide on 4A type synthetic zeolites with helium as the carrier gas. Single adsorbate equilibria and rate data determined with the binary mixtures were then used to calculate the results for the ternary one. Partial differential equations were derived to describe the mass transfer of each adsorbate based on pore diffusion in the adsorbent as a major rate controlling mechanism. With a simplified binary Langmuir equilibrium to describe the effect of water on the adsorption of carbon dioxide, and assuming that the effective pore diffusion coefficient of one adsorbate was not affected by the presence of the other, accurate predictions of the concentration transient were obtained. Four zones are formed in the bed with the ternary mixture resulting from the desorption of carbon dioxide by water, the concentrations of the former rising above the inlet value. An enhanced rate of adsorbed phase transport of water was found, additional to that expected from macropore diffusion, suggesting that surface or capillary flow of the adsorbate occurred.

Notes: IIsotherm

Fritz, W. and Schlünder, E.U. (1974), Simultaneous adsorption equilibria of organic solutes in dilute aqueous solutions on activated carbon. *Chemical Engineering Science*, **29** (5), 1279-1282.

Full Text: [C\Che Eng Sci29, 1279.pdf](C/Che%20Eng%20Sci29,%201279.pdf)

Marcusse, L. (1974), Influence of temperature on effective diffusivity and adsorption-kinetics for humid air porous alumina. *Chemical Engineering Science*, **29** (10), 2061-2069.

Full Text: [C\Che Eng Sci29, 2061.pdf](C/Che%20Eng%20Sci29,%202061.pdf)

Abstract: The kinetics of water adsorption from an air stream on porous alumina is studied experimentally in a differential bed at five temperatures in the range 9.8–64.0°C. The mass transfer rate is calculated theoretically by means of a model, which considers simultaneous resistance to mass transfer in the pore system of the solid and in a film surrounding the particle. The adsorption equilibrium is described by the non-linear Freundlich isotherm. Comparison of experiments with theory shows that the model describes the adsorption kinetics adequately and allows the effective diffusivity in the porous solid to be calculated. This leads to the result that the effective diffusivity is decreased by a factor 3 when temperature is increased from 9.8–64.0°C.

? Rodrigue, A. and Tondeur, D. (1974), Sorption-desorption cycles in single agitated reactor and in series - isotherm of linear sorption - instantaneous equilibrium. *Chemical Engineering Science*, **29** (10), 2125-2126.

Full Text: [1960-80\Che Eng Sci29, 2125.pdf](1960-80/Che%20Eng%20Sci29,%202125.pdf)

Notes: MModel

Spahn, H. and Schlünder, E.U. (1975), The scale-up of activated carbon columns for water purification, based on results from batch tests. I Theoretical and experimental determination of adsorption rates of single organic solutes in batch tests. *Chemical Engineering Science*, **30** (5-6), 529-537.

Full Text: [C\Che Eng Sci30, 529.pdf](C/Che%20Eng%20Sci30,%20529.pdf)

Abstract: Mass transfer coefficients for external and internal transport were determined using experimentally established time-concentration curves in batch tests for the adsorption of organic impurities from water on activated carbon particles. These tests revealed that the mass transfer coefficient for internal transport depended on the initial concentration of the adsorbates in the water, the concentration in the carbon and the Biot number. It is wrong, therefore, to assume that the mass transfer coefficient for internal transport is constant, when calculating concentrations in activated carbon columns, even though it is normally taken to be constant in technical literature.

Assuming film and pore diffusion and irreversible adsorption, the rate of adsorption may be obtained as an analytical function of the concentration of the adsorbates in water and carbon and the Biot-number. Experimental and theoretical results agree satisfactorily.

Brauch, V. and Schlünder, E.U. (1975), The scale-up of activated carbon columns for water purification, based on results from batch tests. II: Theoretical and experimental determination of breakthrough curves in activated carbon columns. *Chemical Engineering Science*, **30** (5-6), 539-548.

Full Text: [C\Che Eng Sci30, 539.pdf](C/Che%20Eng%20Sci30,%20539.pdf)

Abstract: Based on the adsorption-rate equation derived in Part I of this investigation, a differential equation has been obtained for the prediction of the concentration distribution in activated carbon columns. This differential equation derived without the constant pattern assumption has been solved analytically. The solution includes both the transition region and the range of the constant pattern which is fully developed in a finite time and finite column length. The comparison of predicted data with experimental values indicates that film resistance has a considerable influence on the concentration history and should never be ignored.

Karger, J. and Bulow, M. (1975), Theoretical prediction of uptake behavior in adsorption- kinetics of binary gas-mixtures using irreversible thermodynamics. *Chemical Engineering Science*, **30** (8), 893-896.

Full Text: [C\Che Eng Sci30, 893.pdf](C/Che%20Eng%20Sci30,%20893.pdf)

Abstract: The relations proposed by Ash and Barrer [1] on the basis of the thermodynamics of irreversible processes for the description of surface flow are transferred to the adsorption kinetics of binary gas mixtures. With the use of several simplifying assumptions (highly different adsorption behaviour of the two components, negligible “cross coefficients”, applicability of the Langmuir model for the equilibria), an analytical expression for the description of sorption kinetics of binary mixtures is derived, which provides a satisfactory description of experimental data obtained by us for the mixture adsorption system benzene-*n*-heptane/NaX-zeolite.

Ganho, R., Gibert, H. and Angelino, H. (1975), Kinetics of phenol adsorption using fluidized-bed of active carbon. *Chemical Engineering Science*, **30** (10), 1231-1238.

Full Text: [C\Che Eng Sci30, 1231.pdf](C/Che%20Eng%20Sci30,%201231.pdf)

Abstract: Phenol adsorption from dilute aqueous solutions was studied using fluidized bed of active carbon. Isotherms adsorption at 14 and 18°C were determined and Langmuir type equation is proposed. For three different particles sizes, *ds* = 0, 129 cm, *ds* = 0, 093 cm and *ds* = 0, 071 cm, and various flow rate the controlling diffusional mechanisms were checked, i.e. external and/or internal diffusion.

Neretnieks, I. (1976), Adsorption in finite bath and countercurrent flow with systems having a nonlinear isotherm. *Chemical Engineering Science*, **31** (2), 107-114.

Full Text: [C\Che Eng Sci31, 107.pdf](C/Che%20Eng%20Sci31,%20107.pdf)

Abstract: Isothermal countercurrent, cocurrent and finite bath adsorption has been modelled mathematically. The model equations have been solved numerically by using the method of orthogonal collocation. The equilibrium between the solid and the fluid phase is assumed to be nonlinear and is described by either the Langmuir or the Freundlich type of equation. The transport mechanisms in the particles are assumed to be pore diffusion, solid diffusion or a combination thereof. The effect of film resistance is included. The above three adsorption cases are mathematically described by the same equations.

Computed results are shown for various flowratios and parameters in the Langmuir and Freundlich equations. The results may be of help for evaluating coefficients of diffusion from finite bath experiments and for designing continuous countercurrent absorbers.

The equations, their parameters and the diagrams showing the results are given in what is hoped to be a comprehensive way to facilitate the comparison of various mechanisms and isotherms.

Lee, L.K. and Ruthven, D.M. (1976), Kinetics of adsorption in pore diffusion controlled systems. *Chemical Engineering Science*, **31** (9), 851.

Full Text: [C\Che Eng Sci31, 851.pdf](C/Che%20Eng%20Sci31,%20851.pdf)

Schunder, E.U. (1976), Kinetics of adsorption in pore diffusion controlled systems - reply. *Chemical Engineering Science*, **31** (9), 852.

Full Text: [C\Che Eng Sci31, 852.pdf](C/Che%20Eng%20Sci31,%20852.pdf)

Neretnieks, I. (1976), Analysis of some adsorption experiments with activated carbon. *Chemical Engineering Science*, **31** (11), 1029-1035.

Full Text: [C\Che Eng Sci31, 1029.pdf](C/Che%20Eng%20Sci31,%201029.pdf)

Abstract: A simple method is proposed whereby the film transfer coefficient and coefficient of diffusion in the particles may be determined from finite bath adsorption experiments. The method also makes it possible to separate pore and surface diffusion. Under certain conditions it is also possible to determine the influence of particle phase concentration on the surface diffusivity. The method is based on models describing the instationary diffusion in the solids. Data from six different adsorption systems were analysed using this method. The adsorbed components were: phenol, paranitrophenol, parachlorophenol, bensoic acid, phenylacetic acid and 2-4-dichlorophenoxyacetic acid. In all systems surface diffusion was the determining transport mechanism in the particles. In the system phenol and phenylacetic acid the surface diffusion coefficient increased by about a factor 3 with an increase in surface concentration of about 40%. For parachlorophenol the increase was somewhat less. For the other systems there was no significant increase. The increase in diffusivity is explained by a decrease in bonding forces with increasing concentration.

Ozil, P. and Bonnetain, L. (1977), Dynamical adsorption in fixed bed. *Chemical Engineering Science*, **32** (3), 303-309.

Full Text: [C\Che Eng Sci32, 303.pdf](C/Che%20Eng%20Sci32,%20303.pdf)

Abstract: The behavior of an adsorbent fixed-bed had been investigated for irreversible equilibrium when the adsorption rate is limited by internal diffusion. Breakthrough curves equations has been established for spherical or cubic sorbent particles considering axial dispersion. It has been found out a linear law between the extrapolated breakthrough time and the inverse of adsorbate flowrate. That allows the evaluation of internal diffusion and axial dispersion coefficients.

The breakthrough curves of propylene on 13X molecular sieves are interpreted accurately when it is admitted that the adsorption rate is limited by the action of combined internal and external difrusions and when the axial diffusion is taken into account.

When the axial diffusion is neglected, the breakthrough curves can be also computed but the coefficients of mass transfer chosen for a good fitting do not agree with those predicted by classical formula.

Myers, A.L. and Moser, F. (1977), Slurry sorption separations I: Equlibrium adsorption of gases by suspensions of solid adsorbents in liquids. *Chemical Engineering Science*, **32** (5), 529-533.

Full Text: [C\Che Eng Sci32, 529.pdf](C/Che%20Eng%20Sci32,%20529.pdf)

Abstract: The effect of liquid slurry medium upon the equilibrium adsorption isotherm of a gas is studied for the case when adsorbed species form an ideal solution. The solvent effect can be predicted on the basis of its vapor sorption isotherm.

Liapis, A.I. and Rippin, D.W.T. (1977), A general model for the simulation of multi-component adsorption from a finite bath. *Chemical Engineering Science*, **32** (6), 619-627.

Full Text: [C\Che Eng Sci32, 619.pdf](C/Che%20Eng%20Sci32,%20619.pdf)

Abstract: General equations are presented to describe multi-component adsorption from a finite bath onto adsorbent particles. External film resistance and diffusional resistance within the particle are both included. Transport within the particle can be by pore or solid diffusion or both.

Orthogonal collocation was used to solve the equations for two component adsorption onto uniform spherical particles for the two cases of pore and solid diffusion. In certain circumstances, the concentration profiles within the particles can show a displacement effect.

By superposition of model predictions onto experimental results of Balzli [18] estimates were made of pore and solid diffusion within carbon particles. In one case studied, the estimated values of solid diffusivities were less sensitive to changes in the initial bath concentrations than the pore diffusivities.

Höll, W. and Sontheimer, H. (1977), Ion exchange kinetics of the protonation of weak acid ion exchange resins. *Chemical Engineering Science*, **32** (7), 755-762.

Full Text: [C\Che Eng Sci32, 755.pdf](C/Che%20Eng%20Sci32,%20755.pdf)

Abstract: A mathematical model to describe the protonation of weak acid ion-exchange resins with various acids has been developed. The charge profiles calculated using the theory are demonstrated by photographs. Interdiffusion coefficients in the resin phase have been determined and it is shown how they depend on the system parameters and on the properties of the resin.

Liapis, A.I. and Rippin, D.W.T. (1978), The simulation of binary adsorption in activated carbon columns using estimates of diffusional resistance within the carbon particles derived from batch experiments. *Chemical Engineering Science*, **33** (5), 593-600.

Full Text: [C\Che Eng Sci33, 593.pdf](C/Che%20Eng%20Sci33,%20593.pdf)

Abstract: AU-A computatIonal procedure IS presented for solvmg the set of coupled parabohc parted dtierenw equatmns descnbmg the sunuhaneous adsorpuon of two components m a column packed with adsorbent particles Orthogonal collocatmn IS used to solve for the first time the general form of these equahons for simultaneous adsomon which mclude the effects of axial dlffuslon m the fluld and the film and Internal ddfuslonal mass transfer resistances of the partrcles Simulated results obtamed from this model are compared with expenmental data for the adsorption of mixtures of 2-butanol and t-amylalcohol When pubhshed correlations are used to estimate the axial dtffuslvitles and the film mass transfer coetlicients and estimates of the pore ddfuslvmes are taken from the results of batch experunents reported previously[lSl. the results of the column expenmeuts for various mlet concentrations and column lengths can be prechcted W&III the accuracy of the parameters avadable from the pubbshed correlations Further development of the procedure for charactensmg the diffuslvlty of the solutes wlthm the carbon particles by batch expenments. followed by column amulatlon, may reduce or even eliminate the need for expensive and time-consummg column expenments for the design of adsorption systems.

Heink, W., Kärger, J. and Pfeifer, H. (1978), Application of zeugmatography to study kinetics of physical adsorption. *Chemical Engineering Science*, **33** (8), 1019-1023.

Full Text: [C\Che Eng Sci33, 1019.pdf](C/Che%20Eng%20Sci33,%201019.pdf)

Abstract: Spatial resolution of nuclear magnetic resonance signals may be achieved by use of magnetic field gradients. This new technique, called “zeugmatography”, has been applied in the present work to study dynamic processes, especially the kinetics of physical adsorption in microporous systems. The method provides information similar to the results of Dubinin’s X-ray technique, but is not limited to X-ray contrast adsorbates. After a general discussion, examples of application of “dynamic zeugmatography” are given. Mass transfer for sorption of butane in NaCa*A* zeolites of different shape and of water in Na*X* zeolites could be observed directly.

Notes: IIsotherm

Jossens, L., Prausnitz, J.M., Fritz, W., Schlünder, E.U. and Myers, A.L. (1978), Thermodynamics of multi-solute adsorption from dilute aqueous solutions. *Chemical Engineering Science*, **33** (8), 1097-1106.

Full Text: [C\Che Eng Sci33, 1097.pdf](C/Che%20Eng%20Sci33,%201097.pdf)

Abstract: Experimental adsorption data at 20°C are given for six dilute aqueous bi-solute systems adsorbing on activated carbon.

The three-parameter Tóth adsorption isotherm gives good representation of the data for aqueous single-solute adsorption. Using the thermodynamic ideal-adsorbed-solution method, total and partial adsorptions are calculated for the bi-solute systems; agreement with experimental data is good. Prediction for total adsorption is within about 2-10% and for adsorption of individual components within about 3-20%. In the prediction calculations only single-solute data are used. A new three-parameter adsorption isotherm is presented. This new isotherm also represents the single-solute data well. For bi-solute systems where dissociation is negligible, calculated individual adsorptions agree with experiment within 2%.

Wakao, N. and Funazkri, T. (1978), Effect of fluid dispersion coefficients on particle-to-fluid mass transfer coefficients in packed beds. *Chemical Engineering Science*, **33** (10), 1375-1384.

Full Text: [C\Che Eng Sci33, 1375.pdf](C/Che%20Eng%20Sci33,%201375.pdf)

Abstract: Gas-phase and liquid-phase mass transfer data published in the literature are corrected for the axial fluid dispersion coefficient values proposed by W

The corrected Sherwood numbers in the range of Reynolds number from about 3 to 10,000 are correlated by *Sh* = 2 + 1.1 *Sc*1/3 *Re*0.6.

Brunovská, A., Hlavácek, V., Ilavský, J. and Valtýni, J. (1978), An analysis of a nonisothermal one-component sorption in a single adsorbent particle. *Chemical Engineering Science*, **33** (10), 1385-1391.

Full Text: [C\Che Eng Sci33, 1385.pdf](C/Che%20Eng%20Sci33,%201385.pdf)

Abstract: Heat and mass balances describing the process of a nonisothermal sorption within an adsorbent particle are formulated. Application to gas––solid adsor The governing equations represent a set of coupled strongly nonlinear parabolic equations. A finite-difference method based on explicit––implicit proc The equations are solved for a case of a strong adsorption accompanied with significant heat generation effects for molecular and Knudsen diffusion. It temperature differences may be of the order of magnitude 10–50°C.

Digiano, F.A., Baldaulf, G., Frick, B. and Sontheimer, H. (1978), A simplified competitive equilibrium adsorption model. *Chemical Engineering Science*, **33** (12), 1667-1673.

Full Text: [C\Che Eng Sci33, 1667.pdf](C/Che%20Eng%20Sci33,%201667.pdf)

Abstract: Adsorption equilibria in liquid multicomponent systems are an essential part of the description of the adsorption behaviour in adsorber beds. This work presents a simplified model for the prediction of competitive adsorption equilibria, only with single-solute data in the interesting concentration range. It is easy to handle and can be extended to each number of components. A comparison between this model and the IAS theory shows that both models are based on the same concept. However, there are some deviations and limitations in the use of the simplified model. It can be shown that in a concentration range less than 0.1 mmol/l. the two models are in good agreement, while at higher concentrations the results may differ. For drinking water treatment, the low concentrations are of interest and thus the simplified model provides a good alternative for the prediction of multi-component equilibria data.

? Mor, L., Mor, L.A., Sideman, S. and Brandes, J.M. (1980), Time dependent packed bed adsorption of a chemically-bound adsorbate. *Chemical Engineering Science*, **35** (3), 725-736.

Full Text: [1960-80\Che Eng Sci35, 725.pdf](1960-80/Che%20Eng%20Sci35,%20725.pdf)

Abstract: A fixed bed adsorption column in which an adsorbate (*B*) is generated from a chemical complex (*AB*) was analysed for a closed-loop operation. The analytical model accounts for adsorbents with a microporous structure which prevents the penetration of *AB* into the pores, and for adsorbents with macropores into which all species may enter. The unified presentation, for a constant ratio of the free *B* to the total *B* in the solution, also encompasses the standard case of fixed bed adsorption of an unbounded solute *B*. The effect of the various parameters is illustrated, indicatin the advantage of using macroporous adsorbents for adsorbates of low diffusivities. Experimental data substantiates the validity of the theoretical analysts

? Soave, G. (1980), Rigorous and simplified procedures for determining the pure-component parameters in the Redlich-Kwong-Soave equation of state. *Chemical Engineering Science*, **35** (8), 1725-1729.

Full Text: [1960-80\Che Eng Sci35, 1725.pdf](1960-80/Che%20Eng%20Sci35,%201725.pdf)

Abstract: The paper describes three procedures to derive the pure-component parameters for a recently proposed Redlich—Kwong type equation of state, which applies to polar and nonpolar compounds and to inorganic gases. Besides a rigorous procedure, a simplified one is described, with the same accuracy, but much lower computation time. A third, very fast procedure is suggested, which makes use of only two experimental points (the atmospheric boiling temperature and the boiling temperature at a pressure of 10 mm Hg) and gives the result directly, with no iterative procedure.

Werling, K. and Wimmerstedt, R. (1980), A kinetic-study of the adsorption and desorption process of 2 commercial molecular-sieves. *Chemical Engineering Science*, **35** (8), 1783-1786.

Full Text: [C\Che Eng Sci36, 1783.pdf](C/Che%20Eng%20Sci36,%201783.pdf)

Abstract: A mathematical model and its numerical solution is presented to describe adiabatic adsorption––desorption processes in a fixed bed when the mass and heat transfer can be described by external film transfer coefficients only, which is especially interesting in the case of non-uniform, irregular particles. A new method to measure such rates is presented, based on continuous weighing of a through-circulated bed. The measured rates can be checked against the difference in humidity and temperature between the outlet and inlet air in order to minimize errors.

The comparison between experimental results and calculations showed that the adsorption process in a bed of molecular sieve pellets can not be described with a constant mass transfer coefficient; the desorption process is better described although not entirely satisfactorily. In the case of a honeycomb molecular sieve, a constant mass transfer coefficient described both the adsorption and desorption processes satisfactorily.

Fritz, W. and Schlünder, E.U. (1981), Isothermal effectiveness factor. II Analytical expression for single reaction with arbitrary kinetics, geometry and activity distribution. *Chemical Engineering Science*, **36** (4), 713-719.

Full Text: [C\Che Eng Sci36, 713.pdf](C/Che%20Eng%20Sci36,%20713.pdf)

Abstract: A previously presented method[1], to predict isothermal effectiveness factor with a single complex reaction in isothermal slab pellets is extended to encompass much more complex and general situations. In this work the geometry of the pellet can be arbitrary and a non uniform distribution of the catalyst is considered.

Though the previously presented method[1] has had to be slightly modified to predict with great accuracy the effectiveness factor, (with less than 3% deviation from the exact values), an almost general and very simple algebraic expression is deduced to predict effectiveness factor values within 10% of their respective exact values. Thus for many applications in engineering design and catalytic reactor simulation, this simple general expression can be extremely useful since only one easily generated parameter is needed, as shown throughout the present contribution.

Fritz, W. and Schlünder, E.U. (1981), Isothermal effectiveness factor: II Analytical expression for single reaction with arbitrary kinetics, geometry and activity distribution. *Chemical Engineering Science*, **36** (4), 721-730.

Full Text: [C\Che Eng Sci36, 721.pdf](C/Che%20Eng%20Sci36,%20721.pdf)

Abstract: A previously presented method[1], to predict isothermal effectiveness factor with a single complex reaction in isothermal slab pellets is extended to encompass much more complex and general situations. In this work the geometry of the pellet can be arbitrary and a non uniform distribution of the catalyst is considered.

Though the previously presented method[1] has had to be slightly modified to predict with great accuracy the effectiveness factor, (with less than 3% deviation from the exact values), an almost general and very simple algebraic expression is deduced to predict effectiveness factor values within 10% of their respective exact values. Thus for many applications in engineering design and catalytic reactor simulation, this simple general expression can be extremely useful since only one easily generated parameter is needed, as shown throughout the present contribution.

Fritz, W., Merk, W. and Schlünder, E.U. (1981), Competitive adsorption of two dissolved organics onto activated carbon: I Adsorption equilibria. *Chemical Engineering Science*, **36** (4), 731-741.

Full Text: [C\Che Eng Sci36, 731.pdf](C/Che%20Eng%20Sci36,%20731.pdf)

Abstract: Prediction of multi-solute adsorption, using the ideal adsorbed solution (IAS) theory [1, 2], may be greatly simplified by representing the single-solute data with several Freundlich adsorption isotherms. Accuracy of the proposed method is tested by comparing experimental with predicted adsoption data for five, dilute, aqueous bi-solute solutions and for four different activated carbons. The simplified method permits rapid and accurate calculations of multi-solute adsorption equilibria; it is suitable for engineering-design applications.

Merk, W., Fritz, W. and Schlünder, E.U. (1981), Competitive adsorption of two dissolved organics onto activated carbon: III Adsorption kinetics in fixed beds. *Chemical Engineering Science*, **36** (4), 743-757.

Full Text: [C\Che Eng Sci36, 743.pdf](C/Che%20Eng%20Sci36,%20743.pdf)

Abstract: Bi-solute adsorption of dissolved organics by activated carbon was studied in a finite bath system. The batch tests with strongly adsorbable species show that at low concentrations (*X* < 0.1 mmol/1) only external mass transfer resistance is rate-determining. For higher concentrations internal mass transfer becomes increasingly important. This behavior indicates that the diffusional process within the particle occurs predominantly in the adsorbed phase.

Bi-solute calculations were performed, using only single-solute data. Systems with differing equilibrium behavior, but similar diffusive properties of both solutes, were described adequately by a model which takes into account diffusion in the liquid-filled pores and in the adsorbed phase, as well as external mass transfer. Deviations between measured and predicted rates can be observed for systems with large differences in the mobility of the diffusing molecules, or if counter diffusion inside the particles occurs. It is likely that the discrepancies in these cases are caused by diffusional interactions between the two different species in the adsorbed phase.

Notes: highly cited

? Patel, N.C. and Teja, A.S. (1982), A new cubic equation of state for fluids and fluid mixtures. *Chemical Engineering Science*, **37** (3), 463-473.

Full Text: [1982\Che Eng Sci10, 463.pdf](1982/Che%20Eng%20Sci10,%20463.pdf)

Abstract: A new cubic equation of state for pure fluids is presented in this work. The new equation requires the critical temperature and pressure, as well as two additional parameters to characterize each particular fluid. These parameters have been evaluated by minimizing deviations in saturated liquid densities while simultaneously satisfying the equality of fugacities along the saturation curve. Thus, good predictions of volumetric properties in the liquid region are obtained, while accuracy in vapour-liquid equilibrium calculations is maintained. Parameters for polar as well as nonpolar fluids are presented in this paper. In the case of nonpolar fluids, the two parameters required can be correlated with the acentric factor. No such relationship with independently measured quantities could be found for polar fluids. It is shown that the new equation reproduces many of the good features of the Soave and Peng-Robinson equations of state for nonpolar fluids, whilst overcoming some of the limitations of these equations for polar fluids. Applications of the equation of state to the correlation of phase equilibria are demonstrated.

Rice, R.G. (1982), Transpiration effects in solids dissolution. *Chemical Engineering Science*, **37** (10), 1465-1469.

Full Text: [C\Che Eng Sci10, 1465.pdf](C/Che%20Eng%20Sci10,%201465.pdf)

Abstract: The correction for transpiration effects is applied to our previous theoretical analysis to predict the time-to-complete-dissolution (TCD) of a spherical particle in a diffusion-controlled environment. The widely accepted mass transferexpressions of Frössling and Levich are combined with falling sphere hydrodynamics and corrected for transpiration to yield a simple fundamental expression to predict TCD in terms of initial particle size. These predictions are in excellent agreement with experimental data for the disappearance of area pellets falling in water. Since first principles are used throughout, the theoretical and experimental results suggest a quick and simple technique to obtain engineering estimates for solid or crystal diffusivity.

Morbidelli, M. and Varma, A. (1983), Isothermal diffusion-reaction in a slab catalyst with bimolecular Langmuir-Hinshelwood kinetics; Connections with negative first-order kinetics. *Chemical Engineering Science*, **38** (2), 289-296.

Full Text: [C\Che Eng Sci38, 289.pdf](C/Che%20Eng%20Sci38,%20289.pdf)

Abstract: The problem of isothermal diffusion-reaction in a slab catalyst with bimolecular Langmuir-Hinshelwood kinetics is studied. Analytic solutions for the concentration profile and the catalytic effectiveness factor are reported for the full range of Thiele modulus values, in the limit of large adsorption inhibition constant. In this limit, connections with negative first-order kinetics are shown, and rather good explicit estimates of the region of multiple steady states are provided. Comparisons with numerical calculations are also made.

Jaroniec, M., Derylo, A. and Marczewski, A.W. (1983), An equation for multi-solute adsorption from dilute aqueous-solutions involving energetic heterogeneity of the solid and differences in molecular sizes of the solutes. *Chemical Engineering Science*, **38** (2), 307-311.

Full Text: [C\Che Eng Sci38, 307.pdf](C/Che%20Eng%20Sci38,%20307.pdf)

Abstract: This work presents a simple model for multi-solute adsorption from dilute aqueous solutions on solids. The proposed model leads to a simple relationship defining dependence between adsorbed amounts and concentrations of two arbitrary solutes. This relationship is derived by assuming ideality of both phases, energetic heterogeneity of the solid and different molecular sizes of solutes.

The experimental data for bi-solute adsorption from dilute aqueous solutions on activated carbon, available from literature, are used to examine the proposed equation. These studies show that the new equation gives good representation of the bi-solute adsorption data.

Cooney, D.O., Adesanya, B.A. and Hines, A.L. (1983), Effect of particle size distribution on adsorption kinetics in stirred batch systems. *Chemical Engineering Science*, **38** (9), 1535-1541.

Full Text: [C\Che Eng Sci38, 1535.pdf](C/Che%20Eng%20Sci38,%201535.pdf)

Abstract: The effect of different particle size distributions (PSD’s) on kinetic behavior in stirred-batch adsorption systems was investigated by numerically modeling the uptake of *p*-nitrophenol from aqueous solution by granular activated carbon in a well-stirred batch type of environment. Four different Gaussian PSD’S, two different log-normal PSD’s and one case of uniform particle size were studied. The model accounted for both external and internal mass transfer resistances, and for the highly nonlinear equilibrium relation which characterizes the *p*-nitrophenol/activated carbon system. All isotherm parameters and “base-case” kinetic parameters were experimentally determined values (from the literature). The kinetic parameter values were varied in some cases to assess their influence. Moreover, both infinite-bath and finite-bath situations were evaluated. The modeling results show that the different particle size distributions did not generally give kinetic behavior widely different from the uniform particle size case when an infinite bath was assumed. However, for the more realistic case of a finite bath, the different PSD’s gave significantly more distinctive results, especially for fractional mass uptake values greater than about 0.7. It is concluded that, in finite bath experiments, the nature of the adsorbent PSD must be accounted for in interpreting data obtained at fractional mass uptake values greater than about 0.7, unless the adsorbent PSD is reasonably nar

Jaroniec, M., Dabrowski, A. and Tóth, J. (1984), Multilayer single-solute adsorption from dilute-solutions on energetically heterogeneous solids. *Chemical Engineering Science*, **39** (1), 65-70.

Full Text: [C\Che Eng Sci39, 65.pdf](C/Che%20Eng%20Sci39,%2065.pdf)

Abstract: The isotherm equations for multilayer single-solute adsorption from dilute solutions on energetically heterogeneous solids are derived by solving the integral equation for different energy distributions and local adsorption isotherm of BET-type. This procedure is analogous to that used in multilayer gas adsorption on heterogeneous solid surfaces. The equations, obtained for quasi-gaussian energy distribution, are examined using the adsorption data of *n*-valeric acid, *n*-amyl alcohol, aniline and cyclohexanol from dilute aqueous solutions on different types of carbon adsorbents of specific surface areas from 18.4m2/g to 124m2/g. The best equation for describing the above data is the modified Langmuir-Freundlich one, denoted in the paper by *k*-LF equation.

McKay, G. (1984), The adsorption of basic dye onto silica from aqueous solution-solid diffusion model. *Chemical Engineering Science*, **39** (1), 129-138.

Full Text: [C\Che Eng Sci39, 129.pdf](C/Che%20Eng%20Sci39,%20129.pdf)

Abstract: The adsorption of Basic Blue 69 dye onto silica in a batch adsorption system has been studied. A two resistance mass transfer model has been developed based on film resistance and homogeneous solid phase diffusion. An analytical solution is presented and experimental results and theoretical data are in good agreement, for a wide range of operating conditions, using a single external mass transfer coefficient and a single effective solid diffusivity. The variables investigated are: initial dye concentration, solid/liquid ratios and adsorbent particle size range. Under constant agitation conditions almost all data can be correlated using a film mass transfer coefficient of 2.0×10-4 cm sec-1 and a diffusion coefficient of 1.2×10-9 cm2 sec-1.

? Soave, G. (1984), Improvement of the Van Der Waals-equation of state. *Chemical Engineering Science*, **39** (2), 357-369.

Full Text: [1984\Che Eng Sci39, 357.pdf](1984/Che%20Eng%20Sci39,%20357.pdf)

Abstract: The Van Der Waals equation of state has been modified in order to improve its accuracy. The introduction of a temperature dependence of the attraction term allows reproducing accurately pure-compound vapour pressures. The modification of the mixing rules, with the infinite-pressure excess-free-energy term expressed by a NRTL-like model, allows reproducing accurately phase equilibria of polar and apolar systems. Finally, the introduction of a volume correction improves markedly the calculated liquid densities, without changing the phase-equilibrium conditions. The improved equation is accurate enough to be applied for design purposes.

Seidel, A., Tzscheutschler, E., Radeke, K.H. and Gelbin, D. (1985), Adsorption equilibria of aqueous phenol and indol solutions on activated carbons. *Chemical Engineering Science*, **40** (2), 215-222.

Full Text: [C\Che Eng Sci40, 215.pdf](C/Che%20Eng%20Sci40,%20215.pdf)

Abstract: Adsorption isotherms of aqueous phenol and indol solutions have been measured in a concentration range of 10-3–2 mmol/l on four different activated carbons at 20°C and for phenol on one carbon at 55°C. Pretreatment of the carbons with hydrochloric acid had little effect on the equilibrium data. The experimental results have been fitted with six different isotherms. For the calculation of kinetic processes or of breakthrough curves an isotherm is proposed, combining the Redlich-Peterson equation with elements of the Dubinin-Radushkevich analysis. For equal weight concentrations in the aqueous phase indol is adsorbed more strongly than phenol, but for equal adsorption potentials phenol is adsorbed more strongly, i.e. the affinity of the carbons for phenol is greater. At the higher temperature more phenol is adsorbed than at the lower, indicating a greater packing density of phenol in the adsorbed phase at the higher temperature.

Yoshida, H., Kataoka, T. and Fujikawa, S. (1986), Kinetics in a chelate ion exchanger. I. Theoretical analysis. *Chemical Engineering Science*, **41** (10), 2517-2524.

Full Text: [C\Che Eng Sci41, 2517.pdf](C/Che%20Eng%20Sci41,%202517.pdf)

Abstract: A kinetic model for sorption of metallic ions by a chelate ion exchanger is proposed in which the resistances of intraparticle diffusion and chelate complex formation reaction are both included. The Nernst-Planck equation is applied to the flux of ions in the resin particle. Analytical solutions are given for the limiting cases of diffusion control and reaction control, and numerical solutions are presented for the general case in which both resistances are significant. The analytical solution for diffusion control, which is based on the shrinking core model, gives the fractional exchange as a function of the diffusivities and valencies of the counter-ions. Uptake curves are calculated from the theoretical equations to show how the kinetics are influenced by the equilibrium constant, the diffusivity ratio of the counter-ions, the rate constant for the chelate complex formation reaction and the ionic valencies. The range in which the analytical solutions can be considered as an acceptable approximation is given.

Yoshida, H., Kataoka, T. and Fujikawa, S. (1986), Kinetics in a chelate ion exchanger. II. Experimental. *Chemical Engineering Science*, **41** (10), 2525-2530.

Full Text: [C\Che Eng Sci41, 2525.pdf](C/Che%20Eng%20Sci41,%202525.pdf)

Abstract: Equilibrium and kinetic data on a chelate ion exchanger are presented and discussed in relation to the theory derived in Part I. Two typical ion exchangers, which show extremely high selectivity for Cu2+ and Hg2+, are used. The experimental systems are R-Na/CuCl2, R-Na/CoCl2 and R-Na/Cr(NO3)3. Reaction rate constants, intraparticle self-diffusivity of Na+, equilibrium constants and the concentration of electrolyte in the resin phase which is in equilibrium with the bulk solution concentration are presented. When the particle radius is larger than 10-4 m, the theoretical model for diffusion control with chelate complex formation provides a good representation of the uptake curve of Cu2+. The uptake curves of Co2+ and Cr3+, for which the exchangers do not show such high selectivity, are correlated well by the usual Nernst-Planck model for ion exchange, since for these ions the chelate complex is very much weaker.

McKay, G., Mckee, S. and Walters, J.H.R. (1987), Solid-liquid adsorption based on external mass transfer, macropore and micropore diffusion. *Chemical Engineering Science*, **42**, 1145-1151.

Full Text: [C\Che Eng Sci42, 1145.pdf](C/Che%20Eng%20Sci42,%201145.pdf)

Abstract: A mass transfer model has been developed based on external film mass transfer, macropore diffusion and micropore diffusion to explain the adsorption of pollutants from aqueous solutions onto adsorbent particles. A computer program has been developed to facilitate analysis of the model in order that theoretical concentration decay curves may be compared with experimental data. A brief comparison has been made for the adsorption of Acid Blue 25 dye on chitin and phenol on carbon. However, the main purpose of the paper is to show the mathematical development of the model using the basic equations of the branched pore theory developed by Peel *et al.* (1981, *A.I.Ch.E. J.* 27, 26) and undertake a sensitivity analysis to study the effect of changing the four main parameters, namely, the external film mass transfer coefficient, the surface diffusion coefficient, the branched pore rate coefficient and the fraction of total adsorptive capacity in the macropores.

Do, D.D. and Rice, R.G. (1987), On the relative importance of pore and surface diffusion in non-equilibrium adsorption rate processes. *Chemical Engineering Science*, **42** (10), 2269-2284.

Full Text: [C\Che Eng Sci42, 2269.pdf](C/Che%20Eng%20Sci42,%202269.pdf)

Abstract: A unified treatment of adsorption processes suggests that only two key parameters control the selection amongst the six standard models. The parameter φ is the square root of the ratio of adsorption rate to the rate of pore diffusion. The second parameter, λ, is the ratio of surface to pore diffusion rates. Degenerate models occur in the limits of these parameters. Three contacting configurations are studied: batch, CSTR and dispersed PFR. A parameter-domain analysis suggests sets of experiments which can reveal rate-controlling mechanisms.

Seidel, A. and Gelbin, D. (1988), On applying the ideal adsorbed solution theory to multicomponet adsorption equilibria of dissolved organic components on activated carbon. *Chemical Engineering Science*, **43** (1), 79-89.

Full Text: [C\Che Eng Sci43, 79.pdf](C/Che%20Eng%20Sci43,%2079.pdf)

Abstract: Multicomponent adsorption equilibria of organic components from aqueous solutions on activated carbons were measured and the applicability of the ideal adsorbed solution (IAS) theory was tested. Systematic deviations between experiments and theory were observed. Adsorbed phase activity coefficients which account for these deviations proved to be thermodynamically inconsistent. However, the calculation of spreading pressure in the IAS theory requires extrapolation of single solute isotherms to zero concentration. A correction of extrapolation errors was determined by fitting binary equilibrium data to the IAS theory. For a mixture of *N* components, *N* –– 1 constants have to be obtained from binary mixtures of *N* –– 1 components with a reference component. For the adsorption of 3 chemically non-interacting organic solutes constants derived from two binary systems allow the prediction of the third binary system as well as of the ternary system. The method is successful only if chemical interactions of the components in the adsorbed phase can be excluded.

Shallcross, D.C., Herrmann, C.C. and McCoy, B.J. (1988), An improved model for the prediction of multicomponent ion exchange equilibria. *Chemical Engineering Science*, **43** (2), 279-288.

Full Text: [C\Che Eng Sci43, 279.pdf](C/Che%20Eng%20Sci43,%20279.pdf)

Abstract: Nonideal behaviour for liquid and resin phases is investigated theoretically and experimentally for ion exchange equilibrium of the aqueous ternary system Mg2+, Ca2+, Na+ with Cl-. A semi-theoretical model is proposed in which the Pitzer approach is applied to the solution nonidealities, and the Wilson approach, based on experimental binary data, is applied to the resin. Predictions of the model agree with experimental data for both binary and ternary systems. The predictions of the proposed model are more accurate than those made using existing models.

McKay, G. and Al-Duri, B. (1988), Prediction of bisolute adsorption isotherms using single-component data for dye adsorption onto carbon. *Chemical Engineering Science*, **43** (5), 1133-1142.

Full Text: [C\Che Eng Sci43, 1133.pdf](C/Che%20Eng%20Sci43,%201133.pdf)

Abstract: Equilibrium isotherms have been determined for the adsorption of dyes in solution onto activated carbon. Single-component isotherms were measured for three basic dyes and then the three possible bisolute isotherms from the dyes were determined. Methods of predicting multicomponent dye isotherms were developed and applied using the single-component dye adsorption data to predict the bisolute equilibrium data. A comparison was made between predicted and experimental results. A simplified proximate method and a more rigorous method incorporating a Langmuir isotherm approach failed to give accurate predictions. However, the same rigorous method using a modified Freundlich isotherm proved successful in predicting bisolute isotherm data for a number of two-component dye mixtures adsorbing onto activated carbon.

Reschke, G., Bunke, G., Seidel, A. and Gelbin, D. (1988), Using liquid-chromatographic texture analysis of activated carbons for calculating breakthrough curves. *Chemical Engineering Science*, **43** (7), 1710-1712.

Full Text: [C\Che Eng Sci43, 1710.pdf](C/Che%20Eng%20Sci43,%201710.pdf)

Richter, E., Schutz, W. and Myers, A.L. (1989), Effect of adsorption equation on prediction of multicomponent adsorption equilibria by the ideal adsorbed solution theorys. *Chemical Engineering Science*, **44** (8), 1609-1616.

Full Text: [C\Che Eng Sci44, 1609.pdf](C/Che%20Eng%20Sci44,%201609.pdf)

Abstract: The ideal adsorbed solution (IAS) theory is a thermodynamic method for predicting multicomponent adsorption equilibria from isotherms for single gases. Failure to agree with experiment may be due to: (1) nonidealities in the adsorbed phase, or (2) the failure of the adsorption equation to fit experimental data for adsorption of single gases. An investigation of the Freundlich, Langmuir and Dubinin––Radushkevich equations reveals that calculations of mixed-gas equilibria are very sensitive to deviations of these equations from the single-gas adsorption data. Multicomponent predictions also depend upon the regression technique used to extract parameters from the single-gas adsorption data.

? Chatterjee, S.G. and Tien, C. (1989), Adsorption with chemical reaction in a single modified-carbon pellet. *Chemical Engineering Science*, **44** (10), 2283-2294.

Full Text: [1898\Che Eng Sci44, 2283.pdf](1898/Che%20Eng%20Sci44,%202283.pdf)

Abstract: An analysis is presented of the uptake of toxic gases by a single modified-carbon pellet. The uptake rate is effected through physical adsorption and the chemical reactions involving both the toxic gas and metal impregnants with the assumption that the reaction occurs instantaneously. The results provide detailed information on the relative importance of physical adsorption vs chemical reaction in toxic-gas uptake as well as the effect of the impregnant concentration on the efficacy of the modified carbon in removing toxic gases.

Tan, H.K.S. (1989), General-solutions of 2nd-order kinetics for fixed-bed sorption processes. *Chemical Engineering Science*, **44** (11), 2756-2760.

Full Text: [C\Che Eng Sci44, 2756.pdf](C/Che%20Eng%20Sci44,%202756.pdf)

Farooq, S. and Ruthven, D.M. (1990), A comparison of linear driving force and pore diffusion models for a pressure swing adsorption bulk separation process. *Chemical Engineering Science*, **45** (1), 107-115.

Full Text: [C\Che Eng Sci45, 107.pdf](C/Che%20Eng%20Sci45,%20107.pdf)

Abstract: The linear driving force model with frozen solid approximation during pressurization and blowdown, originally developed to simulate pressure swing adsorption air separation for nitrogen production on a carbon molecular sieve, has been applied to a similar process using the zeolite molecular sieve RS-10. It is shown that this simplified model gives performance predictions which are in good agreement with published experimental data as well as with the predictions of the more complex pore diffusional model.

Goto, M., Smith, J.M. and McCoy, B.J. (1990), Parabolic profile approximation (Linear driving-force model) for chemical reactions. *Chemical Engineering Science*, **45**, 443-448.

Full Text: [C\Che Eng Sci45, 443.pdf](C/Che%20Eng%20Sci45,%20443.pdf)

Abstract: The parabolic approximation for the concentration profile inside a particle yields a substantial simplification in computations. The linear driving-force model for combined internal diffusion and external mass transfer arises from the approximation. We have applied this approximation to consider the time dependence of two cases of isothermal, irreversible, first-order chemical reaction in a spherical particle and in a slab: (1) when the reactant is a nondiffusing (adsorbed or solid) component initially inside the particle and the products diffuse out of the particle (e.g. for a reaction extraction), and (2) when the reactant is diffusing into the particle (e.g. for a catalytic reaction). The approximation is found to be satisfactory over a wide range of parameters for case (1). For case (2), however, the accuracy of the approximation is limited to small Biot numbers and Thiele moduli.

? Lu, X., Madey, R., Rothstein, D., Jaroniec, M. and Huang, J.C. (1990), Pressure swing adsorption for a system with a Langmuir-Freundlich isotherm. *Chemical Engineering Science*, **45** (4), 1097-1103.

Full Text: [1990\Che Eng Sci45, 1097.pdf](1990/Che%20Eng%20Sci45,%201097.pdf)

Abstract: Expressions for the enrichment factor, the critical recycle ratio, and the extent of recovery are discussed for a pressure swing adsorption system with a Langmuir—Freundlich isotherm. The enrichment factor is defined as the ratio of the mole fraction of the adsorbate gas in the low-pressure product stream to that in the high-pressure feed stream, the critical recycle ratio is defined as the ratio of the number of moles of the purge gas to the total number of moles of high-pressure product gas, and the extent of recovery is defined as the ratio of the net amount of the carrier gas in the product stream to the total amount of the carrier gas that enters the bed during a cycle. Effects of the non-linear isotherm parameters on these quantities are discussed. It is shown that the enrichment factor increases with increasing adsorbent heterogeneity, whereas the extent of recovery and the critical recycle ratio depend only slightly on the heterogeneity parameter.

Al-Duri, B. and McKay, G. (1991), Prediction of bisolute system for kinetics of batch adsorption using basic dyes onto activated carbon. *Chemical Engineering Science*, **46**, 193-204.

Full Text: [C\Che Eng Sci45, 443.pdf](C/Che%20Eng%20Sci45,%20443.pdf)

Abstract: The parabolic approximation for the concentration profile inside a particle yields a substantial simplification in computations. The linear driving-force model for combined internal diffusion and external mass transfer arises from the approximation. We have applied this approximation to consider the time dependence of two cases of isothermal, irreversible, first-order chemical reaction in a spherical particle and in a slab: (1) when the reactant is a nondiffusing (adsorbed or solid) component initially inside the particle and the products diffuse out of the particle (e.g. for a reaction extraction), and (2) when the reactant is diffusing into the particle (e.g. for a catalytic reaction). The approximation is found to be satisfactory over a wide range of parameters for case (1). For case (2), however, the accuracy of the approximation is limited to small Biot numbers and Thiele moduli.

Kapoor, A. and Yang, R.T. (1991), Contribution of concentration-dependent surface-diffusion to rate of adsorption. *Chemical Engineering Science*, **46** (8), 1995-2002.

Full Text: [C\Che Eng Sci46, 1995.pdf](C/Che%20Eng%20Sci46,%201995.pdf)

Abstract: A model is presented which describes the intraparticle mass transfer considering both gas phase andm adsorbed-phase diffusion. The model accounts for the concentration dependence of surface diffusion, and uses the Langmuir isotherm to describe the adsorption equilibria. A parametric study is presented showing the effects of various variables on the overall uptake curve and intraparticle concentration profiles. It is shown that surface diffusion contributes significantly to the overall intraparticle mass transfer. More importantly, inclusion of concentration dependence of surface diffusivity in the model influences significantly both the overall uptake and the intraparticle concentration profiles. The overall effect of concentration dependence of surface diffusivity is to enhance the rate of uptake during adsorption, and decrease it during desorption. Also, experimental uptake curves are presented for n-hexane on BPL activated carbon at two temperatures, and the data are correlated with the model. The surface diffusivities calculated from the model ignoring the concentration dependence of surface diffusivity are higher by a factor of 2-3 compared to the correct values obtained from the concentration-dependent model.

Keywords: Porous Solids, Activated Carbon, Pore, Model, Sorption

Sevon, D.W. and Cooper, D.J. (1991), Modeling combustion efficiency in a circulating fluid bed liquid incinerator. *Chemical Engineering Science*, **46** (12), 2983-2996.

Full Text: [C\Che Eng Sci46, 2983.pdf](C/Che%20Eng%20Sci46,%202983.pdf)

Abstract: Circulating fluidized bed (CFB) incinerators are capable of destroying a variety of organic wastes. However, a fundamental understanding of CFB incinerators when designed specifically for the destruction of organic liquids is still lacking. Detailed here is a model that combines first principles with proven fluidization correlations to describe the combustion efficiency of CFB organic liquid incinerators. The model specifically seeks to explain the interdependence of operating parameters such as residence time, air staging, total excess air, and temperature on incinerator combustion efficiency. The model is validated with data collected from an experimental CFB incinerator facility. Also presented are a series of case studies using the validated model to investigate process sensitivities as a function of the operating parameters. Finally, the model is used to investigate the effect of modest design changes on incinerator performance.

Keywords: Coal Combustors, Patterns

Jaroniec, M., Choma, J. and Lu, X. (1991), An improved method for evaluating the micropore-size distribution from adsorption-isotherm. *Chemical Engineering Science*, **46** (12), 3299-3301.

Full Text: [C\Che Eng Sci46, 3299.pdf](C/Che%20Eng%20Sci46,%203299.pdf)

Keywords: Dubinin-Radushkevich Equation, Physical Adsorption, Active Carbons, Vapors, Adsorbents, Solids

Boyer, P.M. and Hsu, J.T. (1992), Effects of ligand concentration on protein adsorption in dye-ligand adsorbents. *Chemical Engineering Science*, **47** (1), 241-251.

Full Text: [C\Che Eng Sci47, 241.pdf](C/Che%20Eng%20Sci47,%20241.pdf)

Abstract: The effect of ligand concentration on both equilibrium and fixed-bed adsorption has been studied for three model proteins on dye-ligand adsorbents. Adsorption equilibrium data corresponded well to the Langmuir isotherm. It was found that binding capacity was approximately proportional to immobilized dye concentration. Also it was observed that the more highly substituted adsorbents exhibited higher affinity for proteins. Breakthrough curves were measured for protein adsorption on fixed beds. These data were analyzed by a simple model to determine rate constants for the adsorption process. In general it was found that the rate constants decreased with increasing ligand concentration. The contributions of mass transfer and intrinsic adsorption kinetics to the overall rate were estimated, and it has been found that the adsorption kinetics are rate-limiting. The implications of these results on development of a dye-ligand process, as well as the validity and utility of this simple model for scale-up and design procedures, were discussed.

Keywords: Affinity-Chromatography, Biospecific Adsorption, Triazine Dyes, Purification, Prediction, Particles, Elution, Beds

Yao, C.C. and Tien, C. (1992), Approximation of intraparticle mass-transfer in adsorption processes. 1. Linear-systems. *Chemical Engineering Science*, **47** (2), 457-464.

Full Text: [C\Che Eng Sci47, 457.pdf](C/Che%20Eng%20Sci47,%20457.pdf)

Abstract: Approximate expressions of adsorbate uptake rate by spherical pellets were derived from the solutions of the intraparticle diffusion equation by the methods of weighted residuals. For systems with linear adsorption isotherms, the classic linear driving force (LDF) expression was shown to be equivalent to the solution of the intraparticle diffusion equation using the orthogonal collocation method with one collocation point. Alternatively, it can be shown that the LDF expression gives the best approximation (in the least-square sense) if a parabolic adsorbate concentration profile within the pellet is assumed. The use of higher-order polynomials for approximating the adsorbate concentration profile is equivalent to the use of a correspondingly larger number of collocation points in the solution of the intraparticle diffusion equation.

Keywords: Driving-Force Approximation, Diffusion, Model, Simulation, Adsorbers

? Matranga, K.R., Myers, A.L. and Glandt, E.D. (1992), Storage of natural-gas by adsorption on activated carbon. *Chemical Engineering Science*, **47** (7), 1569-1579.

Full Text: [1992\Che Eng Sci47, 1569.pdf](1992/Che%20Eng%20Sci47,%201569.pdf)

Abstract: Natural gas may be stored by liquefaction, compression, or adsorption. For use as a transportation fuel, liquefaction is impractical and compression requires high pressure (20 MPa) and an expensive multi-stage compression facility. At relatively low pressure (3-4 MPa) achievable by single-stage compression, adsorbed natural gas (ANG) has nearly the capacity of compressed natural gas (CNG). Monte Carlo calculations were performed to simulate the adsorption of natural gas on activated carbon. The model is pure methane intercalated between parallel planes of graphite at a slit of width 11.4 angstrom, optimized for ANG storage. The simulations predict that the maximum delivered energy density of ANG is 0.25 for monolithic carbon and 0.17 for pelletized carbon, compared to 0.29 for CNG and 1.0 for gasoline.

Keywords: Equilibrium Data, Mixtures, Methane, Dioxide, Isotherms, Pressures, Binary, Fiber

Hu, X. and Do, D.D. (1992), Multicomponent adsorption kinetics of hydrocarbons onto activated carbon: Effect of adsorption equilibrium equations. *Chemical Engineering Science*, **47** (7), 1715-1725.

Full Text: [C\Che Eng Sci47, 1715.pdf](C/Che%20Eng%20Sci47,%201715.pdf)

Abstract: In this paper we present a theoretical and experimental analysis of multicomponent adsorption dynamics of hydrocarbons onto activated carbon. The mathematical model allows for the dual mode of diffusion into the particle, with surface diffusion being driven by a chemical potential rather than the usual concentration gradient. The multicomponent adsorption equilibrium is calculated using the ideal adsorption solution theory (IAST), with the single-component isotherm being described by either the Langmuir or the Tóth equation. The effect of the isotherm equation on the prediction of the multicomponent sorption dynamics is investigated in this paper.

Torres, J. and Cervera-March, S. (1992), Kinetics of the photoassisted catalyic oxidation of Pb(II) in TiO2 suspensions. *Chemical Engineering Science*, **47** (15-16), 3857-3862.

Full Text: [C\Che Eng Sci47, 3857.pdf](C/Che%20Eng%20Sci47,%203857.pdf)

Abstract: A practical method of recovery of lead from wastewaters (primary effluents), avoiding its environmental effects, could be based on photoassisted semiconductor catalysis. The photooxidation of Pb(II) has been studied at pH less-than-or-equal-to 4 using a photocatalyst composed of TiO2 (anatase) loaded with Pt deposits. A kinetic study has been carried out considering the different mass transfer and chemical kinetic steps. The pH and Pb(II) concentration do not affect the reaction rate. A first-order relationship describes the influence of the oxygen partial pressure upon the rate. A reaction mechanism has been postulated using the heterogeneous catalysis theory: the rate-limiting step seems to be the reduction of oxygen adsorbed on the catalyst surface.

Hu, X. and Do, D.D. (1993), Multicomponent adsorption kinetics of hydrocarbons onto activated carbon: Contribution of micropore resistance. *Chemical Engineering Science*, **48** (7), 1317-1323.

Full Text: [C\Che Eng Sci48, 1317.pdf](C/Che%20Eng%20Sci48,%201317.pdf)

Abstract: In this paper we present a theoretical analysis of multicomponent adsorption dynamics of hydrocarbons into a medium-sized activated carbon. The mathematical model allows for the diffusions of the free and adsorbed species into the particle, with the driving force for the adsorbed species being the chemical potential gradient rather than the concentration gradient. The adsorbed species diffuse in two directions inside the particle. One direction is the direction along the particle coordinate while the other is the direction along the grain coordinate. The multicomponent adsorption equilibrium is calculated using the ideal adsorbed solution theory, with the single-component isotherm described by Langmuir equation.

Gonzalezpatino, F., Catalan, J. and Galan, M.A. (1993), Affinity-chromatography - effect of particle-size on adsorption equilibrium and mass-transfer kinetics. *Chemical Engineering Science*, **48** (9), 1567-1573.

Full Text: [C\Che Eng Sci48, 1567.pdf](C/Che%20Eng%20Sci48,%201567.pdf)

Abstract: Hydrophilic and hydrophobic bonds, adsorption equilibrium, binding rates and partition and diffusion coefficients inside particles have been studied for L-asparaginase on activated Sepharose 4B with hexaMethylenediamine and L(+)-chlorosuccinamic acid as the spacer arm and specific ligand, respectively, in column and batch reactors, at pH = 8.6 (borate buffer) and 298 K, for different ionic strengths (0-2.0) and different particle sizes (55-134 μm diameter). The effect of ionic strength on equilibrium was different for each particle size, being very small for larger particles (134 μm) and showing hysteresis, which was larger for small particles (55 μm). Equilibrium data were correlated using a semi-quantitative theory developed by Morrow et al. based on the Debye-Huckel theory for activity coefficients. Kinetic data at ionic strength zero were fixed using a second-order equation for adsorption and first order for desorption, the value of the adsorption constants being: ka = 4.4 and 7.7 g of adsorbent/mol min for particles of 55 and 66 mum and Kd = 3.5 and 3.2×10-2 min-1, respectively. 134 μm particles have internal mass transfer resistance. Thus, the partition coefficient was determined according to a model based on that of Taylor and Swaisgood, finding a value of 0.346. Also, for this size of particle, the effective diffusion coefficient was determined using the initial adsorption rate. The value of this coefficient was De = 1.9×10-5 cm2/s, of the same order as free diffusion for L-asparaginase.

Goto, M. and Hirose, T. (1993), Approximate rate equation for intraparticle diffusion with or without reaction. *Chemical Engineering Science*, **48** (10), 1912-1915.

Full Text: [C\Che Eng Sci48, 1912.pdf](C/Che%20Eng%20Sci48,%201912.pdf)

Do, D.D. and Hu, X. (1993), An energy distributed model for adsorption kinetics in large heterogeneous microporous particles. *Chemical Engineering Science*, **48** (11), 2119-2127.

Full Text: [C\Che Eng Sci48, 2119.pdf](C/Che%20Eng%20Sci48,%202119.pdf)

Abstract: In this paper, we present a new model for describing adsorption and desorption of gaseous adsorbate into large microporous particles. The principal feature of this model is that it allows for the energy distribution of adsorption site in both equilibrium isotherm and surface diffusion of the adsorbed species. The model is valid for large microporous particles, where all controlling mass transfer resistances are along the particle coordinate. Parametric study is carried out to show the effect of the energy distribution on the dynamics of adsorption and desorption. The effects of other parameters such as external bulk adsorbate concentration and maximum adsorption capacity are also studied. Finally, experimental data of adsorption of hydrocarbons (ethane and n-butane) and sulphur dioxide in an Ajax activated carbon are applied to demonstrate the potential of this theory.

Keywords: Surface-Diffusion, Equilibrium Adsorption, Isotherm

Yoshida, H., Okamoto, A. and Kataoka, T. (1993), Adsorption of acid dye on cross-linked chitosan fibers: Equilibria. *Chemical Engineering Science*, **48** (12), 2267-2272.

Full Text: [C\Che Eng Sci48, 2267.pdf](C/Che%20Eng%20Sci48,%202267.pdf)

Abstract: Two different cross-linked chitosan fibers (ChF-A and ChF-B) were developed for use as adsorbents or ion exchangers for the recovery of dyestuffs. The concentration of amino group in the adsorbent phase was 3 to 5 times larger than that of the commercial weak-base ion exchangers and decreased with increasing degree of cross-linking. For pH = 6.9, the experimental equilibrium isotherms for adsorption of Acid Orange II (acid dye) were correlated by the BET equation for a finite number of layers. The maximum amounts of the dye adsorbed on ChF (original non-cross-linked chitosan fiber), ChF-A, and ChF-B were about 10, 6, and 3.2 mol/kg, respectively, for initial liquid-phase concentration of the dye C0 = 1 mol/m3 and 298 K. These values are much larger than the corresponding values for activated carbon fiber. The amount of the dye adsorbed increased with increase in C0 and decreased with increasing temperature. The presence of an inorganic salt also increased the amount of the dye adsorbed. For pH less-than-or-equal-to 4, the selectivity of adsorption of the dye was extremely high and the isotherm was almost rectangular. The saturation capacities of the dye on ChF-A and ChF-B in pH less-than-or-equal-to 4 were 4, 8 and 3.5 mol/kg, respectively, almost the same as the concentrations of the amino group in the solid phase of ChF-A and ChF-B, respectively.

Keywords: External Mass-Transfer, Pore Diffusion-Model, Activated Carbon, Batch Adsorbers, Dyestuffs, Chitin, Peat

Seidel-Morgenstern, A. and Guiochon, G. (1993), Modeling of the competitive isotherms and the chromatographic separation of two enantiomers. *Chemical Engineering Science*, **48** (15), 2787-2797.

Full Text: [C\Che Eng Sci48, 2787.pdf](C/Che%20Eng%20Sci48,%202787.pdf)

Abstract: Using frontal analysis, we measured the adsorption isotherms of each Troger’s base enantiomers on microcrystalline cellulose triacetate, with ethanol as solvent. The isotherm of the first eluted (-)-enantiomer can be described satisfactorily by the Langmuir equation. The isotherm of the (+)-enantiomer has an inflection point and can be modelled by a quadratic isotherm equation. As a consequence, both the retention time of the (+)-enantiomer and the resolution of a racemic mixture increase with increasing concentration in a certain range. Using the pure enantiomer isotherms and the equilibrium-dispersive model, we could calculate the elution profiles of racemic mixtures of the two enantiomers. At low sample sizes, the bands are well resolved, the competition between the two enantiomers can be neglected in the calculations, and satisfactory band profiles are obtained for the racemic mixture. At high concentrations, the ideal adsorbed solution (IAS) theory was applied to predict the competitive isotherms. Experimental data on the separation of racemic mixtures at high concentrations, including the individual band profiles, are well represented by the results of calculations made with these isotherms.

Keywords: Nonlinear Chromatography, Band Profiles, Liquid-Chromatography, Cellulose Triacetate, Adsorption, Simulation, Triacetylcellulose, Resolution, Carbon, Levan

Hu, X. and Do, D.D. (1994), Effect of energy distribution shape on the sorption equilibrium and dynamics of SO2 in activated carbon. *Chemical Engineering Science*, **49** (6), 919-923.

Full Text: [C\Che Eng Sci49, 919.pdf](C/Che%20Eng%20Sci49,%20919.pdf)

Keywords: Energetically Heterogeneous Surfaces, Diffusion, Adsorption

Tan, H.K.S. (1994), Analysis of cyclic fixed bed sorption processes for second-order irreversible kinetics. *Chemical Engineering Science*, **49** (8), 1277-1285.

Full Text: [C\Che Eng Sci49, 1277.pdf](C/Che%20Eng%20Sci49,%201277.pdf)

Abstract: Analysis of a cyclic fixed bed sorption process based on second-order irreversible kinetics is undertaken. Cyclic steady-state solutions are obtained in closed form for both cocurrent and countercurrent regeneration. By converting two integral equations to two simultaneous differential equations, the solutions can also be evaluated numerically. In two special cases explicit analytic solutions are also derived. The performance of the cyclic process is evaluated based on sorption effectiveness and is shown to be dependent on four cyclic design parameters. Calculated results indicate that cyclic sorption effectiveness is independent of the direction of regeneration.

Hu, X., Do, D.D. and Rao, G.N. (1994), Experimental concentration dependence of surface diffusivity of hydrocarbons in activated carbon. *Chemical Engineering Science*, **49** (13), 2145-2152.

Full Text: [C\Che Eng Sci49, 2145.pdf](C/Che%20Eng%20Sci49,%202145.pdf)

Abstract: A new procedure is introduced to a differential adsorption bed (DAB) to determine the intrinsic concentration dependence of the surface diffusivity of hydrocarbons in activated carbon. The DAB is operated under a small change in bulk concentration that the adsorbed concentration is nearly constant during the adsorption process. The intrinsic surface diffusivity is then determined by analysing the experimental data using a pore and surface diffusion model. Experimental results show a much stronger concentration dependence of the surface diffusivity than that predicted by a Darken relationship in the studies of ethane and propane adsorption in Ajax-activated carbon. The effect of adsorption equilibrium equations on the prediction of the intrinsic surface diffusivity is also studied.

Keywords: Adsorption-Kinetics, Sorption Kinetics, Particles, Model

Grzegorczyk, D.S. and Carta, G. (1996), Adsorption of amino acids on porous polymeric adsorbents. 1. Equilibrium. *Chemical Engineering Science*, **51** (5), 807-817.

Full Text: [C\Che Eng Sci51, 807.pdf](C/Che%20Eng%20Sci51,%20807.pdf)

Abstract: The adsorption of the amino acids leucine, phenylalanine, and tryptophan and, for a comparison, of the antibiotic penicillin-G is studied for a range of porous polymeric adsorbents. The adsorbent materials investigated include both highly hydrophobic adsorbents as well as functionalized, more hydrophilic ones. The adsorption isotherms approach the ideal Langmuir form. For the amino acids considered in this work, the isotherms are essentially independent of pH, but they vary significantly with temperature and with the addition of alcohols. Heats of adsorption for phenylalanine are obtained from van’t Hoff plots of the Henry’s law constant limit of the Langmuir isotherm and they are found to be larger for the more hydrophobic adsorbents. However, adsorption affinities for this amino acid are larger for the more hydrophilic sorbents, indicating a significant entropic contribution for the adsorption on these materials.

Keywords: Reversed-Phase Chromatography, Activated Carbon, Cephalosporin-C, Resins, Mixtures, Derivatives, Performance, Separation, Sorption, Peptides

Grzegorczyk, D.S. and Carta, G. (1996), Adsorption of amino acids on porous polymeric adsorbents. 2. Intraparticle mass transfer. *Chemical Engineering Science*, **51** (5), 819-826.

Full Text: [C\Che Eng Sci51, 819.pdf](C/Che%20Eng%20Sci51,%20819.pdf)

Abstract: Mass transfer data are obtained for the adsorption of phenylalanine in porous polymeric adsorbents with different pore structures and Functionalities. In most cases, the data are adequately described by assuming that hindered diffusion in liquid-filled pores is the controlling mass transfer mechanism. For these adsorbents, the ratio of particle porosity and tortuosity factor is found to be essentially constant as a function of temperature and composition of the liquid phase. The tortuosity factors are somewhat larger for the smaller pore materials than for the larger-pore ones. However, in the case of a nearly microporous adsorbent, the diffusivity appears to be dependent on temperature to an extent which is not consistent with the assumption of diffusion in rigid, liquid-filled pores.

Keywords: Liquid-Filled Pores, Polystyrene Resins, Ion-Exchange, Transport, Diffusion, Coefficients

Do, D.D. and Do, H.D. (1997), A new adsorption isotherm for heterogeneous adsorbent based on the isosteric heat as a function of loading. *Chemical Engineering Science*, **52** (2), 297-310.

Full Text: [C\Che Eng Sci52, 297.pdf](C/Che%20Eng%20Sci52,%20297.pdf)

Abstract: A new adsorption isotherm model is proposed in this paper for a heterogeneous solid. The basis of this isotherm equation is that the degree of heterogeneity is reflected through the variation of the isosteric heat of adsorption with respect to loading. This degree as well as the pattern of heterogeneity is assumed to be independent of adsorbate used. The influence of the adsorbate on the isotherm will be through the interaction energy at zero loading as well as parameters which reflect the way in which the adsorbate fits into the adsorption sites. The resulting isotherm equation is very general, and under certain conditions it reduces to many isotherms commonly used in the literature, such as the Langmuir, Langmuir-Freundlich, Tóth, Fowler-Guggenheim and Nitta et al. equations. The new isotherm is tested with adsorption isotherm data of many adsorbates on various samples of activated carbon and zeolite, and the parameters extracted for these adsorbates shed some light on the system heterogeneity. Implications of this new isotherm are discussed in this paper. Copyright (C) 1996 Elsevier Science Ltd.

Keywords: Adsorption Isotherm, Isosteric Heat, Heterogeneity

Grzegorczyk, D.S. and Carta, G. (1997), Adsorption of amino acids on porous polymeric adsorbents. 2. Intraparticle mass transfer (vol 51, pg 819, 1996). *Chemical Engineering Science*, **52** (4), 655.

Full Text: [C\Che Eng Sci52, 655.pdf](C/Che%20Eng%20Sci52,%20655.pdf)

Notes: Highly cited

? Krishna, R. and Wesselingh, J.A. (1997), Review article number 50 - The Maxwell-Stefan approach to mass transfer. *Chemical Engineering Science*, **52** (6), 861-911.

Full Text: [1997\Che Eng Sci52, 861.pdf](1997/Che%20Eng%20Sci52,%20861.pdf)

Abstract: The limitations of the Fick’s law for describing diffusion are discussed. It is argued that the Maxwell-Stefan formulation provides the most general, and convenient, approach for describing mass transport which takes proper account of thermodynamic non-idealities and influence of external force fields. Furthermore, the Maxwell-Stefan approach can be extended to handle diffusion in macro- and microporous catalysts, adsorbents and membranes. (C) 1997 Elsevier Science Ltd.

Keywords: Multicomponent Diffusion, Porous Media, Membrane Separations, Fick’s Law, Ionic Diffusion, Zeolites, Pressure Swing Adsorption, Predicting Multicomponent Diffusivities, Energetically Heterogeneous Surfaces, Occupancy Zeolite Catalysts, Vapor-Deposition Reactors, Solution-Diffusion-Model, Wetted-Wall Column, Dusty-Gas-Model, Chemical-Reaction, Film-Model

? Sheng, P.Z. and Costa, C.A.V. (1997), Modified linear driving force approximations for cyclic adsorption-desorption processes. *Chemical Engineering Science*, **52** (9), 1493-1499.

Full Text: [1997\Che Eng Sci52, 1493.pdf](1997/Che%20Eng%20Sci52,%201493.pdf)

Abstract: This work deals with linear driving force (LDF) approximations to the intraparticle pore diffusion equation assuming linear equilibrium. Two approaches are used to calculate global rate coefficients for the LDF model: the usual way where the average intraparticle concentration is calculated from the LDF model and a new one that uses the solution of the diffusion equation. The cyclic steady-state solutions to various cyclic perturbations are presented and compared for both methods. Also the global rate coefficients for processes with half-cycles of different length subjected to square wave perturbations are presented. It is shown that the two rate coefficients needed to represent a cycle are practically equal. To avoid the difficulties associated with the non-universality, i.e. dependence on the perturbation type, of the global rate coefficients, an instantaneous rate coefficient is presented, valid for perturbations smoother than the square wave. (C) 1997 Elsevier Science Ltd.

Keywords: Adsorption, Concentration, Dependence, Diffusion, Diffusion, Equilibrium, Global, Intraparticle Mass-Transfer, LDF, Model, PSA, Rate Coefficient, Systems, Times

? Chung, T.W. and Chung, C.C. (1998), Increase in the amount of adsorption on modified silica gel by using neutron flux irradiation. *Chemical Engineering Science*, **53** (16), 2967-2972.

Full Text: [1998\Che Eng Sci53, 2967.pdf](1998/Che%20Eng%20Sci53,%202967.pdf)

Abstract: Boron-doped silica gel was formulated successfully in this study. The silica gel was doped with boron-10 to enhance microscopic damage and/or to increase micropore zones within the solid during neutron irradiation. As a result, the adsorbed amount per unit volume of silica gel in the adsorption-dehumidification systems was increased and the quantity of regeneration heat needed was decreased. A novel equipment for measuring breakthrough curves was built and utilized in the investigation. A computer real-time data acquisition system was designed for monitoring and recording the experimental data. A detailed description of the technique and its utilization will be given in this study. The surface properties of the modified adsorbents were measured by a BET sorptometer. Under operating conditions of this study, the amount of moisture adsorption by the modified adsorbent was increased by more than 23% of that of the commercial silica gel. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Boron-10, Breakthrough Curve, Data Acquisition, Flux, Irradiation, Modified Adsorbents, Moisture Sorption, Monitoring, Neutron Flux Irradiation, Porous Carbon, Properties, Quantity, Regeneration, Silica, Silica Gel, Surface Properties, Utilization

? Chung, T.W. and Chung, C.C. (1999), Increase in the amount of adsorption on modified activated carbon by using neutron flux irradiation. *Chemical Engineering Science*, **54** (12), 1803-1809.

Full Text: [1999\Che Eng Sci54, 1803.pdf](1999/Che%20Eng%20Sci54,%201803.pdf)

Abstract: Neutron flux irradiation was used to modify the surface properties of activated carbon as a means to increase the amount of moisture adsorption on the modified activated carbon samples. The activated carbon was first dropped into the saturated boric acid solution to make the boron-doped activated carbon. The dried boron-doped activated carbon sample was further irradiated by neutrons to produce the alpha particles (He-4(2)). The alpha particles bombarded the activated carbon randomly to enhance the microscopic damages and/or to increase the micropore zones. As a result, the effective surface area on the activated carbon was increased and the amount of adsorption per unit volume of absorbent was increased also. An equipment to measure the breakthrough curves of water vapor adsorption on the activated carbon samples was built in this study. A computer real-time control for data logger was also designed successfully for recording the data points in the breakthrough curves. The BET sorptometer was used to measure the surface properties of the adsorbents in this study. Under the operating conditions, the amount of moisture adsorption by the modified activated carbon increased by more than 18.8 % of that of the original activated carbon sample. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Boron-10, Breakthrough Curve, Carbon, Control, Flux, Irradiation, Moisture Sorption, Neutron Flux Irradiation, Neutrons, Particles, Porous Carbon, Properties, Surface Area, Surface Properties, Water, Water Vapor

Dooling, D.J., Nielsen, R.J. and Broadbelt, L.J. (1999), A density-functional study of the interaction of nitrogen with ruthenium clusters. *Chemical Engineering Science*, **54** (15-16), 3399-3409.

Full Text: [C\Che Eng Sci54, 3399.pdf](C/Che%20Eng%20Sci54,%203399.pdf)

Abstract: Recently, the synthesis of ammonia over ruthenium-based catalysts has become an industrially viable process. Unfortunately, investigations of ammonia synthesis over ruthenium are scarce, particularly in comparison to the number of studies carried out over iron. To begin to fill this void, we have performed a series of electronic density-functional theory (DFT) calculations to investigate the effect of particle size and surface structure on ammonia synthesis over ruthenium. Our study has focused on the dissociative adsorption of dinitrogen, which is thought to be the rate-determining step in the synthesis, on both single-crystal surfaces and spherical clusters of ruthenium. The equilibrium adsorbate geometries were remarkably similar on both the single-crystal surfaces and the spherical clusters studied. The binding energy of dinitrogen in the end-on state exhibited a strong dependence on ruthenium surface atom coordination, being much stronger on atoms with low coordination. The main difference between the two single-crystal surfaces studied was the ability of the open Ru(11 (2) over bar 0) face to stabilize a low-energy side-on dinitrogen state, while the close-packed Ru(0001) face could not. It is likely that this stable Side-on state provides a low-energy dissociation pathway. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Nitrogen, Ruthenium, Promoter, Ammonia, Single Crystal, Density-Functional Theory, Temperature-Programmed Desorption, Small Iron Particles, Ammonia-Synthesis, Transition-Metal, Dissociative Chemisorption, Magnetic-Properties, Ru(0001) Surface, Alkali-Metal, Ru Catalyst, Adsorption

Chanda, M. and Rempel, G.L. (1999), Gel-coated ion-exchange resin: A new kinetic model. *Chemical Engineering Science*, **54** (17), 3723-3733.

Full Text: [C\Che Eng Sci54, 3723.pdf](C/Che%20Eng%20Sci54,%203723.pdf)

Abstract: Regenerable ‘gel-coated’ cationic resins with fast sorption kinetics and high sorption capacity have application potential for removal of trace metal ions even in large-scale operations. Poly(acrylic acid) has been gel-coated on high-surface area silica (pre-coated with ethylene-vinyl acetate copolymer providing a thin barrier layer) and insolubilized by crosslinking with a low-molecular-weight diepoxide (epoxy equivalent 180 g) in the presence of benzyl dimethylamine catalyst at 70°C, In experiments performed for Ca2+ sorption from dilute aqueous solutions of Ca(NO3)2, the gel-coated acrylic resin is found to have nearly 40% higher sorption capacity than the bead-form commercial methacrylic resin Amberlite IRC-50 and also several limes higher rate of sorption. The sorption on the gel-coated sorbent under vigorous agitation has the characteristics of particle diffusion control with homogeneous (gel) diffusion in resin phase. A new mathematical model is proposed for such sorption on gel-coated ion-exchange resin in finite bath and solved by applying operator-theoretic methods. The analytical solution so obtained shows goad agreement with experimental sorption kinetics at relatively low levels (< 70%) of resin conversion. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Gel-Coated Resin, Poly(Acrylic Acid), Weakly Acidic Resin, Sorption Kinetic Model, Chromium(III) Removal, Silica, Sorption, Phenolics, Capacity, Recovery

Wang, Z.L. (1999), Effect of adsorbent shape on adsorption dynamics in a batch adsorber. *Chemical Engineering Science*, **54** (23), 5787-5790.

Full Text: [C\Che Eng Sci54, 5787.pdf](C/Che%20Eng%20Sci54,%205787.pdf)

Keywords: Intraparticle Diffusion, Supports

Porter, J.F., McKay, G. and Choy, K.H. (1999), The prediction of sorption from a binary mixture of acidic dyes using single-and mixed-isotherm variants of the ideal adsorbed solute theory. *Chemical Engineering Science*, **54** (24), 5863-5885.

Full Text: [C\Che Eng Sci54, 5863.pdf](C/Che%20Eng%20Sci54,%205863.pdf)

Abstract: Equilibrium isotherms have been determined for the adsorption of two single-component and one binary acid dye solutions on carbon. The ideal adsorbed solute theory (IAST) has been used to predict isotherm data for the binary system using the single-component dye sorption data alone. A detailed analysis has been carried out to investigate the effect of different error criteria for determining single-component isotherm parameters and their influence on the results of IAS model simulations using the Langmuir and Freundlich isotherm equations. It was found that the “best-fit” single-component isotherm based on the minimum error criteria did not result in the “best-fit” IAS model predictions. Furthermore, the IAS model producing the closest fit to the binary experimental data did not use the same isotherm model as the single-component data for one dye. Reasons for this apparently anomalous behaviour have been discussed and the most likely cause appears to be dye-dye interactions in the binary system.

Keywords: IAST, Acid dyes, Mixed isotherm, Carbon

Ho, Y.S. and McKay, G. (2000), Correlative biosorption equilibria model for a binary batch system. *Chemical Engineering Science*, **55** (4), 817-825.

Full Text: [C\Che Eng Sci55, 817.pdf](C/Che%20Eng%20Sci55,%20817.pdf)

Abstract: The binary sorption of copper and nickel ions onto peat has been studied. Equilibrium isotherms have been determined for three different copper : nickel molar concentration ratios. The experimental results have been analysed using an extended multicomponent Langmuir equation with a competition term but the correlation between the experimental and the predicted values was poor. An interaction factor was incorporated into the extended Langmuir equation and a significant improvement in correlation was obtained. The final model involved deriving an expression to correlate the interaction factor with surface loading and these correlations produced coefficients greater than 0.995 for all the isotherms. An *F*-test on the variable interaction factor model developed in this paper confirmed that it produces a significant improvement in correlating isotherm equilibria data.

Keywords: Competition Sorption, Copper, Nicker, Peat, Isotherm, Activated Carbon, Heavy-Metals, Aqueous-Solutions, Removal, Peat, Adsorption, Sorption, Ions, Biomass

Qiao, S. and Hu, X. (2000), Effect of micropore size distribution induced heterogeneity on binary adsorption kinetics of hydrocarbons in activated carbon. *Chemical Engineering Science*, **55** (9), 1533-1544.

Full Text: [C\Che Eng Sci55, 1533.pdf](C/Che%20Eng%20Sci55,%201533.pdf)

Abstract: Experimental data of sorption kinetics of ethane and propane and their binary mixtures on Norit activated carbon under various conditions were measured using a differential adsorber bed (DAB) rig and used to further validate the predictive capability of the kinetic model proposed by Hu, Qiao and Do (1999, Langmuir). The model utilizes the concept of micropore size distribution and Lennard-Jones potential theory to describe the adsorption energetic heterogeneity on activated carbon. The pore size distribution is treated as the intrinsic property of adsorbent and taken as the sole source of solid surface heterogeneity. A gamma distribution is used to describe the micropore size distribution. The size exclusion effect is taken into account in the competition of different species for a given pore. The effect of the minimum size of pore accessible to different adsorbates on kinetics prediction is investigated. The requirement of thermodynamic consistency for adsorption equilibrium model is also studied in simulating the multicomponent adsorption kinetics. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Desorption, Kinetics, Activated Carbon, Pore Size Distribution, Diffusion, Surface-Diffusion, Structural Heterogeneity, Energetic Heterogeneity, Bidispersed Solids, Model Micropores, Adsorbed Gases, Mixtures

Ko, D.C.K., Porter, J.F. and McKay, G. (2000), Optimised correlations for the fixed-bed adsorption of metal ions on bone char. *Chemical Engineering Science*, **55** (23), 5819-5829.

Full Text: [C\Che Eng Sci55, 5819.pdf](C/Che%20Eng%20Sci55,%205819.pdf)

Abstract: The sorption of two divalent metal ions, namely, copper and cadmium ions, has been studied due to their toxicity in nature and extensive use in industry. Fixed-bed column experiments with different feed concentrations, flowrates and adsorbent particle sizes have been carried out, evaluating sorption of these two metal ions on bone char. Pilot-plant experimental studies have been performed and two simplified design models, namely, the BDST model and EBRT analysis, have been used to analyse the data. New correlations, incorporating a time-dependent term, have been developed to compensate for the time required for the bed to achieve equilibrium sorption capacity. Finally, predictions of the operating lines on the EBRT plot have been correlated using the two metal ion sorption systems. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Packed Bed, Mathematical Modelling, Optimisation, Metal Ion, Bone Char, Activated Carbon Columns, 2 Dissolved Organics, Competitive Adsorption, Water-Purification, Exchange Kinetics, Diffusion-Model, Batch Tests, Basic Dye, Scale-Up, Removal

Feng, B. and Bhatia, S.K. (2000), Determination of activation energy distributions for chemisorption of oxygen on carbon: An improved approach. *Chemical Engineering Science*, **55** (24), 6187-6196.

Full Text: [C\Che Eng Sci55, 6187.pdf](C/Che%20Eng%20Sci55,%206187.pdf)

Abstract: The present paper proposes an approach to obtaining the activation energy distribution for chemisorption of oxygen onto carbon surfaces, while simultaneously allowing for the activation energy dependence of the pre-exponential factor of the rate constant. Prior studies in this area have considered this factor to be uniform, thereby biasing estimated distributions. The results show that the derived activation energy distribution is not sensitive to the chemisorption mechanism because of the step function like property of the coverage. The activation energy distribution is essentially uniform for some carbons, and has two or possibly more discrete stages, suggestive of at least two types of sites, each with its own uniform distribution. The pre-exponential factors of the reactions are determined directly from the experimental data, and are found not to be constant as assumed in earlier work, but correlated with the activation energy. The latter results empirically follow an exponential function, supporting some earlier statistical and experimental work. The activation energy distribution obtained in the present paper permits improved correlation of chemisorption data in comparison to earlier studies. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Activation Energy Distribution, Carbon, Char, Chemisorption, Coal, Kinetics, Kinetics, Model, Oxidation, Temperature

Inglezakis, V.J., Lemonidou, M. and Grigoropoulou, H.P. (2001), Liquid holdup and flow dispersion in zeolite packed beds. *Chemical Engineering Science*, **56** (17), 5049-5057.

Full Text: [C\Che Eng Sci56, 5049.pdf](C/Che%20Eng%20Sci56,%205049.pdf)

Abstract: A simple tracing method, based on residence time distribution measurements, is presented for the evaluation of the liquid holdup and dispersion in zeolite packed beds. Two tracers and two different materials. one porous (zeolite clinoptilolite) and one non-porous (SiC), were used in experiments on seven packed beds of different dimensions, operating under downflow or upflow condition, in the range of superficial velocities from 0.04 to 0.61×10-2 m s. The corresponding superficial Reynolds number is between 0.6 and 8.50. Drainage and tracing methods are experimentally compared. The tracing techniques tested are reliable and applicable for the determination of liquid holdup and dispersion in clinoptilolite beds. Liquid holdup, as % of void volume of the bed, is 90±10% for upflow condition, independent of the superficial velocity. For downflow condition it reaches 80% for superficial velocities greater than 0.4×10-2 m s. Peclet numbers were determined, giving different trends for upflow and downflow conditions. For superficial velocity near 0.4×10-2 m s (Reynolds number near 4) and greater, Peclet numbers are identical and in the vicinity of 0.12. A discussion is conducted in order to clarify this observation. Approximate correlations are proposed for liquid holdup and Peclet number in zeolite packed beds. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Carborundum, Clinoptilolite, Columns, Dispersion, Ion-Exchange, Liquid Holdup, Metals, Packed Bed, Peclet Number, Reactors, Removal, Zeolite

Esposito, A., Pagnanelli, F. and Vegliò, F. (2002), pH-related equilibria models for biosorption in single metal systems. *Chemical Engineering Science*, **57** (3), 307-313.

Full Text: [C\Che Eng Sci57, 307.pdf](C/Che%20Eng%20Sci57,%20307.pdf)

Abstract: Biosorption is an innovative technology used to remove heavy metals from aqueous solutions. A wider application of this alternative process is strictly related to the understanding of the chemico-physical aspects involved, in order to optimize the operative conditions. Mechanistic models are the most useful tools used for understanding purposes, even if the empirical models are still widely applied for their simplicity. In this paper, two original models were used to represent the experimental data of copper and cadmium biosorption onto *Sphaerotilus natans* in different operative conditions of pH and biomass concentration. Both models can represent the effect of pH onto biosorption performances using two different approaches. The first model is empirical, based on the observation that the maximal specific metal uptake courses vs. pH presents a logistic pattern. The second model is based on the non-competitive mechanism between heavy metals and H+ protons. Both models can represent adequately the experimental data, but the non-competitive model also gives a realistic description of the mechanism operating in the system according to a preliminary biomass characterization.

Keywords: Adsorption, Downstream Processing, Environment, Modeling, Pollution, Heavy Metal Biosorption

Bayramoğlu, G., Kaya, B. and Arıca, M.Y. (2002), Procion Brown MX-5BR attached and Lewis metals ion-immobilized poly(hydroxyethyl methacrylate)/chitosan IPNs membranes: Their lysozyme adsorption equilibria and kinetics characterization. *Chemical Engineering Science*, **57** (13), 2323-2334.

Full Text: [C\Che Eng Sci57, 2323.pdf](C/Che%20Eng%20Sci57,%202323.pdf)

Abstract: Interpenetration networks (IPNs) in membrane form were synthesized from 2-hydroxyethyl methacrylate (HEMA) and chitosan (pHEMA/chitosan) via UV-initiated photo-polymerization in the presence of an initiator alpha, alpha’-azoisobutyronitrile. Procion Brown MX-5BR (PB MX-5BR) was covalently attached onto IPNs membrane as a metal chelating dye-ligand. Two different Lewis metal ions (Fe(III) or Cu(II)) were immobilized onto the dye-ligand for utilization in the immobilized metal affinity chromatography (IMAC). The binding characteristics of a model protein (lysozyme) to IMAC adsorbents and selectivity of immobilized metal ions (Fe(III) and Cu(II)) to the lysozyme have been investigated from aqueous solution using the dye-ligand-attached IPNs membrane as a control system. The experimental data was analysed using the two adsorption kinetic models the pseudo-first-order and pseudo-second order to determine the best-fit equation for the adsorption of lysozyme onto dye-ligand and IMAC adsorbents. The second-order equation for the adsorption of lysozyme on the dye-ligand, dye-ligand-Fe(III) and dye-ligand-Cu(II) membrane systems is the most appropriate equation to predict the adsorption capacity for all the tested adsorbents. The reversible lysozyme adsorption on the dye-ligand and IMAC adsorbents obeyed the Temkin isotherm. The lysozyme adsorption capacities of the dye-ligand, dye-ligand-Fe(III) and dye-ligand-Cu(II) immobilized IPNs membranes were 79.1, 147.4, and 128.2 mg ml-1, respectively. The adsorption of the lysozyme on the pHEMA/chitosan membrane plain was about 8.3 mg ml-1. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Polymers, Membranes, Kinetics, IPNs, IMAC, Lysozyme, Affinity-Chromatography, Protein Adsorption, Poly(2-Hydroxyethyl Methacrylate), Human Serum, Separation, Performance, Adsorbents, Chelate, Purification, Peptid

Rivero, M.J., Ibáñez, R. and Ortiz, M.I. (2002), Mathematical modelling of styrene drying by adsorption onto activated alumina. *Chemical Engineering Science*, **57** (13), 2589-2592.

Full Text: [C\Che Eng Sci57, 2589.pdf](C/Che%20Eng%20Sci57,%202589.pdf)

Abstract: This work is focused on the analysis and modelling of styrene drying, raw material in the manufacture of synthetic rubber, by means of adsorption onto activated alumina. Equilibrium experiments, carried out tinder isothermal conditions at 10degreesC, cot-related to the equation q (kg, kg) =2.659×10-4 C (mg, kg). Fixed bed column experiments were performed working with different flow rates and using different bed lengths in order to obtain experimental breakthrough curves. A mathematical model that considers the influence of both film and pore mass transfer resistances described satisfactorily well the experimental results. Finally a value of D-p = 6.101×10-9 m2, s was obtained from correlation of experimental data to simulated curves and using the minimum weighted standard deviation as optimisation criterion. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Alumina, Breakthrough, Breakthrough Curves, Column, Drying, Fixed-Bed, Mass Transfer, Model, Modelling, Packed Bed, Styrene, Water

Hui, C.W., Chen, B. and McKay, G. (2002), Contact time optimization of two-stage batch adsorber systems using the modified film-pore diffusion model. *Chemical Engineering Science*, **57** (14), 2863-2873.

Full Text: [C\Che Eng Sci57, 2863.pdf](C/Che%20Eng%20Sci57,%202863.pdf)

Abstract: In this paper, a contact time optimization methodology of a two-stage batch adsorber system taking minimum contact time as the objective function has been developed. The initial concentration of the second stage unit and adsorbent weight have been designated as variables and these have been studied under two conditions of the equilibrium solid-phase concentration, qe, namely, when qe is a variable and when qe is a constant. Contact time optimization of a two-stage batch adsorber system has been demonstrated at three different conditions/cases for the adsorption of phenol on activated carbon and the adsorption of Astrazone Blue dye (Basic Blue 69) onto silica. A new concept of “pinch point” for the optimum design of batch adsorber system has been proposed. The optimization solutions show that there is a significant difference for minimum contact time at different process conditions.

The diffusion mass transport model used to predict the concentration-time decay curve is a film-pore diffusion model. An analytical solution has been used for simplicity which assumes a constant capacity pseudo-irreversible isotherm. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Optimization, Diffusion, Isotherm, Ion-Exchange Kinetics, Shrinking-Core Model, Bovine Serum-Albumin, Surface-Diffusion, Activated Carbon, Mass-Transfer, Multicomponent Adsorption, Concentration-Dependence, Transport, Particles

Ebrahimi, S., Kleerebezem, R., van Loosdrecht, M.C.M. and Heijnen, J.J. (2003), Kinetics of the reactive absorption of hydrogen sulfide into aqueous ferric sulfate solutions. *Chemical Engineering Science*, **58** (2), 417-427.

Full Text: [C\Che Eng Sci58, 417.pdf](C/Che%20Eng%20Sci58,%20417.pdf)

Abstract: The reactive absorption of *H2S* into aqueous *Fe2(SO4)3* solutions, was studied in a stirred cell reactor operated batchwise with and without a flat interface. The temperature was varied from *25°C* to *65°C* and the concentrations of aqueous *Fe2(SO4)3* solutions ranged from 0.025 to *0.8kmol/m3*. The corresponding initial pH values ranged from 2 to 0.8, respectively. Additional measurements were conducted at other pH values by addition of NaOH. The *H2S* partial pressure was varied between 0 and *200mbar*. The rate of *H2S* absorption was measured by recording the pressure drop as a function of time during batch absorption experiments. In this system the absorbed *H2S* reacts with ferric iron and is oxidized to elemental sulfur. The kinetic results are in agreement with enhanced absorption due to a fast chemical reaction according to the film theory. The reaction of ferric sulfate and *H2S* appears to proceed irreversibly and is first order in both the total concentrations of ferric iron and *H2S*. The activation energy for the reaction was calculated to be *22kJ/mol*.

Keywords: Absorption, H2S, Kinetics, Fe2(SO4)3, Multiphase Reactions, Mass Transfer

Liu, S. (2003), Chemical kinetics of alkaline peroxide brightening of mechanical pulps. *Chemical Engineering Science*, **58** (11), 2229-2244.

Full Text: [C\Che Eng Sci58, 2229.pdf](C/Che%20Eng%20Sci58,%202229.pdf)

Abstract: A new mechanism is proposed for the heterogeneous alkaline peroxide brightening reactions of mechanical pulps. The mechanism consists of four key kinetic steps: adsorption of hydrogen peroxide and hydroxide to the pulp fiber walls; chromophore-removing chemical reaction on the fiber wall; desorption of “light” organic products formed from the fiber wall; and oxidation chain reduction of the cleaved organic substances. The most important step here is the surface reaction, rather than reactions occurring in the liquid phase. In general, the removal of the cleaved organic substances from the fiber wall is not anticipated to occur completely during the brightening reaction operation stage. The failure of the “light” organic products to completely dissociate from the fiber wall is more pronounced at high consistencies and when agitation is weak. The pulp brightness is measured after washing the pulp and thus removing the “light” organic products. The overall brightness enhancement or chromophore-removal rate is thus limited by the reaction occurring on the fiber wall. A kinetic model has thus been developed based on the proposed mechanism. An apparent second-order reaction in terms of the chromophore concentration, first orders in terms of the adsorbed hydrogen peroxide and adsorbed hydroxyl concentrations are observed from the kinetic model. The derived kinetic model can explain the existing experimental data from various sources quite well.

Keywords: Surface Reaction, Adsorption, Brightening, Chromophore, Interface, Kinetics, Mechanical Pulp, Multiphase

Pagnanelli, F., Mainelli, S., Vegliò, F. and Toro, L. (2003), Heavy metal removal by olive pomace: Biosorbent characterisation and equilibrium modelling. *Chemical Engineering Science*, **58** (20), 4709-4717.

Full Text: [C\Che Eng Sci58, 4709.pdf](C/Che%20Eng%20Sci58,%204709.pdf)

Abstract: This paper concerns with metal biosorption onto an agricultural waste, olive pomace. Experimental tests of adsorbent characterisation (potentiometric titration, IR analyses, selective extractions) and titration modelling (accounting for adsorbent heterogeneity by the introduction of a two-peak proton affinity distribution function) evidence that carboxylic and phenolic groups are the main active sites involved in metal removal. Potentiometric titration and single metal system biosorption tests (Pb, Cu, Cd) onto native and treated olive pomace samples are represented by an equilibrium model describing the competition among heavy metals and hydrogen ions in solution.

Keywords: Olive Pomace, Heavy Metals, Adsorption, Mathematical Modelling, Environment

Choy, K.K.H., Porter, J.F. and McKay, G. (2004), Film-pore diffusion models: Analytical and numerical solutions. *Chemical Engineering Science*, **59** (3), 501-512.

Full Text: [C\Che Eng Sci59, 501.pdf](C/Che%20Eng%20Sci59,%20501.pdf)

Abstract: The sorption of acid dyes from aqueous effluents onto activated carbon has been studied. The effects of initial dye concentration and activated carbon mass on the rate of Acid Blue 80 and Acid Yellow 117 removal have been investigated. Three mass transport models based on film and pore diffusion control have been applied to model the experimental concentration decay curves. The models are compared on the basis of the solid-phase loading capacity using various assumptions since the assignment of an appropriate solid-phase loading has been the subject of several papers on this topic and no comparisons have been provided on the effectiveness of each approach. The equilibrium solid-phase concentration is assumed: (i) incorporating a time-dependent solid-phase concentration *Ye*, *t*, (II) equal to the intersection point of the equilibrium isotherm and the operating line and (iii) the point on the equilibrium isotherm where the liquid-phase concentration equals the initial concentration in the film–pore diffusion model.

Keywords: Film-Pore Diffusion, Batch Sorption, Analytical Method, Numerical Method, Acid Blue 80, Acid Yellow 117, Activated Carbon

Wood, B.D., Quintard, M. and Whitaker, S. (2004), Estimation of adsorption rate coefficients based on the Smoluchowski equation. *Chemical Engineering Science*, **59** (10), 1905-1921.

Full Text: [C\Che Eng Sci59, 1905.pdf](C/Che%20Eng%20Sci59,%201905.pdf)

Abstract: In this paper we show how the Smoluchowski equation can be used to determine the coefficients in the *interfacial flux constitutive equation* given by

Here *cAs* is the surface concentration (particles/cm2) at the γ–small kappa, Greek interface and *cA*γ is the volume concentration (particles/cm3) in the γ-phase. This form of the flux relation represents the simplest linear expression for the *one-sided* fluxes to and from a solid surface. Values of *k*1 and *k*-1=*k*1*Keq*-1 are determined on the basis of numerical solutions of both the Smoluchowski equation and the classical diffusion equation coupled to a jump condition. This approach allows for subsequent averaging or upscaling without the complications associated with the Smoluchowski equation. Results are presented for two forms of the particle–surface interaction potential. In addition to the direct numerical solution of the Smoluchowski equation, numerical results are also obtained for the case of local adsorption equilibrium.

Keywords: Colloids, Smoluchowski Equation, Diffusion, Adsorption, Desorption, Boundary Condition, Interfacial Flux Constitutive Equation

Mooney, D.A. and Don MacElroy, J.M. (2004), Differential water sorption studies on KevlarTM 49 and as-polymerised poly (*p*-phenylene terephthalamide): Adsorption and desorption isotherms. *Chemical Engineering Science*, **59** (11), 2159-2170.

Full Text: [C\Che Eng Sci59, 2159.pdf](C/Che%20Eng%20Sci59,%202159.pdf)

Abstract: We have conducted differential water vapour sorption experiments on KevlarTM 49 at 30°C over a series of water vapour pressures from 0 to 90% of saturation, and on the as-polymerised form of the material at 30°C, 45°C and 60°C over a series of water vapour pressures of 0–60%, 0–25% and 0–15%, respectively. The equilibrium isotherms obtained for both samples show a distinct hysteresis-type behaviour. For KevlarTM 49, the hysteresis loop can be divided into two regions, namely above 30%, which is indicative of the presence of microvoids, and below 30%, which suggests inclusion of water into the intimate structure of the surface layer of the polymer crystallites, in a process known as intercalation.

Keywords: Adsorption, Desorption, Polymers, KevlarTM, Hysteresis, Intercalation

Kyriakopoulos, G., Doulia, D. and Anagnostopoulos, E. (2004), Adsorption of pesticides on porous polymeric adsorbents. *Chemical Engineering Science*, **60** (4), 1177-1186.

Full Text: [C\Che Eng Sci60, 1177.pdf](C/Che%20Eng%20Sci60,%201177.pdf)

Abstract: The adsorption of herbicides alachlor, amitrole, trifluralin and prometryn on porous polymeric adsorbents has been studied. Two adsorbent resins were investigated, the highly hydrophobic Amberlite XAD-4 (polystyrene–divinylbenzene copolymer) and the functionalized more hydrophilic XAD-7 (nonionic aliphatic acrylic polymer). Equilibrium adsorption experiments using buffered aqueous solutions were conducted to estimate the types of isotherms and their parameters. The effect of chemical composition and structure of the herbicides, was investigated. The pH range studied was 3–6.5, the temperature range was 288–303 K and the ionic strength was maintained at 0.01 M. Adsorption isotherms seemed generally to approach the Langmuir or Freundlich isotherm model and can be characterized by temperature and pH dependent apparent adsorption equilibrium constants, characteristic of the adsorbent–adsorbate system. By studying the dependence of temperature of this adsorption constant, heats of adsorption have been estimated from van’t Hoff law. In the case of trifluralin and prometryn adsorption on both resins and amitrole adsorption on XAD-4 resin, the heats of adsorption were negative (8.1–33.6 kcal/mol). On the contrary, in alachlor adsorption on both resins and amitrole adsorption on XAD-7 resin, the estimated heats of adsorption were positive.

Keywords: Adsorption, Chromatography, Pollution, Porous Media, Pesticides, Heat of Adsorption

? Mohanty, K., Jha, M., Meikap, B.C. and Biswas, M.N. (2005), Removal of chromium(VI) from dilute aqueous solutions by activated carbon developed from Terminalia arjuna nuts activated with zinc chloride. *Chemical Engineering Science*, **60** (11), 3049-3059.

Full Text: [2005\Che Eng Sci60, 3049.pdf](2005/Che%20Eng%20Sci60,%203049.pdf)

Abstract: Different structured activated carbons were prepared from Terminalia arjuna nuts, an agricultural waste, by chemical activation with zinc chloride for the adsorption of Cr(VI) from dilute aqueous solutions. The most important parameter in chemical activation was found to be the chemical ratio (activating agent/precursor, g/g). Carbonization temperature and time are the other two important variables, which had significant effect on the pore structure of carbon. A high surface area of 1260 m(2)/g was obtained at a chemical ratio of 300%, carbonization time and temperature of 1 h and 500 degrees C, respectively. The activated carbon developed shows substantial capability to adsorb Cr(VI) from dilute aqueous solutions. The parameters studied include pH, adsorbent dosage, contact time, and initial concentrations. The kinetic data were best fitted to the Lagergren pseudo-first-order model. The isotherm equilibrium data were well fitted by the Langmuir and Freundlich models. The maximum removal of chromium was obtained at pH 1.0 (about 99% for adsorbent dose of 2 g/l and 10 mg/l initial concentration). (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorption, Agricultural Waste, Aqueous Solutions, Bagasse, Carbon, Carbonization, Carbons, Chemical Activation, Chloride, Chromium, Chromium(VI), Cr(VI), Cr(VI) Removal, Equilibrium, Fly-Ash, Freundlich, Ions, Isotherm, Kinetic, Langmuir, Langmuir And Freundlich Models, Model, Multistage Bubble-Column, Nuts, pH, Pollution, Pseudo-First-Order, Ratio, Removal, Surface Area, Surface Areas, Temperature, Terminalia Arjuna Nuts, Waste, Waste Water Treatment, Water Pollution, Zinc

? Schlegl, R., Tscheliessnig, A., Necina, R., Wandl, R. and Jungbauer, A. (2005), Refolding of proteins in a CSTR. *Chemical Engineering Science*, **60** (21), 5770-5780.

Full Text: [2005\Che Eng Sci60, 5770.pdf](2005/Che%20Eng%20Sci60,%205770.pdf)

Abstract: A model to predict refolding of proteins in a continuous stirred tank reactor (CSTR) was developed and compared to a batch refolding process with simple dilution of the protein in a stirred tank reactor. For experimental verification of the model a continuous refolding of a model protein (alpha-lactalbumin) was performed in a CSTR. The refolding process of denatured and fully reduced alpha-lactalbumin could be accurately predicted by a set of differential equations assuming a first order reaction rate for folding and a second order reaction rate for aggregation. The system composed of a CSTR with an additional diafiltration circuit for removal of denaturing agents from the feed solution and to maintain constant refolding conditions. Based on the folding kinetic the dynamic behavior of such a continuous refolding reactor was simulated under different operating conditions. It was shown that the refolding efficiency was higher compared to batch dilution under certain conditions, namely high residence times. The yield of refolded protein could further increased by recycling the outlet stream containing unfolded protein to the reactor entrance. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Continuous Refolding, CSTR, Diafiltration, Renaturation, Alpha-Lactalbumin, Aggregation, Renaturation, Lysozyme, Competition, Kinetics

? Malkoc, E. and Nuhoglu, Y. (2006), Fixed bed studies for the sorption of chromium(VI) onto tea factory waste. *Chemical Engineering Science*, **61** (13), 4363-4372.

Full Text: [2006\Che Eng Sci61, 4363.pdf](2006/Che%20Eng%20Sci61,%204363.pdf)

Abstract: The adsorption of Cr(VI) ions from aqueous solutions onto waste of tea factory in fixed beds was investigated. Experiments were carried out as a function of liquid flow rate, initial feed of Cr(VI) concentration, particle size, feed solution pH and bed depth. The bed capacities were found to increase with decreasing flow rate and particle size. The maximum bed capacities for the tested flow rates were found to be 55.65, 40.41 and 33.71 mg g-1 at 5, 10 and 20 ml min-1, respectively. When the initial Cr(VI) concentration is increased from 50 to 200 mg l-1, the corresponding adsorption bed capacity appears to increase from 27.67 to 43.67 mg g-1. The longest breakthrough time and maximum of Cr(VI) adsorption is obtained at the lowest examined pH value. Decrease in the particle size from 1.00-3.00 to 0.15-0.25 mm resulted in significant increase in the treated volume, breakthrough time and bed capacity. Breakthrough volume varies with bed depth and the treated volume considerably increases from about 4200 to 11800 ml as the bed depth increases from 5 to 30 cm. Thomas model for tea factory waste on Cr(VI) adsorption was used to predict the breakthrough curves under varying experimental conditions. This study indicated that the tea factory waste can be used as an effective and environmentally friendly adsorbent for the treatment of Cr(VI) ions in aqueous solutions. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Fixed Bed, Adsorption, Waste Tea, Thomas Model, Breakthrough Curve, Aqueous-Solutions, Hexavalent Chromium, Activated-Sludge, Heavy-Metals, Removal, Biosorption, Adsorption, Biomass, Column, Sawdust

? Martins, P.M. and Rocha, F. (2006), A new theoretical approach to model crystal growth from solution. *Chemical Engineering Science*, **61** (17), 5696-5703.

Full Text: [2006\Che Eng Sci61, 5696.pdf](2006/Che%20Eng%20Sci61,%205696.pdf)

Abstract: A description of crystal growth in supersaturated solutions is suggested, based on conventional theories of mass diffusion and integration of solute molecules into the crystal lattice. In this approach, the integration step is preceded by two other steps (solute diffusion and adsorption) occurring concurrently over the adsorption layer. The new arrangement of the processes involved and the estimation of crystallization kinetics as a function of what is adsorbed are thought as being the main differences relative to established models. The physical concepts are presented in the first part of the paper, following a methodology comparable to well-known derivations of adsorption isotherms. Supported on that theoretical background, shell mass conservation balances are formulated, with resulting second-order differential equations for the concentration profile around the crystals. The model-characteristic equations are then derived for different crystal geometries, diffusional resistances and kinetic orders. Finally, a simplified growth rate equation is deduced, providing a generic way of relating the crystallization variables.

Keywords: Adsorption, Diffusion, Kinetics, Crystallization, Mass Transfer

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Full Text: [2007\Che Eng Sci62, 2032.pdf](2007/Che%20Eng%20Sci62,%202032.pdf)

Abstract: The reverse flow adsorption (RFA) was proposed as a novel concept for the recovery of homogeneous catalysts. For the modelling of the RFA process it is important to have a good description of the adsorption of various complex species present in the solution. Therefore the goal of this paper is to develop an adequate model which can describe the adsorption of a homogeneous catalyst. In this research bis(triphenylphosphine) cobalt(II)dichloride (CoCl2(PPh3)2) was selected as a model catalyst. Since in a solution CoCl2(PPh3)2 is always in equilibrium with its free metal centre CoCl2(M), free ligand PPh3 (L) and other complex forms, CoCl2(PPh3) and CoCl2(PPh3)2 (ML and ML2), three models were evaluated (M, M-ML and M-ML-ML2) that combine the equilibrium of the complex forms present in the solvent with its competitive adsorption on the functionalized silica. Comparison of the model results with the experimental adsorption data shows that the model which takes all three forms M, ML and ML2, into account describes the results most consistently. The 2-(2-pyridyl)ethyl-functionalized silica and 3-(1-morpholino)propyl-functionalized silica were selected as promising adsorbents. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Reverse Flow Adsorption, Homogeneous Catalyst, Competitive Adsorption, Stability Constants, Reverse Flow Adsorption, Complexes, Recovery, Mixtures, Ligands

? Leinekugel-le-Cocq, D., Tayakout-Fayolle, M., Le Gorrec, Y. and Jallut, C. (2007), A double linear driving force approximation for non-isothermal mass transfer modeling through bi-disperse adsorbents. *Chemical Engineering Science*, **62** (15), 4040-4053.

Full Text: [2007\Che Eng Sci62, 4040.pdf](2007/Che%20Eng%20Sci62,%204040.pdf)

Abstract: The aim of this paper is to derive a double LDF non-isothermal model to describe mass transfer through a fixed bed of bi-disperse adsorbent pellets. Firstly, we perform an analysis concerning the different way the composition within the pellets can be described and the consequence on the model structure and compactness. Secondly, we present a bed model including a simplified intra-particle model that is based on a double LDF approximation. This bi-disperse pellet model reduces the number of variables and parameters that are needed. This simplified model is used to simulate breakthroughs of a methane/carbon dioxide mixture over a 5 A zeolite and of a 2,2-dimethylbutane/2-methylpentane mixture over a silicalite molecular sieve. It is also compared with a more detailed model based on Stefan-Maxwell theory that we have previously developed. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Mass Transfer, Heat Transfer, Linear Driving Force, Modeling, Simulation, Pressure Swing Adsorption, Pore-Diffusion-Model, Inverse Chromatography, Sorbent Particles, Simulation, Mixtures, Representation, Diffusivities, Formulation, Separation

? Lü, Z., Zhang, F.Z., Lei, X.D., Yang, L., Evans, D.G. and Duan, X. (2007), Microstructure-controlled synthesis of oriented layered double hydroxide thin films: Effect of varying the preparation conditions and a kinetic and mechanistic study of film formation. *Chemical Engineering Science*, **62** (21), 6069-6075.

Full Text: [2007\Che Eng Sci62, 6069.pdf](2007/Che%20Eng%20Sci62,%206069.pdf)

Abstract: The microstructure-controlled synthesis of oriented layered double hydroxide (LDH) thin films on polystyrene substrates has been investigated in detail and the effect of varying the preparation conditions, such as the extent of sulfonation of the substrate, the total concentration of metal ions in the precursor solution, the temperature, and the reaction time are described. The kinetic features of the formation of the LDH films have also been derived; it was found that the best fit corresponds to a second-order exponential nucleation law. As a result, a possible mechanism for the formation of LDH films on the polystyrene substrate has been proposed, involving transportation of metal cations to the surface of the substrate, adsorption, and enrichment of the cations on the substrate, followed by nucleation and oriented growth of LDH films at the phase boundary. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Cations, Concentration, Delamination, Deposition, Enrichment, Features, Film, Film Formation, Films, Formation, Growth, Hydrotalcite, Hydroxide, Immobilization, Interfaces, Ions, Kinetic, Kinetics, Law, Layered Double Hydroxide, Layered Double Hydroxides, Ldh, Mechanism, Metal, Metal Cations, Metal Ions, Nucleation, Orientation, Polystyrene, Polystyrene, Precursor, Precursors, Preparation, Reaction, Reaction Time, Second Order, Solvothermal Ion-Exchange, Substrate, Substrates, Sulfonation, Surface, Synthesis, Temperature, Thermogravimetric Data, Thin Films, Time, Total Concentration, Transparent, Transportation

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Full Text: [2007\Che Eng Sci62, 6939.pdf](2007/Che%20Eng%20Sci62,%206939.pdf)

Abstract: A model comprising external and intraparticle mass transfer resistances has been developed to describe ion exchange in microporous materials. The Maxwell-Stefan approach has been adopted due to their well documented advantages over Nernst-Planck relationships, particularly the facts of taking into account non-idealities, ion-ion and ion-solid interactions, and being easily applied to multicomponent systems. The model was tested with data available on literature, namely batch experiments on mercury (11) removal from aqueous solution using ETS-4 microporous titanosilicate (pore diameters between 3-4 angstrom). Calculated results point out it provides excellent fittings (AAD = 4.93%; 44 data points) and exhibits fine predictive capability. Actually, the model is able to simulate ion exchange process with average deviations well inside the experimental accuracy (5-8%), using model parameters correlated from data measured under different operating conditions. This feature was analysed with three independent sets of data, and the average absolute deviations found increased only to 4.94%, 5.32%, and 7.72%. Such behaviour may be attributed to the sound physical principles of Maxwell-Stefan theory. The Nernst-Planck and the pseudo second-order kinetic models have been adopted for comparison. The Nernst-Planck based model provides higher deviation (AAD = 5.57%) but offers good representations also; the last one is totally unable to describe solution concentration along time (AAD = 60.93%), though it is one of the most applied equation in the field. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Accuracy, Aqueous Solution, Aqueous-Solution, Batch, Batch Experiments, Batch Process, Comparison, Concentration, DEC, Diffusion-Coefficients, Earth Metal-Ions, Electrolysis Process, Ets-4, Experimental, Experiments, Heterovalent Ions, Interactions, Intraparticle, Intraparticle Mass Transfer, Ion, Ion Exchange, Ion-Exchange, Kinetic, Kinetic Models, Kinetic-Models, Length Column Method, Literature, Mass, Mass Transfer, Mass-Transfer, Materials, Maxwell-Stefan, Maxwell-Stefan Theory, Mercury, Microporous, Microporous Materials, Model, Modelling, Models, Multicomponent, Numerical-Solution, Operating Conditions, Parameters, Physical, Pore, Process, Process Modelling, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo Second-Order, Pseudo-Second-Order, Removal, Second Order, Theory, Time, Transfer

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Full Text: [2008\Che Eng Sci63, 609.pdf](2008/Che%20Eng%20Sci63,%20609.pdf)

Abstract: The macroscopic adsorption behavior of dissolved oxygen on a coconut shell-derived granular activated carbon has been studied in batch mode at 301 and 313K for initial dissolved oxygen concentrations of 10-30 mg/l and oxygen/carbon ratios of 2-180 mg/g. BET (Brunauer, Emmett, and Teller) surface area, micropore volume, and pore size distribution were determined from NZ isotherm data for fresh and used samples of carbon. The surface groups were characterized using Boehm titrations, potentiometric titrations, and FTIR study. The material is characterized by its high specific surface area (1307 m2/g), microporocity (micropore volume 0.54 cm3/g), its basic character (0.57 meq/g total basic groups) and its high iron content (15,480 ppm Fe). BET n-layer isotherm describes adsorption equilibrium suggesting cooperative adsorption and important adsorbate-adsorbate interactions. Kinetic data suggest a process dependent on surface coverage. At low coverage a Fickian, intraparticle diffusion rate model assuming a local equilibrium isotherm (oxygen dissociation reaction) adequately describes the process. The calculated diffusion coefficients (D) vary between (4.7-8.2) ×10-9 m2/min and (3.5-5.3)×10-9 m2/min for initial oxygen concentration of 10 and 20 mg/l, respectively. Sensitivity analysis shows that the oxygen dissociation equilibrium constant determines the equilibrium concentration, whereas the diffusion coefficient controls the kinetic rate of the adsorption process having no effect at the final equilibrium concentration. A combined kinetic mass transfer model with concentration-dependent diffusion (parabolic form) has been developed and successfully applied on the dissolved oxygen adsorption system at high surface coverage. For equilibrium uptake of 0.08 mg/m(2) the estimated mean mass transfer coefficient and adsorption rate constant are 3.38×10-5 m/min and 1.0×10-2 1/(m2 min), respectively. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Behavior, Adsorption Equilibrium, Adsorption Isotherm, Air Separation, Analysis, Carbon, Diffusion, Dissolved Oxygen, Equilibrium, Equilibrium Isotherm, FTIR, Gases, Granular Activated Carbon, Iron, Isotherm, Kinetic, Kinetics, Mass Transfer, Model, Molecular-Sieves, Porous Media, Probes, Selectivity, Size, Transfer Coefficient

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Full Text: [2008\Che Eng Sci63, 1586.pdf](2008/Che%20Eng%20Sci63,%201586.pdf)

Abstract: Equilibrium of gas phase adsorption on Vycor glass has been investigated. Adsorption isotherms for propane, carbon dioxide and butane as pure gases, binary mixtures and ternary mixtures were determined experimentally as a function of temperature using a volumetric method. The single-component isotherms were described with the Langmuir and Freundlich equations. Additionally, a second order isotherm based on statistical thermodynamics and an isotherm equation based on vacancy solution theory taking into account real phase behavior were used for fitting single-component equilibrium data. In order to describe the measured partial isotherms for binary mixtures, at first simple extensions of the single-component isotherm models were used, i.e., the conventional competitive Langmuir model and a multi-Freundlich equation based on the ideal adsorbed solution theory (IAS). Since these two simple isotherm models failed to represent the unusual competitive behavior observed, three model extensions using additional mixture parameters were applied, i.e., two modified multi-Langmuir equations based on: (a) statistical thermodynamics and (b) vacancy solution theory and a modified multi-Freundlich IAS model correcting spreading pressure uncertainties. These three model equations were found to be capable to describe the observed behavior better. Finally, the measured partial adsorption equilibrium data of the ternary system were correlated based on the extended equations using the determined additional binary parameters. The results obtained reveal the difficulty to predict accurately multi-component adsorption equilibria. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Adsorption Equilibrium, Behavior, Carbon, Carbon Dioxide, Competitive Adsorption, Equilibria, Equilibrium, First, Function, Isotherm, Isotherms, Langmuir, Model, Models, Pressure, Rights, Solution, Temperature, Theory, Thermodynamics

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Full Text: [2008\Che Eng Sci63, 1850.pdf](2008/Che%20Eng%20Sci63,%201850.pdf)

Abstract: A new method has been developed to estimate physico-chemical parameters from transient kinetic data: second-order statistical regression (SOSR). It allows to account for heteroskedasticity and nonwhiteness of the noise in the time series measured. SOSR makes use of replicates to estimate the second-order statistics, i.e. the autocovariance pattern of the noise. A sample principal noise component analysis of the experimental time series allows nonlinear least-squares (NLSQ) regression of the latter. The method has been validated by regression of artificially generated experimental data and the results have been compared with those obtained with direct NLSQ regression. The SOSR has also been applied to the irreversible adsorption of oxygen on a reduced vanadia/silica catalyst and the interaction of propane with a copper/ceria catalyst, as studied with a temporal analysis of products (TAP) setup. In general, compared with those obtained with direct NLSQ regression, the parameter estimates and their confidence intervals are more accurate. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Analysis, Catalyst, Confidence, Confidence Intervals, Design, Estimates, Experimental, Heterogeneous Catalysis, Interaction, Intervals, Kinetic, Kinetics, Models, Parameter Identification, Parameter-Estimation, Products TAP, Reaction Engineering, Replicate Experiments, Rights, Statistics, Tap-Reactors Theory, Temporal Analysis, Temporal Analysis of Products, Transient, Transient Response

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Full Text: [2010\Che Eng Sci65, 6471.pdf](2010/Che%20Eng%20Sci65,%206471.pdf)

Abstract: The strong adsorbability of Ag(I) ions onto poly(3-mercaptopropylsilsesquioxane) (PMPSQ) microspheres synthesized through a two-step acid-base catalyzed sol-gel process method was systematically examined. The effect of adsorption time, initial Ag(I) concentration, and solution pH was studied to optimize the Ag(I) adsorbability of PMPSQ microspheres. The PMPSQ microspheres demonstrate a powerful Ag(I) adsorbability with an adsorptivity above 99.99% when the initial Ag(I) concentration is lower than 10 mM and the highest Ag(I) adsorbance of 1140 mg/g at an initial Ag(I) concentration of 150 mM. Adsorption phenomena appeared to follow Langmuir isotherm. The kinetic studies indicated that the adsorption process well fits the pseudo-second-order kinetics with a very rapid initial adsorption rate of 15.28 mg g(-1) min(-1). The appropriate solution pH for Ag(I) adsorption is around 2.0-5.4. The PMPSQ microspheres demonstrate a promising application in the removal of Ag(I) ions from aqueous solutions. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Polysilsesquioxane, Condensation, Particle, Adsorption, Silver, Kinetics, Heavy-Metal Ions, Aqueous-Solutions, Organosilica Nanoparticles, Silica Particles, Facile Synthesis, Chelating Resin, Microparticles, Removal, Separation, Recovery

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Özdural, A.R. (1994), Determination of overall mass transfer cofficients in fixed bed sorption columns. *Chemical Engineering & Technology*, **17**, 285-289.

Full Text: [1994\Che Eng Tec17, 285.pdf](1994/Che%20Eng%20Tec17,%20285.pdf)

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Full Text: [1996\Che Eng Tec19, 137.pdf](1996/Che%20Eng%20Tec19,%20137.pdf)

Abstract: The equilibria and kinetics of adsorption of lysozyme and bovine serum albumin on the Fractogel-EMD tentacle-type cation exchanger and the Fractogel-TSK conventional cation exchanger have been studied experimentally by batch stirred-tank methods. Adsorption equilibrium data corresponded well to the Langmuir isotherm. For both proteins, the tentacle-type exchanger exhibited a higher binding capacity than the conventional exchanger. This is attributed to the flexibility of the functional groups in the tentacle-type exchanger which enhances optimal electrostatic interactions. The dynamic data were analyzed by a simplified rate model which lumped mass transfer resistances and intrinsic adsorption kinetics into a single rate constant. For both proteins, it was found that the tentacle-type exchanger showed a smaller lumped rate coefficient than the conventional exchanger. The difference in the values of the lumped rate coefficients was shown to be due to the influence of nonlinear equilibrium constants rather than due to any difference in rate of adsorption.

Keywords: Affinity-Chromatography, Liquid-Chromatography, Performance

Dasmahapatra, G.P., Pal, T.K. and Bhattacharya, B. (1998), Continuous separation of hexavalent chromium in a packed bed of flyash pellets. *Chemical Engineering & Technology*, **21** (1), 89-95.

Full Text: [C\Che Eng Tec21, 89.pdf](C/Che%20Eng%20Tec21,%2089.pdf)

Abstract: The metal pollutant hexavalent chromium has been separated from flyash. Various types of flyash pellets were prepared by mixing flyash with different binders, such as cement, bitumen, kaolin, etc. Pellets containing 20% (w/w) kaolin were found to have satisfactory separation efficiency. Break through curves for a hexavalent chromium separation process at different bed heights, flow rates, and temperatures were evaluated. It was also observed that Cr(VI) removal in the packed bed increases with an increase in temperature and bed height but decreases with an increase in flow rate. Presence of other competing cations had no significant interference on separation. Desorption of adsorbed Cr(VI) from a packed bed of flyash pellets using H2SO4 and NaOH as eluants was also studied; it was found that sulfuric acid has better desorption efficiency. Leaching of Cr(VI) from flyash pellets to an aqueous phase at different temperatures was studied and it was observed that release of chromium(VI) is not a spontaneous process. The extent of leaching was markedly reduced when cement was present in the flyash as binder and temperature has little effect on the leaching. A model for break through curves has been established to co-relate the relative hexavalent chromium separation efficiency of flyash with other variables.

Keywords: Aqueous-Solutions, Ash, Removal

Sakuth, M., Schweer, A., Sander, S., Meyer, J. and Gmehling, J. (1998), Databank and software package for adsorption equilibria of gases and vapors. *Chemical Engineering & Technology*, **21** (11), 866-869.

Full Text: [C\Che Eng Tec21, 866.pdf](C/Che%20Eng%20Tec21,%20866.pdf)

Keywords: Multicomponent Adsorption, Mixtures

Eligwe, C.A., Okolue, N.B., Nwambu, C.O. and Nwoko, C.I.A. (1999), Adsorption thermodynamics and kinetics of mercury(II), cadmium(II) and lead(II) on lignite. *Chemical Engineering & Technology*, **22** (1), 45-49.

Full Text: [C\Che Eng Tec22, 45.pdf](C/Che%20Eng%20Tec22,%2045.pdf)

Abstract: This study examines the adsorption thermodynamics and kinetics of heavy metal ions [(Hg(II), Cd(II), Pb(II)) on a demineralized lignite coal. The study also investigates the effects of process parameters like contact time, pH, concentration of metal ion, temperature and adsorbent mass on the extent of metal-ion adsorption from solution.The results of the kinetic studies show that the adsorption reaction is first order with respect to the metal cation solution concentration, with activation energies of 4.9, 8.2 and 9.1 kJ mol-1 for Hg(II), Cd(II) and Pb(II), respectively. These low activation energy values indicate that the adsorption reaction is diffusion-controlled. The results of the thermodynamic investigations indicate that the adsorption reactions are spontaneous (ΔGº), slightly exothermic (ΔHº) and irreversible (ΔSº). The results of the study further show that the adsorption process is pH, adsorbent mass and metal-ion concentration dependent. Adsorption increases with increase in these variables. Temperature has only a marginal effect on adsorption. The reasons for these observations have been suggested.

Grünewald, M. and Schmidt-Traub, H. (1999), Adsorption in multistage fluidized bed column. *Chemical Engineering & Technology*, **22** (3), 206-209.

Full Text: [C\Che Eng Tec22, 206.pdf](C/Che%20Eng%20Tec22,%20206.pdf)

Abstract: Adsorption process are usually operated in fixed beds. However due to its discontinuous characteristic, fixed bed adsorption leads to an insufficient utilization of the adsorbent. Moreover, a prevent clogging may cause a high product previous separation of suspended solids to pre The usage of fluidized beds provides direct product recovery without any clogging from streams containing solids like unclarified fermentation broth or waste water.

Janocha, B., Bauser, H., Oehr, C., Brunner, H. and Göpel, W. (1999), Electrosorption on activated carbon textile. *Chemical Engineering & Technology*, **22** (9), 750-752.

Full Text: [C\Che Eng Tec22, 750.pdf](C/Che%20Eng%20Tec22,%20750.pdf)

Abstract: This article shows the results of a study that aims to remove the sediment fraction containing heavy metals from river sediment by flotation. Different parameters such as pH, flotation time, different collectors, distilled water, tap water, and different salts were investigated to achieve a high separation efficiency. Explanations are suggested for the obtained results. Results of flotation revealed that 63 % by weight of the input dredged sediment can be safely and successfully separated, thus, meeting the standard environmental requirement of current Flemish (Belgium) regulation “bodemsaneringsdecreet” (February 1995). This dredged fraction could not be achieved before a flotation time of 15 min. Increasing flotation time would impart less metal content but with a lower yield. In the case of applying the settling technique, 55 % by weight of the dredged sample meeting the same standard specification was obtained. Results are explained in the light of a model, which assumes that sediment contains organic matter together with heavy metals, clay, and sand. Upon aeration, air bubbles are adsorbed on hydrophobic particles, which carry them up to the froth layer with the hydrophilic particles left behind in the pulp. The use of an organic collector has a minor effect on flotation process. Results of the settling technique are discussed.

Rappold, U. and Luft, G. (1999), New dry process for separating HCl from flue gases by adsorption on MgO. *Chemical Engineering & Technology*, **22** (10), 843-846.

Full Text: [C\Che Eng Tec22, 843.pdf](C/Che%20Eng%20Tec22,%20843.pdf)

Abstract: Fossil fuels are still the most important source for supplying the world’s energy and heating needs. The growing demands of more stringent pollution control regulations make it necessary to develop new flue gas cleaning processes. Up to now there is no known process that allows the dry separation of hydrogen chloride from flue gases with ready adsorbent regeneration. The well known BF-Uhde process cannot be applied to flue gases containing hydrogen chloride. Our aim was to develop a process for dry separation of hydrogen chloride from flue gases that can be used in combination with the BF-Uhde process. The new process is based on a gas-solid reaction between active magnesia and hydrogen chloride at temperatures of about 120 ºC. The new process performed well in experiments conducted under industrial conditions. The adsorbent can be regenerated at temperatures of about 450 ºC. Hydrogen fluoride is the only known flue gas component that interferes with the regeneration capability of the adsorbent.

Venus, J., Beitz, H. and Spyra, W. (2000), Microbial regeneration of the adsorbents for the cleaning of triazine-contaminated ground water. *Chemical Engineering & Technology*, **23** (1), 26-29.

Full Text: [C\Che Eng Tec23, 26.pdf](C/Che%20Eng%20Tec23,%2026.pdf)

Keywords: Granular Activated Carbon, Atrazine, Pollutants

Jin, W. and Zhu, S. (2000), Study of adsorption equilibrium and dynamics of benzene, toluene, and xylene on zeolite NaY. *Chemical Engineering & Technology*, **23** (2), 151-156.

Full Text: [C\Che Eng Tec23, 151.pdf](C/Che%20Eng%20Tec23,%20151.pdf)

Abstract: The equilibrium and dynamics of low concentrations of benzene, toluene, and xylene in heptane adsorbed by zeolite NaY at 30, 40, and 50 ºC were studied. The Langmuir equation was suggested to simulate the isotherms. Based on isotherms and material balances, multi-component competitive adsorption isotherms can be successfully predicted by mono-component adsorption isotherm parameters. A series of column adsorption experiments were conducted to study the adsorption dynamics. The mass transfer equations were solved by numerical analysis and used to describe the breakthrough curves, and the mass transfer coefficients in the adsorption column were obtained as well.

Bart, H.J. and Schöneberger, A. (2000), Reactive processes for recovery of heavy metals in miniplants. *Chemical Engineering & Technology*, **23** (8), 653-660.

Full Text: [C\Che Eng Tec23, 653.pdf](C/Che%20Eng%20Tec23,%20653.pdf)

Abstract: Miniplants offer enormous time and cost savings when developing an industrial process. Initial product samples and the performance of the whole process with all recycle streams is the result saving pilot scale experiments. The potential use of reactive processes in a miniplant environment is discussed on different extraction techniques (liquid-liquid extraction, membrane extraction and solvent impregnated resins).

Keywords: Extraction, Heavy Metals, Miniplants, Process Engineering, Simulation

Schmidt, H., Koch, D. and Grathwohl, G. (2000), Development of ceramic membranes and adsorbents from silicon-organic precursors. *Chemical Engineering & Technology*, **23** (11), 959-964.

Full Text: [C\Che Eng Tec23, 959.pdf](C/Che%20Eng%20Tec23,%20959.pdf)

Keywords: Oxycarbide Glasses, Temperature, Chemistry, Carbide

Yang, J. and Renken, A. (2000), Heavy metal adsorption to a chelating resin in a binary solid fluidized bed. *Chemical Engineering & Technology*, **23** (11), 1007-1012.

Full Text: [C\Che Eng Tec23, 1007.pdf](C/Che%20Eng%20Tec23,%201007.pdf)

Abstract: The addition of inert particles of lighter density and smaller diameter increases considerably the mass transfer coefficient in comparison to that of mono-component active particles at the same liquid velocity. This effect was applied to elimination of copper ions by adsorption on a chelating resin. An intensification of the film mass transfer coefficient in binary system leads to a 15 % increase of the usable adsorbent efficiency.

Keywords: Adsorption, Binary Systems, Chelating Resins, Heavy Metals, Mass Transfer

Guo, L., Chen, K. and Tian, H. (2001), Kinetics of 2,2,6,6-tetramethylpiperidine oxidation over Sn2+ on ion exchange resin. *Chemical Engineering & Technology*, **24** (2), 181-184.

Full Text: [C\Che Eng Tec24, 181.pdf](C/Che%20Eng%20Tec24,%20181.pdf)

Abstract: The oxidation of 2,2,6,6-tetramethylpiperidine (TEMP) over Sn2+ on ion exchange resin is carried out in a batch reactor. The influence of the reactant concentrations, reaction temperature and catalyst amount is investigated. Within the temperature range studied, 303-323 K, the reaction follows the second order kinetic equation -rTEMP = kCTEMPCH2O2, with reaction rate constant k = 2.2×107exp (-51200/RT) L/mol h. We propose a reaction mechanism different from that for catalyzation by tungstate. The catalyst likely forms complexes with hydroxyl radicals, keeping their concentration steady. At the same time, the catalyst also decreases the decomposition of hydrogen peroxide caused by high temperatures and the reactant 2, 2,6,6-tetramethylpiperidine itself.

Keywords: Oxidation, Reaction Rate, Reactors, Batch

Boskovic, G., Vulic, T., Kis, E. and Putanov, P. (2001), Acid sites in HZSM-5 upon copper exchange by FTIR and DSC using ammonia. *Chemical Engineering & Technology*, **24** (3), 269-274.

Full Text: [C\Che Eng Tec24, 269.pdf](C/Che%20Eng%20Tec24,%20269.pdf)

Abstract: The acidity of the parent HZSM-5 zeolite and Cu-HZSM-5 catalyst has been examined by FTIR and DSC using ammonia desorption. Sites of different strength were found in HZSM-5, desorbing ammonia at a relative temperature difference of about 100 ºC. Upon copper exchange a fraction of Brønsted sites were transformed to Lewis sites, but the acid strength of the remaining Brønsted sites was increased. Aside from Lewis sites originating from copper exchange, there might be some additional sites formed from precipitated copper. This could explain the quantity of adsorbed NH3 on Cu-ZSM-5 which is higher than theoretically expected. While changing their nature, acid sites of higher strength keep their location, which is manifested by some diffusion effect towards ammonia.

Keywords: Acidity, Ammonia, Catalysts, Desorption, Zeolites

Falamaki, C., Sohrabi, M. and Talebi, G. (2001), The kinetics and equilibrium of ethanol adsorption from aqueous phase using calcined (Na-1, 6-hexanediol)-ZSM-5. *Chemical Engineering & Technology*, **24** (5), 501-506.

Full Text: [C\Che Eng Tec24, 501.pdf](C/Che%20Eng%20Tec24,%20501.pdf)

Abstract: Na-ZSM-5, synthesized using 1, 6-hexanediol as the structure directing agent, has been found to have a suitable selectivity and adsorbing capacity for ethanol adsorption from aqueous solutions. In contrast to quaternary ammonium based Na-ZSM-5 zeolites, this Na-ZSM-5 did not show any catalytic interaction with ethanol during thermal desorption. The dynamics of the adsorption process were investigated using the finite volume “uptake rate” route. The data predicted from the governing relations of the process were correlated with experimental results. The micro-diffusion coefficient was determined as a function of temperature. The macropore diffusional mass transfer contribution for biporous zeolite particles was found to be negligible.

Keywords: Zeolite

Balasubramanian, N. and Madhavan, K. (2001), Arsenic removal from industrial effluent through electrocoagulation. *Chemical Engineering & Technology*, **24** (5), 519-521.

Full Text: [C\Che Eng Tec24, 519.pdf](C/Che%20Eng%20Tec24,%20519.pdf)

Abstract: In the present investigation, it is attempted to remove arsenic from smelter industrial wastewater through electrocoagulation. Experiments covering a wide range of operating conditions for removal of the arsenic present in the smelter wastewater are carried out in a hatch electrochemical reactor. Mild Steel and Stainless Steel plates have been used as the anode and cathode respectively. It has been observed from the present work that arsenic can be removed effectively through electrocoagulation.

Keywords: Adsorption, Waste

Düren, T. and Keil, F.J. (2001), Molecular modeling of adsorption in carbon nanotubes. *Chemical Engineering & Technology*, **24** (7), 698-702.

Full Text: [C\Che Eng Tec24, 698.pdf](C/Che%20Eng%20Tec24,%20698.pdf)

Keywords: Adsorption, Modeling, Nanotubes

Mehler, C. and Peukert, W. (2001), Adsorption from aqueous solutions: Comparison of different theoretical strategies to predict the Henry’s law coefficients (Reprinted from Chem. Ing. Tech., vol 72, pg 822-826, 2000). *Chemical Engineering & Technology*, **24** (8), 789-794.

Full Text: [C\Che Eng Tec24, 789.pdf](C/Che%20Eng%20Tec24,%20789.pdf)

Keywords: Solvent

Dreisbach, F., Lösch, H.W. and Nakai, K. (2001), Adsorption measurement of water/ethanol mixtures on activated carbon fiber. *Chemical Engineering & Technology*, **24** (10), 1001-1005.

Full Text: [C\Che Eng Tec24, 1001.pdf](C/Che%20Eng%20Tec24,%201001.pdf)

Keywords: Adsorption, Carbon Fiber, Mixtures

Chaudhuri, A.R., Dey, G.K. and Pal, T.K. (2002), Synthesis and characterization of detergent-grade zeolite from indian clay. *Chemical Engineering & Technology*, **25** (1), 91-95.

Full Text: [C\Che Eng Tec25, 91.pdf](C/Che%20Eng%20Tec25,%2091.pdf)

Abstract: Detergent-grade zeolite 4A has been synthesized from the clays found in various parts of India. The process parameters for the synthesis of detergent-grade zeolite, like the activation temperature for the chemical transformation of clay, the composition of the reacting mixture and finally the crystallization temperature, have been studied. Better metakaolinite formation has been observed at a calcination temperature of around 550 ºC. The characterization of the synthesized zeolite by X-ray diffraction study confirms its formation. Moreover, the calcium binding capacity 170 mg of CaO/gm as well as particle size in the range of 3-7 microns of this zeolite are found to be satisfactory characteristics to substitute phosphate in detergents.

Keywords: Detergents, Synthesis, Zeolites

Alicilar, A., Komurcu, M., Ar, I. and Murathan, A. (2002), Removal of cyanides from water by air oxidation in a cocurrent downflow fixed bed reactor. *Chemical Engineering & Technology*, **25** (3), 283-286.

Full Text: [C\Che Eng Tec25, 283.pdf](C/Che%20Eng%20Tec25,%20283.pdf)

Abstract: A method for removal of cyanides from water is described. The method involves the air oxidation of cyanides in a fixed bed reactor with cocurrent downflow. Effects of parameters such as temperature, concentration, gas and liquid flow rates on the oxidation yield are studied. It was observed that the yield increases by increasing temperature and decreasing gas and liquid flow rates. Altering the concentration had no clear effect on the yield. A yield of 86 % was achieved at high temperature (60 ºC) while the maximum yield was 68 % at room temperature.

Keywords: Cyanides, Oxidation, Reactors, Fixed bed, Wastewater

? Kurama, H., Zimmer, A. and Reschetilowski, T. (2002), Chemical modification effect on the sorption capacities of natural clinoptilolite. *Chemical Engineering & Technology*, **25** (3), 301-305.

Full Text: [2002\Che Eng Sci25, 301.pdf](2002/Che%20Eng%20Sci25,%20301.pdf)

Abstract: This work determines the effect of chemical modification on the sorption capacity of natural Turkish zeolite, clinoptilolite, for its potential application as a sorbent. Pore size distribution and surface area are critical for assessing the suitability of the zeolite for sorbent application. Because natural clinoptilolite has small pore sizes and low surface area compared to synthetic zeolites, modification studies have been performed to improve the sorption capacity. The conversion of natural clinoptilolite to the hydrogen form has been carried out by two different ion exchange procedures, namely ammonium exchange followed by calcination and direct treatment with HCl. The natural and modified clinoptilolite samples were characterized by XRD, Al-27 MAS NMR and BET methods.

Keywords: Ammonium, Capacity, Chemical, Chemical Modification, Conversion, Distribution, Hcl, Hydrogen, Ion, Ion Exchange, Natural, Nmr, Size Distribution, Sorption, Sorption Capacity, Surface Area, Treatment, XRD, Zeolite

Reuβ, J., Bathen, D. and Schmidt-Traub, H. (2002), Desorption by microwaves: Mechanisms of multicomponent mixtures. *Chemical Engineering & Technology*, **25** (4), 381-384.

Full Text: [C\Che Eng Tec25, 381.pdf](C/Che%20Eng%20Tec25,%20381.pdf)

Abstract: Desorption by microwaves is an alternative to standard industrial processes for the regeneration of fixed-bed-adsorbers. There are several advantages to using microwaves as the heat supply, but the mechanisms of microwave desorption, especially if several components are present. still have not been analyzed. In this article experiments of multicomponent desorption of fixed-bed-adsorbers are presented. An overview is given about the different mechanisms appearing during the process.

Keywords: Adsorbents, Regeneration

Banat, F., Al-Asheh, S. and Al-Makhadmeh, L. (2004), Utilization of raw and activated date pits for the removal of phenol from aqueous solutions. *Chemical Engineering & Technology*, **27** (1), 80-86.

Full Text: [C\Che Eng Tec27, 80.pdf](C/Che%20Eng%20Tec27,%2080.pdf)

Abstract: Activated carbons prepared from date pits, an agricultural waste byproduct, have been examined for the adsorption of phenol from aqueous solutions. The activated carbons were prepared using a fluidized bed reactor in two steps; carbonization at 700 degreesC for 2 hours in N2 atmosphere and activation at 900 degreesC in CO2 atmosphere. The kinetic data were fitted to the models of intraparticle diffusion, pseudo-second order, and Lagergren, and followed more closely the pseudo-second-order chemisorption model. The isotherm equilibrium data were well fitted by the Freundlich and Langmuir models. The maximum adsorption capacity of activated date pits per Langmuir model was 16 times higher than that of nonactivated date pits. The thermodynamic properties calculated revealed the endothermic nature of the adsorption process. The uptake of phenol increased with increasing initial phenol concentration from 10 to 200 ppm and temperature from 25 to 55 degreesC, and decreased with increasing the solution pH from 4 to 12. The uptake of phenol was not affected by the presence of NaCl salt.

Keywords: Fertilizer Waste, Adsorption, Water, Carbons, Industry, Dyes

Islam, M.A., Khan, M.R. and Mozumder, S.I. (2004), Adsorption equilibrium and adsorption kinetics: A unified approach. *Chemical Engineering & Technology*, **27** (10), 1095-1098.

Full Text: [C\Che Eng Tec27, 1095.pdf](C/Che%20Eng%20Tec27,%201095.pdf)

Abstract: Conventional methods for the characterization of adsorption systems (determination of equilibrium and kinetic parameters) have been discussed. It is shown that the kinetic parameters determined by conventional methods are completely inconsistent with the equilibrium parameters. This inconsistency is due to the application of completely different models for equilibrium and kinetic study. In the present study adsorption is viewed as a Langmuir type physico-chemical reversible process and a three-parameter model is proposed which describes an adsorption system from both equilibrium and kinetic viewpoints. The model satisfactorily describes the kinetic and the equilibrium data reported by previous authors

Keywords: Waste Fe(III)/Cr(III) Hydroxide, Aqueous-Solutions, Fly-Ash, Removal, Water, Peat

Rajkumar, D., Kim, J.G. and Palanivelu, K. (2005), Indirect electrochemical oxidation of phenol in the presence of chloride for wastewater treatment. *Chemical Engineering & Technology*, **28** (1), 98-105.

Full Text: [2005\Che Eng Tec28, 98.pdf](2005/Che%20Eng%20Tec28,%2098.pdf)

Abstract: Electrochemical oxidation of phenol using a Ti/TiO2-RuO2-IrO2 anode in the presence of chloride as the supporting electrolyte was investigated. The experiments were performed in an undivided batch reactor. Preliminary investigations showed that only a small fraction of phenol was oxidized by direct electrolysis, while complete degradation of phenol was achieved by indirect electrochemical oxidation using chloride as a supporting electrolyte. The effect of operating parameters such as initial pH, supporting electrolyte concentration, phenol concentration, and charge input was studied using Box-Behnken second order composite experimental design. The effect of current density on COD removal was studied separately. TOC removal and AOX formation were studied for selected conditions. It was found that the formation of chlorinated organic compounds was pronounced at the beginning of electrolysis, but it was reduced to lower levels by extended electrolysis.

Keywords: Hypochlorous Acid Generation, Anodic-Oxidation, Lead Dioxide, Degradation, Electrode

? Millitzer, M., Wenzig, E. and Peukert, W. (2005), Adsorption isotherms and irreversible binding of proteins on commercially available hydrophobic adsorbents. *Chemical Engineering & Technology*, **28** (7), 756-761.

Full Text: [2005\Che Eng Tec28, 756.pdf](2005/Che%20Eng%20Tec28,%20756.pdf)

Abstract: Measurement of ascending and descending breakthrough curves of two proteins, hen egg white lysozyme and bovine serum albumin, on commercially available hydrophobic-interaction chromatographic columns reveal that only one part, i.e., the reversible adsorbed fraction, of the total bound amount can be desorbed by dilution of the feed solution. The other part is bound irreversibly; its binding behavior follows a hysteresis. Our procedure allows a clear separation of both parts. The reversibly adsorbed fraction of lysozyme can be represented with a Henry-type isotherm. For both proteins and for the reversible as well as the irreversible part, the “adsorbed” amount increases when the number of charges of the proteins decreases by approaching the isoelectric point.

Keywords: Adsorbents, Adsorption, Adsorption Isotherms, Behavior, Bovine Serum-Albumin, Breakthrough, Breakthrough Curves, Hydrophobic, Hysteresis, Interaction Chromatography, Isotherm, Isotherms, Particles, Proteins, Separation, Surface

? Goud, V.V., Mohanty, K., Rao, M.S. and Jayakumar, N.S. (2005), Phenol removal from aqueous solutions by tamarind nutshell activated carbon: Batch and column studies. *Chemical Engineering & Technology*, **28** (7), 814-821.

Full Text: [2005\Che Eng Tec28, 814.pdf](2005/Che%20Eng%20Tec28,%20814.pdf)

Abstract: Activated carbons prepared from tamarind nutshell, an agricultural waste by-product, have been examined for the removal of phenol from aqueous solutions. The activated carbon was prepared by sulfuric acid activation. Both batch and column studies were performed for the sorption of phenol. The kinetic data were fitted to the models of Lagergren, pseudo-second-order and intraparticle diffusion, and closely followed the pseudo-second-order chemisorption model. The Freundlich and Langmuir isotherm models were well fitted. The solution pH greatly affects the sorption process. The column study results indicate that the sorption of phenol is dependent on the flow rate, the inlet phenol concentration as well as on the particle size of the adsorbent.

Keywords: Adsorption, Aqueous solutions, Columns

? Staszak, K. and Prochaska, K. (2005), Estimation of diffusion coefficients based on adsorption measurements in model extraction systems. *Chemical Engineering & Technology*, **28** (9), 985-990.

Full Text: [2005\Che Eng Tec28, 985.pdf](2005/Che%20Eng%20Tec28,%20985.pdf)

Abstract: The drop volume technique has been used to measure the equilibrium and dynamic interfacial tension at the liquid/liquid interfaces of selected hydroxyoximes, as examples of chelating type hydrophobic metal ion extractants. The measurements for the kinetics of adsorption enable the calculation of diffusion coefficients. In this paper, new methods for the estimation of the diffusion coefficient by Fick’s and the Maxwell-Stefan equations are presented. The calculated values of the diffusion coefficient were compared with the values obtained from the short and long time approximation models of the Ward-Tordai equation. The influence of the organic phase and the addition of non-organic electrolyte to the aqueous phase on the estimated values of the diffusion coefficients were investigated.

Keywords: Adsorption, Air, Approximation, Complexes, Copper(II), Diffusion, Diffusion Coefficient, Dynamic Surface-Tension, Equilibrium, Extraction, Hydrophobic, Interfacial Tension, Interfacial-Tension, Kinetics, Layers, Model, Models, Volume, Water-Interface

? Goud, V.V., Mohanty, K., Rao, M.S. and Jayakumar, N.S. (2005), Prediction of mass transfer coefficients in a packed bed using tamarind nut shell activated carbon to remove phenol. *Chemical Engineering & Technology*, **28** (9), 991-997.

Full Text: [2005\Che Eng Tec28, 991.pdf](2005/Che%20Eng%20Tec28,%20991.pdf)

Abstract: Phenol is a refractive pollutant that is generated from almost all the types of industries. Removal of phenol can be achieved economically by using a cost effective technique like adsorption on to activated carbon. The present paper reports on the preparation and characterization of activated carbon from tamarind nutshell, an agricultural waste byproduct, and its use in a packed bed for the removal of phenol. The breakthrough curves for column sorption of phenol from aqueous solutions to TNSAC have been measured at various flow rates and different particle sizes at 28°C. The results obtained showed that the sorption of phenol is dependent on both the flow rate and the particle size of the adsorbent, and that the breakpoint time and phenol removal yield decrease with increasing flow rate and particle size. The overall mass transfer coefficient is calculated from the experimental data and compared with the values obtained from the correlation. Experimental values are in excellent agreement with the predicted values from the correlation.

Keywords: Adsorption, Aqueous-Solutions, Waste, Water

? Abu-Arabi, M.K., Allawzi, M.A. and Ai-Zoubi, A.S. (2007), Adsorption of phenol from aqueous solutions on Jojoba nuts residue. *Chemical Engineering & Technology*, **30** (4), 493-500.

Full Text: [2007\Che Eng Tec30, 493.pdf](2007/Che%20Eng%20Tec30,%20493.pdf)

Abstract: Equilibrium isotherms for the adsorption of phenol from aqueous solutions of three types of Jojoba nuts residue were determined at 30, 40 and 55 degrees C. Types I and 11 were the residue after extracting the oil by leaching or by a pressing process, respectively. The third type was obtained by thermally treating the residue remaining after pressing. The phenol concentration ranged from 0-100 ppm in the aqueous solutions. A low adsorption capacity relative to activated carbon was obtained on types I and 11, while the adsorption capacity of type III was much higher than types I and II. The results show that Jojoba nuts residue show good potential for adsorption of phenolic compounds if subjected to some type of treatment (activation). As the temperature increased from 30 to 55 degrees C, the adsorption capacity of types I and 11 decreased, but the increase had a negligible effect on type III. The experimental data were fitted to the appropriate adsorption models. The models used were Langmuir, Freundlich, Koble-Corrigan and Redlich-Peterson.

Keywords: Activated Carbon, Activation, Adsorption, Adsorption Capacity, Aqueous Solutions, Capacity, Carbon, Compounds, Data, Equilibrium, Equilibrium Isotherms, Freundlich, Isotherms, Langmuir, Modeling, Models, Organic Pollution, Phenol, Plants, Process, Redlich-Peterson, Temperature, Treatment

? Tang, X.H., Zhang, X.M., Guo, C.C. and Zhou, A.L. (2007), Adsorption of Pb2+ on chitosan cross-linked with triethylene-tetramine. *Chemical Engineering & Technology*, **30** (7), 955-961.

Full Text: [2007\Che Eng Tec30, 955.pdf](2007/Che%20Eng%20Tec30,%20955.pdf)

Abstract: A novel triethylene-tetramine cross-linked chitosan (CCTS) was synthesized via the cross-linking of triethylene-tetramine and epichlorohydrin activated chitosan. Its structure was characterized by elemental analysis, infrared spectroscopy and X-ray diffraction analysis, and the surface topography was determined with ESEM. The results were in agreement with expectations. The capacity of CCTS to adsorb Pb2+ ions from aqueous solutions was examined, and equilibrium and kinetic investigations were undertaken. The adsorption isotherms were fitted well by the Langmuir equation (R > 0.999). The maximum adsorbed amount, at pH 5.5, with an initial concentration of 3 mmol/L (621 ppm), was 378.8 mg/g. The adsorption process could be best described by a second-order equation (R = 1). This suggests that the rate-limiting step may be the chemical adsorption (chemisorption) step and not the mass transport. The separation factor used was 0 < R-L < 1. Therefore, it can be concluded that CCTS is an effective adsorbent for the collection of Pb2+.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Adsorption Process, Analysis, Aqueous Solutions, Aqueous-Solution, Beads, Behavior, Cadmium, Capacity, Chemical, Chemical Adsorption, Chemisorption, Chitosan, Concentration, Cross-Linked Chitosan, Cross-Linking, Crosslinked, Crosslinking, Effective, Elemental Analysis, Equilibrium, Heavy Metals, Infrared Spectroscopy, Investigations, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Equation, Linking, Mass Transport, Metal-Ions, Pb2+, pH, Process, Rate Limiting, Rate Limiting Step, Rate-Limiting Step, Second Order, Second-Order Equation, Separation, Separation Factor, Solutions, Sorption, Spectroscopy, Structure, Surface, Topography, Transport, X-Ray Diffraction

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Full Text: [2007\Che Eng Tec30, 1228.pdf](2007/Che%20Eng%20Tec30,%201228.pdf)

Abstract: The kinetic parameters of the selective isothermal adsorption of ethanol from an aqueous solution onto a hydrophobic zeolite type NaZSM-5 were determined using a series of the so-called standard methods (the initial rate, the saturation rate and the maximum rate methods). The kinetic model of ethanol adsorption was determined by the “model fitting” method. The dependence of the kinetic parameters on the degree of adsorption and the presence of a compensation effect were determined by the isoconversional method. The complex changes of the activation energy and pre-exponential factor with the degree of adsorption were explained by the model of the activation energy distribution of elemental adsorption processes.

Keywords: Activation, Activation Energy, Adsorbents, Adsorption, Analysis, Complex, Ethanol, Hydrophobic, Kinetic, Kinetic Model, Kinetics, Liquid-Phase Adsorption, Model, Molecular-Sieve, Processes, Selective Adsorption, Silicalite, Thermogravimetry, Water Mixtures, Zeolite, Zeolites

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Full Text: [2007\Che Eng Tec30, 1666.pdf](2007/Che%20Eng%20Tec30,%201666.pdf)

Abstract: The performance of two types of perfluorooctyl alumina (PFOAL) adsorbents prepared using gamma-alumina (PFOAL(A)) and alumina-active-basic (R) (PFOAL(B)) is reported. The equilibrium adsorption behavior of the adsorbents was studied for adsorption of methyl tert-butyl ether (MTBE) in a wide range (5-1000 mg/L) of aqueous phase MTBE concentrations. The monolayer adsorption capacities were 3.3 and 3.5 mg MTBE/g adsorbent, and the maximum adsorption capacities were 7.1 and 6.3 mg MTBE/g adsorbent for PFOALA and PFOALB, respectively. The application of Freundlich, Langmuir, BET and BDDT (the general form of BET) isotherms were compared for the modeling of aqueous adsorption of MTBE on the surface of PFOAL adsorbents. It was shown that adsorption of MTBE on the surface of PFOAL is a type IV van der Waals adsorption, which is best modeled by the general form of the BET (BDDT) multilayer adsorption isotherm.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Isotherm, Alumina, BET, Catalytic Ozonation, Degradation, Equilibrium, Freundlich, Germany, Groundwaters, Isotherm, Isotherms, Kinetics, Langmuir, Liquid Phase Adsorption, Modeling, Mtbe, Oxidation, Perfluorooctyl Alumina (PFOAL), Performance, Phase, Removal, Water

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Full Text: [2007\Che Eng Tec30, 1732.pdf](2007/Che%20Eng%20Tec30,%201732.pdf)

Abstract: Monodisperse polystyrene (PS) latex particles were prepared through a conventional batch emulsion polymerization procedure. After cleaning, the latex was subjected to a surfactant titration by sodium dodecyl sulfate (SIDS) and the conductivity was monitored. Using the break point in the conductivity-concentration curve, the adsorption area of the surfactant molecules at saturation, A(s), was determined as 46 angstrom(2) per SDS molecule. In order to determine the contribution of the different ionic species to the conductivity, a simple model based on experimental conductivity measurements was developed. The degrees of counterion binding to the micelles and to the surfactant anions adsorbed onto polymer particles were calculated as 0.770 and 0.849, respectively. The Langmuir adsorption isotherm was determined for the adsorption of SDS onto PS latex particles with Gamma(infinity) = 7.257.10(-10) mol/cm(2) and K = 1.208. 10(5) cm(3)/mol.

Keywords: Adsorption, Adsorption Isotherm, Batch, Conductivity Measurements, Conductometry, Contribution, Counterions, Determination, Dynamic Light-Scattering, Ionic Surfactant, Isotherm, Langmuir, Langmuir Adsorption, Langmuir Adsorption Isotherm, Latices, Micelle, Micellization Parameters, Model, Molecules, Number, Polymer, Polymerization, Polystyrene, Sodium Dodecyl-Sulfate, Surfactant, Titration

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Full Text: [2008\Che Eng Tec31, 355.pdf](2008/Che%20Eng%20Tec31,%20355.pdf)

Abstract: Diesel fuel desulfurization by different commercial activated carbons was studied in a batch adsorber. Experiments, carried out to determine the sulfur adsorption dependency on time, were used to perform kinetic characterization and to screen the best performing activated carbon. The equilibrium characterization of the adsorption process was also performed. The statistical study of the process was undertaken by way of a two-level one-half fractional factorial experimental design with five process parameters. Individual parameters and their interaction effects on sulfur adsorption were determined and a statistical model of the process was developed. Chemviron Carbon SOLCARB (TM) C3 was found to be the most efficient adsorbent. The kinetic pseudo-second order model and Freundlich isotherm are shown to exhibit the best fits of experimental data. The lowest achieved sulfur concentration in treated diesel fuel was 9.1 mg kg-1.

Keywords: Activated Carbon, Activated Carbons, Adsorbent, Adsorbents, Adsorption, Carbon, Characterization, Deep Desulfurization, Dependency, Design, Desulfurization, Diesel Fuel, Equilibrium, Experimental, Experimental Design, Freundlich, Freundlich Isotherm, Interaction, Isotherm, Kinetic, Kinetic Characterization, Kinetics, Mechanism, Model, Pseudo-Second Order, Removal, Selective Adsorption, Sorption, Statistical Studies

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Full Text: [2008\Che Eng Tec31, 365.pdf](2008/Che%20Eng%20Tec31,%20365.pdf)

Abstract: Two types of novel hypercross-linked fiber adsorbents, ZH-01 and ZH-02, were prepared by cross-linking PP-ST-DVB fibers in solution with p-xylylenedichloride and monochloromethylether according to the Friedel-Crafts reaction. A series of static adsorption tests were performed. The results showed that the adsorbents have excellent adsorption capacities for 2-methylpyridine and the adsorption equilibrium data can be fitted well by the Freundlich model. The thermodynamic studies supported the conclusion that the mechanism of adsorption for 2-methyl-pyridine on the adsorbents is physical adsorption and a lower temperature is favorable to the exothermic physisorption process. In addition, kinetic studies were also carried out. The hypercross-linked fiber adsorbents showed a faster adsorption rate than the base PP-ST-DVB fiber. The faster attainment of adsorption equilibrium for 2-methylpyridine on the adsorbents (within 2 h), is advantageous for practical use. A first-order reaction rate equation was assumed for the adsorption system and was suitable to describe the process. The equilibrium rate constants of the adsorbents correlated well with their adsorption capacities.

Keywords: 2-Methylpyridine, Adsorbents, Adsorption, Adsorption Equilibrium, Adsorption Mechanism, Adsorption Rate, Data, Equilibrium, Fiber, Fibers, Freundlich, Freundlich Model, Friedel-Crafts, Kinetic, Kinetics, Mechanism, Model, Physical Adsorption, Physisorption, Process, System, Temperature, Thermodynamic, Thermodynamics

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Full Text: [2008\Che Eng Tec31, 567.pdf](2008/Che%20Eng%20Tec31,%20567.pdf)

Abstract: Domestic bentonite clay was modified using cationic surfactant - hexadecyltrimethylammonium bromide (HDTMA-bromide) in order to obtain more efficient sorbent. Removal of Acid Orange 10 from aqueous solution at different dye concentrations, adsorbent doses, and pH was studied. These studies were carried out under unaltered pH value in order to prove that adjusting pH as an additional operation in wastewater treatment is not entirely necessary. The results obtained confirmed the adsorption capacity is significant even for unaltered pH. The adsorption isotherm data were well fitted with both the Freundlich and Langmuir model and the latter was shown as more appropriate. Dynamical data were well represented with the pseudo second-order kinetic model. The results indicate that HDTMA-bentonite could be employed as low-cost sorbent in textile dye wastewater treatment.

Keywords: Acid Dye, Adsorbent, Adsorption, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous-Solutions, Bentonite, Bentonite Clay, Biological Treatment, Capacity, Clay, Decolorization, Dye, Dyes, Freundlich, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Model, Orange-G, Organobentonite, pH, Pseudo Second-Order, Removal, Solution, Sorption, Surfactant, Treatment, Waste-Water, Wastewater, Wastewater Treatment, Wastewaters

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Full Text: [2008\Che Eng Tec31, 864.pdf](2008/Che%20Eng%20Tec31,%20864.pdf)

Abstract: The application of thermodynamic models in the development of chromatographic separation processes is discussed. The paper analyses the thermodynamic principles of protein adsorption. It can be modeled either as a reversible association between the adsorbate and the ligands or as a steady-state process where the rate of adsorption is equal to the rate of desorption. The analysis includes the competitive Langmuir isotherm and the exponentially modified Langmuir isotherm. If the adsorbate binds to one ligand only, the different approaches become identical. When the adsorbate acts as a ligand, dimerization takes place and will give rise to a sigmoid isotherm. A model that accounts for dimerization is discussed and a sample calculation shows the behavior of this isotherm. Insulin is known to have a concave isotherm at low concentrations. The calculation of the standard Gibbs energy change of adsorption is discussed. Hydrophobic and reversed phase chromatography are useful techniques for measuring solute activity coefficients at infinite dilution.

Keywords: Activity, Activity Coefficients, Adsorption, Adsorption Isotherms, Analysis, Desorption, Development, Dimerization, Hydrophobic Interaction Chromatography, Ion-Exchange, Isotherm, Isotherms, Langmuir, Langmuir Isotherm, Ligand, Model, Models, Process, Process Development, Processes, Protein, Proteins, Retention, Review, Salt, Separation, Systems, Thermodynamic, Thermodynamics

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Full Text: [2008\Che Eng Tec31, 1310.pdf](2008/Che%20Eng%20Tec31,%201310.pdf)

Abstract: A mathematical model including convection, axial dispersion, external- and intraparticle mass transfer resistances, particle size distribution (PSD) and variation of isotherm (VOI) was developed for analyzing the adsorption process of solanesol by macroporous resins. The theoretical predictions were compared with the experimental data obtained at different conditions to examine the validity of the model. The results showed that the theoretical predictions were very consistent with the experimental data. The model parameters were investigated using the model developed. The results showed that: (a) As Pe, Bi, m, n, and a increased and b decreased, the time required to reach the breakthrough point was delayed and the loading capacity at the breakthrough point was increased; (b) When Pe is greater than 50, the effect of axial diffusion decreased to a negligible level, and (c) At the region of low values of m and n, the breakthrough curves changed severely and the adsorption column was penetrated through easily.

Keywords: Acid, Adsorption, Analysis, Breakthrough, Breakthrough Curves, Capacity, Coenzyme Q(10), Data, Diffusion, Dispersion, Equilibrium, Exchange Chromatography, Expanded-Bed, Fixed-Bed Adsorption, Heart-Failure, Isotherm, Isotherms, Macroporous Resins, Mass Transfer, Mass-Transfer, Mathematical Model, Model, Model Parameters, Modeling, Particle-Size, Process, Purification, Solanesol

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Full Text: [2009\Che Eng Tec32, 763.pdf](2009/Che%20Eng%20Tec32,%20763.pdf)

Abstract: Modifications of commercial activated carbons by chemical treatment with HNO3 or HCl and HF and the adsorption behavior of simple aromatic compounds (aniline, pyridine, phenol, and benzene) on activated carbon and modified activated carbon were investigated. The results show that the textural properties change a little after these modifications, but the surface acidity (mainly oxygen-containing groups) of activated carbon modified with HNO3 increases greatly The effect of ash of activated carbon on adsorption of the organic compounds mentioned above is insignificant. However, addition of surface acidity (mainly surface oxygen-containing groups) decreases the adsorption capacity of compounds significantly. The adsorption uptake of compounds on activated carbon with oxidation of HNO3 is low possibly due to dispersive interaction, water cluster blocking, or competition between water and compounds adsorbed on activated carbon’s surface because of hydrophilic increase of the activated carbon surface. The solubility of aromatic compounds in water has an important effect on the adsorption capacity of activated carbon. q(m) and K-L (Langmuir adsorption parameters) for the aromatic compounds vary similarly.

Keywords: Activated Carbon, Adsorption, Adsorption, Adsorption Capacity, Aniline, Aqueous-Solutions, Aromatic Compounds, Benzene, Capacity, Carbon, Carbons, Chemical Treatment, Chemistry, Compounds, Dyes, HNO3, Langmuir, Langmuir Adsorption, Modification, Organic Compounds, Oxidation, Phenol, Properties, Pyridine, Removal, Solubility, Surface Acidity, Surface Chemistry, Toluene, Treatment, Uptake, Water

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Full Text: [2009\Che Eng Tec32, 1625.pdf](2009/Che%20Eng%20Tec32,%201625.pdf)

Abstract: A fixed-bed adsorption study was carried out by using a strong base anion-exchange resin (Amberlite IRA-400) for the removal of fumaric acid from aqueous solutions. The breakthrough curves were obtained as a function of flow rate, temperature, feed pH, and inlet fumaric acid concentration. The total adsorption capacity and the percent fumaric acid removal of the resin were calculated. The Yoon-Nelson model was applied to the experimental data to predict the breakthrough curves and to determine the characteristic column parameters required for process design. The breakthrough curves fit the model predictions well.

Keywords: Adsorption, Adsorption Capacity, Amberlite, Aqueous Solutions, Breakthrough, Breakthrough Curves, Capacity, Column, Data, Exchange-Resin, Fixed-Bed Adsorption, Fumaric Acid, IRA-400 Resin, Model, Modeling, pH, Process, Recovery, Removal, Resin, Rhizopus-Oryzae, Temperature

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Full Text: [2010\Che Eng Tec33, 658.pdf](2010/Che%20Eng%20Tec33,%20658.pdf)

Abstract: Equilibrium constant and mass transfer parameters are needed for the study of amoxicillin separation in any process involving adsorption in fixed beds. In this work, the adsorption of amoxicillin and 6-aminopenillanic acid in aqueous solution on activated carbon were studied using static adsorption tests. The adsorption capacity was found to be strongly dependent on the pH of the aqueous phase. The adsorption constants, overall mass transfer coefficients, and axial dispersion coefficients for amoxicillin and 6-aminopenillanic acid were determined, by moment analysis, from a series of step tests in a fixed bed packed with activated carbon. The total bed voidage and axial dispersion coefficient were estimated from blue dextran pulse test data at different flow rates. The results show that adsorption intensity increased with increasing temperature. Furthermore, the increasing trend of HETP with velocity suggests that axial dispersion and mass transfer resistance control the column efficiency.

Keywords: 6-Aminopenicillanic Acid, Activated Carbon, Acylase, Adsorbent, Adsorption, Adsorption Capacity, Amoxicillin, Analysis, Beta-Lactam Antibiotics, Capacity, Carbon, Control, Data, Dispersion, Enzymatic-Synthesis, Equilibrium, Mass Transfer, Mass-Transfer, pH, Polymeric Resins, Process, Separation, Temperature, Trend

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Full Text: [2010\Che Eng Tec33, 969.pdf](2010/Che%20Eng%20Tec33,%20969.pdf)

Abstract: Batch adsorption experiments were carried out for the removal of norfloxacin from aqueous solution using modified coal fly ash as adsorbent. The effects of various parameters such as contact time, initial solution concentration and temperature on the adsorption system were investigated. The optimum contact time was found to be 100 min. The equilibrium experimental data can be well fitted by the Freundlich model. Thermodynamic parameters such as Delta G, Delta H and Delta S were also calculated. The negative Gibbs free energy change and enthalpy change indicated the spontaneous and exothermic nature of the adsorption, and the negative entropy change indicated that the adsorption process was aided by decreased randomness.

Keywords: Adsorbent, Adsorption, Batch, Contact Time, Data, Equilibrium, Fly Ash, Freundlich, Freundlich Model, Isotherm, Model, Modified Coal Fly Ash, Norfloxacin, Process, Removal, Sulfonamides, System, Temperature, Thermodynamic, Thermodynamic Parameters, Waste

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Full Text: [2010\Che Eng Tec33, 1107.pdf](2010/Che%20Eng%20Tec33,%201107.pdf)

Abstract: Water pollution due to the fuel additive methyl tert-butyl ether (MTBE), which is a suspected carcinogen, is often observed in surface and ground water. The removal of MTBE from aqueous solution at a concentration of 0.00143 g/mL by using exfoliated graphite (EG) as a novel adsorbent is reported. Experiments are carried out in batch mode and the effects of several factors on the removal of MTBE are evaluated. In addition, the influence of ultrasound irradiation on MTBE adsorption is investigated. The results show that an efficient removal of MTBE from aqueous solution could be achieved by implementing an ultrasound facilitated adsorption process using EG. A maximum removal efficiency of 97 % is achieved for MTBE in controlled conditions and it is found that applying ultrasound has a significant positive effect on the removal of MTBE from aqueous solutions.

Keywords: Adsorbent, Adsorption, Aqueous Solutions, Batch, Batch Mode, Carbons, Exfoliated Graphite, Graphite, Heavy Oils, Irradiation, Kinetics, Liquid-Phase Adsorption, Methyl Tert-Butyl Ether, MTBE, Phenol, Pollution, Process, Recovery, Removal, Removal Efficiency, Sorption Capacity, Ultrasound, Water, Water Pollution

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Full Text: [2010\Che Eng Tec33, 1137.pdf](2010/Che%20Eng%20Tec33,%201137.pdf)

Abstract: Adsorptive desulfurization enables the attainment of ultra-low sulfur content in hydrocarbon fuels by removing the refractory sulfur compounds, which are difficult to remove in hydrodesulferization (HDS) processing when sulfur concentrations below 10 mg kg(-1) must be attained. In this work, diesel fuel was desulfurized by adsorption using activated carbon as an adsorbent and the adsorption was carried out in a fixed-bed column. The output sulfur content of less then 0.7 mg kg(-1) was achieved for the lowest flow rate of 1.0 cm(3)min(-1) and the highest bed depth of 28.4 cm at 50 degrees C. In all the experiments, at least one output sample contained less then 10.0 mg kg(-1) of sulfur with a longest achieved breakthrough time of 11.8 h. A mathematical model of the fixed-bed adsorber was applied to describe the kinetics and to estimate the breakthrough curves. The model equations included a differential material balance for a liquid phase and a mass transfer rate expression. The ability of the model to fit the experimental data was shown to be satisfactory.

Keywords: Activated Carbon, Activated Carbons, Adsorbent, Adsorption, Breakthrough, Breakthrough Curves, Breakthrough Time, Carbon, Cell Applications, Column, Columns, Compounds, Data, Deep Desulfurization, Desulfurization, Diesel, Diesel Fuel, Fixed-Bed, Flow Calorimetry, Hd, Kinetics, Mass Transfer, Mathematical Model, Model, Modeling, Organosulfur Compounds, Output, PI-Complexation, Removal, Selective Adsorption, Sulfur, Y-Zeolites

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Full Text: [2010\Che Eng Tec33, 1146.pdf](2010/Che%20Eng%20Tec33,%201146.pdf)

Abstract: The adsorption of levulinic acid in fixed beds of basic polymeric adsorbents at 22 degrees C was studied under various operating conditions. A general rate model which considers pore diffusion and parallel pore/surface diffusion was solved numerically by orthogonal collocation on finite elements to describe the experimental breakthrough data. The adsorption isotherms, and the pore and surface diffusion coefficients were determined independently in batch adsorption studies. The external film resistance and the axial dispersion coefficient were estimated by the Wilson-Geankoplis equation and the Chung-Wen equation, respectively. Simulation elucidated that the model which considers parallel diffusion successfully describes the breakthrough behavior and gave a much better prediction than the model which considers pore diffusion. The results obtained in this work are applicable to design and optimizes the separation process.

Keywords: Adsorbents, Adsorption, Adsorption Isotherms, Basic Polymeric Adsorbent, Batch, Breakthrough, Breakthrough Curves, Chromatography, Columns, Data, Desorption, Diffusion, Dispersion, Fixed-Bed, Fluidized-Beds, Isotherms, Levulinic Acid, Mass-Transfer, Model, Modeling, Operating Conditions, Orthogonal Collocation on Finite Elements, Parallel Pore, Surface Diffusion, Polymeric Adsorbents, Pore, Process, Removal, Separation, Simulation, Surface Diffusion, Surface-Diffusion, Systems

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Full Text: [2010\Che Eng Tec33, 1582.pdf](2010/Che%20Eng%20Tec33,%201582.pdf)

Abstract: The protection of the global environment and in particular, the provision of a sustainable source of clean water is a necessity for human survival. Specifically, large quantities of chromium containing compounds are being discharged into the environment. This study has been carried out to determine the feasibility of chromium adsorption on iron species by an Electrocoagulation (EC) process using the Langmuir Isotherm. The full potential of EC with air injection as an alternative wastewater treatment technique to remove chromium from well water shows more than 99% removal without the addition of any chemical reagents. In this study, X-Ray Diffraction, Scanning Electron Microscopy, Mossbauer Spectroscopy and Fourier Transform Infrared Spectroscopy are used to characterize the solid products that reveal the expected crystalline iron oxides, i.e., lepidocrocite, magnetite, gohetite, and iron oxide.

Keywords: Adsorption, Chromium, Chromium Removal, Compounds, Electrocoagulation, Electrode, Environment, Infrared-Spectroscopy, Iron, Isotherm, Langmuir, Oxide, Process, Removal, Scanning Electron Microscopy, Spectroscopy, Survival, Thermodynamic, Treatment, Waste-Water, Wastewater, Wastewater Treatment, Water

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Full Text: [2010\Che Eng Tec33, 1679.pdf](2010/Che%20Eng%20Tec33,%201679.pdf)

Abstract: The amount of methanol adsorbed in composite sorbents made of activated carbon impregnated with two different mass fractions of LiCl were assessed at selected temperatures and pressures. The adsorbed amounts, temperature, and pressure were well correlated with a Langmuir-type equation that had the same set of coefficients for different isotherms and isobars. However, sorption hysteresis was observed in the composite sorbent and the main practical implication of this phenomenon was the increase of the regeneration temperature necessary to desorb a certain amount of methanol. The specific cooling capacity and the coefficient of performance of the studied adsorbents were calculated, and it was found that the sorbent with 21.3 wt% of LiCl had specific cooling capacities 11% to 31% higher than those obtained with the untreated activated carbon, when the regeneration temperature was 388 K. The heat sink temperature was 303 K, and the evaporation temperature ranged between 263 and 283 K. However, at the same operation conditions, the coefficient of performance of both sorbents was similar.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Capacity, Carbon, Composite, Cooling, Equilibrium, Evaporation, Hysteresis, Isotherms, Mesoporous Silica, Micropores, Organic Vapors, Performance, Phase Equilibrium, Pressure, Refrigeration, Refrigeration, Regeneration, Silica-Gel, Sorbent, Sorbents, Sorption, Systems, Temperature, Water

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Full Text: [2010\Che Eng Tec33, 2008.pdf](2010/Che%20Eng%20Tec33,%202008.pdf)

Abstract: The aim of this study was to investigate the feasibility of a bioreactor system and its scale-up to remove Cr(VI) from solution. The bioreactor is based on an innovative process that combines bioreduction of Cr(VI) to Cr(III) by the bacterium Arthrobacter viscosus and Cr(III) sorption by a specific zeolite. Batch studies were conducted in a laboratory-scale bioreactor, taking into account different operating conditions. Several variables, such as biomass concentration, pH and zeolite pre-treatment, were evaluated to increase removal efficiency. The obtained results suggest that the Cr removal efficiency is improved when the initial biomass concentration is approximately 5 g L-1 and the pH in the system is maintained at an acidic level. Under the optimised conditions, approximately 100% of the Cr(VI) was removed. The scale-up of the developed biofilm process operating under the optimised conditions was satisfactorily tested in a 150-L bioreactor.

Keywords: 13x Zeolite, Arthrobacter Viscosus, Arthrobacter-Viscosus, Batch, Batch Studies, Biomass, Bioreactor, Biosorption, Copper(II), Cr, Cr Removal, Cr(III), Cr(VI), Equilibrium, Granular Activated Carbon, Heavy-Metal Removal, Hexavalent Chromium, Ions, Operating Conditions, pH, Pre-Treatment, Pretreatment, Process, Reduction, Removal, Removal Efficiency, Scale-up, Sorption, System, Zeolite

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Full Text: [2011\Che Eng Tec34, 1459.pdf](2011/Che%20Eng%20Tec34,%201459.pdf)

Abstract: A lignocellulose-based waste biopolymer was impregnated with phosphoric acid and used for the removal of two organic dyes, Direct Blue (DB) and Reactive Blue (RB), from aqueous solution. Batch adsorption kinetic studies were carried out at different initial concentrations of the dyes, at different temperatures and various initial pH values (2-10). The equilibrium data obeyed the Langmuir isotherm model with high regression coefficient. The kinetic data were also used to test three different kinetic models. The validity of the kinetic models was analyzed and the pseudo-second-order model may be the best fit to explain the rate-determining step. Adsorption of both dyes follows chemisorption. The effective diffusion coefficient and the activation energy were also calculated at different temperatures to establish the mechanism. Thermodynamic studies suggest that the adsorption of DB and RB is highly endothermic in nature. Mass transfer analysis reveals that the adsorption of DB and RB occurs through a film diffusion mechanism. Based on the Langmuir isotherm equation, the single-stage batch absorber design of the adsorption of DB and RB onto activated carbon was studied.

Keywords: Activated Carbon, Adsorption, Alunite, Aqueous Solution, Aqueous-Solutions, Batch, Batch Adsorption, Biopolymer, Biopolymers, Congo Red, Diffusion, Dyes, Dyestuffs, Entropy Of Activation, Equilibrium, Fly-Ash, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Models, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Organic Dyes, pH, Phosphoric Acid, Process Design, Pseudo Second Order, Reactive Dyes, Removal, Thermodynamic, Thermodynamic Studies, Waste, Waste-Water

? Sayan, P., Titiz-Sargut, S., Ozgul-Yucel, S. and Kiran, B. (2011), Physical and adsorptive characterization of precipitated magnesium silicate from rice hull ash silica. *Chemical Engineering & Technology*, **34** (9), 1497-1506.

Full Text: [2011\Che Eng Tec34, 1497.pdf](2011/Che%20Eng%20Tec34,%201497.pdf)

Abstract: Precipitation of magnesium silicate from sodium silicate and MgCl2 and MgSO4 solutions was investigated at four different reactant feed rates and two temperatures (25ºC and 50ºC). Sodium silicate solutions were produced from rice hull ash silica. The final product was characterized by scanning electron microscopy, X-ray diffraction, thermogravimetric analysis/differential thermal analysis, crystal size distribution, and filtration rate measurements. Physical characteristics of the studied magnesium silicates were determined by the Brauner-Emmett-Teller method and their adsorption capacities were compared to commercial magnesium silicate (Florisil). The adsorption was spontaneous and endothermic. The best fit of the kinetic results was achieved by a pseudo-second-order equation. The equilibrium data were found to be well represented by the Freundlich isotherm equation.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Ash, Cadmium, Characterization, Electron Microscopy, Equilibrium, Freundlich, Freundlich Isotherm, Ions, Isotherm, Kinetic, Magnesium Silicate, Pseudo Second Order, Removal, Rice, Rice Hull Ash, Silica, Sorption, Talc, Waste, X-Ray Diffraction

? Jin, L., He, D.D. and Wei, M. (2011), Selective adsorption of phenol and nitrobenzene by *β*-cyclodextrin-intercalated layered double hydroxide: Equilibrium and kinetic study. *Chemical Engineering & Technology*, **34** (9), 1559-1566.

Full Text: [2011\Che Eng Tec34, 1559.pdf](2011/Che%20Eng%20Tec34,%201559.pdf)

Abstract: The composite of carboxymethyl-modified *β*-cyclodextrin-intercalated ZnAl-layered double hydroxide (CMCD-LDH) was investigated for selective adsorption of phenol (Ph) and nitrobenzene (NB). The Freundlich model can be used to describe satisfactorily the adsorption isotherms of Ph and NB. The adsorption capacity of CMCD-LDH for Ph and NB increases with the increase of temperature, indicating the endothermic nature of this sorption process. CMCD-LDH exhibits preferential adsorption for Ph over NB at pH 6.5 due to the selective recognition of the interlayer CMCD cavity. Pseudo-first-order and pseudo-second-order kinetic models were applied to simulate the kinetics of the adsorption process. The calculated *q*e values based on the pseudo-second-order model are much closer to the experimental data *q*e,exp. As a result, the pseudo-second-order kinetic model is more reasonable to describe the adsorption process of Ph and NB onto the CMCD-LDH composite. CMCD-LDH can be potentially applied in selective adsorption and separation of wastewater pollutants.

Keywords: Adsorption, Adsorption Isotherms, Composite, Compound, Equilibrium, Freundlich, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Nitrobenzene, Organic Pollution, pH, Phenol, Pseudo Second Order, Removal, Selective, Selective Adsorption, Separation, Sorption, Temperature, Wastewater, Wastewater Pollutants, Water

# Title: Chemical Engineering World

Full Journal Title: Chemical Engineering World

ISO Abbreviated Title: Chem. Eng. World

JCR Abbreviated Title: Chem Eng World

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

McKay, G., Otterbusn, M.S. and Sweeney, A.G. (1980), Activated carbon as an adsorbent for basic yellow dye. Part 1: Factors affecting the rate of dye adsorption. *Chemical Engineering World*, **15**, 91-94.

McKay, G. and Bino, M.J. (1990), Simplified fixed bed adsorption of pollutants from water. *Chemical Engineering World*, **25**, 65-69.

# Title: Chemical Equilibrium

Harper and Row, Publishers, New York, Evanston and London

Bard, A.J. (1966), *Chemical Equilibrium*, Harper and Row, New York.

# Title: Chemical Equilibrium

Plenum Press, New York, and London

Guenther, W.B. (1975), *Chemical Equilibrium*, Plenum Press, New York and London.

# Title: Chemical Geology

Full Journal Title: [Chemical Geology](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=00092541); [Chemical Geology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5799&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=cc25ab064f3f7c8eebffc106138cd7bc)

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ISSN: 0009-2541

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Language: Multi-Language

Publisher: Elsevier Science BV

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

Subject Categories:

Geochemistry & Geophysics: Impact Factor 1.824, 11/45 (2000)

? Farrah, H., Hatton, D. and Pickering, W.F. (1980), The affinity of metal ions for clay surfaces. *Chemical Geology*, **28**, 55-68.

Full Text: [1960-80\Che Geo28, 55.pdf](1960-80/Che%20Geo28,%2055.pdf)

Abstract: An investigation of the adsorption, at 25°C and pH 5, of Pb, Cu, Zn, Cd, Mg and Ca ions by Na+-form kaolin, illite and montmorillonite, has shown that the effect of concentration can be described by a Langmuir isotherm. The derived values for the constant, k, were all of the order 105 l mol−1 with the pre-power terms varying between cations within the range of 1–5 (kaolin and illite) or 3–10 (montmorillonite). The capacity values varied with the type of clay (montmorillonite > illite > kaolin), species being adsorbed, and pH.

The relative affinity of the metal ions for the clay surfaces was examined by adding Na+-form clay suspensions to binary mixtures of divalent cations and subsequently treating the adsorption data by means of a competitive form of the Langmuir equation. This yielded values for bond constant ratios kA/kB, and capacity values for the component cations. As in the previous series, the derived capacities varied with clay type and cation being adsorbed, and kA/kB ratios were small (e.g., between 1 and 3).

Affinity sequences, which can be defined in terms of decreasing k-values, decreasing capacity values, or decreasing uptake under specified conditions (e.g., equal initial or equilibrium concentration of divalent cation), were found to vary with clay type and sequence parameter chosen.

The adsorption of the divalent cations was accompanied by proton displacement. Most of the observed solution pH changes can be explained in terms of competitive adsorption, but with kaolin and illite, there was a small residual effect which has been attributed to specific interactions at edge sites.

The observed adsorption behaviour, and H+ release patterns, indicate that sites of different nature and accessibility are present, and the study clearly demonstrates that the equilibrium position is sensitive to the total chemical environment.

The mechanism of the adsorption process has been considered and extension to natural clays, e.g. in soils, is discussed briefly.

? Rose, S. (1989), The heavy-metal adsorption characteristics of hawthorne formation (Florida, USA) sediments. *Chemical Geology*, **74** (3-4), 365-370.

Full Text: [1989\Che Geo74, 365.pdf](1989/Che%20Geo74,%20365.pdf)

Abstract: The Hawthorne Formation is hydrologically significant in that its massive clay beds confine the principal artesian aquifer in peninsular Florida and other southeastern Coastal Plain locations. Heavy-metal (Pb2+, Cu2+, Zn2+, Cd2+ and Cr3+) isotherms (25°C, pH = 4.0–6.0) were established to define adsorption parameters for these sediments. The relationship between ionic adsorption and metal concentration conformed to the linear Langmuir equation over a wide range of initial metal concentrations (50–1150 mg l−1).

Calculated adsorption maxima associated with the divalent ions (5–26 meq/100 g) were less than the cation exchange capacity (c.e.c.) (13–33 meq/100 g), indicating that these ions were not specifically adsorbed (“fixed”) to exchange sites. In contrast, the adsorption maxima for Cr3+ (27–54 meq/100 g) greatly exceeded the c.e.c., demonstrating that metal attenuation is a function of ionic valence.

The adsorption maxima and the c.e.c. correlated well with the percentage of clay. This reflects the presence of smectite (as determined by X-ray diffractometry) throughout the entire section of Hawthorne Formation within this study area. The correlation between percentage clay and Langmuir adsorption maxima is significant in that it provides some physical credibility for application of the controversial Langmuir model.

? Middelburg, J.J. and Comans, R.N.J. (1991), Sorption of cadmium on hydroxyapatite. *Chemical Geology*, **90** (1-2), 45-53.

Full Text: [1991\Che Geo90, 45.pdf](1991/Che%20Geo90,%2045.pdf)

Abstract: Equilibrium and kinetic data for Cd sorption on hydroxyapatite are presented for a wide range of Cd2+ concentrations. Experimental conditions were kept close to those found in freshwater environments. Dissolved Cd2+ concentrations after equilibration ranged from environmental levels (< 0.1 µg l-1) up to values 6 orders of magnitude higher. At low Cd2+ concentrations (< 500 µg l-1) the equilibrium data follow a Langmuir isotherm, but at higher concentrations solutions are supersaturated with respect to CdCO3. Precipitation of this phase further controlled dissolved Cd2+ concentrations. For low concentrations of Cd2+, an initial rapid uptake of Cd is followed by a period of relatively slow removal from solution. Because of slow sorption processes Cd continues to be taken up even after 28 days. The high affinity of the hydroxyapatite surface for Cd, when compared to other natural solids studied under similar experimental conditions, is consistent with the enrichment of Cd in phosphorite deposits.

Keywords: Apatites Cd5(MO4)3x, Calcite, Surface, Cd5(AsO4)3Br, Cd5(PO4)3Br, Cd5(VO4)3Br, Adsorption, Particles, Model, Ions.

Notes: highly cited

? Mayer, L.M. (1994), Relationships between mineral surfaces and organic carbon concentrations in soils and sediments. *Chemical Geology*, **114** (3-4), 347-363.

Full Text: [1994\Che Geo114, 347.pdf](1994/Che%20Geo114,%20347.pdf)

Abstract: Relationships between mineral specific surface area and organic carbon (OC) concentration are examined for sediments and soil A-horizons from throughout the world. I found (published elsewhere) that continental shelf sediments from many different regions exhibit downcore loss of OC to a refractory background level which shows a consistent relationship with mineral surface area (slope = 0.86 mg m-2 OC). This trend is equivalent to a monolayer of organic matter over all surfaces, and is termed the monolayer-equivalent (ME) level. Sediments and soils from other environments are compared to this empirically derived relationship. Several continental slope areas show extension of this relationship to considerable depth. Marked excesses of OC above this trend, which persist downcore, were found in sediments with high carbonate mineral content or slope sediments with low dissolved oxygen concentrations in the overlying water column. About half of the soils examined also adhered to this relationship, while soils with high carbonate content, low pH, or poor drainage showed OC concentrations higher than the ME level. OC concentrations below the ME level are found in deltaic regions and areas with low organic matter delivery such as the deep sea or arid soils. The nature of mineral surfaces was examined using N2 adsorption-desorption isotherms, and most surface area was found to be present as pores with < 8-nm widths. A hypothesis is developed that explains the observed OC concentrations as a saturation of adsorption sites within small pores, which are small enough to exclude hydrolytic enzymes and hence protect organic matter against biological attack. The relationship between this hypothesis and other hypothesized protection mechanisms is discussed. Adsorption is shown to provide a mechanistic and quantitative explanation for spatial and temporal relationships between sedimentation rate and OC burial.

Keywords: Adsorption, Areas, Burial, Degradation, Marine-Sediments, Matter, Ocean, Particles, Progress, Proteins, Surface Area, Water

Notes: highly cited

? Valsami-Jones, E., Ragnarsdottir, K.V., Putnis, A., Bosbach, D., Kemp, A.J. and Cressey, G. (1998), The dissolution of apatite in the presence of aqueous metal cations at pH 2-7. *Chemical Geology*, **151** (1-4), 215-233.

Full Text: [1998\Che Geo151, 215.pdf](1998/Che%20Geo151,%20215.pdf)

Abstract: Apatite dissolution was studied at 25°C in a series of batch experiments carried out within the pH range of 2-7 with or without the presence of aqueous Pb2+ or Cd2+. The synthetic, microcrystalline hydroxylapatite used in the majority of the experiments was found to have a significantly higher solubility than natural fluorapatite, but a lower dissolution rate. The dissolution rates of both phases increased with decreasing pH. When Pb2+ was present in solution in contact with synthetic hydroxylapatite its concentration decreased over a time interval ranging from several days to several weeks, to a steady state minimum. The rate of Pb2+ loss from solution was sensitive to acidity, and progressed faster at lower pH, but maximum loss was independent of pH. Calcium release to solution matched aqueous lead loss on a mole for mole basis. By the end of each experiment mass calculations suggest that all apatite had been consumed regardless of reaction rate and pH. The solid residue was newly crystallised Pb-hydroxylapatite. This reaction was also observed in situ using Atomic Force Microscopy (AFM) and was found to take place epitaxially onto apatite surfaces. The concentration of aqueous Cd2+ in solution was also reduced in the presence of hydroxylapatite. Cadmium losses were, however, substantially lower. Unlike Pb2+, the maximum amount of Cd2+ lost from solution was a function of pH, and was higher as solution composition approached neutral pH. Cadmium was present in the solid residue at the end of these experiments, probably as a Ca-Cd phosphate solid solution. This work suggests that the interaction between apatite and metals in solution is controlled by apatite dissolution and results in the precipitation of new metal phosphates. The new phosphates nucleate heterogeneously onto the hydroxylapatite surfaces, which acts as a catalyst for the reaction. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: 25°C, AFM, Apatite, Cadmium, Cadmium Ions, Calcium Hydroxyapatite, Catalyst, Dissolution, Feldspar Dissolution, Interaction, Kinetics, Lead, Lead Immobilization, Metals, Minerals, Phosphates, Solubility, Sorption, Surface, Synthetic Hydroxyapatites

Daughney, C.J., Fein, J.B. and Yee, N. (1998), A comparison of the thermodynamics of metal adsorption onto two common bacteria. *Chemical Geology*, **144** (3-4), 161-176.

Full Text: [C\Che Geo144, 161.pdf](C/Che%20Geo144,%20161.pdf)

Abstract: The cell walls of bacteria are known to adsorb a variety of metals, and thus they may control metal mobilities in many low-temperature aqueous systems. In order to quantify metal adsorption onto bacterial surfaces, recent studies have applied equilibrium thermodynamics to the specific chemical and electrostatic interactions occurring at the solution-cell wall interface. However, to date, few studies have used this approach to compare the surface properties and metal affinities of different species of bacteria. In this study, we use acid-base titrations to determine the concentrations and deprotonation constants of specific surface functional groups on Bacillus licheniformis. The cell wall displays carboxyl, phosphate and hydroxyl surface functional groups, with pK (a) values and 1s errors of 5.2±0.3, 7.5±0.4 and 10.2±0.5, respectively. We perform metal-B. licheniformis adsorption experiments using Cd, Pb, Cuand Al. The average log K values for the Cd-, Pb-, Cu-and Al-carboxyl stability constants, with 1s errors, are 3.9±0.5, 4.6±0.3, 4.9±0.4 and 5.8±0.3, respectively. Finally, we compare the surface characteristics and metal affinities of B. licheniformis to those of Bacillus subtilis, as determined by Fein *et al*. [Fein, J.B., Daughney, C.J., Yee, N. and Davis, T. (1997), A chemical equilibrium model of metal adsorption onto bacterial surfaces, *Geochim Cosmochim Acta*, **61**, 3319-3328]. Our investigations indicate that these two species of bacteria have different relative and absolute concentrations of surface sites and slightly different deprotonation and metal adsorption stability constants. We relate these variations in surface properties to variations in metal affinity in order to predict metal mobilities in complex, natural systems.

Mukhopadhyay, B. and Walther, J.V. (2001), Acid-base chemistry of albite surfaces in aqueous solutions at standard temperature and pressure. *Chemical Geology*, **174** (4), 415-443.

Full Text: [C\Che Geo174, 415.pdf](C/Che%20Geo174,%20415.pdf)

Abstract: Surface acidity of albite has been determined by potentiometric titration of water-washed and unwashed powders at 23.5°C and pH range of 2-9.5. Using NH4Cl as the background electrolyte the surface was titrated with HCl and NH4OH in both forward and backward directions. These titrants have the advantage of possessing the same acid-and base-radicals as those of the background electrolyte salt. Acidimetric forward titration of unwashed albite, which is also independent of dissociation of NH4+, shows that titration curves of various ionic strengths intersect at a pH near 3.93 (point of zero salt effect or pHPZSE). The back titrations did not yield a unique pHPZSE. The pH values of point of zero charge (pHZPC) calculated from alkalimetric back titration experiments range from 6.75 to 8.14 depending on the prewashed or unwashed nature of the albite and the ionic strength of the solution. During acidimetric back titration, the pHZPC values vary from 4.15 to 7.14 depending upon the same factors. Published reports on feldspar surface chemistry have relied upon back titration experiments, but these experiments yielded doubtful and discrepant values of pH where the surface charge solely due to protonation is zero (point of zero net proton charge or pHPZNPC). These resulted due to a combination of factors that included differential dissolution of the mineral, precipitation of Al(OH)3, adsorption of ions from the electrolyte salt, and the nature of prewashing. The two contrasting pretreatments produce a Si-rich feldspar surface at acidic pH and an Al-rich feldspar surface at alkaline pH that partly control the difference in results obtained from the back titrations that proceed from the two opposite ends of the pH scale. Therefore, only acidimetric forward titrations with unwashed albite were used in this study, since these yield the most meaningful information on the acid-base chemistry of feldspar surface. The surface charge (sigma (S)) arising simply due to protonation is given by molar concentrations of surface-adsorbed hydrogen ions, [H-Ad(+)] since sigmas = F X [H-Ad(+)]. However, sigmas obtained from calculated values of surface-reacted total proton charge (sigma (SR)) is significantly affected by charged species of Al, Si, Ca, and CO2 that are present in the solutions and Na+ double left right arrow H+ exchange that occurs on feldspar surface in solution. For all compositions, in the pH range studied, the net charge of the aqueous species that must be algebraically added to sigma (SR) to obtain sigma (s), is negative. Thus, the real values of [H-Ad(+)] must be lower than the apparent values of measured concentrations of surface-reacted H+ or [H-s(+)]. The magnitude of this correction is dependent upon the pH at which the solution compositions are determined. When the net charges of the dissolved species are estimated in the forward acid titration with unwashed albite, the corrected surface charge versus pH curves of various ionic strengths show pHPZNPC = 4.38-4.72. The correction procedures assume bulk electrical neutrality of the solution and quasi-equilibrium conditions within the time frame of the experiments and hence disregard the kinetics of dissolution. Since the estimates of the charge in this case are based on solutions collected at alkaline pH, the corrections for charged aqueous species give slight overestimation of surface charge.

Hence, for the unwashed albite, PHPZNPC = PHPZSE = 3.93±0.05. Below this pH, the amount of surface adsorbed [H+] is independent of pH. Consistent with this observation is a theoretically calculated adsorption isotherm with an assumed value of pHPZNPC = 3.93. The theoretically constructed curve further supports that the amount of [H-Ad(+)] is exceedingly small below pHPZNPC. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Acid-Base Chemistry, Albite Surfaces, Aqueous Solution, Feldspar Dissolution, Low pH, 25°C, Adsorption, Oxides, Charge, Rates

? Stipp, S.L.S., Hansen, M., Kristensen, R., Hochella, M.F., Bennedsen, L., Dideriksen, K., Balic-Zunic, T., Leonard, D. and Mathieu, H.J. (2002), Behaviour of Fe-oxides relevant to contaminant uptake in the environment. *Chemical Geology*, **190** (1-4), 321-337.

Full Text: [2002\Che Geo190, 321.pdf](2002/Che%20Geo190,%20321.pdf)

Abstract: The behaviour of Fe-oxides was investigated during precipitation and co-precipitation, phase transformation and dissolution, while their ability to adsorb and incorporate trace components was examined. Some samples were synthesised and studied under controlled laboratory conditions and other samples were taken from experiments designed to test the effectiveness of waste treatment strategies using iron. Surface-sensitive and high-resolution techniques were used to complement information gathered from classical, macroscopic methods.

Adsorption isotherms for Ni2+ uptake on synthetic ferrihydrite (Fe5HO8.4H2O often written simply Fe(OH)3), goethite (alpha-FeOOH), hematite (alpha-Fe2O3) and magnetite (Fe3O4) were all similar, increasing as expected at higher pH. Desorption behaviour was also similar, but one third or more of the Ni2+ failed to return to solution. In the past, “irreversible sorption” has been blamed on uptake into micro-fractures or pores, but during examination (using Atomic force microscopy, AFM) of hundreds of Fe-oxide particles, no evidence for such features could be found, leading to the conclusion that Ni2+ must become incorporated onto or into the solids. When solutions of Fe(II) are oxidised in controlled laboratory conditions or during treatment of ash from municipal waste incinerators, two-line ferrihydrite forms rapidly and on never-dried samples, AFM shows abundant individual particles with diameter ranging from 0.5 to several tens of nanometers. Aging in solution at 70°C promotes growth of the particles into hematite and goethite and their identification (by X-ray powder diffraction, XRPD, with Rietveld refinement) becomes possible at the same aging stage as mineral morphology becomes recognisable by AFM. In other experiments that were designed to mimic natural attack by organic acids, colloidal lepidocrocite (gamma-FeOOH) was observed in situ by AFM, while reductive dissolution removed material on specific crystal faces. Lath ends are eroded fastest while basal planes are more stable.

In order to help elucidate mechanisms of contaminant immobilisation by Fe-oxides, we examined samples from a reactive barrier made with 90% quartz sand, 5% bentonite and 5% zero-valent iron filings that had reacted with a solution typical of leachate from coal-burning fly ash using time-of-flight secondary ion mass spectroscopy (TOF-SIMS). Fe(0) oxidised to Fe(III), while soluble and toxic Cr(VI) was reduced to insoluble Cr(III). Chemical maps show Fe-oxide coatings on bentonite; Cr is associated with Fe-oxides to some extent but its association with Ca in a previously undescribed phase is much stronger. Other samples taken from municipal waste incinerator ash that had been treated by aeration in Fe(II) solutions were examined with transmission electron microscopy (TEM), selected area electron diffraction (SAED) and energy dispersive X-ray spectroscopy (EDS). Ph and some Zn are seen to be dispersed throughout two-line ferrihydrite aggregates, whereas Sri and some Zn are incorporated simply as a result of entrainment of individual ZnSn-oxide crystallites.

Geochemical speciation models that fail to account for contaminant uptake in solid solutions within major phases or as thin coatings or entrained crystals of uncommon phases such as those described here risk to underestimate contaminant retardation or immobilisation. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Atomic Force Microscopy (AFM), Time-of-Flight Secondary Ion Mass Spectroscopy (TOF-SIMS), X-Ray Photoelectron Spectroscopy (XPS), Transmission Electron Microscopy (TEM), Energy Dispersive X-Ray Spectroscopy (EDS), Selected Area Electron Diffraction (SAED), X-Ray Powder Diffraction (XRPD), Rietveld Refinement, Fe-Oxide, Fe-Hydroxide, Fe-Oxyhydroxide, Ferrhydrite, Goethite, Hematite, Magnetite, Lepidocrocite, Zero-Valent Iron, Precipitation, Transformation, Dissolution, Adsorption, Immobilisation, Incorporation, Zero-Valent Iron, Coal Fly-Ash, Multiplet Structure, Vacancy Levels, Goethite, Adsorption, Kinetics, Lepidocrocite, Ferrihydrite, Remediation

? Vico, L.I. (2003), Acid-base behaviour and Cu2+ and Zn2+ complexation properties of the sepiolite/water interface. *Chemical Geology*, **198** (3-4), 213-222.

Full Text: [2003\Che Geo198, 213.pdf](2003/Che%20Geo198,%20213.pdf)

Abstract: Sepiolite is a clay mineral with a wide range of applications derived from its sorptive properties. In this work, aspects of the adsorption of Cu(II) and Zn(II) from aqueous solutions to particles of this material have been studied as a function of the pH and ionic strength of the medium. Cu2+, Zn2+, Mg2+ and Na+ in the suspensions were determined by atomic absorption spectrometry. Amounts of this cations interchanged had been calculated by the difference between concentrations before and after the contact with the mineral. The adsorption data suggest three possible mechanisms that could be involved in the interaction between metal ions like Cu2+ and the surface of the mineral: (1) A process of ion exchange in which Cu2+ replaces Na+. (2) Adsorption Of Cu2+ on surface squareSOH sites on the broken edges of the mineral with simultaneous release of protons. This mechanism takes into account the enhancement of adsorption with increasing pH. The final step of this reaction should be the incorporation of adsorbed cation to octahedral sheet. (3) Replacement of Mg2+ in the edges of octahedral sheet for Cu2+ could be another mechanism that contributes to the total adsorption phenomena. Similar mechanisms may involve the adsorption of Zn2+. The values obtained for complexation constants (constant capacitance model) were lower for this ion than for Cu2+. (C) 2003 Elsevier Science BY. All rights reserved.

Keywords: Sepiolite, Adsorption, Copper, Zinc, Metal-Ions, Adsorption, Montmorillonite, Mechanisms, Hydrolysis, Hectorite, Sorption, Clays

# Title: Chemical Health and Safety

Full Journal Title: [Chemical Health and Safety](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6279&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=c8c7cd5c14977c1d7866242d02b81358)

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Subject Categories:

: Impact Factor

(2003), SARS––What is next and how do you know? *Chemical Health and Safety*, **10** (4), 35.

Full Text: [C\Che Hea Saf10, 35.pdf](C/Che%20Hea%20Saf10,%2035.pdf)

# Title: Chemical Industry & Chemical Engineering Quarterly

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Subject Categories:

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? Cobzaru, C., Cibotaru, C., Rotariu, A., Marinoiu, A. and Oprea, S. (2009), Kinetic study of the sorption process with Cu(II) ions on clinoptilolite and analcime. Effects of temperature and particle size. *Chemical Industry & Chemical Engineering Quarterly*, **15** (2), 63-67.

Full Text: [2009\Che Ind Che Eng Qua15, 63.pdf](2009/Che%20Ind%20Che%20Eng%20Qua15,%2063.pdf)

Abstract: The sorption process of the Cu(II) ions on the clinoptilolite and analcime containing volcanic tuff was studied at different temperatures like 40, 60 and 80ºC. The effects of temperature and a particle size on the sorption capacity of the used zeolites were analysed.

Keywords: Clinoptilolite, Analcime, Sorption Process

? Stankovic, V., Bozic, D., Gorgievski, M. and Bogdanovic, G. (2009), Heavy metal ions adsorption from mine waters by sawdust. *Chemical Industry & Chemical Engineering Quarterly*, **15** (4), 237-249.

Full Text: [2009\Che Ind Che Eng Qua15, 237.pdf](2009/Che%20Ind%20Che%20Eng%20Qua15,%20237.pdf)

Abstract: In this work the results on the batch and column adsorption of copper and some associated ions by employing linden and poplar sawdust as a low-cost adsorbent are presented. The mine water from a local abandoned copper mine, as well as synthetic solutions of those ions which are the main constituents of the mine water were both used as a model-system in this study. The adsorption ability of the chosen sawdust to adsorb heavy metal ions is considered as a function of the initial pH of the solution and kind of metal ions. At lower pH of solutions the adsorption percentage (AD 016) decreases leading to a zero AD % at pH < 1.1. Maximum AD % is achieved at 3.5 < pH < 5. It was found that poplar and linden sawdust have both almost equal adsorption capacities against copper ions. The highest AD % (approximate to 80%) was achieved for Cu2+, while for Fe it was slightly above 10%. The other considered ions (Zn2+ and Mn2+) were within this Interval The results obtained In the batch mode were verified through the column test by using the real mine water originating from an acid mine drainage (AMD) of the copper mine “Cerovo”, RTB Bor The breakthrough curves are presented as a function of the aqueous phase volume passed through the column allowing having an insight into the column adsorption features. Breakthrough points were determined for copper manganese and zinc ions. A very high adsorption degree - higher than 99 916, was achieved in these experiments for all mentioned ions. After completing the adsorption, instead of desorption, the loaded sawdust was drained, dried and burned; the copper bearing ash was then leached with a controlled volume of sulphuric acid solution to concentrate copper therein. The obtained leach solution had the concentration of copper higher than 15 g dm-3 and the amount of H2SO4 high enough to serve as a supporting electrolyte suitable to be treated by the electrowinning for recovery of copper The technology process based on the column adsorption is proposed and discussed.

Keywords: Acid Mine Drainage, Ad, Adsorbent, Adsorption, Adsorption Capacities, Aqueous Phase, Aqueous-Solutions, Batch, Batch Mode, Biosorbent, Biosorption, Breakthrough, Breakthrough Curves, Column, Concentrate, Concentration, Copper, Cu(II), Cu2+, Desorption, Drainage, Experiments, Fixed-Bed Column, Function, Heavy Metal, Heavy Metal Ions, Industrial Effluents, Insight, Ions, Leaching, Local, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Manganese, Metal, Metal Ions, Mine Drainage, Mine Water, Mode, pH, Poplar Sawdust, Recovery, Removal, Sawdust, Solution, Solutions, Sorption, Sulphuric Acid, Technology, Volume, Waste-Water, Water, Work, Zinc, Zn2+

# Title: Chemical Industry and Engineering Progress

Full Journal Title: [Chemical Industry and Engineering Progress](http://www.cqvip.com/QK/95836X/)

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ISSN: 1000-6613

Issues/Year:

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Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhou, J., Yang, Y.R. and Wang, J.D. (2005), Elimination of As(III) from groundwater by bead cellulose adsorbent loaded with Fe(beta-FeOOH). *Chemical Industry and Engineering Progress*, **24** (4), 403-407.

Full Text: [2005\Che Ind Eng Pro24, 403.pdf](2005/Che%20Ind%20Eng%20Pro24,%20403.pdf)

Abstract: Liquid nitrogen adsorption technique was used to obtain poreproperties of activated carbon from scrap tires (TAC) and commercial activated carbon (CAC). The mesopore volume of TAC was about 95.15 % of the total porevolume. TAC is a new mesoporous materialas compared with commercial activated carbon. TAC will make it possible to adsorb and separate big volume molecule from wastewater. TAC was used to remove chromium Cr(VI) from wastewater. TAC had big adsorption capacity, fast adsorption rate, and was easy to yeach equilibrium. So TAC could be an effective adsorbent for wastewater treatment. Its predominant mesopores intensified the adsorption of hydrated HCrO4- ions from wastewater . The adsorption kinetics was tested with the pseudo first order and pseudo second order reaction model. The rate constants of adsorption for these kinetics models were calculated. The pseudo second order chemical reaction model provided the better correlation of data.

Keywords: Scrap Tire, Mesoporous Activated Carbon, Wastewater Treatment, Cr(VI), Adsorption Kinetics

# Title: Chemical Journal of Chinese Universities-Chinese

Full Journal Title: Chemical Journal of Chinese Universities-Chinese

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0251-0790

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Guo, X.J. and Chen, F.H. (2005), Elimination of As(III) from groundwater by bead cellulose adsorbent loaded with Fe(beta-FeOOH). *Chemical Journal of Chinese Universities-Chinese*, **26** (7), 1258-1263.

Full Text: Che J Chi Uni-Chi26, 1258

Abstract: A new adsorbent, bead cellulose loaded with Fe hydroxide (beta-FeOOH) was prepared and applied to the removal of arsenite from groundwater. The adsorbent has perfect properties in As(V) and As(III) adsorption capacity, selectivity and kinetics. There is no need of pH adjusting and preoxidation during the arsenite removal. The adsorbent is porous and has excellent mechanical properties. The adsorbent has a high content of Fe, which is the reactive center with a high reactivity for sorption of arsenite. The sorption kinetic data can be described by the Lagergren pseudo-second order rate equation. Arsenate elimination was favored at pH = 6-9. The addition of chloride, sulfate did not affected the arsenite removal efficiency. The column experiment indicated that the breakthrough and saturation capacity were large with high velocity flow and influent arsenite concentration. The adsorbent can be generated with NaOH solutions, and the desorption and regeneration process were effective. The beta-FeOOH loaded in the bead cellulose was chemically stable during the column experiment and regeneration.

Keywords: Coated Sand, Adsorption, Removal, Water, Arsenic(III), Mechanisms, Goethite

? Zhang, J., Zhang, Z.P., Song, Y. and He, B.K. (2005), Preparation of Cibacron Blue F3GA attached chitosan microspheres and their adsorption properties for bovine serum albumin(BSA). *Chemical Journal of Chinese Universities-Chinese*, **26** (12), 2363-2368.

Full Text: Che J Chi Uni-Chi26, 2363

Abstract: A series of novel aminated chitosan microbeads were prepared from chitosan through inverse suspension crosslinking, hydroxylpropyl-chlorination and amination. Affinity dye-ligand, Cibacron Blue F3GA, was covalently coupled with the animated chitosan microspheres via space arm between the triazine ring of Cibacron Blue F3GA and the amino groups of the microspheres. The maximum attachment of Cibacron Blue F’3GA was 494 mu mol/g by changing the crosslinking degree of the microspheres. Albumin adsorption onto Cibacron Blue F3GA-attached chitosan microspheres was investigated. The BSA equilibrium adsorption capacity was 95.2 mg/g dry beads. The adsorption phenomena appeared to follow a typical Langmuir isotherm. The highest desorption ratio (over 99%) was achieved by using 1.0 mol/L NaSCN (pH = 8.0). The Cibacron Blue F3GA-attached chitosan microspheres could be reused without significant decreases in the adsorption capacities.

Keywords: Adsorption, Affinity Membranes, Bsa, Chitosan, Chromatography, Cibacron Blue F3GA, Column, Dye-Affinity Sorbent, Dye-Ligand, Human Plasma, Langmuir, Macroporous Chitosan, Media, Microbeads, Polyamide, Proteins, Purification

? Guo, Z. and Yuan, Y. (2007), Kinetics and thermodynamics of adsorption of phenol onto mesoporous carbon-CMK-3. *Chemical Journal of Chinese Universities-Chinese*, **28** (2), 289-292.

Full Text: [2007\Che J Chi Uni-Chi28, 289.pdf](2007/Che%20J%20Chi%20Uni-Chi28,%20289.pdf)

Abstract: Mesoporous carbon CMK-3 was used to adsorb phenol from water by comparing its adsorption ability with commercial spherical activated carbon(CAC). CMK-3 had a higher adsorption capacity and faster adsorption rate than CAC. The adsorption property of phenol onto the mesoporous carbon CMK-3 was discussed from the thermodynamic and kinetic viewpoints. The adsorption parameters for Langmuir and Freundlich isotherm models were determined for CMK-3. Both isotherms were suitable models to analyze the equilibrium data for the phenol adsorption. However, the Freundlich model fitted better than the Langmuir model. The adsorption kinetics was tested with the pseudo-first-order and pseudo-second-order reaction model. The rate constants of adsorption for these kinetics models were calculated. The pseudo-second-order kinetic model provided the best correlation of the experimental data compared to the pseudo-first-order model. The thermodynamic constants of the adsorption process Delta G(0), Delta S-0 and Delta H-0 were evaluated. These show that adsorption of phenol on CMK-3 was endothermic and spontaneous.

Keywords: Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Rate, Adsorption Thermodynamics, Capacity, Carbon, Carbons, CMK-3, Correlation, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Model, Models, Molecular-Sieves, Parameters, Phenol, Reaction, Thermodynamic, Thermodynamics, Water

? Zhang, Y.Y., Zhou, K. and Ping, Z.H. (2007), Studies on an affinity sorbent with polyvinylimidazole as ligand for removing endotoxin. *Chemical Journal of Chinese Universities-Chinese*, **28** (7), 1371-1376.

Full Text: [2007\Che J Chi Uni-Chi28, 1371.pdf](2007/Che%20J%20Chi%20Uni-Chi28,%201371.pdf)

Abstract: A novel composite affinity adsorption material bearing polyvinylimidazole (PVI) as the ligand for selective removal of endotoxin (ET) was prepared by graft polymerization of vinylimidazole onto silica gel particles in DMF (N, N-dimethyl-formamide). The characteristic bands of imidazole ring at 1500 cm-1 and 665 cm-1 were detected via FTIR and the grafting degree(GD) of PVI was measured with TGA according to the weight loss of the sample. The ET adsorption capacity of the sorbents shows dependence on GD of PVI on the sorbent, and the maximum ET adsorption capacity was attained with GD of 2.5%. The effects of ionic strength and pH values of the testing solution on the sorbent performance were also studied. At pH = 7 and ionic strength lower than 1 mol/L the sorbent had the best adsorption ability toward ET even in presence of BSA. The sorbent shows a good blood compatibility. The adsorption kinetics and the isotherm of the sorbent were well accorded with the second order equation and Freundlich equation, respectively. The results reveal the applicability of PVI or other compounds with imidazole group to serve for good ligand in ET removal.

Keywords: Adsorption, Adsorption Ability, Adsorption Capacity, Adsorption Kinetics, Affinity, Affinity Adsorption, Beads, Blood, Blood Compatibility, BSA, Capacity, Compatibility, Composite, Dependence, Dna, Effects, Endotoxin, Freundlich, Freundlich Equation, FTIR, GD, Gel, Graft, Graft Copolymerization, Graft Polymerization, Grafting, Group, Histidine, Ionic Strength, Ionic Strength and pH, Isotherm, Kinetics, Ligand, Membrane Adsorbers, Order, Particles, Performance, pH, pH Values, Polymerization, Protein Solutions, Removal, Second Order, Selective, Silica, Silica Gel, Sorbent, Sorbents, Strength, Testing, TGA, Vinylinudazole, Weight Loss

? Zhang, L., Li, H.M., Han, G.X. and Kang, P.L. (2010), Adsorption behavior and mechanism of nano-Al2O3 for Ge(IV). *Chemical Journal of Chinese Universities-Chinese*, **31** (1), 135-140.

Full Text: [2010\Che J Chi Uni-Chi31, 135.pdf](2010/Che%20J%20Chi%20Uni-Chi31,%20135.pdf)

Abstract: The effects of various equilibrium time, temperature and pH on the adsorption of Ge(IV) on nano-Al2O3 were studied. The results show that the adsorption is fast to reach equilibrium within 2 min. It was found that the adsorption efficiency of Ge(IV) was more than 95% with pH from 4 to 11. Almost all of Ge(IV) ions adsorpted onto nano-Al2O3 can be eluted with 0.3 mol/L K-3 PO4-1 mol/L H2SO4 mixed solution within 5 min, the desorption percentage can reach 97%. The sorption of Ge(IV) ions onto nano-Al2O3 followed the second-order rate equation, the kinetic experimental data properly correlate with the second-order kinetic model and the values of activation energy(E-a) was 11.63 kj/mol. The adsorption data are fitted to the Freundlich and the magnitude of sorption energy computed from D-R equation is 10.87 kJ/mol, thus, the type of the adsorption of germanium on nano-Al2O3 is a chemical adsorption. The Delta G(0) and Delta H-0 values is negative and positive respectively which indicate the adsorption of Ge(IV) on nano-Al2O3 is spontaneous and endother-mic.

Keywords: Ge(IV), Nano-Gamma-Al2O3, Adsorption, Kinetics, Thermodynamic, Germanium

? Han, Z.B., Dong, Y.C. and Liu, C.Y. (2010), Coordination of modified pan fibers with Fe3+ and catalytic activity of their complexes for dye degradation. *Chemical Journal of Chinese Universities-Chinese*, **31** (5), 986-993.

Full Text: [2010\Che J Chi Uni-Chi31, 986.pdf](2010/Che%20J%20Chi%20Uni-Chi31,%20986.pdf)

Abstract: The amidoximated PAN fiber(denoted as AO-PAN) and the mix-modified PAN fiber(denoted as M-PAN) were prepared with hydroxylamine and its mixture with hydrazine, and then used to coordinate with Fe3+ respectively, to produce two Fe-modified PAN fiber complexes (denoted as Fe-AO-PAN and Fe-M-PAN, respectively). Coordinating kinetics of both modified PAN fibers with Fe3+ was mainly studied, and effect of temperature and Fe3+ initial concentration on coordinating kinetics were also examined. The catalytic activities of both Fe-modified PAN fiber complexes were investigated in the oxidative degradation of an azo dye (Reactive Red 195) by DRS and ESR methods. The results indicated that within the observed temperature and concentration range, equilibrium data for the coordination of Fe3+ with two modified PAN fibers were obtained and correlated with Langmuir and Freundlich isotherm equations, and coordination kinetics showed better agreement with the Lagergren second order equation. Fe coordinating capacity and reaction rate constant of AO-PAN to Fe3+ were higher than those of M-PAN to Fe at the same conditions, indicating that AO-PAN reacted with Fe3+ more easily than M-PAN. Two Fe-modified PAN fibers complexes have the significant catalytic effect on dye degradation, and Fe-AO-PAN showed the stronger catalytic performance than Fe-M-PAN in the dark. Moreover, catalytic ability of the Fe-modified PAN fiber complexes, especially Fe-AO-PAN was remarkably enhanced by light irradiation.

Keywords: Adsorption, Azo Dye, Capacity, Catalytic, Complexes, Concentration, Coordination, Coordination Reaction, Data, Degradation, Drs, Dye, Equilibrium, ESR, Fe, Fe3+, Fibers, Fibrous Catalyst, Freundlich, Freundlich Isotherm, Ions, Irradiation, Isotherm, Isotherm Equations, Kinetics, Langmuir, Methods, Modified, Modified Pan Fiber, Performance, Photocatalysis, Photodegradation, Rate Constant, Second Order, Second-Order, Temperature

# Title: Chemical Kinetics

Harper Collins Publishers, New York

? Laidler, K.J. (1987), *Chemical Kinetics*, Harper Collins Publishers, New York.

# Title: Chemical and Metallurgical Engineering

Full Journal Title: Chemical and Metallurgical Engineering

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tolman, R. and Karrer, S. (1920), Motion of droplets and particles in the field of the corona discharge. *Chemical and Metallurgical Engineering*, **22**, 1203-1206.

Abstract: This work was undertaken in order to throw some light upon the electrostatic precipitation of dust. The particles were dropped through a discharge chamber into which light from an electric arc was passed and photographs were taken of the particles in motion. The discharge chamber consisted of a wire between two plates and the electric pressure was rectified. The authors distinguish the following four methods by which droplets may obtain an electric charge, namely: (1) By electrostatic induction, (2) by conduction from the earth when the jet is earthed, (3) by the adsorption of gaseous ions, and (4) by direct contact with the central wire. With regard to the induction effect, it was found that when a stream of water was introduced into the field between the wire and plates there was a general tendency for the jet as a whole to bend towards the wire. This is doubtless due to the charges on opposite sides of the particles, those on the side of the more intense field experiencing a greater force. Arrangements were made so that the stream could be earthed and the effect then determined of earthing either the central wire or the plates. The motion of the earthed stream towards the un-earthed electrode was found to be very marked, provided that the voltage was not too high. With higher voltages, however, the corona effect became marked and of much greater importance. When this stage is reached the particles have a great tendency to assume a charge of the same sign as the central wire and to move away from it. This occurs whether the central wire is positive or negative. Thus the corona effect may completely overcome the earthing effect. It appears to the authors that the space charge in the field of a corona discharge, except in the immediate neighbourhood of the central wire, is of the same sign as the central wire. With regard to contact effect, the particles may obtain a charge in the field of a corona current by direct contact with one of the electrodes. If they come into contact with the central wire they are then repelled with great violence right through the ionisation region of the plate. Photographs are reproduced in support of these conclusions and corroborative experiments were made with single particles. It was noticed that a jet of water broke into finer particles when positively charged than when negatively charged and this apparently means that the surface tension of water is lowered more by a positive charge than by a negative charge.

Keywords: Adsorption, Water

# Title: Chemical Papers-Chemicke Zvesti

Full Journal Title: Chemical Papers-Chemicke Zvesti

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Klucakova, M.K. and Omelka, L. (2004), Sorption of metal ions on lignite and humic acids. *Chemical Papers-Chemicke Zvesti*, **58** (3), 170-175.

Abstract: The adsorption of some heavy metal ions (Co2+, Ni2+, and Cu2+) on modified lignite from South Moravia region was studied. The sorption properties of humic acids isolated from this lignite were also investigated. The kinetics of the adsorption process was described applying the Langmuir theory. The adsorption is considered to be the reaction of the second order, the desorption is described by the first-order kinetics. Nevertheless, the rate constants have to be taken as effective values, where the influence of the size and the shape of particles is included. The sorption capacity of lignites and humic acids was calculated using Langmuir isotherms. The regression analysis confirmed very good accordance of experimental data with the Langmuir relations. Therefore, it can be concluded that heavy metal ions are predominantly chemically bound to the lignite and humic acids. Simultaneously, substantially higher adsorption ability of humic acids was documented, when compared with that of unmodified or modified lignite.

Keywords: Fulvic-Acids, Adsorption, Complexation, Substances, Water, pH

# Title: Chemical & Pharmaceutical Bulletin

Full Journal Title: [Chemical & Pharmaceutical Bulletin](http://cpb.jstage.jst.go.jp/en/); [Chemical & Pharmaceutical Bulletin](http://sciencejournals.info/CPB.html)

ISO Abbreviated Title: Chem. Pharm. Bull.

JCR Abbreviated Title: Chem Pharm Bull

ISSN: 0009-2363

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Publisher: Pharmaceutical Soc Japan

Publisher Address: 2-12-15-201 Shibuya, Shibuya-Ku, Tokyo 150, Japan

Subject Categories:

Chemistry, Medicinal Chemistry: Impact Factor

Pharmacology & Pharmacy: Impact Factor 1.177, /181 (2000)

Wada, H., Satake, T., Murakami, T., Kojima, T., Saiki, Y. and Chen, C.M. (1985), Chemical and chemotaxonomic studies on pterophytes. 59. Chemical studies of the contents of Alsophila-spinulosa Tryon. *Chemical & Pharmaceutical Bulletin*, **33** (10), 4182-4187.

# Title: Chemical Physics

Full Journal Title: [Chemical Physics](http://sciencejournals.info/Chemical_Physics.html)

ISO Abbreviated Title: Chem. Phys.

JCR Abbreviated Title: Chem Phys

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cerofolini, G.F. (1978), Distribution function of adsorption energy in relation to overall adsorption-isotherm. *Chemical Physics*, **33** (3), 423-434.

? Loisruangsin, A., Fritzsche, S. and Hannongbua, S. (2008), An alternative approach for ab initio fitted potentials: The n-pentane/silicalite-1 system. *Chemical Physics*, **344** (1-2), 1-12.

Abstract: Quantum chemical calculations at the second-order Moller-Plesset perturbation (MP2) levels were performed to evaluate n-pentane/n-pentane and n-pentane/silicalite-1 interactions where several hundred configurations of the pair were generated. The silicalite-1 crystal structure was represented by a 10-T ring, in which the chemical composition is O[10]Si[10]H[20]. The energies of these configurations were fitted to analytical functions. Our goal was to reproduce both the experimental heat of adsorption (Q(st)) as well as the self-diffusion coefficient (D-s). The MP2/6-31+G(d,p) was applied and the collision constants were introduced into the ab initio fitted potential function. The extrapolated Q(st) from the newly developed function of 52.28 kJ/mol is 9.39% lower than that of the experiment and the dependence of the D, as a function of temperatures is in good agreement with that observed experimentally. The obtained function was applied for a series of molecular dynamics simulations by varying temperatures and the concentration of n-pentane. The obtained structural data were interpreted in terms of residence distributions. Their changes were, then, described in terms of a competition between potential fields exerted by the zeolite and molecular movement. The attractive potential fields dominate the molecular movement at low temperature and this dominance decreases when the temperature increases. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alternative, Branched Alkanes, Changes, Competition, Cyclic Alkanes, Diffusion, Diffusion, Dynamics, Experimental, Force-Field, Function, Functions, Heat of Adsorption, MD Simulation, Md Simulations, Molecular-Dynamics Simulations, Nuclear-Magnetic-Resonance, Pentane, Potential, Rights, Silicalite-1, Silicalite-1, Temperature, Zeolite, Zeolites

# Title: Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa

Full Journal Title: Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: 2010\Che Pro Eng-Inz Che Pro31, 801.pdf

Abstract: A model of mass transfer and chemical reaction kinetics for sorption of Cu2+ ions in hydrogel chitosan granules has been proposed. To determine the process rate, it is necessary to know physicochemical data of the solution and adsorbent and one experimental parameter which does not depend on the initial adsorbate concentration.

Keywords: Adsorbent, Adsorption, Chemical, Chitosan, Concentration, Cu2+, Data, Experimental, Hydrogel, Ions, Kinetics, Mass Transfer, Metals, Model, Peat, Reaction Kinetics, Solution, Sorbents, Sorption

? Bartoňová, L., Kořistková, M., Klika, Z., Kolat, P. and Simha-Martynková, G. (2009), Evaluation of elemental volatility in a fluidised bed power station in terms of unburned carbon study. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **30** (3), 495-506.

Full Text: [2010\Che Pro Eng-Inz Che Pro30, 495.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro30,%20495.pdf)

Abstract: The investigation was focused to behaviour of toxic minor and trace elements during coal combustion in a circulating fluidised bed power station. The evaluation was performed through the study of unburned carbon particles in terms of elemental and mineral compositions as well as their textural characteristics.

Keywords: Trace-Elements, Coal Combustion, Boiler Output, Behavior, Plant, Ash, Size

? Witek-Krowiak, A., Mitek, M., Pokomeda, K., Szafran, R.G. and Modelski, S. (2010), Biosorption of cationic dyes by beech sawdust. I. Kinetics and equilibrium modelling. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (3), 409-420.

Full Text: [2010\Che Pro Eng-Inz Che Pro31, 409.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro31,%20409.pdf)

Abstract: Removal of cationic dyes, rhodamine B and methylene blue, from aqueous solutions by unmodified beech sawdust was investigated. The adsorption kinetics and equilibrium data were fitted by various models. The pseudosecond order kinetics and the Langmuir model described biosorption data reasonably well. The maximum adsorption capacity was 70.40 mg.dm(-3) and 52.66 mg.dm(-3) for rhodamine B and methylene blue, respectively. The study shows that beech sawdust has the potential off application as an efficient sorbent for removal of cationic dyes.

Keywords: Adsorption, Adsorption Capacity, Adsorption Kinetics, Application, Aqueous Solutions, Biosorption, Capacity, Cationic Dyes, Data, Dyes, Equilibrium, Kinetics, Langmuir, Langmuir Model, Methylene Blue, Model, Modelling, Models, Potential, Removal, Rhodamine B, Rhodamine-B, Sawdust, Sludge, Solids, Solutions, Sorbent, Sorption

? Witek-Krowiak, A., Mitek, M., Pokomeda, K., Szafran, R.G. and Modelski, S. (2010), Biosorption of cationic dyes by beech sawdust II. Effect of parameters on the process efficiency. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (3), 421-432.

Full Text: [2010\Che Pro Eng-Inz Che Pro31, 421.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro31,%20421.pdf)

Abstract: Presented studies are focused on the use of beech sawdust waste biomass for the biosorption of cationic dyes (rhodamine B and methylene blue) from aqueous solutions. The biosorption kinetics of cationic dyes on beech sawdust has been studied. The effects of pH, temperature, salinity and surfactant addition on the dye uptake was investigated.

Keywords: Aqueous Solutions, Aqueous-Solution, Basic Dye, Biomass, Biosorbents, Biosorption, Biosorption Kinetics, Cationic Dyes, Dye, Dyes, Green, Kinetics, Methylene Blue, Peel, pH, Removal, Rhodamine B, Rhodamine-B, Salinity, Sawdust, Solutions, Sorption, Surfactant, Temperature, Uptake, Waste, Waste Biomass

? Rotkegel, A. (2010), Mathematical modelling of low temperature condensation coupled with adsorption. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (3), 433-449.

Full Text: 2010\Che Pro Eng-Inz Che Pro31, 433.pdf

Abstract: A mathematical model of removal of volatile organic compounds from air in an integrated system of condensation and adsorption has been presented. The model consists of two calculation steps: low temperature condensation of vapours and low temperature adsorption. Due to the character of both processes, each of them should be calculated separately.

Keywords: Adsorption, Air, Calculation, Cryogenic Condensation, Low Temperature, Mathematical Model, Model, Modelling, Organic, Organic Compounds, Removal, Temperature, Volatile Organic Compounds, Volatile Organic-Compounds

? Yesilyurt, M. and Gözübüyük, Ö. (2010), Adsorption of Pb(II) ions from aqueous solutions on fossilized wood. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (4), 567-578.

Full Text: [2010\Che Pro Eng-Inz Che Pro31, 567.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro31,%20567.pdf)

Abstract: The removal of lead from aqueous solutions on fossilized wood, Oltu stone, was explored and interpreted by both adsorption and kinetic mechanisms. Batch experiments were conducted to investigate the adsorption effect under various pH (3, 4, 6, and 7), temperatures (290, 298, 303, and 313 K) and the ratios of amounts of lead ions adsorbent (5.5, 8.3, 16.6, and 25 mg/g). The experimental data were analyzed based on the Freundlich, Langmuir and Dubinin-Radushkevich isotherm models. The batch adsorption was tested in terms of the pseudo-first order, pseudo second order and intraparticle diffusion kinetic reaction models. The equilibrium and kinetics data were used to evaluate the thermodynamics parameters. The thermodynamics studies revealed that adsorption of Pb(II) ions was endothermic. It followed the Freundlich model with the pseudo second order kinetics.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous Solutions, Batch, Batch Adsorption, Data, Diffusion, Endothermic, Equilibrium, Experimental, Experiments, Freundlich, Freundlich Model, Heavy-Metal Ions, Intraparticle Diffusion, Ions, Isotherm, Isotherm Models, Kinetic, Kinetics, Langmuir, Lead, Lead(II) Ions, Lignite, Mechanism, Mechanisms, Model, Models, Nanoparticles, Pb(II), Pb(II) Ions, Peat, pH, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Second Order, Second Order Kinetics, Second-Order, Solutions, Sorption, Thermodynamics, Wood

? Bartoňová, L., Kořistková, M., Kolat, P., Klika, Z. and Čech, B. (2010), Study of unburned carbon and volatility of elements during co-combustion of coal and waste alternative fuel. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (4), 725-739.

Full Text: [2010\Che Pro Eng-Inz Che Pro31, 725.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro31,%20725.pdf)

Abstract: The main objective of this work was to compare characteristics of unburned carbon and behaviour of toxic elements at the co-combustion of coal and solid waste fuel with the results obtained for the same coal combustion with no addition of the waste fuel performed at the same fluidised-bed power station.

Keywords: Activated Carbons, Adsorption, Behaviour, Bituminous Coal, Boiler, Carbon, Characteristics, Coal, Combustion, Elements, Emissions, Fly-Ash, Lignite, Plants, Power, Power-Station, Solid Waste, Toxic, Waste, Work

? Witek-Krowiak, A., Eckert, K. and Modelski, S. (2010), Removal of copper ions from aqueous solutions using maple leaves as a low-cost biosorbent. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (4), 813-824.

Full Text: [2010\Che Pro Eng-Inz Che Pro31, 813.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro31,%20813.pdf)

Abstract: Biosorption of Cu2+ ions from aqueous solutions with maple leaves biomass was investigated in function of initial pH, biomass concentration and temperature. The kinetics of biosorption was examined for various initial concentrations of Cu2+ (20, 50, 100 mg/dm(3)). Seven different isotherms were used to describe equilibrium data. Kinetic parameters were determined using four different kinetic equations. The desorption study of Cu2+ from biosorbent surface was carried out with four eluents.

Keywords: Activated Carbon, Adsorption, Aqueous Solutions, Biomass, Biosorbent, Biosorption, Concentration, Copper, Cu2+, Data, Desorption, Dyes, Equilibrium, Function, Fungal Biomass, Ions, Isotherm, Isotherms, Kinetic, Kinetic Equations, Kinetic Parameters, Kinetics, Lead, pH, Removal, Sawdust, Solutions, Surface, Temperature

? Witek-Krowiak, A., Krysiak, M., Modelski, S., Eckert, K. and Kłoczkowski, P. (2010), Biosorption of cationic dyes from aqueous solutions with maple leaves. *Chemical and Process Engineering-Inzynieria Chemiczna I Procesowa*, **31** (4), 825-837.

Full Text: [2010\Che Pro Eng-Inz Che Pro31, 825.pdf](2010/Che%20Pro%20Eng-Inz%20Che%20Pro31,%20825.pdf)

Abstract: Removal of cationic dyes, methylene blue and rhodamine B from aqueous solutions with biomass of maple leaves was investigated. Several commonly used isotherms were chosen to analyze the experimental results. Comparison of linear and non-linear methods of estimating the isotherm parameters was examined. Results show that the non-linear regression is more suitable method to determine isotherm parameters. The Redlich-Peterson model provides the best correlation with experimental data. Factors affecting biosorption such as contact time, pH, ionic strength and temperature were also evaluated.

Keywords: Adsorption-Isotherm, Aqueous Solutions, Biomass, Biosorbents, Biosorption, Cationic Dyes, Correlation, Data, Dyes, Equilibrium, Experimental, Ionic Strength, Isotherm, Isotherm Parameters, Isotherms, Kinetics, Malachite Green Removal, Methods, Methylene Blue, Methylene-Blue, Model, Non-Linear Regression, Nonlinear Regression, Nonlinear-Regression Analysis, pH, Redlich-Peterson, Regression, Removal, Rhodamine B, Rhodamine-B, Solutions, Sorption, Strength, Temperature, Violet, Wood Sawdust

# Title: Chemical Physics Letters

Full Journal Title: [Chemical Physics Letters](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5231&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=2c91c8e65679f2270803891503d91118), [Chemical Physics Letters](http://sciencejournals.info/Browse.html)

ISO Abbreviated Title: Chem. Phys. Lett.

JCR Abbreviated Title: Chem Phys Lett

ISSN: 0009-2614

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fedjanin, V.K. (1973), Adsorption and desorption kinetics with regard for interaction among adatoms. *Chemical Physics Letters*, **22** (1), 99-100.

Full Text: [1960-80\Che Phy Let22, 99.pdf](1960-80/Che%20Phy%20Let22,%2099.pdf)

Abstract: A new method of obtaining adsorption and desorption rates on a uniform surface with interacting adatoms is proposed.

Perram J.W. and Smith, E.R. (1976), Percus-Yevick theory of adsorption. *Chemical Physics Letters*, **39** (2), 328-332.

Full Text: [C\Che Phy Let39, 328.pdf](C/Che%20Phy%20Let39,%20328.pdf)

Abstract: We study adsorption of hard sphere particles on to a plane surface with a delta function adsorption potential. The calculation takes account of exclusion via the Percus-Yevick approximation. At low and intermediate bulk adsorbate densities, both type II and type III BET adsorption isotherms can be found for the surface excess density and for the monolayer surface density. The surface excess isotherm agrees with an expansion of the exact surface excess isotherm to second order in the density. We mention some biochemical ramifications of the results.

Notes: highly cited

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Full Text: [1997\Che Phy Let481, 151.pdf](1997/Che%20Phy%20Let481,%20151.pdf)

Abstract: The most time-consuming step in molecular calculations using approximate density functional theory is the evaluation of Coulomb and exchange-correlation terms. We investigate the possibility of fast and sufficiently accurate evaluation of both terms using the expansion of molecular electronic density in atom-centered auxiliary basis sets. Such an approach is shown to be about an order of magnitude faster than usual approaches in which only Coulomb terms are treated using the approximated density. Test calculations suggest that auxiliary basis sets of moderate size are sufficient to achieve good accuracy of molecular properties such as geometries and reaction energies. (C) 1997 Published by Elsevier Science B.V.

Keywords: Accuracy, Geometries, Science, Sphere

? Li, Y.H., Wang, S.G., Wei, J.Q., Zhang, X.F., Xu, C.L., Luan, Z.K., Wu, D.H. and Wei, B.Q. (2002), Lead adsorption on carbon nanotubes. *Chemical Physics Letters*, **357** (3-4), 263-266.

Full Text: [2002\Che Phy Let357, 263.pdf](2002/Che%20Phy%20Let357,%20263.pdf)

Abstract: Carbon nanotubes (CTNs) show exceptional adsorption capability and high adsorption efficiency for lead removal from water. The adsorption is significantly influenced by the pH value of the solution and the nanotube surface status, which can be controlled by their treatment processing. The adsorption isotherms are well described by both Langmuir and Freundlich models, Our results suggest that CNTs can be good Pb2+ adsorbers and have great potential applications in environmental protection. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Removal

Notes: highly cited

? Peng, X.J., Li, Y.H., Luan, Z.K., Di, Z.C., Wang, H.Y., Tian, B.H. and Jia, Z.P. (2003), Adsorption of 1,2-dichlorobenzene from water to carbon nanotubes. *Chemical Physics Letters*, **376** (1-2), 154-158.

Full Text: [2003\Che Phy Let376, 154.pdf](2003/Che%20Phy%20Let376,%20154.pdf)

Abstract: The as-grown CNTs and graphitized CNTs were used as adsorbents to remove 1,2-dichlorobenzene from water. The experiments demonstrate that it takes only 40 min for CNTs to attain equilibrium and the adsorption capacity of as-grown and graphitized CNTs is 30.8 and 28.7 mg/g, respectively, from a 20 mg/l solution. CNTs can be used as adsorbents in a wide pH range of 3-10. Thermodynamic calculations indicate that the adsorption reaction is spontaneous with a high affinity and the adsorption is an endothermic reaction. (C) 2003 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Waste-Water, Removal

Zhao, Y.L., Zhang, R.Q. and Wang, R.S. (2004), The role of lithium in hydrogen storage in aromatic carbon materials. *Chemical Physics Letters*, **398** (1-3), 62-67.

Full Text: [C\Che Phy Let398, 62.pdf](C/Che%20Phy%20Let398,%2062.pdf)

Abstract: Three representative aromatic carbon compounds, C6H6, C10H8 and C13H9, are chosen to simulate H2 adsorptions in aromatic carbon materials. The calculations of H2 locating on top of the hexagon center, middle of C–C bond and a C atom of these compounds using density functional and the second order Møller–Plesset perturbation theories indicate that the bindings of H2 with these compounds are very weak. However, the binding is significantly enhanced when lithium is introduced between the H2 and the aromatic carbon compound. In particular, the binding energy of H2 at Li adsorbed on top of the C13H9 is as large as 2.5 kcal mol−1, one order of magnitude enhanced. Such a stable H2 adsorption and the moderate adsorption energy facilitate good H2 storage. According to the similarity of surface features and chemical reactivities among the various aromatic carbon compounds and carbon nanotubes, we conjecture that the H2 storage in these materials would all be enhanced by introducing Li.

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Full Text: [2007\Che Phy Let438, 72.pdf](2007/Che%20Phy%20Let438,%2072.pdf)

Abstract: Interactions of tabun (GA) with non-hydroxylated and hydroxylated CaO clusters have been studied using density functional (DFT) and Moller-Plesset second order perturbation (MP2) levels of theory. The nature of interactions has been further investigated from the topology of charge distribution (using Atoms in Molecules formalism) and molecular electrostatic potential (MEP) surfaces. These adsorption studies indicate that GA adsorbs strongly on the non-hydroxylated CaO cluster through its P=O bond, while interactions of GA on the hydroxylated cluster are weak. These model studies could thus be useful to characterize inorganic oxides for efficient detection and disposal of GA. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Ab-Initio, Adsorption, Calcium, Chemical Warfare Agents, Cluster, Clusters, Decomposition, Density, Disposal, Distribution, Functional, GA, Inorganic, Interactions, Levels, Model, Organophosphorus Compounds, Oxides, Particles, Perturbation, Phosphorus-Compounds, Sarin, Surfaces, Treated Magnesium-Oxide, Unique Surface-Chemistry, VX

? Kolodziejczyk, W., Majuradar, D., Roszak, S. and Leszczynski, J. (2007), Probing the role of P=O stretching mode enhancement in nerve-agent sensors: Simulation of the adsorption of diisopropylfluorophosphate on the model MgO and CaO surfaces. *Chemical Physics Letters*, **450** (1-3), 138-143.

Full Text: [2007\Che Phy Let450, 138.pdf](2007/Che%20Phy%20Let450,%20138.pdf)

Abstract: The interactions of diisopropylfluorophosphate (DFP) with model MgO and CaO surfaces have been investigated using density functional (DFT) and Moller-Plesset second order perturbation techniques. The geometries were fully optimized at the DFT level. The calculated interaction energies and the corresponding thermodynamic properties show that DFP is physisorbed on these two model oxide surfaces and adsorption on the MgO surface is stronger. Analyses of the calculated IR and Raman spectra point to the enhancement of the P=O stretching mode with respect to the isolated DFP and this property could be used to detect nerve-agents using surface-enhanced Raman spectroscopy. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Chemical Warfare Agents, Decomposition, Density, Energy, GD, HD, Interaction, IR, Oxide, Silica, Spectroscopy, VX

? Li, H.B., Pan, L.K., Zhang, Y.P., Zou, L.D., Sun, C.Q., Zhan, Y.K. and Sun, Z. (2010), Kinetics and thermodynamics study for electrosorption of NaCl onto carbon nanotubes and carbon nanofibers electrodes. *Chemical Physics Letters*, **485** (1-3), 161-166.

Full Text: [2010\Che Phy Let485, 161.pdf](2010/Che%20Phy%20Let485,%20161.pdf)

Abstract: The carbon nanotubes and carbon nanofibers composite films (CNTs-CNFs) were fabricated by chemical vapor deposition. The electrosorption performance of CNTs-CNFs films at different solution temperatures was studied. It is found that the salt removal decreases from 45.4% to 33% due to hydrophobic-hydrophilic transition taking place on the surface of CNTs-CNFs films, when solution temperature ranges from 281 to 295 K. The electrosorption isotherm investigation shows Langmuir isotherm can better describe experimental data. Meanwhile, the kinetics and thermodynamics analyses indicate that the electrosorption of NaCl onto CNTs-CNFs electrodes follows first-order kinetics model and is driven by a physisorption process. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Adsorption, Analyses, Aqueous-Solutions, Behavior, Carbon, Carbon Nanotubes, Chemical, Composite, Data, Deposition, Electrosorption, Experimental, First Order, First-Order Kinetics, Graphite, Investigation, Isotherm, Kinetics, Kinetics and Thermodynamics, Kinetics Model, Langmuir, Langmuir Isotherm, Model, NaCl, Nanofibers, Nanotubes, Performance, Removal, Rights, Salt, Solution, Surface, Temperature, Thermodynamics, Water Desalination

# Title: Chemical Processing

Full Journal Title: Chemical Processing

ISO Abbreviated Title: Chem. Process.

JCR Abbreviated Title: Chem Process

ISSN: 0009-2630

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Putman Publ Co

Publisher Address: 301 E Erie Street, Chicago, IL 60611

Subject Categories:

Engineering, Chemical: Impact Factor 0.009, 109/110 (1999); Impact Factor 0.014, 117/123 (2001)

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Abstract: Now that the Chemical Manufacturers Association (CMA) has made zero discharge and public reporting part of Responsible Care(R), sustainable development seems a lot less utopian.

? Knox, P., Beaver, E., Smith, W., Keesee, G., Li, N., Pond, D.M., Jacob, K. and Bell, T. (1999), Environmental hurdles. *Chemical Processing*, **62** (7), 68-??.

Abstract: Major chemical companies are cleaning up their operations despite regulations, rather than because of them. A consensus emerged on that and other issues in a roundtable discussion among the industry leaders of the Chemical Processing Editorial Advisory Board. In this CP Special Report, a continuation of the June cover story, board members traded comments on Responsible Care and ISO 14001 as well as the regulatory scene. Many on the board admonished the chemical industry to build better relationships with their communites, Plant tours can win over the neighbors, transforming them from skeptics to allies, board members said.

? Grepps, L.S. (1999), Says employees are part of CMA Responsible Care((R)). *Chemical Processing*, **62** (10), 7.

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Abstract: In the 12 years since Responsible Care was adopted by the American Chemistry Council (ACC), formerly known as the Chemical Manufacturers Association (CMA), the public’s perception of the chemical industry has changed for the better, What have U.S. chemical companies done to improve relations with their neighbors? Senior Editor Kathie Canning takes a look at some companies’ efforts to “open plant fences” and educate their communities.

# Title: Chemical Reaction Engineering

John Wiley and Sons, New York, Chichester, Brisbane, Toronto, Singapore

Levenspiel, O. (1972), *Chemical Reaction Engineering*. John Wiley and Sons, New York, Chichester, Brisbane, Toronto, Singapore.

# Title: Chemical Research in Chinese Universities

Full Journal Title: Chemical Research in Chinese Universities

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1005-9040

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wu, Z.J. and Lee, K. (2004), Adsorption mechanisms of mesoporous adsorbents in solutions. *Chemical Research in Chinese Universities*, **20** (2), 185-187.

Abstract: Sieve effect, complexation, ionic exchange, electrostatic interaction, hydrogen bonding, hydrophobic interaction, and molecular recognition based on molecular imprinting are comprehensively discussed.

Keywords: Adsorption Mechanism, Mesoporous Adsorbent, Sieve Effect, Electrostatic Interaction, Hydrophobic Interaction, Molecular Recognition, Heavy-Metal Ions, Molecular-Sieves, Selective Adsorption, Aqueous-Solution, Silica, Monolayers, Separation, pH

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Abstract: The paper deals with the degradation of the organic compounds in the coke plant wastewater by the combined process of ultrasonic irradiation and activated sludge. The influence factors of the ultrasonic degradation effect such as air atmosphere, initial concentration. ultrasonic power density and the category and consumption of catalyst were investigated. A water quality model was used to explain the degradation of different kinds of organic compounds in the coke plant wastewater by ultrasonic irradiation. After the wastewater was treated by the combined process of ultrasonic irradiation and activated sludge, the COD degradation efficiency was 95.74%, which is 63.49% higher than that by the process of activated sludge alone.

Keywords: Activated Sludge, Aqueous-Solution, COD Degradation, Coke Plant Wastewater, Degradation, Degradation, Organic Compounds, Phenol, Ultrasonic Irradiation, Water Quality Model

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Full Text: Che Res Chi Uni26, 431.pdf

Abstract: Ordered mesoporous carbons CMK-3. CMK-1 coated with poly(methyl methaerylate)(PMMA)(CMK-3-PMMA and CMK-1-PMMA) and pristine mesoporous carbons CMK-3, CMK-1 were employed to adsorb vitamin B12(VB12) from water solution. Adsorption isotherm and kinetics of adsorption were investigated via batch experiments. It was found that the adsorption capacity of VB12 at 30, 40 and 50 degrees C can reach 688.2, 572.4 and 428.7 mg/g, respectively. The adsorption isotherm can be described by Langmuir model. The pseudo first- and second-order kinetic models were employed to Fit the dynamic adsorption. It was found that the dynamic adsorption follows the pseudo second-order model. The thermodynamic equilibrium coefficients obtained at different temperatures were used to evaluate the thermodynamic constants ΔG(0), Delta H-0 and ΔS-0. The negative value of Gibbs free energy, ΔG(0) indicates that the adsorption occurred via a spontaneous process. The increase in the value of -ΔG(0) with increasing temperature indicates that higher temperatures were favourable to the sorption process. The enthalpy values of ΔH-0>40 kJ/mol(66.36 kJ/mol and 56.43 kJ/mol) for CMK-3-PMMA and CMK-1-PMMA confirm that chemisorption were involved in the adsorption process. This is consistent with the IR spectra and is another evidence for the formation of hydrogen bond between PMMA in the pore of CMK-3 and VB12.

Keywords: Adsorption, Adsorption Isotherm, CMK-3, Equilibrium, Equilibrium, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Mesoporous Carbon, Molecular-Sieves, Removal, Templates, Thermodynamics, VB12 Adsorption

# Title: Chemical Reviews

Full Journal Title: [Chemical Reviews](http://pubs.acs.org/journals/chreay/index.html)

ISO Abbreviated Title: Chem. Rev.

JCR Abbreviated Title: Chem Rev

ISSN: 0009-2665

Issues/Year: 8

Journal Country/Territory: United States

Language: English

Publisher: Amer Chemical Soc

Publisher Address: 1155 16th St, NW, Washington, DC 20036

Subject Categories:

Chemistry: Impact Factor 21.244, 1/121

Notes: highly cited, MModel

? Eyring, H. (1935), The activated complex and the absolute rate of chemical reactions. *Chemical Reviews*, **17** (1), 65-77.

Full Text: [-1959\Che Rev17, 65.pdf](-1959/Che%20Rev17,%2065.pdf)

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Keywords: Thermodynamic

Notes: highly cited

Dubinin, M.M. (1960), The potential theory of adsorption of gases and vapors for adsorbents with energetically nonuniform surface. *Chemical Reviews*, **60** (2), 235-241.

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Low, M.J.D. (1960), Kinetics of chemisorption of gases on solids. *Chemical Reviews*, **60** (3), 267-312.

Full Text: [1960-80\Che Rev60, 267.pdf](1960-80/Che%20Rev60,%20267.pdf)

Notes: highly cited

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Full Text: [1993\Che Rev93, 2355.pdf](1993/Che%20Rev93,%202355.pdf)

Keywords: X-Ray-Diffraction, Energy Electron-Diffraction, Single-Crystal Surfaces, Graphite Basal-Plane, Commensurate-Incommensurate Transitions, Averaged Interaction Potentials, Kosterlitz-Thouless Transition, Carbon-Monoxide Monolayers, Low-Temperature Structure, Solid Virial-Coefficient

Braun, T., Schubert, A.P. and Kostoff, R.N. (2000), Growth and trends of fullerene research as reflected in its journal literature. *Chemical Reviews*, **100** (1), 23-38.

Full Text: [2000\Che Rev100, 23.pdf](2000/Che%20Rev100,%2023.pdf)

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Full Text: [2008\Che Rev108, 4125.pdf](2008/Che%20Rev108,%204125.pdf)

Keywords: Monte-Carlo Simulations, Single-File Diffusion, Elastic Neutron-Scattering, Long N-Alkanes, United-Atom Description, Transition-State Theory, Temperature-Programmed Desorption, Faujasite-Type Zeolites, Pt/H-Zsm-22 Bifunctional Catalyst, Dimensional Nanoporous Materials

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Full Text: [2010\Che Rev110, 5989.pdf](2010/Che%20Rev110,%205989.pdf)

Keywords: Polycyclic Aromatic-Hydrocarbons, Solvation Energy Relationships, Water Solubility Enhancements, Amino-Substituted Aromatics, Competitive Sorption, Phenolic-Compounds, Activated Carbons, Humic-Acid, Noncovalent Functionalization, Partition-Coefficients

# Title: Chemical Society Pollution Symposium, Belfast

(Chem. Sco. Pollution Symp. Belfast)

McKay, G. and Otterburn, M.S. (1979), Dye removal from water using adsorption techniqes. *Chemical Society Pollution Symposium*, *Belfast*, **September**, 1-13.

# Title: Chemical Society Reviews

Full Journal Title: [Chemical Society Reviews](http://www.rsc.org/is/journals/current/chsocrev/csrpub.htm)

ISO Abbreviated Title: Chem. Soc. Rev.

JCR Abbreviated Title: Chem Soc Rev

ISSN: 0306-0012

Issues/Year: 6

Journal Country/Territory: England

Language: English

Publisher: Royal Soc Chemistry

Publisher Address: Thomas Graham House, Science Park, Milton Rd, Cambridge CB4 0WF, Cambs, Eng

Subject Categories:

Chemistry: Impact Factor 8.798, 4/121

Blundell, T.L. and Jenkins, J.A. (1977), The binding of heavy metals to proteins. *Chemical Society Reviews*, **6**, 139-171.

# Title: Chemical Speciation and Bioavailability

Full Journal Title: [Chemical Speciation and Bioavailability](http://www.ingentaconnect.com/content/stl/csb;jsessionid=a683bo7em7e7a.victoria)

ISO Abbreviated Title: Chem. Speciation Bioavail.

JCR Abbreviated Title: Chem Spec Bioavailab

ISSN: 0954-2299

Issues/Year: 4

Journal Country/Territory: England

Language: English

Publisher: Science & Technology Letters

Publisher Address: Po Box 81, Northwood HA6 3DN, Middx, England

Subject Categories:

Biochemistry & Molecular Biology: Impact Factor 0.423, / (2001)

Environmental Sciences: Impact Factor 0.423, / (2001)

Toxicology: Impact Factor 0.423, / (2001)

? Wasay, S.A., Haq, I. and Puri, B.K. (1993), Distribution of heavy-metals in a sewage oxidation pond and their adsorption in residual solid (sewage-sludge ash). *Chemical Speciation and Bioavailability*, **5** (4), 141-148.

Abstract: Electrometric studies were carried out on the interaction of heavy metal ions such as manganese, chromium, nickel, copper, zinc, cadmium and lead with the extracted organic matter, humic and fulvic acid from the sludge in a sewage oxidation pond. The distribution of heavy metals was between 60 and 97%, which is associated with the solid waste (sludge) of the oxidation pond. The adsorption/removal efficiency of metal ions onto the sludge ash was more than 90% and 97%, respectively, in the pure system. To obtain the ash, the sludge was burnt at 500-degrees-C, treated with nitric acid (1+1) to leach out all the metals and then filtered; the residue left on the filter paper was the pure ash. Both this and that coated with organic matter were studied.The adsorption isotherm for metals, humic/fulvic acids and metal-humic/fulvic acid complexes in the metal-free sludge ash and in the organic matter in the pure system were studied using the Freundlich relationship. Good agreement was found suggesting that sediment and humic/fulvic acids have an important role in the mobility, dispersion and sedimentation of metal ions in an aquatic environment. More of these heavy metals are removed in the pure system than in the natural system. This may be due to the lesser availability of humic and fulvic acids in the lagoons during the short detention time of sewage in suspension in the oxidation pond, whereas the sludge which has settled to the bottom of the pond for several years contains rich decomposed organic matter in the form of humic and fulvic acids containing heavy metals. Such pure systems could be useful for the effective removal of heavy metals.

Keywords: Heavy Metals, Sewage Sludge Ash, Sewage Oxidation Ponds

Fiol, W., Poch, J. and Villaescusa, I. (2004), Chromium(VI) uptake by grape stalks wastes encapsulated in calcium alginate beads: Equilibrium and kinetics studies. *Chemical Speciation and Bioavailability*, **16** (1-2), 25-33.

Full Text: [C\Che Spe Bio16, 25.pdf](C/Che%20Spe%20Bio16,%2025.pdf)

Abstract: The removal of hexavalent chromium from aqueous solution using grape stalks wastes encapsulated in calcium alginate (GS-CA) beads was investigated. Cr(VI) sorption kinetics were evaluated as a function of chromium initial concentration and grape stalks (GS) content in the calcium alginate (CA) beads. The process follows pseudo second-order kinetics. Transport properties of hexavalent chromium on GS-CA beads was characterised by calculating chromium diffusion coefficient using the Linear Absorption Model (LAM). Langmuir isotherms, at pH 3.0 were used to describe sorption equilibrium data as a function of GS percentage in the CA beads. Maximum uptake obtained was 86.42 mmol of Cr(VI) per L of wet sorbent volume. Results indicated that both kinetic and equilibrium models describe adequately the adsorption process.

Keywords: Grape Stalks Waste, Calcium Alginate Beads, Kinetics, Equilibrium, Cr(VI) Adsorption, Ion-Exchange, Metal-Ions, Gel Beads, Adsorption, Biosorption, Sorption, Diffusion, Biomass, Models, Acid

? Sharma, P., Goyal, P. and Srivastava, S. (2007), Biosorption of trivalent and hexavalent chromium from aqueous systems using shelled *Moringa oleifera* seeds. *Chemical Speciation and Bioavailability*, **19** (4), 175-181.

Full Text: Che Spe Bio19, 175.pdf

Abstract: The present study explores the sorption properties of shelled Moringa oleifera seeds (SMOS) for removal of two environmentally important oxidation states of chromium (trivalent and hexavalent) from an aqueous system on the laboratory scale. Sorption studies reveal the optimum conditions for the removal of 81.02%; Cr(III) and 88.15% Cr(VI) as follows: biomass dosage (4.0g), metal concentration [25 mg/L for Cr(III); 50 mg/L for Cr(VI)], contact time (40 minutes) at pH 6.5 and 2.5 respectively. The adsorption data were found to fit well both the Freundlich and Langmuir isotherms. Characterization of the seed powder by FTIR showed the clear presence of amino acid moieties having both positively charged amino and negatively charged carboxylic groups and confirmed that biosorption involves amino acid-chromium interactions. SEM studies of native and exhausted [Cr(III)) and Cr(VI)] treated SMOS revealed large spherical clusters having a pore area of 8.66 μm2 in the case of native SMOS while dense agglomerated etched dendrite type morphology have a pore area of 0.80 μm2 in Cr(Ill) and 0.78 μm2 in Cr(VI) treated SMOS The spent biosorbent was regenerated and found to be effectively reusable for four cycles.

Keywords: Chromium, Biosorption, Moringa Oleifera, Amino Acid-Chromium Interactions, Regeneration, Metal Removal, Biomass, Cadmium, Plant, Acids

? Ghazy, S.E., Khedr, A.E.S. and Youssef, H.M.M. (2009), Biosorptive-flotation of copper(II) from environmental water samples using sugar beet pulp as sorbent and oleic acid as surfactant. *Chemical Speciation and Bioavailability*, **21** (3), 131-140.

Full Text: [2009\Che Spe Bio21, 131.pdf](2009/Che%20Spe%20Bio21,%20131.pdf)

Abstract: Trace elements, especially toxic metals, are considered to be one of the main sources of pollution in the environment, since they have a significant effect on its ecological quality. The present study aims to develop a simple biosorptive-flotation method to remove Cu(II) from aqueous solutions using sugar beet pulp (SBP) as sorbent and oleic acid (HOL) as surfactant. SBP as an agricultural plant waste (which is an effective and inexpensive sorbent) was used as native sugar beet pulp (NSBP), i.e. without treatment, or after treatment with an acid (ASBP) or a base (BSBP). The main parameters (initial pH, sorbent, Cu2+ ions and surfactant concentrations, shaking times, temperature, ionic strength and the presence of foreign ions) that influence the flotation process were examined. Under the optimum experimental conditions, at pH 7 and at room temperature (similar to 25ºC), about 100% of Cu(II) was removed. The recommended procedure was successfully applied to recover Cu2+ ions spiked in aqueous solution and in natural water samples.

Keywords: Adsorbents, Adsorption, Agricultural, Aqueous Solution, Aqueous Solutions, Aqueous-Solutions, Binding, Biosorptive-Flotation, Copper, Copper(II), Cu(II), Cu2+, Environment, Environmental, Experimental, Flotation, Foreign Ions, Heavy-Metal Removal, Ionic Strength, Ions, Limestone, Metals, Natural, Natural Water, Oleic Acid, pH, Plant, Pollution, Procedure, Quality, Room Temperature, Separation, Solution, Solutions, Sorbent, Sorption, Sources, Strength, Sugar Beet Pulp, Surfactant, Temperature, Toxic, Toxic Metals, Treatment, Waste, Waste-Water, Water, Water Samples

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Full Text: [2011\Che Spe Bio23, 175.pdf](2011/Che%20Spe%20Bio23,%20175.pdf)

Abstract: Adsorption behaviour of cadmium from its aqueous solution by growing and non-growing cells of a mutant strain of Bacillus cereus M(16)(1) has been studied to explore the possibility of the biomass to address environmental pollution due to this toxic metal. The results establish that about 75% and 88% of the cadmium can be removed by growing and non-growing cells of the selected strain respectively from its aqueous solution at pH 6.8±0.2, temperature 30±1ºC and 120 rpm shaking speed. For growing cells, inoculum size 2% and medium volume 50 mL is found to be optimum. The adsorption rate of cadmium on the biomass is very fast initially and attains equilibrium within 60 min following pseudo second-order rate model (R2 = 0.99). The equilibrium adsorption isotherm can be best described by Langmuir-Freundlich dual model (R2 = 0.99) indicating that both physisorption and chemisorption take place simultaneously. Cadmium can be desorbed from the loaded biomass using mineral acids (0.1 M).

Keywords: Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous-Solution, Bacillus Cereus M(16)(1), Bacterial Surfaces, Binding, Biomass, Biosorption, Biosorption, Cadmium, Environmental Pollution, Equilibrium, Heavy-Metals, Isotherm, Langmuir Isotherm, Metal Adsorption, pH, Physisorption, Pseudo Second Order, Removal, Temperature, Vulgaris

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? Starek, J. (1980), Isothermal kinetics and dynamics of adsorption. 1. Definition of the problem. *Chemicke Listy*, **74** (9), 922-933.

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Full Text: 1985\Che Lis79, 989.pdf

? Exner, O. (1993), Scientometrics, impact factor, citation analysis - An extremely critical-view. *Chemicke Listy*, **87** (10), 719-728.

Full Text: 1993\Che Lis87, 719.pdf

Abstract: Some fundamental terms of bibliometrics (impact factor, immediacy factor, citation index, citation history) are explained and their meaning elucidated on some examples as well as on artificial extreme cases. Their misuse as indicators in evaluating the quality of scientific work is heavily criticised: the main objection is that the research itself influences strongly the observed phenomena.

Keywords: Bibliometrics, Citation, Citation Index, History, Impact, Impact Factor, Indicators, Physics, Quality, Research, Scientometrics

? Exner, O. (1993), Scientometrics, impact factor, citation analysis - An extremely critical-view (Vol 87, Pg 719, 1993). *Chemicke Listy*, **87** (12), 888.

Full Text: 1993\Che Lis87, 888.pdf

Keywords: Citation, Scientometrics

? Vrana, B., Balaz, S., Dercova, K. and Tandlich, R. (1998), Biosorption of hydrophobic organic pollutants. *Chemicke Listy*, **92** (3), 186-196.

Full Text: 1998\Che Lis92, 186.pdf

Abstract: Hydrophobic organic chemicals are hazardous pollutants because of their toxicity and a strong tendency to concentrate in food chains. Biosorption is an important mechanism for the removal of these compounds in activated sludge systems. Measurement, modelling, thermodynamic and kinetic aspects of biosorption and the effect of biosorption on the biodegradation of hydrophobic organic pollutants are discussed in this review.

Keywords: Aquatic Food-Chains, Microbial Biomass, Hazardous Organics, Activated-Sludge, Sorption, Systems, Adsorption, Bioaccumulation, Biodegradation, Dissolution

Vymĕtal, J. (1999), Contemporary information media in chemistry. *Chemicke Listy*, **93** (6), 382-390.

Full Text: 1999\Che Lis93, 382.pdf

Abstract: In the present society information is the key source of its further development. The goal of such a society is ensuring a universal access to information, the criterion is the scope, content, quality, usefulness and accessibility of information services. Chemistry represents a top area dealt with in informatics. The article reflects the publication explosion, including its consequence, it deals with scientometric assessment of selected chemical journals and citations, distribution of chemical information as regards the principal areas, geographical sources and geographical distribution of chemical production.

Keywords: Citation Analysis, Impact Factor

Zíka, I. (2000), Responsible care in chemistry. *Chemicke Listy*, **94** (10), 919-923.

Full Text: 2000\Che Lis94, 919.pdf

Abstract: Chemical industry through its products facilitates the human life. Its achievements, conditioned by scientific progress and research, predominate over the damages caused by chemical production and products. The consequences of the damages lead in the general public to reservation and mistrust in chemical industry. The unclear hazard in using some common substances and fear of further development lead the European Commission and national administrations to extraordinary legal and economic regulations of marketing chemical substances and preparations. The low trust in chemical industry in the globalization period has no frontiers. The chemical industry of the Czech Republic encountered its consequences in preparation and fulfilling of regulations of new chemical legislation. The world chemical industry unites its power and financial means, and demonstrates its self-control by accepting and fulfilling obligations in the frame of the programme Responsible Care and by purposeful research of hazard associated with most frequently used substances. The credibility of enterprisintog being of primary importance must be proved. Therefore chemical industry expends substantial financial means and requires that the principle of preventive safety be used in making decisions only exceptionally, in the cases where convincing arguments are still missing. The chemical industry in the Czech Republic, which strives for continuous sustainable development, has no alternative to following the partners-competitors in developed countries. The approach leads to “total” cooperation within the plant and to openness to stimuli from without. Such strategy is a challenge both for top managers of plants and those intellectuals who care about the fate of chemical industry in the Czech Republic.

? Exner, O. (2001), What is further fate of a published scientific paper? *Chemicke Listy*, **95** (8), 498-503.

Full Text: 2001\Che Lis95, 498.pdf

Abstract: Acceptance of a published paper may be different as shown on examples from the author’s work. A wrong finding was rebutted (acyl derivatives of oximes, configuration of hydroximoyl chlorides), a method was accepted but not always followed (isokinetic relationship), a long-term discussion started which has not been resolved (resonance in nitrobenzene), a work was repeated without knowledge of the predecessor (acylation of a hydroxylamine derivative) or the paper was accepted but not cited (polyvalent iodine derivatives). The consequences are discussed from the philosophic, ethical, psychological and scientometric viewpoints.

Keywords: Compensation, Configuration, Field, Ions, Knowledge, Nitro-Group, Resonance, Substituent

? Sabová, L., Chmielewská, E. and Gáplovská, K. (2010), Development and exploitation of combined zeolite adsorbents for removing oxyanions from water. *Chemicke Listy*, **104** (4), 243-250.

Full Text: [2010\Che Lis104, 243.pdf](2010/Che%20Lis104,%20243.pdf)

Abstract: Natural zeolites are very popular in environment remediation due to their abundance and cost effectiveness. Their large surface area offers surface modification to improve their adsorption properties. The aim of the study is to develop combined adsorbents based on zeolites and alginates for removal of oxyanions from water. The combined adsorbents were prepared by mixing powdered zeolite and alginate, which, in the presence of divalent cations like Ca2+ form hydrogel beads. The Ca(II)-alginate-zeolite beads were further treated with Fe3+ cations to enhance their adsorption capacity. The zeolite/alginate ratio in the adsorbent was studied in order to find the most effective adsorbent. Kinetics of nitrate and sulfate adsorption were investigated. From the measured data, adsorption isotherms were obtained and evaluated.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Properties, Alginate, Aqueous-Solutions, Beads, Capacity, Chitosan, Clinoptilolite, Cost, Cost Effectiveness, Cost-Effectiveness, Data, Divalent Cations, Effectiveness, Environment, Heavy-Metals, Hydrogel, Interfaces, Isotherms, Kinetics, Mechanisms, Mixing, Modification, Montmorillonite, Nitrate, Remediation, Removal, Sorption, Sulfate, Surface, Surface Area, Surface Modification, Water, Zeolite, Zeolites

? Kizek, R. and Adam, V. (2008), Impact factors of the journals published in the Czech Republic in 2007. *Chemicke Listy*, **102** (10), 926-928.

Full Text: 2008\Che Lis102, 926.pdf

Abstract: Thomson Reuters Corporation presents new impact factors (IF) of the ISI-indexed journals in 2007. The Czech Republic is represented by twenty-three scientific journals from various branches of science in the Web of Science database. The article reports on trends in IFs of the journals. Great attention is paid to Chemicke Listy. Its impact factor was 0.683 in 2007, which is by almost 60% higher than in the preceding year. 202 articles and reviews have been published in Chemicke Listy in 2005/2006 and approximately the same number of papers as in 2004/2005. The papers have been cited 138 times, which represents an increase of more than 38% compared with the preceding biennium.

Keywords: Attention, Chemistry, Extraction, Impact, Impact Factor, Impact Factors, Journals, Papers, Science, Trends, Web of Science

? Kostura, B., Matýsek, D. and Leško, J. (2011), Mechanisms of phosphate sorption from aqueous solutions by calcined Mg-Al-CO3 hydrotalcite. *Chemicke Listy*, **105** (11), 874-878.

Full Text: [2011\Che Lis105, 874.pdf](2011/Che%20Lis105,%20874.pdf)

Abstract: The study deals with rehydration of calcined Mg-Al-CO3 hydrotalcite (Mg/Al molar ratio 2:1) occuring in the presence of phosphate ions. The sorption process follows the Langmuir isotherm and may be characterized by a pseudo-second-order kinetic model. The sorption capacity of calcined hydrotalcite (89.3 mg Pig) is determined by various sorption mechanisms. Kinetic tests proved the existence of a fast and slow step. The fast step is characterized by rehydration of the mixed oxide leading to the formation of hydroxide form of hydrotalcite associated with surface sorption of phosphates. This step proceeds within the first 90-120 min and its rate is determined by intra-particleular diffusion. However, if an excess of phosphates is present in solution, the slow step proceeds - intercalation of phosphate ions into interlayer space realized as the ion exchange with OH(-) anions. Precipitation of Al phosphates may also occur in the slow step. The slow-step processes have a negative impact on the structure-memory effect of calcined hydrotalcite.

Keywords: Adsorption, Anions, Hydrotalcite, Isotherm, Kinetic, Langmuir, Phosphate, Regeneration, Rehydration, Removal, Sorption

# Title: Chemicke Zvesti

Full Journal Title: Chemicke Zvesti

ISO Abbreviated Title:

JCR Abbreviated Title: Chem Zvesti

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kachanak, S. (1968), Equations of adsorption isochrones and isoplanes in systems with Langmuir course of adsorption isotherm. *Chemicke Zvesti*, **22** (6), 461-??.

? Kachanak, S., Moncmano, A. and Valtyni, J. (1970), Kinetics and dynamics of gas and vapour adsorption on solid sorbents. 1. Material balances and similitude criteria. *Chemicke Zvesti*, **24** (3), 182-??.

? Kachanak, S., Moncmano, A. and Valtyni, J. (1971), Kinetics and dynamics of gas and vapour adsorption on solid sorbents. 2. Adsorption dynamics in fixed bed at constant value of overall mass-transfer coefficient and at negligible influence of longitudinal diffusion. *Chemicke Zvesti*, **25** (4), 259-??.

? Kachanak, S., Valtyni, J. and Moncmano, A. (1971), Kinetics and dynamics of gas and vapor adsorption on solid sorbents. 3. Adsorption dynamics in fixed bed at variable value of overall mass-transfer coefficient and at negligible influence of longitudinal diffusion. *Chemicke Zvesti*, **25** (6), 401-??.

? Kachanak, S., Moncmano, A. and Valtyni, J. (1973), Kinetics and dynamics of gas and vapor adsorption on solid sorbents. 4. Generalization of definition of similitude criteria. *Chemicke Zvesti*, **27** (3), 289-295.

? Kachanak, S., Moncmano, A. and Valtyni, J. (1973), Kinetics and dynamics of gas and vapor adsorption on solid sorbents. 5. Verification of equations of adsorption dynamics in fixed-bed at variable mass-transfer coefficient and at negligible influence of longitudinal diffusion. *Chemicke Zvesti*, **27** (6), 721-727.

? Zikanova, A., Kocirik, M. and Dubsky, J. (1975), Adsorption-kinetics in microporous adsorbents. *Chemicke Zvesti*, **29** (3), 312-318.

? Bobok, D., Kossaczky, E. and Sefcikova, M. (1975), Description of equilibrium data of adsorption of n-heptane on molecular-sieve 5-A by an actual form of Freundlich isotherm. *Chemicke Zvesti*, **29** (3), 303-311.

? Sedlacek, Z. (1975), Adsorption-kinetics from one-component gaseous phase. *Chemicke Zvesti*, **29** (3), 338-343.

? Kocirik, M. (1975), Adsorption-kinetics and planck-fokker equation. *Chemicke Zvesti*, **29** (3), 356-360.

? Seidl, P. and Kadlec, O. (1975), Importance of adsorption-kinetics in separation of N2 and O2 on NaA zeolite. *Chemicke Zvesti*, **29** (4), 493-495.

# Title: Chemico-Biological Interactions

Full Journal Title: [Chemico-Biological Interactions](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=00092797)

ISO Abbreviated Title: Chem.-Biol. Interact.

JCR Abbreviated Title: Chem-Biol Interact

ISSN: 0009-2797

Issues/Year: 14

Journal Country/Territory: Netherlands

Language: Multi-Language

Publisher: Elsevier Sci Ireland Ltd

Publisher Address: Customer Relations Manager, Bay 15, Shannon Industrial Estate Co, Clare, IR

Subject Categories:

Biochemistry & Molecular Biology: Impact Factor 1.887, 138/295 (1999); Impact Factor 1.707, 173/310 (2000)

Biology: Impact Factor 1.887, 15/53 (1999); Impact Factor

Chemistry, Medicinal: Impact Factor 1.887, 8/30 (1999); Impact Factor

Chemistry: Impact Factor 1.887, 22/121 (1999); Impact Factor181 (2000)

Pharmacology & Pharmacy: Impact Factor 1.887, 50/175 (1999); Impact Factor181 (2000)

Toxicology: Impact Factor 1.887, 14/74 (1999); Impact Factor

Marsteinstredet, U., Wiger, R., Brunborg, G., Hongslo, J.K. and Holme, J.A. (1997), Apoptosis in HL-60 cells induced by 3-chloro-4-(dichloromethyl)-5-hydroxy-2[5H]-furanone (MX). *Chemico-Biological Interactions*, **106** (2), 89-107.

Full Text: [C\Che Bio Int106, 89.pdf](C/Che%20Bio%20Int106,%2089.pdf)

Abstract: The potent bacterial mutagen 3-chloro-4-(dichloromethyl)-5-hydroxy-2[5H]-furanone (MX), which is formed during chlorination of drinking water, has been studied with respect to induction of cell death in promyelocytic leukemic HL-60 cells. Cells exposed to MX for 1 h and further incubated for 3 h, revealed no significant increase in the proportion of cells with compromised plasma membrane damage as judged by trypan blue or propidium iodide exclusion. However, flow cytometric studies and microscopic analysis of HL-60 cells after staining with Giemsa or Hoechst 33342, revealed that more than 30% of the cells exposed to 30-100 microM of MX, showed the characteristic morphology and biochemical markers of apoptosis. On the other hand, in cultures exposed to 300 microM MX, less than 5% of the cells appeared to be apoptotic (< G1 DNA) 3 h after treatment, which is similar to control values. Microscopic analysis of Hoechst 33342-stained cells revealed that they were ‘arrested’ in the early stages of chromatin condensation, but these cells eventually became necrotic. Some decrease in the percentage of cells in S-phase was observed 3 h after exposure to MX (10), 30 and 100 microM), but the induced cell death was not markedly cell stage specific. The characteristic ladder pattern of apoptotic cells was observed when DNA isolated from MX-exposed HL-60 cells was electrophoresed in agarose. The apoptotic process could also be detected by analysis with alkaline filter elution (AE), as a decrease in the total DNA recovered; and by single cell gel electrophoresis, as a decrease in the average number of cells/comets observable on each slide. With the protocols used no apparent increase in values in the normalized area above the curve (NAAC) (alkaline elution) or tail moments (single cell gel electrophoresis (SCGE) were detected, indicating that apoptotic cells are not necessarily a confounding factor when assaying for genotoxicity with these techniques.

# Title: Chemie Ingenieur Technik

Full Journal Title: [Chemie Ingenieur Technik](http://www3.interscience.wiley.com/cgi-bin/jhome/107561433); [Chemie Ingenieur Technik](http://www3.interscience.wiley.com/cgi-bin/jhome/60500203?CRETRY=1&SRETRY=0)

ISO Abbreviated Title: Chem. Ing. Tech.

JCR Abbreviated Title: Chem-Ing-Tech

ISSN: 0009-286X

Issues/Year: 1

Journal Country/Territory: Germany

Language: English

Publisher: Wiley-V C H Verlag Gmbh

Publisher Address: PO box 10 11 61, D-69451 Berlin, Germany

Subject Categories:

Engineering, : Impact Factor 0.386, / (2000)

Chemical: Impact Factor 0.386, / (2000)

? Schwuger, M.J., Juntgen, H. and Peters, W. (1968), Adsorption of dissolved substances on activated coke in water. (Kinetic measurements in a shaking reactor at decreasing concentration). *Chemie Ingenieur Technik*, **40** (18), 903-910.

Full Text: [1960-80\Che Ing Tec40, 903.pdf](1960-80/Che%20Ing%20Tec40,%20903.pdf)

Abstract: An vier verschiedenen Adsorptionskoksen wird der zeitliche Verlauf der Adsorption von Phenol aus Wasser experimentell untersucht und - unter der Voraussetzung der Porendiffusion als geschwindigkeitsbestimmendem Schritt und der Gültigkeit der Isothermen-Gleichung nach Freundlich - mit Hilfe eines Näherungsverfahrens berechnet. Bei zwei Adsorptionskoksen findet man die theoretisch geforderte Beziehung zwischen der Halbwertszeit und dem Quadrat des Korndurchmessers, so daß sich ein für das gesamte Hohlraumsystem gültiger Diffusionskoeffizient definieren läßt. Bei den anderen Adsorptionskoksen deutet eine verminderte Korngrößenabhängigkeit auf ein uneinheitliches Porensystem hin. Die gefundene Abhängigkeit des Adsorptionsverlaufes von der Größe der Diffusionskoeffizienten sowie von der Porenverteilung und der Größe des Zuleitungsporensystems wird an Beispielen diskutiert.

Keywords: Adsorption, Kinetic

? Knoblauc, K., Juntgen, H. and Peters, W. (1969), Adsorption of dissolved substances on activated cokes in water. 2. Kinetic measurements in a differential reactor at constant external concentration. *Chemie Ingenieur Technik*, **41** (14), 798-805.

Full Text: [1960-80\Che Ing Tec41, 798.pdf](1960-80/Che%20Ing%20Tec41,%20798.pdf)

Abstract: An neun Adsorptionskoksen wird der zeitliche Verlauf der Adsorption von Pyridin p-Nitrophenol und Carminsäure aus Wasser experimentell untersucht und - unter der Voraussetzung, daß die Diffusion in das Korninnere geschwindigkeitsbestimmend ist - mit Hilfe einer Näherungsgleichung berechnet. Die Adsorptionskokse unterscheiden sich im Adsorptionsporen. Der zeitliche Verlauf der Adsorption wird am Anfang durch die Diffusion in den Zuleitungsporen (Porendiffusion) und später durch die Diffusion in den Adsorptionsporen (Oberflächendiffusion) bestimmt, wobei die Größenordnung des Adsorptionsfaktors die Diffusion in den Zuleitungsporen entscheidend beeinflußt. Für alle Kokse wird die theoretisch geforderte Beziehung zwischen der Sorptionszeit und dem Quadrat des Korndurchmessers experimentell nachgewiesen.

? Schwuger, M.J. (1970), Kinetics of adsorption of surfactants and organic acids on activated charcoal. *Chemie Ingenieur Technik*, **42** (7), 433-438.

Full Text: [1960-80\Che Ing Tec42, 433.pdf](1960-80/Che%20Ing%20Tec42,%20433.pdf)

Abstract: An einigen homologen Reihen von Tensiden werden die Einflüsse verschiedener Molekülbausteine auf die Adsorptionskinetik aus stark verdünnten Lösungen an einer gut definierten Aktivkohle untersucht. Der Diffusionskoeffizient ist direkt proportional dem Quadrat der KornGröße und umgekehrt proportional der Adsorptionszeit. Mit steigender Zahl der CH2-Gruppen im hydrophoben Rest eines Tensids nimmt der Diffusionskoeffizient linear ab und die Gleichgewichtsadsorption nach einer e-Funktion zu. Demgegenüber bewirkt bei unverändertem Molekulargewicht die Verzweigung des hydrophoben Restes eine lineare Zunahme der Adsorptionsgeschwindigkeit und eine Abnahme der Gleichgewichtsbeladung. Da sich die Adsorptionskinetik und das Adsorptionsgleichgewicht als Funktion des Molekülaufbaus prinzipiell unterschiedlich ändern werden die optimalen Bedingungen hinsichtlich der Adsorption in bezug auf beide Größen ermittelt. Es wird auch auf die praktische Bedeutung dieser Änderung für die Anwendung von Tensiden hingewiesen.

Keywords: Adsorption, Kinetics

? Seiler, H., Knoblauc, K. and Juntgen, H. (1970), Significance of equilibrium isotherms and kinetics for design of adsorption reactors for drinking water purification. *Chemie Ingenieur Technik*, **42** (14), 943.

Full Text: [1960-80\Che Ing Tec42, 943.pdf](1960-80/Che%20Ing%20Tec42,%20943.pdf)

? Dengler, W. and Kruckels, W. (1971), Study of kinetics of adsorption of water vapour on individual grains of industrial adsorbents. *Chemie Ingenieur Technik*, **43** (5), 269-271.

Full Text: [1960-80\Che Ing Tec43, 269.pdf](1960-80/Che%20Ing%20Tec43,%20269.pdf)

? Seiler, H., Peters, W. and Juntgen, H. (1972), Adsorption of water-soluble substances on activated cokes. 3. Kinetic measurements in an integral reactor with constant input concentration. *Chemie Ingenieur Technik*, **44** (10), 663-670.

Full Text: [1960-80\Che Ing Tec44, 663.pdf](1960-80/Che%20Ing%20Tec44,%20663.pdf)

Abstract: Im Festbett wird an sieben Aktivkoksen definierter Porenstruktur der zeitliche Verlauf der Adsorption von organischen Modellsubstanzen (Pyridin, p-Nitrophenol) und deren Mischung aus Wasser untersucht. Variiert werden die Parameter Schichthöhe, Strömungsgeschwindigkeit, Korngröße und mittlerer Adsorptionsporen-Durchmesser. Die Meßergebnisse werden nach einem Diffusionsmodell mit der Porendiffusion als geschwindigkeitsbestimmendem Schritt der Sorptionskinetik beschrieben. Die Auswertung der Durchbruchskurven mit dem Diffusionsmodell wird auf Messungen an Fluß- und Abwasser übertragen.

? Neretnie, I. (1974), Adsorption of components having a saturation isotherm. *Chemie Ingenieur Technik*, **46** (18), 781.

Full Text: [1960-80\Che Ing Tec46, 781.pdf](1960-80/Che%20Ing%20Tec46,%20781.pdf)

? Krotzsch, P., Kurten, H., Daucher, H. and Popp, K.H. (1976), Overall kinetics of biodegradation in sewage-treatment plants. *Chemie Ingenieur Technik*, **48** (4), 343-343.

Full Text: [1960-80\Che Ing Tec48, 343.pdf](1960-80/Che%20Ing%20Tec48,%20343.pdf)

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Full Text: 1983\Che Ing Tec55, 143.pdf

Keywords: Kinetics, Sorption

? Eldiwani, G., Hafez, A.I. and Hawash, S. (1987), Mathematical-modeling of an ozone-azo-dye reaction system. *Chemie Ingenieur Technik*, **59** (8), 654-656.

Full Text: [1987\Che Ing Tec59, 654.pdf](1987/Che%20Ing%20Tec59,%20654.pdf)

# Title: Chemija

Full Journal Title: Chemija

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kaušpėdienė, D., Kazlauskienė, E., Selskienė, A. and Gefenienė, A. (2011), Kinetics of removing chromium complex dye from acidic aqueous solutions employing anion exchange resins. *Chemija*, **22** (1), 1-8.

Full Text: [2011\Chemija22, 1.pdf](2011/Chemija22,%201.pdf)

Abstract: The kinetics of removing the chromium complex dye Lanasyn Navy M-DNL from model solutions, using the acrylic matrix gel type weak base anion exchanger Purolite A 845 and a polystyrene matrix, the macroporous type I strong base anion exchanger Purolite A 500P has been investigated in batch experiments with respect to solution concentration and temperature. The kinetics studies, combined with optical microscopy, were conducted to reveal the relation between the physical-chemical characteristics of the anion exchangers and their performance in the removal of the chromium complex dye. The chromium complex dye sorption mechanism onto both anion exchangers investigated consists of ion exchange, physical sorption and diffusion. Kinetic parameters such as external mass transfer coefficient k(s), intraparticle diffusion coefficient k(i) and the rate constants of chemical sorption k(2) for the dye - Purolite A 845 and dye - Purolite A 500P systems were studied using the Weber and Morris intraparticle diffusion model equations and the pseudo-second order kinetic equation, respectively. The activation energies such as external mass transfer E(a-ks), intraparticle diffusion E(a-ki) and chemical sorption E(a-k2) for dye-anion exchanger systems were calculated using the Arrhenius relationship. The intraparticle diffusion activation energy E(a-ki) for the dye - Purolite A 845 system was 4.7-fold lower that for the dye - Purolite A 500P system, resulting in a deeper diffusion of the dye in the bead of the gel type weak base anion exchanger.

Keywords: Adsorption, Anion Exchanger, Chromium Complex Dye, Design, Diffusion, Fly-Ash, Kinetics, Mechanism, Methylene-Blue, Model, Pseudo-Second Order, Pseudo-Second-Order, Sorption, Sorption, Yellow

# Title: Chemiker-Zeitung

Full Journal Title: Chemiker-Zeitung

ISO Abbreviated Title:

JCR Abbreviated Title: Chem Ztg

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Langeman, H. (1968), Kinetics of adsorption procedures in closed 2-phase and 3-phase systems. *Chemiker-Zeitung*, **92** (5), 145-??.

? Gobel, G. and Starnick, J. (1978), Kinetic studies on adsorption polymerization on porous silica- gel surfaces. *Chemiker-Zeitung*, **102** (6), 230.

# Title: ChemInform

Full Journal Title: [ChemInform](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1522-2667/issues)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ho, Y.S. (2006), Review of second-order models for adsorption systems. *ChemInform*, **37** (48), 7 Nov, DOI: 10.1002/chin.200648222.

Full Text: [2006\ChemInform37, 7.pdf](2006/ChemInform37,%207.pdf)

Abstract: ChemInform is a weekly Abstracting Service, delivering concise information at a glance that was extracted from about 200 leading journals. To access a ChemInform Abstract, please click on HTML or PDF.

Keywords: Inorganic Chemistry, Review, Interfaces, Interface Equilibria, Chromatography

# Title: Chemische Technik

Full Journal Title: Chemische Technik

ISO Abbreviated Title: Chem. Tech.

JCR Abbreviated Title: Chem Tech-Leipzig

ISSN: 0045-6519

Issues/Year: 6

Journal Country/Territory: Germany

Language: English

Publisher: Chemische Technik

Publisher Address: C/O Michael Fuchs, Tschaikowskistrasse 19, D-04105 Leipzig, Germany

Subject Categories:

Engineering, Chemical: Impact Factor 1.375, / (2000); Impact Factor123 (2001)

? Ciborows, J. and Sieniuty, S. (1969), On kinetics of drying and adsorption based on counter-current principle when dropping crushed materials. *Chemische Technik*, **21** (12), 750-??.

? Mittelst, M. and Hofmann, U. (1970), Schirmer, W., Grossman, A., Fiedler, K., Sichhart, K.H. and Bulow, M.. *Chemische Technik*, **22** (7), 405-??.

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? Wolf, F. and Pilchows, K. (1971), Kinetics of liquid phase adsorption of paraffins on synthetic magnesium and calcium zeolites of a-type. 1. Influence of degree of cation exchange on kinetics of adsorption of decane from decane-toluene solution. *Chemische Technik*, **23** (11), 672-??.

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Keywords: Adsorption

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Keywords: Adsorption

# Title: Chemisches Zentralblatt

(Chem. Zentr.)

Notes: IIsotherm

Dubinin, M.M. and Radushkevich, L.V. (1947), Equation of the characteristic curve of activated charcoal. *Chemisches Zentralblatt*, **1**, 875.

Full Text: [C\Che Zen1, 875.pdf](C/Che%20Zen1,%20875.pdf)

# Title: Chemisorption

Butterworths

? Hayward, D.O. and Trapnell, B.M.W. (1964), *Chemisorption*. Butterqorths, 2nd Edn.

# Title: Chemistry-An Asian Journal

Full Journal Title: Chemistry-An Asian Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fan, J.J., Cai, W.Q. and Yu, J.G. (2011), Adsorption of N719 dye on anatase TiO2 nanoparticles and nanosheets with exposed (001) facets: Equilibrium, kinetic, and thermodynamic studies. *Chemistry-An Asian Journal*, **6** (9), 2481-2490.

Full Text: [2011\Che-An Asi J6, 2481.pdf](2011/Che-An%20Asi%20J6,%202481.pdf)

Abstract: Anatase TiO2 nanosheets (TiO2 NS) with dominant (001) facets and TiO2 nanoparticles (TiO2 NP) with dominant (101) facets are fabricated by hydrothermal hydrolysis of Ti(OC4H9)4 in the presence and absence of hydrogen fluoride (HF), respectively. Adsorption of N719 onto the as-prepared samples from ethanol solutions is investigated and discussed. The adsorption kinetic data are modeled using the pseudo-first-order, pseudo-second-order, and intraparticle diffusion kinetics equations, and indicate that the pseudo-second-order kinetic equation and intraparticle diffusion model can better describe the adsorption kinetics. Furthermore, adsorption equilibrium data of N719 on the as-prepared samples are analyzed by Langmuir and Freundlich models; this suggests that the Langmuir model provides a better correlation of the experimental data. The adsorption capacities (*q*max) of N719 on TiO2 NS at various temperatures, determined using the Langmuir equation, are 65.2 (30ºC), 68.2 (40ºC), and 76.6 (50ºC) mg g-1, which are smaller than those on TiO2 NP, 92.4 (30ºC), 100.0 (40ºC), and 108.2 (50ºC) mg g-1, respectively. The larger adsorption capacities of N719 for TiO2 NP versus NS are attributed to its higher specific surface areas. However, the specific adsorption capacities (*q*max/S(BET)) at various temperatures are 1.5 (30ºC), 1.6 (40ºC), and 1.7 (50ºC) mg m-2 for TiO2 NS, which are otherwise higher than those for NP, 0.9 (30ºC), 1.0 (40ºC), and 1.1 (50ºC) mg m2-, respectively. The larger specific adsorption capacities of N719 for TiO2 NS versus NP are because the (001) surface is more reactive for dissociative adsorption of reactant molecules compared with (101) facets. Notably, the *q*max and *q*max/S(BET) for both TiO2 samples increase with increasing temperature, suggesting that adsorption of N719 on the TiO2 surface is an endothermic process, which is further confirmed by the calculated thermodynamic parameters including free energy, enthalpy, and entropy of adsorption process. The present work will provide a new understanding on the adsorption process and mechanism of N719 molecules onto TiO2 NS and NP, and this should be of great importance for enhancing the performance of dye-sensitized solar cells.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Diffusion, Dye, Dye-Sensitized Solar Cells, Enhanced Photocatalytic Activity, Equilibrium, Films, Freundlich, Hollow Spheres, Kinetic, Kinetics, Langmuir, Langmuir and Freundlich Models, Light, Mechanism, Nanomaterials, Nanoparticles, Nanosheets, Performance, Sensitized Solar-Cells, Surface, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Titania Nanotubes, Titanium, Water

# Title: Chemistry & Biodiversity

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? Horsfall, Jr., M. and Spiff, A.I. (2005), Sorption of lead, cadmium, and zinc on sulfur-containing chemically modified wastes of fluted pumpkin (*Telfairia occidentalis* HOOK f.). *Chemistry & Biodiversity*, **2** (3), 373-385.

Full Text: [2005\Che Bio2, 373.pdf](2005/Che%20Bio2,%20373.pdf)

Abstract: We have tested the applicability of regular as well as sulfanylacetic acid (SA) modified fluted pumpkin waste biomass as adsorbents for Pb2+, Cd2+, and Zn2+ aqueous solutions by means of the batch-sorption technique. The data revealed that SA modification produces a larger surface area, enhancing the metal-ion binding capacity of the biomass. The sorption process was examined by means of Freundlich and Langmuir models. The kinetic study showed that the sorption rates can be described by a pseudo-second-order process. The rate constants for the control biomass (CB) were 2.2×10-2, 4.4×10-2, and 1.6×10-1 mg g-1 min-1 for Pb2+, Cd2+, and Zn2+, respectively; and the corresponding rate constants for the SA-modified biomass were 4.0×10-2, 4.7×10-2, and 1.7×10-1 mg g-1 min-1, respectively. Thermodynamic considerations indicated a spontaneous exothermic process, which implies that physisorption is the main mechanism in the sorption process.

Keywords: Biomass, Ions, Removal, Metals

? Horsfall, Jr., M. Ogban, F. and Akporhonor, E.E. (2005), Biosorption of Pb2+ from aqueous solution by waste biomass of aerial roots of *Rhizophora mangle* (red mangrove). *Chemistry & Biodiversity*, **2** (9), 1246-1255.

Full Text: [2005\Che Bio2, 1246.pdf](2005/Che%20Bio2,%201246.pdf)

Abstract: The processing waste of the aerial roots of Rhizophora mangle was used in both its unmodified or mercaptoacetic acid (MAA) modified form for the sorption of Pb2+ from aqueous solution. The biomass rapidly and strongly sorbed Pb2+ at pH 5.0, which indicated chemisorption. A significant increase in Pb2+ sorption resulted from MAA treatment of the biomass, indicating that sorption occurs through an ion-exchange process. From sorption-capacity experiments, the unmodified and modified materials extracted, at pH 5, 31.3 and 85.5 mg of Pb2+ per gram of biomass, respectively, from aqueous solutions. Our studies may contribute to an innovative method for the economical and ecologically save removal and recovery of heavy-atom metal ions from contaminated waters through biosorption.

Keywords: Manihot-Sculenta Cranz, Activated Carbon, Cassava Waste, Removal, Ions, Lead, Adsorption, Sorption, Cadmium, Copper

? Horsfall, Jr., M. and Spiff, A.I. (2005), Adsorption of transition metals in aqueous solutions by fluted pumpkin (*Telfairia occidentalis* HOOK f) waste. *Chemistry & Biodiversity*, **2** (9), 1266-1276.

Full Text: [2005\Che Bio2, 1266.pdf](2005/Che%20Bio2,%201266.pdf)

Abstract: The adsorption of some divalent transition metal (Hg, Rh, Pt, and Pd) ions in aqueous solution onto fluted pumpkin waste biomass has been investigated. The data were discussed in terms of ionic radii, surface area, and the hard-soft acid-base (HSAB) concept. The monolayer sorption capacities as obtained by the Langmuir adsorption isotherm model were determined to be ca. 9.89 mg/g, 9.81 mg/g, 10.59 mg/g, and 6.84 mg/g for for Hg-II, Rh-II, Pt-II, and Pd-II, respectively. The results are relevant for the optimal design of a wastewater treatment plant and for prediction of model parameters of sorbate - sorbent interactions.

Keywords: Sorption, Ions, Kinetics, Pore, Lead

? Horsfall, Jr., M., Ogban, F. and Akporhonor, E.E. (2006), Sorption of chromium(VI) from aqueous solution by Cassava (*Manihot sculenta* CRANZ.) waste biomass. *Chemistry & Biodiversity*, **3** (2), 161-174.

Full Text: [2006\Che Bio3, 161.pdf](2006/Che%20Bio3,%20161.pdf)

Abstract: The sorption of highly toxic Cr-VI ions by cassava waste biomass was quantitatively investigated. The sorption was found to be influenced by several physico-chemical factors such as agitation speed, temperature, contact time, pH, and sorbent/sorbate ratio. The adsorption data at equilibrium were fitted to Freundlich and Langmuir isotherms. The monolayer sorption capacity was found to be 61.79 mg of Cr-VI per gram of biomass. The kinetics of Cr-VI adsorption to pure cassava-tuber-bark wastes were determined based on a pseudo-second-order-rate model using the batch-sorption technique at a temperature of 30 degrees. The kinetics data suggest that the adsorption process is exothermic, and that the rate-limiting step is physisorption. Negative Delta G(ads) values indicate that the adsorption is spontaneous and exothermic in nature. Also, under optimal conditions (in agitated 1M H2SO4 at 30 degrees), the cassava waste biomass appears to be recyclable.

Keywords: Bicolor Wild Cocoyam, Pseudomonas-Aeruginosa, Ions, Removal, Biosorption, Adsorption, Pb2+, Biosorbents, Desorption, Cadmium

? Tarawou, T., Horsfall, M. and Vicente, J.L. (2007), Adsorption of methyl red by water-hyacinth (*Eichornia crassipes*) biomass. *Chemistry & Biodiversity*, **4** (9), 2236-2245.

Full Text: [2007\Che Bio4, 2236.pdf](2007/Che%20Bio4,%202236.pdf)

Abstract: The surface characteristics and adsorbent properties of biomass, obtained from low-cost and environmentally problematic water hyacinth. were determined. Optimum conditions for the elimination of the industrial dye Methyl Red (1) from aqueous solution were established by means of a batch adsorption technique. The ultimate adsorption capacity of water-hyacinth biomass in terms of the elimination of 1 was calculated from a Langmuir-type isotherm as 8.85×10-2 mol g-1 at 30° and at an optimum solution pH of 8.0. Dye elimination was found to be associated with strong electrostatic forces (physisorption). the overall process being slightly endergonic (Delta G>0). Our study shows that water hyacinth has a great potential of removing color from wastewater and other dye-polluted aquatic systems.

Keywords: Dye, Sorption, Adsorbents

? Taha, G.M. and Mosaed, T.M. (2010), Blast furnace slag of a ferrosilicon firm in Aswan Governorate, upper Egypt, as an adsorbent for the removal of merocyanine dye from its aqueous solution. *Chemistry & Biodiversity*, **7** (4), 878-886.

Full Text: [2010\Che Bio7, 878.pdf](2010/Che%20Bio7,%20878.pdf)

Abstract: The adsorption potential of the blast furnace slag of a ferrosilicon firm in Aswan Governorate, Egypt, to decolorize aqueous solutions of 3-methyl- l-phenylpyrazol-5-one 4[2] merocyanine dye (1) was investigated at room temperature. The influence of the solution pH, the quantity of adsorbent, the initial concentration of 1. and the applied contact time were studied with the batch technique. The maximum percentage of removal of 1 was observed at pH 4. The adsorption data were better fitted by the Freundlich than by the Langmuir adsorption isotherm model, confirming the formation of monolayers of 1 on the adsorbent surface. Kinetic rate constants and the transient behavior at different initial concentrations of 1 were determined with both the Lagergren pseudo-first-order and the Ho and McKay pseudo-second-order kinetic models. The calculated kinetic parameters revealed that the adsorption of 1 on blast furnace slag followed a second-order chemisorption process.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Isotherm Model, Aqueous Solutions, Batch, Behavior, Blast Furnace Slag, Chemisorption, Concentration, Data, Dye, Egypt, Fly-Ash, Freundlich, Furnace Slag, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Models, Kinetic Parameters, Kinetic Rate, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Model, Models, Monolayers, Peat, pH, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constants, Removal, Room Temperature, Second Order, Second-Order, Slag, Solution, Solutions, Sorption, Surface, Temperature, Time, Transient, Treated Wheat Bran

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Subject Categories:

Chemistry: Impact Factor 0.659, 60/121

(1991), Du Pont delays on Irish incinerator. *Chemistry in Britain*, **27** (7), 614.

? (1997), Responsible care. *Chemistry in Britain*, **33** (8), 9.

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# Title: Chemistry and Ecology

Full Journal Title: [Chemistry and Ecology](http://journalsonline.tandf.co.uk/app/home/journal.asp?wasp=3pvxjewyrp2tpl4wrh5u&referrer=parent&backto=linkingpublicationresults,1:101994,1); [Chemistry and Ecology](http://www.ingentaconnect.com/content/tandf/gche)

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Ecology: Impact Factor 0.475, 103/116 (2007); Impact Factor 0.634, 107/129 (2009)

Environmental Sciences: Impact Factor 0.475, 144/160 (2007); Impact Factor 0.634, 161/181 (2009)

? Sirry, S.M. and Soltan, M.E. (2004), Physicochemical aspects of using natural scavengers in removing Methylene blue (basic dye) from solution. *Chemistry and Ecology*, **20** (6), 449-458.

Full Text: [2004\Che Eco20, 449.pdf](2004/Che%20Eco20,%20449.pdf)

Abstract: Effluent from dyeing and finishing processes is an important source of water pollution. The effectiveness of bentonite, kaolinite and sediment from a local deposit in removing Methylene blue as a cationic dye from aqueous solutions has been investigated. The adsorption equilibrium (isotherm) has been determined according to Freundlich and Langmuir equations. The optimum amount is 0.5 g for all adsorbents, and the optimum pH ranges are 2-8 for bentonite and 2-6 for kaolinite and sediment. With respect to kinetic modelling, the adsorption of Methylene blue on various adsorbents was fitted to a second-order equation. Also, the thermodynamic parameters were determined. The negative free energy values indicate the feasibility of the process and spontaneous nature of adsorption. The positive Δ*H*° values indicate the endothermic nature of the process. Thus, Egyptian clay minerals and sediments have a great tendency to remove the dye from solutions.

Keywords: Kaolinite, Bentonite, Sediment, Methylene Blue, Adsorption, Kinetic, Thermodynamic Par

? Penche, F., Fraile, A., González, F., Blázquez, M.A., Muñoz, J.A, and Ballester, A. (2005), Biosorption of copper, zinc, cadmium and nickel by *Chlorella vulgaris*. *Chemistry and Ecology*, **21** (1), 61-75.

Full Text: [2005\Che Eco21, 61.pdf](2005/Che%20Eco21,%2061.pdf)

Abstract: The sorption capacity of the microalga, *Chlorella vulgaris*, was investigated using different metals (Cu, Zn, Cd and Ni), in both monometallic and bimetallic solutions. The final metal concentrations were significantly low. In the case of copper, an acid pretreatment (at pH 3) of the biomass was required to avoid an excessive increase in pH and the subsequent precipitation of metal during tests. This pretreatment was not necessary for the rest of the metals. The study of the influence of pH led to a greater metal uptake at a higher pH, suggesting a clear competition between metal cations and protons during the biosorption process. The biomass concentration was also a relevant variable, and the best sorption capacities were achieved at the lowest biomass concentration. pH also had a great influence on the elution of the metal retained by the biomass. The best recovery yields were obtained for the lower pH of the eluent solution. Sorption isotherms were well fitted to the Langmuir model, for both single-metal and two-metal systems. In both cases, the biomass showed a greater affinity for Cd.

Keywords: Biosorption,Copper, Zinc, Cadmium, Nickel, *Chlorella vulgaris*

? Shaker, M.A. and Hussein, H.M. (2005), Heavy-metal adsorption by non-living biomass. *Chemistry and Ecology*, **21** (4), 303-311.

Full Text: [2005\Che Eco21, 303.pdf](2005/Che%20Eco21,%20303.pdf)

Abstract: The adsorption of some heavy metals onto the walls of harvested, washed, and dried non-living biomass cells of different Pseudomonas strains was studied at optimum experimental conditions using a simplified single component system. The Langmuir adsorption model was found to be a suitable approach to describe the system via multi-step processes. Isotherms measured at 30.0°C and pH 5.5 with [M](total) = 10-100 mM for tight, reversible Cr6+(aq), Ni2+(aq), Cu2+(aq) and Cd2+(aq) binding by the cell walls of the investigated biomass fit the Langmuir model and give the pH-independent stoichiometric site capacities v(i) and equilibrium constants K-i for metal binding at specific biomass sites i = A, B, C, and D. Tight binding sites A, B, and D of the non-living biomass are occupied by Cr-V1, sites A and C by Ni-II, sites A and D by Cd-II, and only site B by Cull. It is concluded that vi is a stoichiometric parameter that is independent of the magnitude of Ki for binding site i and that the studied heavy metals selectively and tightly bind at different biomass sites.

Keywords: Adsorption, Binding, Binding Sites, Biosorption, Copper(II), Heavy Metals, Isotherm, Kinetics, Langmuir, Mechanism, Non-Living Biomass, Removal

? El Sikaily, A., Khaled, A., El Nemr, A. and Abdelwahab, O. (2006), Removal of Methylene Blue from aqueous solution by marine green alga *Ulva lactuca*. *Chemistry and Ecology*, **22** (2), 149-157.

Full Text: [2006\Che Eco22, 149.pdf](2006/Che%20Eco22,%20149.pdf)

Abstract: Biosorption of colours is an important technology for treatment of different types of industrial wastewaters containing dyes. The objective of this study was to convert green alga Ulva lactuca to dye adsorbents for wastewater treatment. The importance of commonly available green alga Ulva lactuca was investigated as viable biomaterials for the biological treatment of synthetic basic blue 9 (5-ch1oro-N,N,N’,N’-tetramethyl-5λ4-phenothiazine-3,7-diamine) effluents. The results obtained from the batch experiments revealed the ability of the green algae to remove the basic blue 9, and this was dependent on the dye concentration, pH, and algal biomass. We investigated the equilibrium and kinetics of adsorption, and the Langmuir and Freundlich equations were used to fit the equilibrium isotherm. The adsorption isotherm of basic blue 9 followed both the Langmuir and Freundlich models with a correlation coefficient of ~0.96–0.99, and the adsorption kinetics followed the pseudo-second-order model (R 2 =1.0). The maximum adsorption capacity was about 40.2 mg of dye per gram of dry green algae at pH 10, 25 g l-1 dye and 2.5 g l-1 alga concentrations. This study demonstrated that the green algae could be used as an effective biosorbent for the treatment of dye-containing wastewater streams.

Keywords: Biosorption, Basic Dye, Methylene Blue, Green Algae, *Ulva Lactuca*, Wastewater Treatment, Removal of Dyes

? El Nemr, A., Abdelwahab, O., Khaled, A. and El Sikaily, A. (2006), Biosorption of Direct Yellow 12 from aqueous solution using green alga *Ulva lactuca*. *Chemistry and Ecology*, **22** (4), 253-266.

Full Text: [2006\Che Eco22, 253.pdf](2006/Che%20Eco22,%20253.pdf)

Abstract: The potential of commonly available green alga Ulva lactuca was investigated as viable biomaterials for removal of synthetic azo dye (Direct Yellow 12, DY-12) from aqueous solution. The results obtained from the batch experiments revealed that the ability of the U. lactuca to remove DY-12 from its aqueous solution was dependent on the dye concentration, pH, and algal biomass but less dependent on the particle size of the U. lactuca. The equilibrium conditions and kinetics of adsorption were investigated, and the adsorption kinetic was consistent with the pseudo-second-order model (R2 = 1). The adsorption isotherm followed only the Freundlich model with a correlation coefficient R2 = 0.99. This study demonstrated that the U. lactuca could be used as an effective biosorbent for the removal of DY-12 from its aqueous solution.

Keywords: Biosorption, Removal, Dyes, Direct Yellow 12, Green Alga, *Ulva Lactuca*, Textile Effluents, Color Removal, Azo Dyes, Adsorption, Equilibria, Copper(II), Sorbents, Wastes, Model

? Abdelwahab, O., El Sikaily, A., Khaled, A. and El Nemr, A. (2007), Mass-transfer processes of chromium(VI) adsorption onto guava seeds. *Chemistry and Ecology*, **23** (1), 73-85.

Full Text: [2007\Che Eco23, 73.pdf](2007/Che%20Eco23,%2073.pdf)

Abstract: The chromium(VI) biosorption onto guava seeds, as an alternative method for Cr6+ removal from aqueous solutions, was investigated. The parameters affecting kinetics and equilibrium of Cr6+ adsorption onto guava seeds were studied. An external mass-transfer diffusion coefficient k and intra-particle diffusion coefficient ki were determined to measure the rate-limiting step of adsorption. A single external mass-transfer diffusion model and intra-particle diffusion models were used. The effects of initial pH, sorbent mass, and initial Cr6+ concentrations on mass-transfer coefficients were investigated. The external mass-transfer coefficient has an average value of 7.2×10-3 cm s-1, while the intra-particle mass-transfer diffusion coefficient was 0.34 mg g-1 min-0.5. This indicates that external diffusion to the guava seeds surface and intra-particle diffusion are both involved in the sorption process. The isotherm equilibrium data were well fitted by the Langmuir and Freundlich models with an average correlation coefficient R2 = 0.98. The maximum removal of Cr6+ was obtained at pH I (about 100% for adsorbent dose of 15 g l-1 and 25 mg l-1 initial concentration of Cr6+). The results indicated that the guava seeds exhibit acceptable sorption capacity.

Keywords: Guava Seed, Chromium(VI) Removal, Adsorption, Mass Transfer, Wastewater Treatment, Water Pollution, Sugar-Beet Pulp, Aqueous-Solutions, Cr(VI) Removal, Hexavalent Chromium, Activated Carbons, Waste-Water, Sorption, Ions, Kinetics, Pith

? Baral, S.S., Das, S.N., Rath, P., Chaudhury, G.R. and Swamy, Y.V. (2007), Removal of Cr(VI) from aqueous solution using waste weed, *Salvinia cucullata*. *Chemistry and Ecology*, **23** (2), 105-117.

Full Text: [2007\Che Eco23, 105.pdf](2007/Che%20Eco23,%20105.pdf)

Abstract: Biosorption studies of Cr(VI) were carried out using waste weed, Salvinia cucullata. Various adsorption parameters were studied, such as agitation speed, contact time, pH, particle size, and concentrations of adsorbent and adsorbate. The equilibrium was achieved in 12 h. A lower pH favoured adsorption of Cr(VI). The kinetics followed pseudo-second-order rate equations. The adsorption isotherm obeyed both the Langmuir and Freundlich models. The calculated activation energy (1.1 kJ mol-1) suggested that the adsorption followed a diffusion-controlled mechanism. Various thermodynamic parameters such as Delta G degrees, Delta H degrees, and Delta S degrees were also calculated. The positive values of enthalpy indicated the endothermic nature of the reaction, and Delta S degrees. showed the increasing randomness at the solid liquid interface of Cr(VI) on the adsorbent, which revealed the ease of adsorption reaction. These thermodynamic parameters showed the spontaneity of the reaction. The maximum adsorption of uptake (232 mg g-1) compared well with reported values of similar adsorbents. The rate-determining step was observed to follow an intra-particle diffusion model.

Keywords: Activated Carbon, Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Isotherm, Adsorption Parameters, Agitation, Aqueous Solution, Biomass, Biosorption, Concentrations, Contact Time, Cr(VI), Diffusion, Diffusion Model, Endothermic, Energy, Enthalpy, Equations, Equilibrium, Equilibrium, Freundlich, Hexavalent Chromium, Industrial-Waste, Interface, Intra-Particle Diffusion, Intra-Particle Diffusion Model, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Isotherm, Kinetics, Langmuir, Mechanism, Metals, Model, Models, Parameters, Particle, Particle Size, pH, Pseudo Second Order, Pseudo-Second-Order, Rate-Determining Step, Reaction, Sawdust, Speed, Thermodynamic, Thermodynamic Parameters, Uptake, VI, Waste, Weed

? El Nemr, A., El Sikaily, A., Khaled, A. and Abdelwahab, O. (2007), Removal of toxic chromium(VI) from aqueous solution by activated carbon using Casuarina equisetifolio. *Chemistry and Ecology*, **23** (2), 119-129.

Full Text: [2007\Che Eco23, 119.pdf](2007/Che%20Eco23,%20119.pdf)

Abstract: Highly activated carbon from the seed husk of Casuarina Casuarinas equisetifolia, a worldwide famous plant, have been prepared and tested for the removal of toxic Cr(VI) from its aqueous solution. The adsorbent was investigated for influences of initial chromium concentration (75, 100, 125, and 150 mg l-1), pH, contact time, and quantity of carbon on removal of Cr(VI) from aqueous solution at room temperature (25±2°C). The adsorption kinetic of Cr(VI) was studied, and the rates of sorption were found to conform to pseudo-second-order kinetics with a good correlation (R2 >= 0.99). The Langmuir and Freundlich models fit the isotherm data well. Furthermore, the Gibbs free energy was obtained for each system and was found to be -5.29 kJ mol-1 for removal of Cr(IV). The negative value of ΔG° indicates the feasibility and spontaneous nature of adsorption. The results indicate that acidic pH (1.05) supported the adsorption of Cr(IV) on activated carbon. The maximum adsorption capacity of Cr(VI) on activated carbon was about 172.4 mg g-1 at pH 1.05.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Kinetic, Aqueous Solution, Capacity, Carbon, Casuarina, Casuarinas Equisetifolia, Chromium, Concentration, Contact Time, Correlation, Cr(IV), Cr(VI), Energy, Equilibrium, Free Energy, Freundlich, Freundlich Model, Gibbs Free Energy, Ions, Isotherm, Isotherm Data, Iv, Kinetic, Kinetics, Langmuir, Langmuir Model, Models, pH, Plant, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Quantity, Removal, Room Temperature, Seed, Sorption, Temperature, Toxic, VI

? El Nemr, A. (2007), Pomegranate husk as an adsorbent in the removal of toxic chromium from wastewater. *Chemistry and Ecology*, **23** (5), 409-425.

Full Text: [2007\Che Eco23, 409.pdf](2007/Che%20Eco23,%20409.pdf)

Abstract: The use of a new sorbent developed from the husk of pomegranate, a famous fruit in Egypt, for the removal of toxic chromium from aqueous solution has been investigated. The batch experiment was conducted to determine the adsorption capacity of the pomegranate husk. The effects of initial metal concentration (25 and 50 mg l-1), pH, contact time, and sorbent concentration (2-6 g l-1) have been studied at room temperature. A strong dependence of the adsorption capacity on pH was observed, the capacity increased as the pH decreased, and the optimum pH value was pH 1.0. Adsorption equilibrium and kinetics were studied with different sorbent and metal concentrations. The adsorption process was fast, and equilibrium was reached within 3 h. The maximum removal was 100% for 25 mg l-1 of Cr6+ concentration on 5 g l-1 pomegranate husk concentration, and the maximum adsorption capacity was 10.59 mg g-1. The kinetic data were analysed using various kinetic models-pseudo-first-order, pseudo-second-order, Elovich, and intraparticle diffusion equations-and the equilibrium data were tested using several isotherm models, Langmuir, Freundlich, Tempkin, Dubinin-Radushkevich, and Generalized isotherm equations. The Elovich and pseudo-second-order equations provided the greatest accuracy for the kinetic data, while Langmuir and Generalized isotherm models were the closest fit for the equilibrium data. The activation energy of sorption has also been evaluated as 0.236 and 0.707 kJ mol-1 for 25 and 50 mg l-1 chromium concentration, respectively.

Keywords: Accuracy, Activated Carbon, Activation, Activation Energy, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Process, Alga Ulva-Lactuca, Aqueous Solution, Aqueous-Solution, Batch, Batch Experiment, Biosorption, Capacity, Chromium, Concentration, Concentrations, Contact Time, Cr6+, Dependence, Diffusion, Effects, Egypt, Elovich, Energy, Equations, Equilibrium, Equilibrium Data, Experiment, Freundlich, Fruit, Intraparticle, Intraparticle Diffusion, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetics, Kinetics, L(1), Langmuir, Mass-Transfer, Metal, Methylene-Blue, Models, pH, Pomegranate Husk, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Room Temperature, Sorbent, Sorption, Temperature, Tempkin, Time, Toxic, Toxic Chromium, Value, Wastewater

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Full Text: [2008\Che Eco24, 285.pdf](2008/Che%20Eco24,%20285.pdf)

Abstract: Periwinkle shell, an abundant and inexpensive natural resource, was used to prepare activated carbon by physicochemical activation with potassium hydroxide (KOH) and carbon dioxide (CO2) as the activating agents at 850°C for 2 h. The adsorption equilibrium and kinetics of Methylene blue dye on such carbon were then examined at 25°C. Adsorption isotherm of the Methylene blue (MB) on the activated carbon was determined and correlated with common isotherm equations. The equilibrium data for Methylene blue adsorption well fitted to the Langmuir equation, with maximum monolayer adsorption capacity of 500.00 mg/g. Two simplified kinetic models including pseudo-first-order and pseudo-second-order equation were selected to follow the adsorption processes. The adsorption of Methylene blue on activated carbon derived from periwinkle shell could best be described by the pseudo-second-order equation. The kinetic parameters of this best-fit model were calculated and discussed.

Keywords: Acid, Adsorbents, Adsorption, Coir Pith, Dye, Isotherm, Kinetics, Periwinkle Shell, Pore, Porosity, Removal, Stones, Surface-Area, Waste, Water

? Anirudhan, T.S. and Radhakrishnan, P.G. (2010), Uptake and desorption of nickel(II) using polymerised tamarind fruit shell with acidic functional groups in aqueous environments. *Chemistry and Ecology*, **26** (2), 93-109.

Full Text: [2010\Che Eco26, 93.pdf](2010/Che%20Eco26,%2093.pdf)

Abstract: The sorption potential of formaldehyde polymerised tamarind fruit shell (FPTFS) containing acidic functional groups for the treatment of Ni(II) ions from aqueous solutions has been investigated. The adsorbent was characterised by infrared spectroscopy and scanning electron microscopy. Operating parameters affecting Ni(II) adsorption were investigated by the batch technique. Maximum Ni(II) sorption was found to occur at an initial pH of around 6. Kinetic studies showed that the amount adsorbed increased with initial Ni(II) concentration and the equilibrium was established in 180min. The kinetic data were analysed using the Lagergren pseudo-first-order, Ritchie second-order and modified Ritchie second-order equations, and showed better fit with the modified Ritchie second-order equation. Equilibrium data were analysed by Langmuir, Freundlich, Sips and Tóth isotherm models and the Sips model best defined the isotherm. The adsorption of Ni(II) was endothermic in nature (Hads: 45.93kJ/mol) with an increase in entropy (Sads: 245.67J/mol/K) and a decrease in Gibbs free energy (Gads:-28.52 to-35.67kJ/mol) in the temperature range 30-60ºC. The reduction in adsorption capacity with an increase in ionic strength and isosteric heat of adsorption (Hx: 24.85kJ/mol) revealed an ion exchange mechanism for Ni(II) adsorption. The adsorption efficiency of FPTFS towards Ni(II) removal from a nickel-plating industry wastewater sample was investigated and quantitative removal of 100mg/L of Ni(II) in 1 L of industrial wastewater was possible with 6g of FPTFS. The spent, nickel-laden FPTFS was regenerated by 0.1M HCl and four adsorption/desorption cycles were performed. The results indicated that FPTFS exhibited considerable potential for application in the removal of Ni(II) ions from aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption, Desorption, Application, Aqueous Solutions, Batch, Bone Char, Capacity, Concentration, Data, Desorption, Efficiency, Electron Microscopy, Elovich Equation, Endothermic, Energy, Entropy, Equilibrium, Fixed-Bed Adsorption, Formaldehyde, Freundlich, Functional Groups, Gibbs Free Energy, Heat of Adsorption, Heavy-Metals, Industrial Wastewater, Infrared Spectroscopy, Ion Exchange, Ion-Exchange, Ionic Strength, Ions, Isosteric Heat of Adsorption, Isotherm, Kinetic, Kinetic Studies, Langmuir, Mechanism, Model, Models, Modified, Ni(II), Ni(II) Ions, Nickel(II), pH, Potential, Pseudo First Order, Pseudo-First-Order, Reduction, Regeneration, Removal, Ritchie Second Order Equation, Scanning Electron Microscopy, Second Order, Second-Order, Second-Order Equation, Solutions, Sorption, Sorption Potential, Spectroscopy, Strength, Tamarind Fruit Shell, Temperature, Thermodynamics, Treatment, Waste-Water, Wastewater

? Dekhil, A.B., Hannachi, Y., Ghorbel, A. and Boubaker, T. (2011), Removal of lead and cadmium ions from aqueous solutions using the macroalga *Caulerpa racemosa*. *Chemistry and Ecology*, **27** (3), 221-234.

Full Text: [2011\Che Eco27, 221.pdf](2011/Che%20Eco27,%20221.pdf)

Abstract: In this study, *Caulerpa racemosa* was characterised and used for the removal of Cd(II) and Pb(II) from aqueous solutions. The effect of pH, adsorbent dosage, contact time and temperature on the adsorption process was studied in batch experiments. Langmuir and Freundlich models were applied to describe the biosorption isotherm of the metal ions by *C. racemosa* biomass. The adsorption data can be well described by the Langmuir isotherm. The monolayer biosorption capacity of *C. racemosa* biomass for Pb(II) and Cd(II) ions was found to be 34.5 and 29 mg center dot g-1, respectively. The mean free energy calculated from the Dubinin-Radushkevich isotherm indicated that the biosorption of Pb(II) and Cd(II) onto *C. racemosa* macroalga took place by chemisorption. Kinetics data of both metal ions were best described by a pseudo-second-order model. Thermodynamic studies showed that the adsorption was spontaneous and exothermic in nature. Analysis with FTIR indicated that possible functional groups involved in metal sorption by this alga were O-H bending, N-H stretching, C-N stretching, C-O and S=O stretching

Keywords: Adsorption, Algae, Biomass, Biosorption, Biosorption, Cadmium, Caulerpa Racemosa, Cd(II), Co, Dubinin-Radushkevich Isotherm, Equilibrium, Freundlich, FTIR, FTIR Analysis, Heavy Metal Biosorption, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir and Freundlich Models, Langmuir Isotherm, Metal-Ions, Pb(II), pH, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Studies

# Title: Chemistry Education Research and Practice

Full Journal Title: Chemistry Education Research and Practice

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Verdan, A.M., Ingallinera, J.T. and Bhattacharyya, G. (2010), Scientific norms and ethical misconduct: Research towards the design of a course in scientific ethics. *Chemistry Education Research and Practice*, **11** (2), 118-123.

Full Text: [2010\Che Edu Res Pra11, 118.pdf](2010/Che%20Edu%20Res%20Pra11,%20118.pdf)

Abstract: We report our study of chemistry graduate students’ beliefs regarding the normative values of their disciplines and their perceptions of the ethical challenges they face as students, teachers, and scientific researchers. Using a phenomenographical lens, we interviewed seven graduate students who had achieved Ph.D. candidacy and at least 3 full years of experience in the program. Inductive, grounded-theory analysis of the data indicated that the students focused on plagiarism and data falsification when speaking of scientific misconduct, and tended to view normative values as the opposite of misconduct. None of the students appeared to understand clearly the process of establishing claims in science. Instead, they believed that it was the advisors’ roles to make final judgments regarding the validity of their data. Overall, the data indicate that the participants’ impoverished conceptions of scientific ethics resulted from naive personal epistemologies of science, which, in turn, was partly due to their under-developed professional identities. We recommend that training in scientific norms and the nature of science should precede instruction involving case study analysis of misconduct or ambiguous scenarios.

Keywords: Chemistry Instruction, Chemists, Epistemic Development, Ethics, Graduate Education, Personal Epistemology, Plagiarism, Professional Identity, Research, Science, Scientific Misconduct, Scientific Norms, Students

# Title: Chemistry-A European Journal

Full Journal Title: [Chemistry-A European Journal](http://www3.interscience.wiley.com/cgi-bin/jhome/26293)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0947-6539

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Huang, M.R., Peng, Q.Y. and Li, X.G. (2006), Rapid and effective adsorption of lead ions on fine poly(phenylenediamine) microparticles. *Chemistry-A European Journal*, **12** (16), 4341-4350.

Full Text: [2006\Che-A Eur J12, 4341.pdf](2006/Che-A%20Eur%20J12,%204341.pdf)

Abstract: Fine microparticles of poly(p-phenylenediamine) (PpPD) and poly(m-phenylenediamine) (PmPD) were directly synthesized by a facile oxidative precipitation polymerization and their strong ability to adsorb lead ions from aqueous solution was examined. It was found that the degree of adsorption of the lead ions depends on the pH, concentration, and temperature of the lead ion solution, as well as the contact time and microparticle dose. The adsorption data fit the Langmuir isotherm and the process obeyed pseudo-second-order kinetics. According to the Langmuir equation, the maximum adsorption capacities of lead ions onto PpPD and PmPD microparticles at 30°C are 253.2 and 242.7 mg g-1, respectively. The highest adsorptivity of lead ions is up to 99.8%. The adsorption is very rapid with a loading half-time of only 2 min as well as initial adsorption rates of 95.24 and 83.06 mg g-1 min-1 on PpPD and PmPD particles, respectively. A series of batch experiment results showed that the PpPD microparticles possess an even stronger capability to adsorb lead ions than the PmPD microparticles, but the PmPD microparticles, with a more-quinoid-like structure, show a stronger dependence of lead-ion adsorption on the pH and temperature of the lead-ion solution. A possible adsorption mechanism through complexation between Pb2+ ions and =N-groups on the macromolecular chains has been proposed. The powerful leadion adsorption on the microparticles makes them promising adsorbents for wastewater cleanup.

Keywords: Adsorption, Conducting Materials, Ladder Polymers, Lead Surface Chemistry, Heavy-Metal Ions, Aqueous-Solutions, Functional-Groups, Removal, Copolymers, Oxide, Phenylenediamine, Immobilization, Nanoparticles, Equilibrium

? Dietzel, P.D.C., Johnsen, R.E., Blom, R. and Fjellvåg, H. (2008), Structural changes and coordinatively unsaturated metal atoms on dehydration of honeycomb analogous microporous metal-organic frameworks. *Chemistry-A European Journal*, **14** (8), 2389-2397.

Full Text: [2008\Che-A Eur J14, 2389.pdf](2008/Che-A%20Eur%20J14,%202389.pdf)

Abstract: Porous metal-organic framework compounds with coordinatively unsaturated metal sites on the inner surface of the pores promise to be valuable adsorbents and catalyst systems, either in industrial applications or as model systems to study interactions with guest molecules. The dehydration process of two isostructural microporous coordination polymers, [M-2(dhtp)-(H2O)2]center dot 8H2O, termed CPO-27-M (M=Co, Zn; H(4)dhtp=2,5-dihydroxytereplithalic acid) was investigated by in situ variable temperature X-ray diffraction. Both compounds contain accessible coordination sites at the metal after complete removal of the solvent. However, despite the analogy of their crystal structures, they behave differently during dehydration. For CPO-27-Co, water desorption is a smooth topotactic process of second order with no concomitant space group change and no increase in microstrain, which is beneficial for the applicability of the material. Removal of the water propagates from the center of the channels outwards. The coordinating water molecule at the metal desorbs only when almost all the bulk water in the pores has disappeared. In contrast, discontinuities in the powder pattern of CPO-27-Zn indicate the occurrence of first-order transitions. The crystal structures of four of the five individual phases could be determined. The structure of the intermediate phase occurring just before the framework is completely evacuated was elusive in respect to full structure solution and refinement, but it is most probably related to the removal of the axis of threefold symmetry. The zinc-based material experiences a significant amount of strain.

Keywords: Adsorbents, Analogy, Bilayer Open Framework, Catalyst, Changes, Coordination Polymers, Desorption, Framework, Guest Removal, Hydrogen Adsorption, Metal, Microporous Materials, Model, Molecular Framework, Polymers, Removal, Single-Crystal Transformations, Single-Site Catalyst, Sites, Solution, Structure, Synchrotron Powder Diffraction, Temperature, Topotactic Transformation, Water, X-Ray Diffraction, X-Ray-Diffraction, Zeolite Laumontite

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Full Text: [2009\Che-A Eur J15, 4573.pdf](2009/Che-A%20Eur%20J15,%204573.pdf)

Abstract: Poly(aniline (AN)-co-5-sulfo-2-anisidine (SA)) nanoparticles were synthesized by chemical oxidative copolymerization of AN and SA monomers, and their extremely strong adsorption of mercury ions in aqueous solution was demonstrated. The reactivity ratios of AN and SA comonomers were found to be 2.05 and 0.02, respectively. While AN monomer tends to homopolymerize, SA monomer tends to copolymerize with AN monomer because of the great steric hindrance and electron-attracting effect of the sulfo groups, despite the effect of conjugation of the methoxyl group with the benzene ring. The effects of initial mercury(II) concentration, sorption time, sorption temperature, ultrasonic treatment, and sorbent dosage on mercuryion sorption onto AN/SA (50/50) copolymer nanoparticles with a number-average diameter of around 120 nm were significantly optimized. The results show that the maximum fig-ion sorption capacity on the particulate nanosorbents can even reach 2063 mg of Hg per gram of sorbent, which would be the highest Hg-ion adsorbance so far. The sorption data fit to the Langmuir isotherm, and the process obeys pseudo-second-order kinetics. The IR and UV/Vis spectral data of the Hg-loaded copolymer particles suggest that some mercury(II) was directly reduced by the copolymer to mercury(I) and even mercury(0). A mechanism of sorption between the particles and fig ions in aqueous solution is proposed, and a physical/ion exchange/chelation/redox sorption ratio of around 2/3/45/50 was found. Copolymer nanoparticles may be one of the most powerful and cost-effective sorbents of mercury ions, with a wide range of potential applications for the efficient removal and even recovery of the mercury ions from aqueous solution.

Keywords: Adsorption, Aqueous-Solutions, Coir Pith, Copolymerization, Desorption, Gel Beads, Heavy-Metal Ions, Mercury, Nanomaterials, Nanoparticles, Polyaniline, Removal, Surface Chemistry, Water

? Li, X.G., Feng, H. and Huang, M.R. (2010), Redox sorption and recovery of silver ions as silver nanocrystals on poly(aniline-*co*-5-sulfo-2-anisidine) nanosorbents. *Chemistry-A European Journal*, **16** (33), 10113-10123.

Full Text: [2010\Che-A Eur J16, 10113.pdf](2010/Che-A%20Eur%20J16,%2010113.pdf)

Abstract: Poly[aniline(AN)-co-5-sulfo2-anisidine(SA)] nanograins with rough and porous structure demonstrate ultrastrong adsorption and highly efficient recovery of silver ions. The effects of five key factors-AN/SA ratio, Ag-I concentration, sorption time, ultrasonic treatment, and coexisting ions-on Ag-I adsorbability were optimized, and AN/SA (50/50) copolymer nanograins were found to exhibit much stronger AgI adsorption than polyaniline and all other reported sorbents. The maximal Ag-I sorption capacity of up to 2034 mg-1 (18.86 mmolg-1) is the highest thus far and also much higher than the maximal Hg-ion sorption capacity (10.28 mmolg(-1)). Especially at <= 2 mM Ag-I, the nanosorbents exhibit >= 99.98% adsorptivity, and thus achieve almost complete Ag-I sorption. The sorption fits the Langmuir isotherm well and follows pseudo-second-order kinetics. Studies by IR, UV/Vis, X-ray diffraction, polarizing microscopy, centrifugation, thermogravimetry, and conductivity techniques showed that Ag-I sorption occurs by a redox mechanism mainly involving reduction of Ag-I to separable silver nanocrystals, chelation between Ag-I and -NH-/-N=/-NH2/-SO3H/-OCH3, and ion exchange between Ag-I and H+ on -SO3 H--(+). Competitive sorption of AgI with coexisting Hg, Pb, Cu, Fe, Al, K, and Na ions was systematically investigated. In particular, the copolymer nanoparticles bearing many functional groups on their rough and porous surface can be directly used to recover and separate precious silver nanocrystals from practical Ag-I wastewaters containing Fe, Al, K, and Na ions from Kodak Studio. The nanograins have great application potential in the noble metals industry, resource reuse, wastewater treatment, and functional hybrid nanocomposites.

Keywords: Adsorbability, Adsorption, Application, Behavior, Capacity, Carbon, Chelation, Concentration, Conductivity, Copolymer, Copolymers, Cu, Facile Synthesis, Functional Groups, Hybrid, Ion Exchange, Ion-Exchange, Ions, IR, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Macromolecular Chemistry, Mechanism, Metals, Metals Industry, Microparticles, Nanocomposites, Nanocrystals, Nanoparticles, Nanoparticles, Pb, Polyaniline, Polymers, Potential, Precious-Metal Ions, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Recovery, Redox Chemistry, Reduction, Resins, Reuse, Silver, Sorbents, Sorption, Sorption Capacity, Structure, Surface, Techniques, Thermogravimetry, Treatment, Ultrasonic, Wastewater, Wastewater Treatment, Wastewaters, X-Ray, X-Ray Diffraction

# Title: Chemistry & Industry

Full Journal Title: [Chemistry & Industry](http://www.chemind.org/CI/index.jsp); [Chemistry & Industry](http://ehis.ebscohost.com.ludwig.lub.lu.se/ehost/detail?hid=23&sid=754e5b51-5959-408f-8c75-37a843345253%40sessionmgr10&vid=1&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=bth&jid=1BG)

ISO Abbreviated Title: Chem. Ind.

JCR Abbreviated Title: Chem Ind-London

ISSN: 0009-3068

Issues/Year: 24

Journal Country/Territory: England

Language: English

Publisher: Soc Chemical Industry

Publisher Address: 14 Belgrave Square, London SW1X 8PS, England

Subject Categories:

Chemistry, Applied: Impact Factor 0.719, / (2000)

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Keywords: Adsorption

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Keywords: Adsorption

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Keywords: Adsorption

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Keywords: Adsorption, Pollution

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Keywords: Citation, Science Citation Index

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Keywords: Adsorption, Cellulose, Water

Notes: IIsotherm

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Full Text: [1960-80\Che Ind50, 1772.pdf](1960-80/Che%20Ind50,%201772.pdf)

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Keywords: Adsorption, Determination, Distribution

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Keywords: Adsorption, Determination, Dye, Research

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Keywords: Adsorption, Isotherm

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Keywords: Adsorption, Chemistry, History

Notes: IIsotherm

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Keywords: Adsorption, Chemistry, History, Isotherm

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# Title: Chemistry and Industry of Forest Products

Full Journal Title: [Chemistry and Industry of Forest Products](http://cnki50.csis.com.tw/kns50/Navi/item.aspx?NaviID=1&BaseID=LCHX&NaviLink=%e6%9e%97%e4%ba%a7%e5%8c%96%e5%ad%a6%e4%b8%8e%e5%b7%a5%e4%b8%9a)

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: [2004\Che Ind For Pro24, 79.pdf](2004/Che%20Ind%20For%20Pro24,%2079.pdf)

Abstract: Cross-linked konjac glucomannan granules (CKGG) are prepared from konjac glucomannan (KGM) and cross-linking agent, and factors influencing cross-linked reaction are discussed. CKGG is considered to be used as a new adsorbent. Orthogonal design method is used in the study to determine the factors influencing the reactions, and it is found that when NaOH is 50 % of the quantity of konjac glucomannan and the epoxy chloropropane is the same of the konjac glucomannan, at 45°C, reaction time 6 h with 30 % alcohol solution, the product has good exchange capacity. Results of IR spectrum, optical microscopy and SEM show that CKGG are alveolate and porous, having good colour and luster, and the particle sizes are well distributed. Cation interchange capacity is 0.2114 mmol/g, and CKGG are insoluble in water, acid and alkali.

Keywords: Konjac Glucomannan, Cross-Linked, Adsorbent

# Title: Chemistry of Interfaces

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# Title: Chemistry Letters

Full Journal Title: [Chemistry Letters](http://www.jstage.jst.go.jp/browse/cl)

ISO Abbreviated Title: Chem. Lett.

JCR Abbreviated Title: Chem Lett

ISSN: 0366-7022

Issues/Year: 12

Journal Country/Territory: Japan

Language: English

Publisher: Chemical Soc Japan

Publisher Address: 1-5 Kanda-Surugadai Chiyoda-Ku, Tokyo 101, Japan

Subject Categories:

Chemistry: Impact Factor 1.536, 24/121

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Full Text: [1987\Che Let16, 1421.pdf](1987/Che%20Let16,%201421.pdf)

Abstract: Dealumination of a framework of H-ZSM-5 zeolites with water was investigated by 27Al MASNMR. It was found that the rate of dealumination is apparently second-order dependent on the concentration of framework aluminium.

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Full Text: [1988\Che Let17, 9.pdf](1988/Che%20Let17,%209.pdf)

Abstract: Chitosan was selectively N-nonanoylated, and the influence of the long acyl groups on the adsorption of copper(II) ion was studied. The acylation with nonanoyl chloride was achieved efficiently on a highly swelled chitosan precipitate. The adsorption capacity could be improved markedly by a small extent of acylation.

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Full Text: [1988\Che Let17, 1281.pdf](1988/Che%20Let17,%201281.pdf)

Abstract: The pH dependencies in the adsorption of various metal ions on a resin prepared by crosslinking copper(II)-complexed chitosan were investigated. Separations of gallium and indium from zinc, ferric iron and aluminum from zinc, and nickel from cobalt were possible with high selectivity by this resin. Some applications to hydrometallurgical processes are also proposed.

Xu, Y.H., Ohki, A. and Maeda, S. (1998), Adsorption of arsenic(V) by use of aluminium-loaded Shirasu-zeolites. *Chemistry Letters*, **27** (10), 1015-1016.

Full Text: [1998\Che Let27, 1015.pdf](1998/Che%20Let27,%201015.pdf)

Abstract: A P-1 type Shirasu-zeolite (SZP(1)) was treated with an aluminium sulfate solution, and thus an aluminium-loaded SZP(1) (Al-SZP(1)) was prepared. By use of Al-SZP(1) as an adsorbent, the adsorption of As(V) was examined. The Al-SZP(1) was superior to an activated alumina and other aluminium-loaded zeolites in terms of the adsorption ability for As(V).

Keywords: Activated Carbon, Coral Limestone, Arsenate Ions, Removal, Adsorbent, Water

? Shinohara, T., Wakisaka, S., Ohto, K. and Inoue, K. (2000), Synthesis of novel type resin based on calix[4]arene carboxylate and selective separation of lead from zinc. *Chemistry Letters*, **29** (6), 640-641.

Full Text: [2000\Che Let29, 640.pdf](2000/Che%20Let29,%20640.pdf)

Abstract: A novel type of resin derived from calix[4]arene carboxylate was synthesized and adsorption behavior for lead(II), zinc(II), copper(II), nickel(II), and cobalt(II) was investigated. Further, column separation of lead(II) from zinc(II) was also carried out. Adsorption equilibria of metal ions showed following order of selectivity series among metal ions: Pb(II) >> Cu(II) > Zn(II) > Co(II) = Ni(II). Separation of lead and zinc using the packed column was sufficiently achieved.

Keywords: Chemically-Modified Chitosan, Ions, Adsorption, Extraction

? Wu, X.M., Ling, Y.H., Sun, J.T., Zhi, X. and Huang, Z.H. (2008), Photoelectrocatalytic degradation of Methylene blue dye on titania nanotube array film. *Chemistry Letters*, **37** (4), 416-417.

Full Text: [2008\Che Let37, 416.pdf](2008/Che%20Let37,%20416.pdf)

Abstract: TiO2 nanotube array was fabricated via anodization, and the resulting film was investigated by XRD and SEM. The degradation of Methylene Blue (MB) dye demonstrated its superior photoelectrochemical activity. By comparison of photocatalysis (PC) and photoelectroncatalysis (PEC), it was found that PEC oxidation was a convenient and effective process to mineralize the organic matters. In addition, the excellent capability of adsorption derived from nanoporous configuration on such electrode also plays an important role in accelerating the degradation process.

Keywords: Adsorption, Degradation, Dioxide, Electrodes, Fabrication, Methylene Blue, TiO2

? Kuwahara, Y., Ohmichi, T., Kamegawa, T., Mori, K. and Yamashita, H. (2009), Synthesis of hydroxyapatite-zeolite composite material from disposed steel slag and investigation of its structural and physicochemical characteristics. *Chemistry Letters*, **38** (6), 626-627.

Full Text: [2009\Che Let38, 626.pdf](2009/Che%20Let38,%20626.pdf)

Abstract: Steel slag is a commercial waste material mainly containing SiO(2), Al(2)O(3), and CaO which are the chemical components of zeolite and hydroxyapatite (HAP), respectively. From the steel slag, a hydroxyapatite-zeolite composite material (HAP-ZE) was successfully synthesized in a one batch system by adding H(3)PO(4) and NaOH. The structural characteristics of HAP-ZE were investigated by XRD, SEM, and N(2) adsorption. From the adsorption of VOCs, HAP-ZE was found to have adsorption properties comparable to those of pure zeolite and HAP.

Keywords: Adsorption, Hydrothermal Synthesis, Steel Slag, XRD, Zeolite

# Title: Chemistry of Materials

Full Journal Title: Chemistry of Materials

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Publisher Address: 1155 16th St, NW, Washington, DC 20036

Subject Categories:

Chemistry, Physical: Impact Factor 3.690, / (2001)

Materials Science, Multidisciplinary: Impact Factor 3.690, / (2001)

Tamai, H., Kakii, T., Hirota, Y., Kumamoto, T. and Yasuda, H. (1996), Synthesis of extremely large mesoporous activated carbon and its unique adsorption for giant molecules. *Chemistry of Materials*, **8** (2), 454-462.

Full Text: [C\Che Mat8, 454.pdf](C/Che%20Mat8,%20454.pdf)

Abstract: The steam invigoration of pitches (softening points 85 and 280°C) homogenized with 1-3 wt % of organo rare-earth metal complexes such as Ln(C5H5)3 or Ln(acac) (Ln = Y, Yb) at 930 ˚C provided activated carbons with an extremely high mesopore ratio, >70%. The resulted activated carbon selectively adsorbs giant molecules such as vitamin B12, blue acid 90 dye, dextran, nystatin, and humic acid, reflecting their large mesopore volumes. To understand what kind of carbon skeleton in pitch is suited for generation of high mesopore ratio, the steam invigoration of a series of condensed polynuclear aromatics (COPNA) resins prepared from naphthalene, anthracene, phenanthrene, pyrene, or perylene and *p*-xylene-α, α’-diol were conducted in the presence of rare-earth metal complexes. As a result, COPNA resins containing phenanthrene, perylene, and pyrene generated large mesopore volume.

Notes: highly cited

? Melde, B.J., Holland, B.T., Blanford, C.F. and Stein, A. (1999), Mesoporous sieves with unified hybrid inorganic/organic frameworks. *Chemistry of Materials*, **11** (11), 3302-3308.

Full Text: [1999\Che Mat11, 3302.pdf](1999/Che%20Mat11,%203302.pdf)

Abstract: Mesoporous materials have been synthesized that are composed of hybrid frameworks in which inorganic and organic components have a fixed stoichiometry and are covalently bonded. The creation of UOFMN (unified organically functionalized mesoporous networks) materials incorporates concepts employed in the synthesis of MCM-41 mesoporous silicates, making use of a quaternary ammonium cationic surfactant and a double trialkoxysilyl precursor such as bis(triethoxysilyl)ethane (BTSE) or bis(triethoxysilyl)ethylene (BTSEY). The cetyltrimethylammonium (CTA(+)) surfactant is removed by extraction with acid, resulting in a high surface area porous organosilicate framework in which Si atoms are bridged by ethane (from BTSE) or ethylene (BTSEY) groups. The channels are wormlike and uniform in diameter. UOFMN materials are more hydrothermally stable than MCM-41 prepared under similar conditions and have thicker pore walls. Ethylene groups in products made with BTSEY can be brominated, the brominated product itself being reactive as a bromide source. The UOFMN products were characterized by XRD, N-2 adsorption, solid-state Si-29 and C-13 NMR, and TEM.

Keywords: Sol-Gel Approach, Molecular-Sieves, Functionalized Monolayers, Pore Structure, MCM-41, Condensation, Hydrolysis, Silicates, Catalysts, Coatings

Notes: highly cited

? Morey, M.S., O’Brien, S., Schwarz, S. and Stucky, G.D. (2000), Hydrothermal and postsynthesis surface modification of cubic, MCM-48, and ultralarge pore SBA-15 mesoporous silica with titanium. *Chemistry of Materials*, **12** (4), 898-911.

Full Text: [2000\Che Mat12, 898.pdf](2000/Che%20Mat12,%20898.pdf)

Abstract: We describe the introduction of titanium centers to cubic MCM-48 and SBA-15 mesoporous silica by hydrothermal and postsynthetic grafting techniques. MCM-48 was hydrothermally prepared with a gemini surfactant that favors the cubic phase and leads to a high degree of long-range pore ordering. This phase was chosen due to its high surface area (1100-1300 m(2)/g) and its three-dimensional, bicontinuous pore array, SBA-15, synthesized with a block copolymer template under acidic conditions, has a surface area from 600 to 900 m(2)/g and an average pore diameter of 69 Angstrom, compared to 24-27 Angstrom for MCM-48, Alkoxide precursors of titanium were used to prepare samples of Ti-MCM-48 and Ti-SBA-15, We have detailed the bulk and molecular structure of both the silica framework and the local bonding environment of the titanium ions within each matrix. X-ray powder diffraction and nitrogen adsorption shows the pore structure is maintained despite some shrinkage of the pore diameter at high Ti loadings by grafting methods, UV-visible and Raman spectroscopy indicate that grafting produces the least amount of Ti-O-Ti bonds and instead favors isolated tetrahedral and octahedral titanium centers. High-resolution photoacoustic FTIR spectra demonstrated the presence of intermediate range order within the silicate walls of MCM-48, established the consumption of surface silanols to form Si-O-Ti bonds by grafting, and resolved the characteristic IR absorbance at 960 cm(-1), occurring in titanium silicates, into two components. All three spectroscopic techniques, including in situ Raman, reveal the reactive intermediates formed when the materials are contacted with hydrogen peroxide.

Keywords: Hydrogen-Peroxide, Molecular-Sieves, Selective Oxidation, IR Spectroscopy, Mixed Oxides, UV-VIS, Catalysts, Complexes, Epoxidation, Framework

Notes: highly cited

? Zhang, W.H., Shi, J.L., Wang, L.Z. and Yan, D.S. (2000), Preparation and characterization of ZnO clusters inside mesoporous silica. *Chemistry of Materials*, **12** (5), 1408-1413.

Full Text: [2000\Che Mat12, 1408.pdf](2000/Che%20Mat12,%201408.pdf)

Abstract: Wide band-gap semiconductor-zinc oxide nanoclusters have been prepared in the channels of MCM-41 materials by functionalizing the MCM-41 with ethylenediamine groups, absorbing zinc cations, and calcinating at high temperatures. The products have been characterized by XRD, TEM, EDS, nitrogen adsorption and desorption, and UV-vis and PL spectroscopies. ZnO clusters were mostly confined and dispersed in the pores of mesoporous hosts. No large ZnO particles on the external surfaces have been detected. A massive blue-shift in UV-vis absorption spectra has been observed and large band increase can be expected. The nature of the PL spectrum has been attributed to the defects related to oxygen vacancies. In addition, the assembly of cobalt, nickel, and copper oxides inside MCM-41 materials has also been tried by this scheme, but at the moment, only the cobalt oxide can be prepared with good results. Unfortunately, noble metals have usually grown into large particles on the outside surface of MCM-41 by this scheme, e.g., a lot of silver particles with sizes much larger than the pore diameter of MCM-41 host have been obtained. However, the explanation is not yet clear.

Keywords: Molecular-Sieves, Room-Temperature, Ion-Exchange, Zinc-Oxide, MCM-41, Catalysts, Complexes, Surface, Photoluminescence, Photochemistry

Notes: highly cited

? Zhang, W.H., Shi, J.L., Chen, H.R., Hua, Z.L. and Yan, D.S. (2001), Synthesis and characterization of nanosized ZnS confined in ordered mesoporous silica. *Chemistry of Materials*, **13** (2), 648-654.

Full Text: [2001\Che Mat13, 648.pdf](2001/Che%20Mat13,%20648.pdf)

Abstract: Nanosized ZnS has been prepared inside MCM-41 hosts by two related schemes, both of which are derived from surface modification methods. The ZnS-containing MCM-41 samples with and without the functional groups (ethylenediamine groups in this case) were designated as ZnS-ED-MCM-41 and ZnS-MCM-41(cal), respectively. The ZnS-MCM-41 composites were characterized by powder X-ray diffraction patterns, transmission electron microscopy, energy disperse spectra, Nz adsorption-desorption isotherms, UV-vis diffuse reflectance spectra, and photoluminescence (PL) spectra. The ZnS was mainly formed and retained in the channels of the MCM-41 host, and its growth was controlled by the channels. In contrast, the amount of ZnS on the external surface is much smaller. The existence of ZnS inside the MCM-41 hosts resulted in a considerable decrease in surface area, pore diameter, and pore volume, and a massive blue shift in the UV-vis spectra was observed. In comparison with the ZnS-MCM-41(cal) sample, a dramatic increase in PL emission for the ZnS-ED-MCM-41 sample was observed, which was suggested to arise from a strong interaction between the ZnS clusters and the organic component. The nature of the PL spectra has been tentatively attributed to the sulfur vacancies in the present experiment. Finally, the synthesis of other sulfides, such as CdS and CuS clusters, has also been explored inside the channels of the MCM-41 host.

Keywords: Transmission Electron-Microscopy, Self-Assembled Monolayers, Optical-Properties, Molecular-Sieves, Zeolite-Y, Fe2O3 Nanoparticles, MCM-41, Surface, Metal, Nanoclusters

Nickel, A.M.L., Seker, F., Ziemer, B.P. and Ellis, A.B. (2001), Imprinted poly(acrylic acid) films on cadmium selenide. A composite sensor structure that couples selective amine binding with semiconductor substrate photoluminescence. *Chemistry of Materials*, **13** (4), 1391-1397.

Full Text: [C\Che Mat13, 1391.pdf](C/Che%20Mat13,%201391.pdf)

Abstract: Molecularly imprinted films of poly(acrylic acid) (PAA) have been coated onto n-CdSe in order to make the band-edge photoluminescence (PL) of the semiconductor respond selectively to the imprinting analyte. This strategy has been implemented using PAA films deposited in the presence of ammonia and trimethylamine analytes. PAA films have been characterized by IR spectroscopy, which indicates that binding of either analyte nearly reversibly deprotonates the polymer carboxylic acid groups. PL measurements suggest that the imprinted PAA coatings serve as sieves for selective surface binding: In. contrast to the bare CdSe surface, which responds both to ammonia and trimethylamine with reversible enhancements in PL intensity, CdSe coated with ammonia-imprinted PAA (AI-PAA) films exhibits reversible PL changes toward ammonia but no response to trimethylamine. The PL changes for the AI-PAA films can be fit to a dead-layer model that indicates that ammonia binding reduces the CdSe depletion width by similar to 100 Angstrom an effect comparable to that seen for the bare surface. Binding constants of similar to 103 M-1, estimated using the Langmuir adsorption isotherm model, are similar for adsorption of ammonia onto bare and AI-PAA-coated CdSe surfaces. Coating the CdSe substrate with trimethylamine-imprinted PAA (TI-PAA) Rims leads to PL responses to both ammonia and trimethylamine, presumably reflecting larger imprint pores that are less sterically demanding. Implications for chemical sensing using these composite structures are discussed.

Keywords: Solute Adsorption-Isotherm, Adduct Formation, General Treatment, Classification, Contact, Metalloporphyrins, Modulation, Interface, Complex, Ammonia

Notes: highly cited

? Kruk, M. and Jaroniec, M. (2001), Gas adsorption characterization of ordered organic inorganic nanocomposite materials. *Chemistry of Materials*, **13** (10), 3169-3183.

Full Text: [2001\Che Mat13, 3169.pdf](2001/Che%20Mat13,%203169.pdf)

Abstract: A critical review of adsorption methods that are currently used in the characterization of ordered organic-inorganic nanocomposite materials is presented, and the adsorption methodology that is potentially useful for this characterization, but has not yet been applied, is discussed. The ordered organic-inorganic nanocomposites include surface-functionalized ordered mesoporous materials (OMMs) with siliceous frameworks (synthesized either via postsynthesis surface modification or via direct co-condensation method), periodic mesoporous organosilicas, and surfactant-containing OMMs. This review covers the methods for determination of the specific surface area and pore volume. The available methods for mesopore size analysis are critically compared and evaluated, with special emphasis on the recent developments related to the application of advanced computational methods for studying adsorption in porous media and to the direct modeling of adsorption using highly ordered surface-functionalized OMMs as model adsorbents. The review also covers adsorption methods for studying the surface properties of organic-inorganic nanocomposites, including those based on adsorption of molecules of different polarities. An emphasis is placed on the emerging opportunity for studying the surface properties of nanocomposites using low-pressure adsorption of nonpolar molecules, such as nitrogen and argon. The opportunities and challenges in adsorption characterization of specific surface sites, uniformity of coated or bonded layers, bonding density of groups on the surface, type of surface species, and so forth, are presented. Thus, this review provides an overview of adsorption studies dealing with organic-inorganic nanocomposites, a critical discussion of adsorption methods available for such studies, and some recommendations for thorough characterization of these materials using gas adsorption.

Keywords: Adsorption, Alkyltrimethylammonium-Kanemite Complexes, Channel Walls, Mcm-41 Molecular-Sieves, Mesoporous Materials, Nitrogen Sorption Isotherms, Open Cylindrical Pores, Periodic Mesoporous Organosilicas, Pore Volume, Pore-Size Distributions, Structural-Properties, Surface Area, Surface-Area, X-Ray-Diffraction

Notes: highly cited

? Zhang, W.H., Lu, J.Q., Han, B., Li, M.J., Xiu, J.H., Ying, P.L. and Li, C. (2002), Direct synthesis and characterization of titanium-substituted mesoporous molecular sieve SBA-15. *Chemistry of Materials*, **14** (8), 3413-3421.

Full Text: [2002\Che Mat14, 3413.pdf](2002/Che%20Mat14,%203413.pdf)

Abstract: Ti-substituted mesoporous SBA-15 (Ti-SBA-15) materials have been synthesized by using a new approach in which the hydrolysis of the silicon precursor (tetramethoxysilane, TMOS) is accelerated by fluoride. These materials were characterized by powder X-ray diffraction patterns (XRD), X-ray fluorescence spectroscopy (Y-RF), N-2 sorption isotherms, diffuse-reflectance UV-visible (UV-vis) and UV-Raman spectroscopy, Si-29 MAS NMR, and the catalytic epoxidation reaction of styrene. Experiments show that Ti-SBA-15 samples of high quality can be obtained under the following conditions: F/Si greater than or equal to 0.03 (molar ratio), pH less than or equal to 1.0, aging temperature less than or equal to 80 degreesC, and Ti/Si less than or equal to 0.01. It was found that the hydrolysis rate of TMOS was remarkably accelerated by fluoride, which was suggested to play the main role in the formation of Ti-SBA-15 materials of high quality. There is no stoichiometric incorporation of Ti, and the Ti contents that are obtained are quite low in the case of the approach that is proposed. The calcined Ti-SBA-15 materials show highly catalytic activity in the epoxidation of styrene.

Keywords: Resonance Raman-Spectroscopy, Catalytic Activity, Hydrogen-Peroxide, Amorphous Silica, Liquid-Crystals, Phase-Behavior, TS-1 Zeolite, Acid Groups, MCM-41, Copolymer

Notes: highly cited

? Yu, J.C., Zhang, L.Z. and Yu, J.G. (2002), Direct sonochemical preparation and characterization of highly active mesoporous TiO2 with a bicrystalline framework. *Chemistry of Materials*, **14** (11), 4647-4653.

Full Text: [2002\Che Mat14, 4647.pdf](2002/Che%20Mat14,%204647.pdf)

Abstract: In this study mesoporous TiO2 with a bicrystalline (anatase and brookite) framework was synthesized directly under high-intensity ultrasound irradiation. This was carried out separately, both with and without the use of a triblock copolymer. Without thermal treatment, mesoporous TiO2 was formed by the agglomeration of monodispersed TiO2 sol particles. The resulting materials were characterized by XRD, TEM, nitrogen adsorption, TGA/DTA, and FTIR. The use of ultrasound irradiation assisted in the formation of the brookite phase. As the content of the brookite phase increased, the pore size and the crystalline sizes of anatase and brookite became larger when the triblock. copolymer was used in the synthesis. Both as-prepared samples exhibited better activities than the commercial photocatalyst P25 in the degradation of n-pentane in air. The degradation rate of mesoporous TiO2 synthesized in the presence of triblock copolymer was about two times greater than that of P25. The high activities of the mesoporous TiO2 with a bicrystalline framework can be attributed to the combined effect of three factors: high brookite content, high surface area, and the existence of mesopores.

Keywords: Photocatalytic Degradation, Titanium-Dioxide, Optical-Properties, Molecular-Sieves, Silica Materials, Solid-Solutions, Brookite TiO2, Anatase, Rutile, Oxide

Raff, J., Soltmann, U., Matys, S., Selenska-Pobell, S., Böttcher, H. and Pompe, W. (2003), Biosorption of uranium and copper by biocers. *Chemistry of Materials*, **15** (1), 240-244.

Full Text: [C\Che Mat15, 240.pdf](C/Che%20Mat15,%20240.pdf)

Abstract: Biological ceramic composites (biocers) made according to aqueous sol-gel protocol were used as selective metal binding filters. The biological component of the biocers *Bacillus sphaericus* JG-A12 was isolated from a uranium mining waste pile. Vegetative cells and spores of this strain are known to bind selectively U, Cu, Al, Cd, and Pb in large amounts. Sol-gel ceramics were prepared by dispersing vegetative cells, spores, and stabilized surface-layer proteins (S-layer) in aqueous silica nanosols, gelling, and drying. The biosorption of uranium and copper by the three kinds of biocers and by their single components was investigated with dependence on time, concentration, and preparation conditions. Biocers with cells possess the highest binding capacity compared to matrixes with spores and an S-layer. Freeze-drying of prepared biocers or adding water-soluble compounds as sorbitol lead to higher porosity and faster metal binding. Uranium was bound mainly to the biological component but also to the SiO2 network. In contrast, copper was only bound by the cells, spores, or S-layer. Bound uranium and copper were completely removed by washing with aqueous citric acid.

Newalkar, B.L., Choudary, N.V., Turaga, U.T., Vijayalakshmi, R.P., Kumar, P., Komarneni, S. and Bhat, T.S.G. (2003), Potential adsorbent for light hydrocarbon separation: Role of SBA-15 framework porosity. *Chemistry of Materials*, **15** (7), 1474-1479.

Full Text: [C\Che Mat15, 1474.pdf](C/Che%20Mat15,%201474.pdf)

Abstract: Samples of mesoporous silica SBA-15 with and without controlled framework microporosity were prepared under microwave hydrothermal conditions. These samples were evaluated for their ability to separate ethane and ethylene by obtaining their equilibrium adsorption isotherms using volumetric adsorption at 303 and 323 K, respectively. The data obtained were analyzed using the Langmuir-Freundlich adsorption isotherm model. Although the mesoporous silica samples showed a higher adsorption capacity for ethylene, it was found to decrease upon reduction in the adsorbent’s framework microporosity. Likewise, the isosteric heats of adsorption estimated by the Clausius-Clapeyron equation are higher for ethylene as compared to those for ethane and were also found to depend on framework microporosity. The sample with higher microporosity displayed strong affinity for ethylene and is comparable with those reported for π-complexation-based systems. This affinity was observed to weaken on the sample with lower microporosity and absent altogether on the micropore-free SBA-15 sample. Furthermore, the affinity of the micropore-free SBA-15 framework for ethylene and ethane was observed to be similar to and comparable with those obtained on MCM-41 type mesoporous silica. The thus-obtained trend has revealed the importance of framework microporosity in designing a SBA-15-based adsorbent for ethane/ethylene separation.

Notes: highly cite

? Yu, J.C., Zhang, L.Z., Zheng, Z. and Zhao, J.C. (2003), Synthesis and characterization of phosphated mesoporous titanium dioxide with high photocatalytic activity. *Chemistry of Materials*, **15** (11), 2280-2286.

Full Text: [2003\Che Mat15, 2280.pdf](2003/Che%20Mat15,%202280.pdf)

Abstract: A surfactant-templated approach was used to synthesize phosphated mesoporous titanium dioxide by incorporating phosphorus from phosphoric acid directly into the framework of TiO2. The resulting materials were characterized by XRD, nitrogen adsorption, TEM, XPS analysis, UV-vis spectroscopy, FT-IR spectroscopy, and isoelectric point measurements. The surface area of phosphated mesoporous TiO2 exceeded 300 m(2)/g after calcination at 400 degreesC. It was found that the incorporation of phosphorus could stabilize the TiO2 framework and increase the surface area significantly. This stabilization is attributed to two reasons: the more complete condensation of surface Ti-OH in the as-prepared sample and the inhibition of grain growth of the embedded anatase TiO2 by the interspersed amorphous titanium phosphate matrix during thermal treatment. Both pure and phosphated mesoporous TiO2 show significant activities on the oxidation of n-pentane. The higher photocatalytic activity of phosphated mesoporous TiO2 can be explained by the extended band gap energy, large surface area, and the existence of Ti ions in a tetrahedral coordination.

Keywords: Surfactant-Assisted Synthesis, Metal-Oxides, Heterogeneous Photocatalysis, Molecular-Sieves, Solid-Solutions, TiO2, Degradation, Anatase, Rutile, Framework

Notes: highly cite

? Yang, Q., Wang, S.H., Fan, P.W., Wang, L.F., Di, Y., Lin, K.F. and Xiao, F.S. (2005), pH-responsive carrier system based on carboxylic acid modified mesoporous silica and polyelectrolyte for drug delivery. *Chemistry of Materials*, **17** (24), 5999-6003.

Full Text: [2005\Che Mat17, 5999.pdf](2005/Che%20Mat17,%205999.pdf)

Abstract: An efficient pH-responsive carrier system has been constructed by oppositely charged ionic interaction between carboxylic acid modified SBA-15 silica rods and polyelectrolyte. Active molecules such as vancomycin can be stored and released from the pore voids of SBA-15 by changing pH values at will. The amount of vancomycin stored in the pores of sample based on carboxylic acid modified SBA-15 rods and poly(dimethyldiallylammonium chloride) is up to 36.4 wt % at pH 6.8. When the pH is at mild acidity, vancomycin is steadily released from the pores of SBA-15. Both nitrogen adsorption-desorption isothems and X-ray diffraction patterns show that this system possesses stable mesostructure, which will be considered an interesting alternative to a polymeric delivery system.

Keywords: Controlled-Release, Guest Molecules, Extracellular pH, Micelles, Gel, MCM-41, Nanoparticles, Proteins, Design, Tumors

# Title: Chemistry and Physics of Carbon

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Subject Categories:

Chemistry, Physical: Impact Factor 0.333, 87/91 (2000); Impact Factor 8.75, / (2002)

Energy & Fuels: Impact Factor 8.75, / (2002)

Engineering, Chemical: Impact Factor 6.667, 1/110 (1999); Impact Factor 5.000, 1/123 (2001); Impact Factor 8.75, 1/126 (2002)

?? Dubinin, M.M. (1966), ??. *Chemistry and Physics of Carbon*, **2**, 51-120.

# Title: Chemistry of Wastewater Technology

Ann Arbor Science Publishers, Ann Arbor, MI, USA

Smith, E.F., Mark, Jr., H.B. and MacCarthy, P. (1978), Investigation of chemically modified forms of peat as inexpensive means of watewater treatment. in *Chemistry of Wastewater Technology*. (Edited by Rubin, A.J.), Ann Arbor Science Publishers. Ann Arbor Michigan, USA, 349-372.

# Title: Chemometrics and Intelligent Laboratory Systems

Full Journal Title: [Chemometrics and Intelligent Laboratory Systems](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5232&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=84efc7735ec9987dd5719e788bd8ff9a)

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Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Science BV

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Subject Categories:

Robotics & Automatic Control:

Chemistry, Analytical: Impact Factor

Computer Science, Artificial Intelligence Instruments & Instrumentation

Dunn, III, W.J. (1995), Computational methods for the estimation of solution properties of organic pollutants. *Chemometrics and Intelligent Laboratory Systems*, **29** (1), 1-10.

Full Text: [1995\Che Int Lab Sys29, 1.pdf](1995/Che%20Int%20Lab%20Sys29,%201.pdf)

Abstract: The distribution and subsequent concentration in specific compartments of the environment of organic pollutants is determined by the pollutants’ physicochemical properties. Since the atmospheric, aqueous and biological compartments are of major concern from the public health standpoint, the vapor/water and water/nonpolar compartment properties are of interest. Currently, such properties are estimated from structure using additive structure-property models. Such models are of limited accuracy when properties for new and interesting compounds are needed. Computer simulation methods based on more fundamental principles provide better estimates and mechanistic information. Some of these methods are discussed here.

? Hemmateenejad, B. (2006), Chemometrics in Iran. *Chemometrics and Intelligent Laboratory Systems*, **81** (2), 202-208.

Full Text: 2006\Che Int Lab Sys81, 202.pdf

Abstract: To represent the activity of the Iranian chemometrics community, a list of the publication of the Iranian scientists in the chemometrics was collected from the ISI web of science database. This article will review these publications to increase the awareness about the studies of chemometrics in Iran. A rapid growth is observed in the chemometrics publication in Iran and up to June 2005, some 200 scientific papers have been published in this context, in all fields of chemometrics. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Artificial Intelligence, Artificial Neural-Networks, Awareness, Calcium-Channel Blockers, Chemometrics, Chromogenic Mixed Reagents, Iran, ISI, Multiple Linear-Regression, Multivariate Methods, Papers, Partial Least-Squares, Point Standard Addition, Principal Component Analysis, Principal Component Analysis, Publication, Publications, QSAR, QSPR, Review, Science, Simultaneous Kinetic Determination, Simultaneous Spectrophotometric Determination, Structure-Property Relationship, Web of Science

? Acar, E., Dunlavy, D.M., Kolda, T.G. and Morup, M. (2011), Scalable tensor factorizations for incomplete data. *Chemometrics and Intelligent Laboratory Systems*, **106** (1), 41-56.

Full Text: [2011\Che Int Lab Sys106, 41.pdf](2011/Che%20Int%20Lab%20Sys106,%2041.pdf)

Abstract: The problem of incomplete data - i.e., data with missing or unknown values - in multi-way arrays is ubiquitous in biomedical signal processing, network traffic analysis, bibliometrics, social network analysis, chemometrics, computer vision, communication networks, etc. We consider the problem of how to factorize data sets with missing values with the goal of capturing the underlying latent structure of the data and possibly reconstructing missing values (i.e., tensor completion). We focus on one of the most well-known tensor factorizations that captures multi-linear structure, CANDECOMP/PARAFAC (CP). In the presence of missing data, CP can be formulated as a weighted least squares problem that models only the known entries. We develop an algorithm called CP-WOPT (CP Weighted OPTimization) that uses a first-order optimization approach to solve the weighted least squares problem. Based on extensive numerical experiments, our algorithm is shown to successfully factorize tensors with noise and up to 99% missing data. A unique aspect of our approach is that it scales to sparse large-scale data, e.g., 1000 x 1000 x 1000 with five million known entries (0.5% dense). We further demonstrate the usefulness of CP-WOPT on two real-world applications: a novel EEG (electroencephalogram) application where missing data is frequently encountered due to disconnections of electrodes and the problem of modeling computer network traffic where data may be absent due to the expense of the data collection process. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Algorithm, Analysis, Application, Approach, Bibliometrics, Biomedical, Candecomp, Chemometrics, Collection, Communication, Data, Data Collection, Decompositions, Eeg, Experiments, First Order, Incomplete Data, Least-Squares, Mar, Matlab, Matrices, Missing Data, Modeling, Models, Multiway Analysis, Network, Network Analysis, Networks, Noise, Optimization, Parafac, Rank, Rights, Scales, SI, Social, Social Network Analysis, Structure, Tensor Factorization, Toolbox, Traffic

# Title: Chemosphere

Full Journal Title: [Chemosphere](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5832&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=da6b2440c68c2f04bb430f69c6406b03)

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Environmental Sciences: Impact Factor 1.225, 36/126 (1999); Impact Factor 1.033, 52/127 (2000); Impact Factor 1.181, 43/129 (2001); Impact Factor 1.461, 34/132 (2002); Impact Factor 1.904, 19/131 (2003); Impact Factor 2.359, 12/134 (2004); Impact Factor 2.297, 21/140 (2005); Impact Factor 2.739, 24/160 (2007); Impact Factor 3.054, 23/163 (2008); Impact Factor 3.253, 22/180 (2009)

Steen, W.C. and Karickhoff, S.W. (1981), Biosorption of hydrophobic organic pollutants by mixed microbial populations. *Chemosphere*, **10** (1), 27-32.

Full Text: [1981\Chemosphere10, 27.pdf](1981/Chemosphere10,%2027.pdf)

Abstract: In recognition of the need to estimate biosorption for natural microbial populations, the variability of partition coefficients for two hydrophobic pollutants to natural populations from a variety of aquatic systems was investigated. Biosorption partition coefficents for pyrene [2.46(±0.6)×104] and phenanthrene [6.34(±1)×103] were nearly constant over 14 different microbial sources, consisting of sediments and soils from eight states. For these condensed ring aromatics, semi-empirical equations were developed relating biosorption partition coefficients to octanol/water partition coefficients and to water solubility and melting point. Concepts and relationships developed for these materials should extend to other families of hydrophobic compounds.

Notes: highly cited

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Full Text: [1981\Chemosphere10, 833.pdf](1981/Chemosphere10,%20833.pdf)

Abstract: Methods were developed for estimating the equilibrium sorption behavior of hydrophobic pollutants. At low pollutant concentration (aqueous phase concentration less than half the solubility), sorption isotherms were linear, reversible, and characterized by a partition coefficient, Kp. Partition coefficients normalized to organic carbon, KOC (organic carbon), were highly invariant over a set of sediments and soils collected from throughout the nation. Equations for estimating KOC from water solubility (including crystal energy) and octanol/water partition coefficients were developed. The predictive equations were tested on literature sorption data and found to estimate measured KOC’s generally within a factor of two.

Keywords: Sediments, Soils, Sorption

Lodenius, M., Seppänen, A. and Uusi-Rauva, A. (1983), Sorption and mobilization of mercury in peat soil. *Chemosphere*, **12** (11-12), 1575-1581.

Full Text: [1983\Chemosphere12, 1575.pdf](1983/Chemosphere12,%201575.pdf)

Dickson, L.C., Lenoir, D., Hutzinger, O., Naikwadi, K.P. and Karasek, F.W. (1989), Inhibition of chlorinated dibenzo-para-dioxin formation on municipal incinerator fly-ash by using catalyst inhibitors. *Chemosphere*, **19** (8-9), 1435-1445.

Full Text: [1989\Chemosphere19, 1435.pdf](1989/Chemosphere19,%201435.pdf)

Abstract: Fly ash-catalysed surface reactions are probably the most important mechanism in the formation of chlorinated dibenzo-p-dioxins (PCDD) and related compounds in municipal incinerators. The introduction of a suitable catalyst inhibitor should decrease the yield and change the distribution of PCDD formed on the fly ash. The addition of catalyst inhibitors containing amino- and hydroxy-functional groups to the fly ash surface greatly inhibited the catalytic activity of the fly ash. 2-aminoethanol and triethanolamine were the most effective catalyst inhibitors. The significance of these results to controlling the emissions of PCDD from municipal refuse incinerators is discussed.

Keywords: Chlorinated Dibenzo-p-Dioxins, Catalyst Inhibitors, Incineration, Fly Ash

Carbone, L.G., Gutenmann, W.H. and Lisk, D.J. (1989), Element immobilization in refuse incinerator ashes by solidification in glass, ceramic or cement. *Chemosphere*, **19** (12), 1951-1958.

Full Text: [1989\Chemosphere19, 1951.pdf](1989/Chemosphere19,%201951.pdf)

Abstract: Incineration of municipal refuse results in the production of massive quantities of fly ash and bottom ash. Toxic elements in the original refuse may be concentrated up to 40-fold in the resultant ash. There is concern that burial of such ash in landfills could result in leaching of these elements downward into groundwater. In this study, refuse ashes were incorporated into glass, ceramic and cement composites to immobilize such toxic elements. The EP Toxicity Test (1986) was used to show that extraction of such elements by simulated acid rain is effectively blocked in these new solid materials.

Davies, S., Clement, R.E., Stevens, D., Chiu, C., Bumbaco, M. (1990), Interlaboratory comparison study of polychlorinated dibenzo-para-dioxins and dibenzofurans analyzed under the national incinerator testing and evaluation program. *Chemosphere*, **20** (10-12), 1325-1332.

Full Text: [1990\Chemosphere20, 1325.pdf](1990/Chemosphere20,%201325.pdf)

Abstract: One portion of Environment Canada’s National Incinerator Testing and Evaluation Program (NITEP) involved an interlaboratory Comparison study of various incinerator-related matrices for polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF). Three replicates of two different types of incinerator process samples were analyzed by three laboratories. Statistical analysis of recovery corrected PCDD/PCDF data indicated that the three laboratories exhibited reasonably good repeatability (or precision). However, significant differences existed in the between-laboratory results.

Keywords: Chlorinated Dibenzo-p-Dioxin, Dibenzofurans, Incinerator, Interlaboratory Round Robin

Manscher, O.H., Heidam, N.Z., Vikelsøe, J., Nielsen, P., Blinksbjerg, P., Madsen, H., Pallesen, L. and Tiernan, T.O. (1990), The danish incinerator dioxin study. 1. *Chemosphere*, **20** (10-12), 1779-1784.

Full Text: [1990\Chemosphere20, 1779.pdf](1990/Chemosphere20,%201779.pdf)

Abstract: During the last two years an extensive series of dioxin measurements has been conducted on Danish municipal and hospital solid waste incinerators. The study was directed toward finding the total annual dioxin emissions from MSWI in Denmark, now estimated to be 3 kg. of dioxines and furanes. This sum is equivalent to 50 g. of 2,3,7,8-TCDD according to the Nordic Equivalents. Measurements were carried out according to a statistical design following a plan of pre-randomized sampling. This procedure allowed causal interpretation of the correlations found between the dioxin emissions and certain operating parameters. The statistical model obtained describes the emissions by variations between incinerators, by variation in time, and by changes in the load, the excess air and the HCl concentration in the flue gas.

Keywords: Chlorinated Dibenzo-p-Dioxin, Dibenzofuran, MSW, Hospital Incinerators, Emission, Operating Parameters, Hydrogen Chloride

Ozvacic, V., Wong, G., Marson, G., Clement, R., Rokosh, D., Suter, S., Horsnell, G., Hipfner, J.C., Burns, S., Corinthios, H., Young, M. and Birmingham, B. (1990), Biomedical waste incinerator testing program. *Chemosphere*, **20** (10-12), 1801-1808.

Full Text: [1990\Chemosphere20, 1801.pdf](1990/Chemosphere20,%201801.pdf)

Goldfarb, T.D., Maertz, M., Roethel, F.J., Iden, C.R. and Rieger, R.A. (1990), PCDDs and PCDFs in incinerator ash from several types of facilities in the northeastern united-states. *Chemosphere*, **20** (10-12), 1833-1838.

Full Text: [1990\Chemosphere20, 1833.pdf](1990/Chemosphere20,%201833.pdf)

Abstract: Results are reported for the analyses of the PCDD and PCDF contents of fly, bottom and combined ash from four heat recovery, mass-burn municipal waste incinerators in the Northeastern United States of various capacities and employing a variety of pollution control technologies.

Magagni, A., Boschi, G. and Cocheo, V. (1990), Emissions of a MSW incinerator equipped with a postcombustion chamber, dry scrubber and ESP. *Chemosphere*, **20** (10-12), 1883-1890.

Full Text: [1990\Chemosphere20, 1883.pdf](1990/Chemosphere20,%201883.pdf)

Yamamoto, T. and Inoue, S. (1990), Postfurnace formation of PCDDs and PCDFs in MSWI: Observations in an incinerator installed with quench reactor. *Chemosphere*, **20** (10-12), 1915-1920.

Full Text: [1990\Chemosphere20, 1915.pdf](1990/Chemosphere20,%201915.pdf)

Abstract: Reduction of dioxin emission by a quench reactor with lime spray was investigated in relation to post furnace formation pathways. Results showed that the quench reactor performed to supress post furnace reaction of precursor molecules to form selected congeners of PCDD and PCDF.

Mariani, G., Benfenati, E. and Fanelli, R. (1990), Concentrations of PCDD and PCDF in different points of a modern refuse incinerator. *Chemosphere*, **21** (4-5), 507-517.

Full Text: [1990\Chemosphere21, 507.pdf](1990/Chemosphere21,%20507.pdf)

Abstract: PCDD and PCDF were measured in different points of a modern incinerator of urban solid waste, from the post-combustor to the stack. PCDD and PCDF concentrations increased steeply while the flue gas cooled from 1000 to 270°C. Abatement with electrofilters and a water tower was effective in reducing the concentrations of these micropollutants. The values for PCDD concentrations in the gas phase were (in ng/Nm3) 2.85 after the post-combustor, 64.12 after the boiler and 1.75 at the stack entrance.

? Battersby, N.S. (1990), Characteristics of municipal solid-waste incinerator fly-ash promoting the formation of polychlorinated dioxins. *Chemosphere*, **21** (10-11), 1243-1284.

Full Text: [1990\Chemosphere21, 1243.pdf](1990/Chemosphere21,%201243.pdf)

Abstract: This paper highlights the need for environmentally-realistic data on the kinetics of biodegradation in the aquatic environment and reviews many of the published kinetic expressions. The unsuitability of current Organisation for Economic Co-operation and European Economic Community Sixth Amendment “ready biodegradability” test procedures for generating such data is shown and an experimental approach for producing environmentally-realistic kinetic data proposed.

Keywords: Natural Microbial Communities; Organic-Compounds; Trace Concentrations; Lake Water; Reductive Dechlorination; Mineralization Kinetics; Substrate Concentration; Heterotrophic Bacteria; Quantitative Structure; Estuarine Environment

? von Oepen, B., Kördel, W. and Klein, W. (1991), Sorption of nonpolar and polar compounds to soils: Processes, measurements and experience with the applicability of the modified OECD-guideline-106. *Chemosphere*, **22** (3-4), 285-304.

Full Text: [1991\Chemosphere22, 285.pdf](1991/Chemosphere22,%20285.pdf)

Abstract: The purpose of this study was to analyse the sorption of four chemical classes of chemicals by three representative soils varying in their sorption-relevant properties, e.g. organic carbon content, clay content, pH value, Cation Exchange Capacity etc. The sorption coefficients of 50 organic compounds of different polarity, including carboxylic acids, and corresponding ester, amines and amides were determined by batch equilibrium studies according to a modified version of the OECD-Guideline 106 Adsorption/Desorption. The mechanisms contributing to the sorption of organic chemicals to soils summarized, and the use of koc as a generally applicable parameter is discussed.

Keywords: Hydrophobic Pollutants, Natural Sediments, Humic Acids, Adsorption, Chemicals, Coefficients, Herbicides, Plants, 2,4-D, KOC

Hinton, W.S. and Lane, A.M. (1991), Characteristics of municipal solid-waste incinerator fly-ash promoting the formation of polychlorinated dioxins. *Chemosphere*, **22** (5-6), 473-483.

Full Text: [1991\Chemosphere22, 473.pdf](1991/Chemosphere22,%20473.pdf)

Abstract: Physical and chemical characteristics of fly ash samples from thirteen U.S. MSW incinerators were tested for correlations with PCDD concentrations. Strong correlations may indicate catalytic activity in the de novo synthesis of PCDDs. Copper is strongly correlated with PCDD concentration but carbon and surface area are not. Other correlations include positive effects by sulfur, chlorine, sodium, potassium, and zinc and negative effects by silicon and aluminum.

Keywords: Chlorinated Dibenzodioxins, Mechanism, Incineration, Fly Ash, Catalyst

Benfenati, E., Mariani, G., Fanelli, R. and Zuccotti, S. (1991), ‘De novo’ synthesis of PCDD, PCDF, PCB, PCN and PAH in a pilot incinerator. *Chemosphere*, **22** (11), 1045-1052.

Full Text: [1991\Chemosphere22, 1045.pdf](1991/Chemosphere22,%201045.pdf)

Abstract: PCDD, PCDF, PCB, PCN, PCT and PAH concentrations were determined in different points inside a fluid-bed pilot plant, from the furnace to the stack. The behavior of most of these micropollutants was similar. There was a general drop of levels in the post-combustor, followed by an increase during cooling, and a second fall in the abatement system. The concentrations of the different micropollutants in the various sampling points were correlated with PCDD concentrations.

Sehili, T., Boule, P. and Lemaire, J. (1991), Photocatalysed transformation of chloroaromatic derivatives on zinc oxide IV: 2,4-dichlorophenol. *Chemosphere*, **22** (11), 1053-1062.

Full Text: [1991\Chemosphere22, 1053.pdf](1991/Chemosphere22,%201053.pdf)

Abstract: The irradiation of aqueous solutions of 2,4-dichlorophenol (2,4-dCP) in the presence of ZnO (2 g.*l*-1) leads to the formation of several products which were analysed by HPLC and GC-MS coupling. The main initial reaction is a hydroxylation in *ortho or para* position with respect to phenol function. In position 2 and 4, this hydroxylation implies a dechlorination. The main identified photoproducts were chlorohydroquinone and 3, 5-dichlorocatechol, but the formations of 4-chlorocatechol and chlorohydroxybiphenyls were also observed. The formation of hydrogen peroxide was a linear function of the irradiation time up to conversion extents higher than 30%, whereas the conversion of 2,4-dCP decreased with increasing irradiation time. From the inhibiting effect of EtOH on the transformation of 2,4-dCP, it can be concluded that about 70% of the conversion involves hydroxyl radicals and about 30% can be attributed to positive holes formed on ZnO.

Mumma, R.O., Raupach, D.C., Sahadewan, K., Shane, B.S., Rutzke, M., Bache, C.A., Gutenmann, W.H. and Lisk, D.J. (1991), Variation in the elemental composition of municipal refuse incinerator ashes with time of sampling. *Chemosphere*, **23** (3), 391-395.

Full Text: [1991\Chemosphere23, 391.pdf](1991/Chemosphere23,%20391.pdf)

Abstract: Due to the ever increasing quantities of solid waste, more refuse incinerators are coming on line in the United States. Toxic metals and organics in the resulting ash to be disposed and in suspended particulates that escape the stack are major deterrents to refuse incineration. Since refuse composition is highly variable with time, it was of interest to determine the extent of variation in element composition of the resulting fly ash and bottom ash with time of sampling. In the present study, the ashes were sampled at monthly intervals from the same refuse incinerator and analyzed for 38 elements using neutron activation analysis, emission spectrometry and other methods. Possible factors including refuse composition and reactions occurring during refuse incineration as they affect the elemental composition of refuse ashes are discussed.

Benfenati, E., Mariani, G., Fanelli, R. and Farneti, A. (1991), Synthesis and destruction of PCDD and PCDF inside a municipal solid waste incinerator. *Chemosphere*, **23** (6), 715-722.

Full Text: [1991\Chemosphere23, 715.pdf](1991/Chemosphere23,%20715.pdf)

Abstract: PCDD and PCDF were measured in several points inside a modern municipal solid waste incinerator. In fly ash the concentrations of these micropollutants increased during cooling of the flue gas, corresponding to a trend already reported for other plants, while in the vapour phase they decreased. This finding is discussed in relation to the incinerator characteristics.

Hinton, W.S. and Lane, A.M. (1991), Synthesis of polychlorinated dioxins over MSW incinerator fly-ash to identify catalytic species. *Chemosphere*, **23** (7), 831-840.

Full Text: [1991\Chemosphere23, 831.pdf](1991/Chemosphere23,%20831.pdf)

Abstract: Physical and chemical characteristics of fly ash samples from thirteen U.S. MSW incinerators were tested for correlations with synthesized PCDD concentrations. The fly ash was previously extracted to remove all PCDD. Pentachlorophenol was then passed over the samples in flowing nitrogen at 300°C. Strong correlations may indicate catalytic activity for PCDD synthesis. Copper, potassium, sodium, sulfur, and zinc were positively correlated and aluminum was negatively correlated. These elements closely match those identified in our earlier studies using PCDD concentrations of the raw fly ash. No correlations were noted for carbon, chlorine, or physical parameters such as surface area or particle size distribution.

Hiraoka, M., Fujii, T., Kashiwabara, K., Ieyama, K. and Kondo, M. (1991), The removal efficiency of dioxin in flue-gas of msw incinerator-comparison of a fabric filter with an electrostatic precipitator. *Chemosphere*, **23** (8-10), 1439-1444.

Full Text: [1991\Chemosphere23, 1439.pdf](1991/Chemosphere23,%201439.pdf)

Abstract: This study was carried out at the pilot plant which was equipped a fabric filter in order to confirm the removal efficiency of Dioxin. PCDDs and PCDFs can be removed by the fabric filter. The removal efficiency of PCDDs and PCDFs was 96.9%.

Hiraoka, M., Takeda, N., Kasakura, T., Imoto, Y., Tsuboi, H. and Iwasaki, T. (1991), Catalytic destruction of PCEEs/PCFFs in municipal solid waste flue gas. *Chemosphere*, **23** (8-10), 1445-1452.

Full Text: [1991\Chemosphere23, 1445.pdf](1991/Chemosphere23,%201445.pdf)

Abstract: Catalytic destruction technology was applied to reduce PCDDs/PCDFs concentration levels in the flue gas from a municipal solid waste incinerator. Using common combustion techniques, high temperatures (> 1000 °C) are required to decompose PCDDs/PCDFs. However, from an energy saving perspective, it is more efficient to perform exhaust gas cleanup at low temperatures because the incinerator flue gas temperatures are comparatively low after leaving the waste heat boiler and air pollution control unit (250–300 °C). The ability to remove PCDDs/PCDFs by catalytic destruction was previously confirmed by the authors, with the presented study conducting pilot plant experiments using exhaust gas (max. 1900 N m3/hr) induced from the outlet of the electrostatic precipitator of a municipal solid waste incinerator. A PCDDs/PCDFs destruction ratio of at least 99% was obtained at temperatures less than 300 °C, being dependent on space velocity and the catalyst geometric properties.

Keywords: PCDDs/PCDFs, PCDDs/PCDFs Destruction, Catalytic Destruction, Municipal Solid Waste Incineration, Flue Gas

Lenoir, D., Kaune, A., Hutzinger, O., Mutzenich, G. and Horch, K. (1991), Influence of operating parameters and fuel type on PCDD-f emissions from a fluidized-bed incinerator. *Chemosphere*, **23** (8-10), 1491-1500.

Full Text: [1991\Chemosphere23, 1491.pdf](1991/Chemosphere23,%201491.pdf)

Abstract: The influence of operating parameters and different fuel types on PCDD/F emissions was studied in a fluidized bed incinerator. Under conditions of incomplete combustion, CO concentration in the flue gas was positively, and O2 concentration was negatively correlated with total PCDD/F emissions. Low O2, high CO, and high C concentrations in the flue gas shifted the distribution pattern of PCDD/F to lower chlorinated homologues. Under normal operating conditions, high fluidized bed temperatures, low freeboard temperatures, and high O2 values increased PCDD/F levels. PCDD/F emissions did not depend on the HCl concentration in the flue gas.

The investigated fuel types varied in their chlorine content which, in some experiments, was increased by adding NaCl or polyvinylchloride (PVC). Only the addition of 3% PVC to polyethylene resulted in an increase in PCDD/F concentrations. Apart from this single experiment, no effect of fuel type on PCDD/F emissions was observed. High water contents of refuse derived fuel did not affect total PCDD/F concentrations, but reduced the furans to dioxins ratio and led to a shift to lower chlorinated homologues.

Keywords: Fluidized Bed Incinerator, Fly Ash, Operating Parameters, PCDD, PCDF, RDF; PE, PVC

Deister, U. and Pommer, R. (1991), Distribution of PCDD/F in the vicinity of the hazardous-waste incinerator at schwabach. *Chemosphere*, **23** (11-12), 1643-1651.

Full Text: [1991\Chemosphere23, 1643.pdf](1991/Chemosphere23,%201643.pdf)

Abstract: The distribution of PCDD/F and a selection of heavy metals in the surrounding area of the Hazardous Waste Incinerator (HWI) at Schwabach has been determined. The PCDD/F concentrations measured in soil, grass and lettuce samples are compared to modeling studies realized by the TÜV Bayern.

Bache, C.A., Elfving, D.C. and Lisk, D.J. (1992), Cadmium and lead concentration in foliage near a municipal refuse incinerator. *Chemosphere*, **24** (4), 475-481.

Full Text: [1992\Chemosphere24, 475.pdf](1992/Chemosphere24,%20475.pdf)

Abstract: Whereas landfilling still remains a necessary means of disposing of municipal solid waste, construction of refuse incineration facilities is increasing in the United States. There is currently much public opposition to building such incinerators because of health concerns about toxicants emitted as particulates and gases from the stacks. Cadmium and lead are typically present at significant levels in refuse incinerator fly ash. In this study these heavy metals were determined in tree foliage sampled at increasing distances in the vicinity of a municipal refuse incineration plant equipped with electrostatic precipitators to reduce emitted particulates. There was a high degree of correlation between diminishing foliar concentration of cadmium and lead and the logarithm of the distance north and south of the incinerator, the only directions in which foliar samples could be collected. Sources of these metals in refuse and factors which affect the magnitude of their deposition on foliage are discussed.

Takeshita, R., Akimoto, Y. and Nito, S. (1992), Relationship between the formation of polychlorinated dibenzo-*p*-dioxins and dibenzofurans and the control of combustion, hydrogen chloride level in flue gas and gas temperature in a municipal waste incinerator. *Chemosphere*, **24** (5), 589-598.

Full Text: [1992\Chemosphere24, 589.pdf](1992/Chemosphere24,%20589.pdf)

Abstract: The control of polychlorinated dibenzo-*p*-dioxins and dibenzofurans (PCDDs/Fs) formation was investigated in a municipal waste incinerator equipped with the electrostatic precipitator (EP). The simultaneous control of combustion, hydrogen chloride (HCl) concentration level in the flue gas and the gas temperature proved very effective in the control of PCDDs/Fs formation, reducing the concentration levels of PCDDs/Fs in the flue gas at the EP outlet to 0.2 ng/Nm3 as 2,3,7,8-tetrachlorodibenzo-*p*-dioxin when evaluated by the international toxicity equivalent factors.

Keywords: Municipal Waste Incinerator, Polychlorinated Dibenzo-*p*-Dioxins (PCDDs), Polychlorinated Dibenzofurans (PCDFs), Formation Control, Combustion; Carbon Monoxide, Hydrogen Chloride, Gas Temperature, Electrostatic Precipitator

Hermosin, M.C. and Cornejo, J. (1992), Removing 2,4-D from water by organo-clays. *Chemosphere*, **24** (10), 1493-1503.

Full Text: [1992\Chemosphere24, 1493.pdf](1992/Chemosphere24,%201493.pdf)

Abstract: Decylammonium-montmorillonite (C10M) and decylammonium-vermiculite (C10V) were assayed as sorbent for the weak acid herbicide 2,4-d (2,4-dichlorophenoxy acetic acid) and were compared with untreated clays and activated carbon. Langmuir and Freundlich sorption parameters were calculated from the sorption isotherms. These indicated an increase of sorption capacity for 2,4-d of clays after decylammonium exchange. The sorption at different pH showed that molecular forms were preferentially adsorbed on C10M whereas anionic forms were on C10V. The C10V sample showed much higher and stronger sorption capacity than C10M. The different behaviour of both organic sorbents was related to the different arrangement of decylammonium cations in the interlayer of both minerals, as a consequence of their different layer charge.

Keywords: Adsorption, Desorption, Decylammonium Cation, Herbicides, Montmorillonite, Vermiculite, Industrial Wastewaters, Selective Adsorption, Priority Pollutants, Sorption, Chlorophenols, Smectite, Benzene, Soils

Morselli, L., Zappoli, S. and Tirabassi, T. (1992), Characterization of the effluents from a municipal solid waste incinerator plant and of their environmental impact. *Chemosphere*, **24** (12), 1775-1784.

Full Text: [1992\Chemosphere24, 1775.pdf](1992/Chemosphere24,%201775.pdf)

Abstract: An easy approach for the evaluation of the environmental impact of a Municipal Solid Waste (MSW) incinerator plant is described. In order to perform this study, selected chemical pollutants were monitored both in the plant emissions and in the waste to be burnt. The composition of waste was also determined. A mathematical model was worked out for the estimation of the ground deposition fluxes. A first validation of the model for the case studied was drawn by comparing the simulation values with data obtained on real soil samples.

Gutenmann, W.H., Rutzke, M., Elfving, D.C. and Lisk, D.J. (1992), Analysis of heavy-metals in foliage near a modern refuse incinerator. *Chemosphere*, **24** (12), 1905-1910.

Full Text: [1992\Chemosphere24, 1905.pdf](1992/Chemosphere24,%201905.pdf)

Abstract: Heavy metals such as cadmium and lead are typically found at high levels in fly ash from refuse incinerators. In two earlier studies it was found that such heavy metals on grass or tree foliage in the vicinity of old refuse incinerators with relatively low stacks and limited or no emission control devices showed a high degree of correlation between diminishing foliar concentration and the logarithm of sampling distance from the incinerator. In the study reported here of the concentration of cadmium and lead on foliage near a modern refuse incinerator with a high stack and efficient emission controls, the foliar concentrations of the metals showed no significant diminution with sampling distance from the incinerator. Factors affecting heavy metal emissions from refuse incinerators and contamination of nearby areas are discussed.

Onuska, F.I. and Terry, K.A. (1992), Supercritical fluid extraction of polychlorinated dibenzo-para-dioxins from municipal incinerator fly-ash. *Chemosphere*, **25** (1-2), 17-20.

Full Text: [1992\Chemosphere25, 17.pdf](1992/Chemosphere25,%2017.pdf)

Boos, R., Budin, R., Hartl, H., Stock, M. and Wurst, F. (1992), PCDD-and PCDF-destruction by a SCR-unit in a municipal waste incinerator. *Chemosphere*, **25** (3), 375-382.

Full Text: [1992\Chemosphere25, 375.pdf](1992/Chemosphere25,%20375.pdf)

Abstract: The reduction of PCDD/PCDF levels by a SCR-DeNOx-unit in the municipal waste incineration plant Spittelau/Vienna, constructed by SGP-VA, was determined. After the installation of an additional modified catalyst-layer in 1991, several test runs were performed within a 4 months period in order to determine the degree of catalytic destruction. It is shown that via catalytic oxidation the statutory emission level of 0.1 ng TE/Sm3 (I-TEF) could be achieved.

Hinton, W.S. and Lane, A.M. (1992), Effect of zinc, copper, and sodium on formation of polychlorinated dioxins on MSW incinerator fly ash. *Chemosphere*, **25** (6), 811-819.

Full Text: [1992\Chemosphere25, 811.pdf](1992/Chemosphere25,%20811.pdf)

Abstract: Previous studies showed that zinc, copper and sodium concentrations were correlated with dioxin concentrations on fly ash from municipal solid waste incinerators. Statistically designed experiments were performed to study the effects of these elements on PCDD formation. The elements were deposited as zinc nitrate, copper hydroxide and sodium hydroxide on silica gel. Pentachlorophenol was used as a model precursor. Zinc nitrate promoted PCDD formation. Both copper hydroxide and sodium hydroxide inhibited PCDD formation.

Keywords: Chlorinated Dibenzodioxins, Mechanism, Incineration, Fly Ash, Catalyst

Janssens, J.J., Daelemans, F.F. and Schepens, P.J.C. (1992), Sampling incinerator effluents for PCDDs and PCDFs: A critical evaluation of existing sampling procedures. *Chemosphere*, **25** (7-10), 1323-1332.

Full Text: [1992\Chemosphere25, 1323.pdf](1992/Chemosphere25,%201323.pdf)

Abstract: The chemical analysis of PCDDs and PCDFs is nowadays considered to pose no longer a serious problem. Much larger errors can be made during the sample collection in the stacks of incinerators. In this paper, the potential artefacts that can occur are summarized and a very simple sample collection procedure is suggested, which minimizes the possibility of chemical artefacts and ensures a complete recovery of sampled organochlorinated compounds.

Riggs, K., Reuther, J., White, J. and Pitts, G. (1992), Determination of polyhalogenated dibenzo-*p*-dioxins and dibenzofurans in simulated incinerator emissions. *Chemosphere*, **25** (7-10), 1415-1420.

Full Text: [1992\Chemosphere25, 1415.pdf](1992/Chemosphere25,%201415.pdf)

Abstract: A laboratory-scale device that simulates municipal waste incineration has been developed at Battelle and used to evaluate incinerator emissions from brominated flame retardants and plastics containing brominated flame retardants. Recent results indicate that incineration of pure brominated flame retardants does not generate performance conditions consistent with “good combustion practices”. Combustion appears to be enhanced, however, when the flame retardants are incorporated into a plastic matrix.

Wevers, M., De Fré, R., Rymen, T. and Geuzens, P. (1992), Reduction of dioxin emission from a municipal waste incinerator by wet gas scrubbing. *Chemosphere*, **25** (7-10), 1435-1439.

Full Text: [1992\Chemosphere25, 1435.pdf](1992/Chemosphere25,%201435.pdf)

Abstract: During 1990 an extensive measuring program was organized to evaluate the efficiency of a two stage wet scrubber installed at the municipal waste incinerator plant of Sint Niklaas, Belgium.

This incinerator has two Volund furnaces of 3, 6 ton/hour, each equipped with electrostatic precipitators, and a two step wet gas scrubber. During the measurements both stages of the scrubber were operated with water as adsorbent i.e. a two step acid gas wash. The samples were taken after the electrostatic precipitator before and after the scrubber.

The removal efficiency of the gas cleaning device was evaluated for HCl, HF, SO2, PCDD, PCDF and dust.

The results indicate that the wet gas scrubbing device removes PCDDs and PCDFs from the flue gases for about 71%.

Keywords: PCDDs, PCDFs, Municipal Solid Waste Incinerator, Wet Gas Scrubber

Namasivayam, C. and Kanchana, N. (1992), Waste banana pith as adsorbent for color removal from wastewaters. *Chemosphere*, **25** (11), 1691-1705.

Full Text: [1992\Chemosphere25, 1691.pdf](1992/Chemosphere25,%201691.pdf)

Abstract: The ability of waste banana pith to remove color from synthetic wastewaters containing Acid violet, Congo red+Rhodamine B mixture and Congo red+Acid Violet+Rhodamine-B mixture was investigated. The influence of various parameters like dye concentration, contact time, adsorbent dosage and pH on the removal of dyes has been studied. The adsorption rate constant for Acid violet was found to be 1.27×10-1/min at 20 mg/L dye concentration. The equilibrium data for Acid violet fit well into Langmuir and Freundlich isotherms. Maximum removal of 80% was observed for Acid violet at 50 mg/L and at pH 2. Desorption studies reveal that the adsorption of Acid violet is mainly due to chemisorption. Complete removal of dye mixture, Congo red+Rhodamine-B (20 mg/L each) was observed at an adsorbent dosage of 6 g. The color removal was quantitative for the dye mixtures, Congo red+Acid violet+Rhodamine-B (10 mg/L each) and Congo red+Acid violet+Rhodamine-B (20 mg/L each) by 5 and 6 g of adsorbent, respectively.

Keywords: Waste Banana Pith, Acid Violet, Adsorption Isotherms, Intraparticle Diffusion, pH Effect, Fly-Ash, Adsorption, Dyes, Equilibrium

Päpke, O., Ball, M. and Lis, A. (1993), Potential occupational exposure of municipal waste incinerator workers with PCDD/PCDF. *Chemosphere*, **27** (1-3), 203-209.

Full Text: [1993\Chemosphere27, 203.pdf](1993/Chemosphere27,%20203.pdf)

Abstract: The results of analyses of 10 whole blood samples from workers engaged in operating a Municipal Waste Incinerator (MWI) are reported. The values are compared to the so called “background” values from 102 subjects in Germany. Concerning the MWI-workers it is striking that in certain cases the higher chlorinated dioxins and furans - especially the hexa-, hepta- and octa-CDD/CDF - show elevated concentrations.

Keywords: PCDD/PCDF, Polychlorodibenzo-p-Dioxins, Polychlorodibenzofurans, Incinerator, Blood, Exposure

Nishikawa, H., Katami, T. and Yasuhara, A. (1993), Contribution of an industrial waste incinerator to the atmospheric concentrations of volatile chlorinated organic compounds. *Chemosphere*, **27** (8), 1425-1432.

Full Text: [1993\Chemosphere27, 1425.pdf](1993/Chemosphere27,%201425.pdf)

Abstract: The contribution of five volatile chlorinated organic compounds emitted from waste incinerator to the surrounding atmosphere were investigated. The atmospheric concentrations of these compounds were low level as compared with those around the factories in which chlorinated organic compounds were used as solvent. It was found that the influence of the incinerator exhausts to the atmosphere was negligible or very small for these compounds.

Davis, A.P., Hao, O.J. and Chen, J.M. (1994), Kinetics of heavy-metal reactions with ferrous sulfide. *Chemosphere*, **28** (6), 1147-1164.

Full Text: [1994\Chemosphere28, 1147.pdf](1994/Chemosphere28,%201147.pdf)

Abstract: The kinetics of heavy metal exchange with ferrous sulfide is examined. The removal rates are dependent on the type and concentration of metals, as well as pH. At pH 7, the removal rates follow the order: Cu(II) > Zn(II) > Pb(II) > Cd(II). The reaction with copper occurs very rapidly; however it is inhibited by copper complexation with EDTA. The rate of both lead and cadmium exchange decreases at low pH. Competition among metals for active FeS sites may exist. The addition of copper and subsequent formation of CuS seem to assist in the removal of other metals, apparently due to adsorption onto the CuS.

Keywords: Copper(II) Sulfide, Hydrous CdS(S), Systems, Iron, Dissolution, Surface, Cu(II), Water, Ions

Ruppert, G., Bauer, R. and Heisler, G. (1994), UV-O3, UV- H2O2, UV-TiO2 and the photo-fenton reaction - comparison of advanced oxidation processes for waste-water treatment. *Chemosphere*, **28** (8), 1447-1454.

Full Text: [1994\Chemosphere28, 1447.pdf](1994/Chemosphere28,%201447.pdf)

Abstract: Results of the photochemical mineralization of 4-chlorophenol (4-CP) and of a wastewater from dyehouse industry by the methods UV/O3, UV/H2O2, UV/TiO2 and UV/H2O2/Fe2+ (photo-Fenton reaction) are reported and compared. Under illumination with a 150 W high pressure mercury lamp, TOC-degradation efficiency for 4-CP had the following order: UV/H2O2/Fe2+ > UV/O3 > UV/H2O2 = UV/TiO2. Complete decolourization of the dye waste occurred within 20 minutes with ozone. A mineralization grade of approximately 75% was reached after 90 minutes with the photo-Fenton reaction and after 150 minutes with UV/ozone. The combinations UV/TiO2 and UV/H2O2 were found to be less efficient for bleaching and degradation of the dye waste. Furthermore, a novel combination for wastewater treatment, UV/Fe2+/O3, was investigated. Addition of Fe2+ to the UV/ozone process increased the mineralization rate of 4-CP while no significant effect on dye waste degradation could be observed.

Keywords: Organic-Water Contaminants, Mineralization, Degradation, Ozonation

Fischer, R., Kreuzig, R. and Bahadir, M. (1994), Extraction behavior of polycyclic aromatic hydrocarbons adsorbed on waste incinerator fly ash. *Chemosphere*, **29** (2), 311-317.

Full Text: [1994\Chemosphere29, 311.pdf](1994/Chemosphere29,%20311.pdf)

Abstract: Fortification experiments were performed with waste incineration fly ash samples. The extraction recovery of PAH was found to be influenced by spiking method, PAH concentration, molecular size, storage time, and carbon content of the matrix. Applying 14C-labelled PAH the extracts were found to exhibit only slight alterations in composition compared to the reference substances.

Visser, J.D. and van de Meent, C.J. (1994), Uniform System for the Evaluation of Substances. IV. Distribution and intake. *Chemosphere*, **29** (2), 353-369.

Full Text: [1994\Chemosphere29, 353.pdf](1994/Chemosphere29,%20353.pdf)

Abstract: This is the fourth article in the series on USES, the Uniform System for the Evaluation of Substances. This article describes the modelling approach used to predict concentrations in the environmental media (air, surface water, agricultural soil and groundwater) and the intake media for humans (fish, drinking water, root crops, leaf crops, meat and milk) and for predatory birds and mammals (fish and earthworms). Distribution and intake are estimated on two spatial scales: locally near a point source, and regionally over a larger area. This article focuses on the local distribution and the general intake models. Local distribution is modelled in a hypothetical standard environment, using typical environmental characteristics. Humans and predators are assumed to be exposed to food products from the contaminated system. The choice of models in a system like USES, is limited by the small data sets legally required for risk assessment purposes. Therefore, USES focuses on relatively simple models, and is able to work with the limited input data.

Chatkittikunwong, W. and Creaser, C.S. (1994), Bromo-, bromochloro-and chloro-dibenzo-*p*-dioxins and dibenzofurans in incinerator flyash. *Chemosphere*, **29** (3), 559-566.

Full Text: [1994\Chemosphere29, 559.pdf](1994/Chemosphere29,%20559.pdf)

Abstract: Flyash samples taken from municipal and clinical waste incinerators were analysed for halogenated dibenzo-p-dioxins and dibenzofurans (DDs and DFs). Tri- to octachloro- DDs and DFs were detected, as well as bromo- and bromochloro- compounds at lower levels. These included some bromo- and bromochloro- DDs and DFs not previously reported in flyash. Clinical waste incineration led to similar compounds to those arising from municipal waste.

Fängmark, I., Strömberg, B., Berge, N. and Rappe, C. (1994), Influence of small fly ash particles on the post-combustion formation of PCDDs, PCDFs, PCBzs, and CPs in a pilot incinerator. *Chemosphere*, **29** (9-11), 1903-1909.

Full Text: [1994\Chemosphere29, 1903.pdf](1994/Chemosphere29,%201903.pdf)

Abstract: Experiments in a laboratory scale fluidized bed reactor using a synthetic fuel which simulates municipal solid waste, show that small fly ash particles (<2.2 μm) have a significant influence on the formation of chlorinated aromatic compounds.

Keywords: MSW Combustion, Fly Ash, PCDD, PCDF, PCBz, CP, Flue Gas, Multivariate Data Analysis MVDA, Experimental Design

Ogaki, Y., Yamaguchi, H., Okuyama, K., Hamaguchi, K. and Shibuya, E. (1994), Influence of HCl on thermal-decomposition of PCDDs/PCDFs in fly-ash from MSW incinerator. *Chemosphere*, **29** (9-11), 1965-1970.

Full Text: [1994\Chemosphere29, 1965.pdf](1994/Chemosphere29,%201965.pdf)

Abstract: Fly ash from an electrostatic precipitator in a MSW incinerator was heated at 573–773K for 2–60 minutes in various test gases (nitrogen, air or simulated flue gas (O2 10%, N2 82%, CO2 8%)) with or without 500 or 1000ppm HCl and 20% H2O. Thermal decomposition behavior of PCDDs/PCDFs in fly ash was studied. In any test gas, PCDDs/PCDFs decomposed rapidly at over 673K regardless of HCl presence. Detoxification of PCDDs/PCDFs was more inhibited in simulated flue gas with 1000ppm HCl than in nitrogen or air but concentration of PCDDs/PCDFs decreased to less than 0.01ng-TEQ/g at 773K. Furthermore, it was demonstrated that dioxins in fly ash decomposed almost completely at the bottom of boiler section in a MSW incinerator.

Keywords: PCDDs, PCDFs, MSW Incinerators, Fly Ash, Thermal Decomposition

Kaune, A., Lenoir, D., Nikolai, U. and Kettrup, A. (1994), Estimating concentrations of polychlorinated dibenzo-*p*-dioxins and dibenzofurans in the stack gas of a hazardous waste incinerator from concentrations of chlorinated benzenes and biphenyls. *Chemosphere*, **29** (9-11), 2083-2096.

Full Text: [1994\Chemosphere29, 2083.pdf](1994/Chemosphere29,%202083.pdf)

Abstract: We investigated the relationships among concentrations of polychlorinated dibenzo-*p*-dioxins (PCDD), dibenzofurans (PCDF), benzenes (PCBz), phenols (PCPh), and biphenyls (PCB) and polycyclic aromatic hydrocarbons (PAH) measured in the stack gas of a hazardous waste incinerator. International toxicity equivalents (I-TE) correlated most significantly with PCBz and PCB concentrations. We therefore propose to utilize these classes of compounds as indicator parameters from which I-TE values can be estimated. The most accurate estimates were made using pentachlorobenzene (Cl5Bz). The proposal to use Cl5Bz as indicator parameter was supported by regression analyses performed for four additional sampling points within the hazardous waste incinerator and by literature data.

Keywords: Chlorobenzenes, Chlorophenols, Emission Monitoring, Indicator Parameters, Polychlorinated Biphenyls, Polycyclic Aromatic Hydrocarbons

Davis, A.P. and Bhatnagar, V. (1995), Adsorption of cadmium and humic-acid onto hematite. *Chemosphere*, **30** (2), 243-256.

Full Text: [1995\Chemosphere30, 243.pdf](1995/Chemosphere30,%20243.pdf)

Abstract: Cadmium adsorption onto alpha-Fe2O3 (hematite) is successfully described using a non-electrostatic surface complexation model (NEM). Humic acid (Aldrich) adsorption onto hematite decreases with increasing pH, exhibiting ligand-exchange surface complexation characteristics. In ternary systems, the presence of humic acid (HA) leads to an increase in Cd(II) adsorption, dependent on HA concentration. The substrate loading order is observed to have noticeable effect on metal uptake at higher Cd(II) concentrations in the ternary systems; the general trend with respect to Cd(II) adsorption being: Cd(II) before HA > simultaneous adsorption approximate to HA before Cd(II), EDTA complexation significantly reduces the Cd(II) adsorption in the HA/hematite system.

Keywords: Hydrous Oxides, Chelating-Agents, Iron-Oxides, Substances, Goethite, Ligands, Surface, Feooh, EDTA

Namasivayam, C. and Yamuna, R.T. (1995), Adsorption of chromium(VI) by a low-cost adsorbent: Biogas residual slurry. *Chemosphere*, **30** (3), 561-578.

Full Text: [1995\Chemosphere30, 561.pdf](1995/Chemosphere30,%20561.pdf)

Abstract: Ability of waste biogas residual slurry (BRS) to remove Cr(VI) from aqueous solutions was investigated. The influence of various parameters such as metal ion concentration, contact time, adsorbent dosage, adsorbent particle size, temperature and pH on the removal of Cr(VI) has been studied. The adsorption followed first order rate expression. The equilibrium data fit well into Langmuir and Freundlich isotherms. Adsorption was maximum at an initial pH of 1.51. Temperature studies showed that the adsorption process was endothermic in nature.

Thompson, L.J., Ebel, J.G., Manzell, K.L., Rutzke, M., Gutenmann, W.H. and Lisk, D.J. (1995), Analytical survey of elements in veterinary college incinerator ashes. *Chemosphere*, **30** (4), 807-811.

Full Text: [1995\Chemosphere30, 807.pdf](1995/Chemosphere30,%20807.pdf)

Abstract: While appreciable attention has been given to the elemental composition of ashes from municipal solid waste incinerators, relatively little information is available on the elemental content of incinerators burning animal carcasses and medical wastes. In the work reported here, an analytical survey was conducted of the concentration of 22 elements in the ashes of incinerators located at veterinary colleges or animal disease diagnostic laboratories in seven states. With the exception of Zn, the concentrations of most elements were well below these found in ashes from municipal solid waste incinerators. Conversely, Ca, P and K were much higher in concentration probably deriving largely from bones, teeth and other organs of animals. There was an indication that burned plastic wastes were a source of Pb in the ashes. The concentrations of several toxic elements varied widely probably due to variations in initial waste composition, incinerator design and operating parameters, The concentrations of soluble salts in the ashes were appreciable. Organic matter in the ashes was low to nondetectable indicating the completeness of incineration.

Keywords: Municipal

Wienecke, J., Kruse, H., Huckfeldt, U., Eickhoff, W. and Wassermann, O. (1995), Organic compounds in the flue gas of a hazardous waste incinerator. *Chemosphere*, **30** (5), 907-913.

Full Text: [1995\Chemosphere30, 907.pdf](1995/Chemosphere30,%20907.pdf)

Abstract: This study describes organic compounds in the flue gas af a hazardous waste incinerator. Polycyclic and heterocyclic aromatics, phthalate esters, phosphate esters, halogenated benzenes, biphenyls, naphthalenes, phenols as well as nitro compounds were separated by capillary gas chromatography, characterized and quantified by mass spectroscopy.

Keywords: Combustion, PCDD

Eitzer, B.D. (1995), Polychlorinated dibenzo-*p*-dioxins and dibenzofurans in raw milk samples from farms located near a new resource recovery incinerator. *Chemosphere*, **30** (7), 1237-1248.

Full Text: [1995\Chemosphere30, 1237.pdf](1995/Chemosphere30,%201237.pdf)

Abstract: Bovine milk samples were taken from farms near a new resource recovery incinerator both before and. one year after the incinerator went into operation. These samples were analyzed for 2,3,7,8-substituted polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans using liquid-liquid extraction, a semiautomated clean-up procedure and high resolution gas chromatography/high resolution mass spectrometry. No significant differences were observed between the PCDD/F concentrations in the pre-operational and postoperational samples.

Keywords: Cow Milk, Emissions, Switzerland, Furan

Vartiainen, T., Lampi, P., Tuomisto, J.T. and Tuomisto, J. (1995), Polychlorodibenzo-p-dioxin and polychlorodibenzofuran concentrations in human fat samples in a village after pollution of drinking water with chlorophenols. *Chemosphere*, **30** (8), 1429-1438.

Full Text: [1995\Chemosphere30, 1429.pdf](1995/Chemosphere30,%201429.pdf)

Abstract: Polychorodibenzo-p-dioxin and polychlorodibenzofuran (PCDD/F) and polychlorobiphenyl (PCB) concentrations were analyzed in fat samples of seven people from a village where the population had been exposed to chlorophenols for over twenty years, and in seven matched controls. There was only a minor difference in both PCDD/F and PCB concentrations which seemed to reflect the general difference in background pollution between the locations. We found nothing which could be construed as evidence of elevated levels of PCDD/Fs due to the chlorophenol exposure. Hence any detrimental health effects must be considered as being due to chlorophenols rather than PCDD/F impurities.

Meharg, A.A. and French, M.C. (1995), Heavy metals as markers for assessing environmental pollution from chemical warehouse and plastics fires. *Chemosphere*, **30** (10), 1987-1994.

Full Text: [1995\Chemosphere30, 1987.pdf](1995/Chemosphere30,%201987.pdf)

Abstract: Case histories of large, accidental fires are presented to illustrate that heavy metals may be used as markers to assess the extent of localized environmental contamination resulting from fires. Due to the complexity of fire chemistry with respect to organic pollutants, determination of organic pollutants in the environment following a fire would be time consuming and expensive. Using heavy metals as markers on the other hand is much cheaper and can be done very rapidly.

Keywords: Combustion, Contamination, Cadmium, Dioxin

Kouras, A., Zouboulis, A., Samara, C. and Kouimtzis, T. (1995), Removal of pesticides from surface waters by combined physicochemical processes. 1. Dodine. *Chemosphere*, **30** (12), 2307-2315.

Full Text: [1995\Chemosphere30, 2307.pdf](1995/Chemosphere30,%202307.pdf)

Abstract: The simultaneous action of powdered activated carbon and several coagulant agents on the removal of the fungicide dodine from spiked distilled water, was studied. As coagulants, ferric chloride (FeCl3) and basic polyaluminium chlorosulfate ([Al (OH)xCly (SO4)z]n) were examined, using polyacrylamide, in certain cases, as coagulant aid (polyelectrolyte). The efficiency of dodine removal was investigated with respect to the added amount of powdered activated carbon (PAC), the pH value, as well as the type and dose of coagulant and polyelectrolyte. The experiments were performed applying the standard jar-test procedure. The initial concentration of dodine was 250 µg/L. At this concentration and pH range 5-8 it was found that a dose of 100 mg/L PAC was necessary to achieve more than 98% removal of dodine, whereas lower removal (91-93%) was obtained applying half the dose of PAC under the same conditions. However, when 10-100 mg/L FeCl3 were simultaneously added with PAC, the removal efficiency increased to >98%, even with the half PAC dose.

Mumtaz, M.M., Cibulas, W. and De Rosa, C.T. (1995), An integrated framework to identify significant human exposures (shele). *Chemosphere*, **31** (1), 2485-2498.

Full Text: [1995\Chemosphere31, 2485.pdf](1995/Chemosphere31,%202485.pdf)

Abstract: Typically, health risk assessment methodologies have been designed to assess risks associated with exposure to individual chemicals through one specific medium, such as air, water, or food. This is partly because classical experimental methodology is used to study pure chemicals, and partly because a majority of early promulgated environmental laws (e.g., Clean Air Act, Clean Water Act) regulated chemicals in a given matrix via a specific route. Often, however, exposures in the ambient environment are through multiple routes, multiple media and to multiple chemicals. Presented here is a multimedia framework that health risk assessors can use to identify significant human exposure levels (SHELs) on a site-specific basis. This framework is presented in the context of a decision tree that links health guidance values such as minimal risk levels (MRLs) with site-specific data, using a range of decision-support models. It includes a provision to estimate a level of concern by comparing the estimated total dose (exposures) with guidance values established by the Agency, by other federal organizations, and by basket-survey results. If a SHEL has been identified, a range of follow-up public health actions may be indicated (i.e., surveillance, health education, or other preventive interventions). This framework serves to (1) integrate the overall health assessment process, (2) evaluate the need for public health interventions, (3) incorporate innovative decision-support methods/models, and (4) demonstrate utility of such methods in public health practice and the pursuit of the Agency’s mission.

Keywords: Blood Lead

Shu, H.Y. and Huang, C.R. (1995), Degradation of commercial azo dyes in water using ozonation and UV enhanced ozonation process. *Chemosphere*, **31** (8), 3813-3825.

Full Text: [1995\Chemosphere31, 3813.pdf](1995/Chemosphere31,%203813.pdf)

Abstract: The chemical oxidation of eight non-biodegradable azo dyes by ozonation and photooxidation process was studied in a pilot scale photochemical (UV/ozone) reactor. In experiments with ozone bubbling, the degradation of eight azo dyes was found to occur in the absence of UV light. The degradation rate of azo dyes was observed to be first order with respected to both azo dye and ozone concentrations. The pH of the solution decreased while the azo dyes degraded. UV light did not significantly enhance the degradation ability of the ozonation reaction under various conditions. No degradation was observed when the azo dye solution was irradiated by UV light alone. Effects of ozone dosage, and initial concentrations of azo dyes are discussed. Time for removal of 50% of azo dye and rate constants can be used to determine the decomposition rate of each azo dye by different oxidation processes as a function of various conditions.

Keywords: Ultraviolet-Radiation, Mass-Spectrometry, Ozone, Destruction, Oxidation

Kato, T., Osada, S., Endo, K., Sakai, S. and Hiraoka, M. (1996), Design of a small-scale incinerator with low PCDD/PCDF emissions. *Chemosphere*, **32** (1), 145-150.

Full Text: [1996\Chemosphere32, 145.pdf](1996/Chemosphere32,%20145.pdf)

Abstract: Attempts were made to achieve complete combustion by improving secondary combustion for the purpose of reducing PCDDs/PCDFs in a small-scale incinerator. Particular emphasis was placed on improving gas turbulence in the chamber. First, the gas flow in the chamber was analyzed by the flow visualization technique, using laboratory scale equipment. Then, the combustibility was evaluated using a model gas containing standard carbon monoxide. Finally, the reduction of PCDDs/PCDFs was confirmed with an actual plant. A resultant finding was that PCDDs/PCDFs emissions at the incinerator outlet can be significantly reduced by changing the gas flow pattern in the secondary combustion chamber.

Ogawa, H., Orita, N., Horaguchi, M., Suzuki, T., Okada, M. and Yasuda, S. (1996), Dioxin reduction by sulfur component addition. *Chemosphere*, **32** (1), 151-157.

Full Text: [1996\Chemosphere32, 151.pdf](1996/Chemosphere32,%20151.pdf)

Abstract: Dioxin (PCDD + PCDF) reduction test by sulfur component addition was carried out using small scale FBC (Fluidized Bed Combustor) test system. Sulfur sources were three different modes; CASE A: gaseous SO2 was directly fed; CASE B: coal containing sulfur was fed; CASE C: coal + sulfur reagent were fed. Dioxin reduction occurred for each case and coal addition was so effective for dioxin reduction. It is thought that this effect results from Cl2 reduction which was caused by gaseous SO2 in the flue gas.

Watanabe, T., Asai, M., Kondo, T., Shimizu, M., Takeuchi, Y., Aramaki, H. and Naito, M. (1996), An advanced fluidized-bed swirl incinerator for dioxin control during municipal waste disposal. *Chemosphere*, **32** (1), 177-187.

Full Text: [1996\Chemosphere32, 177.pdf](1996/Chemosphere32,%20177.pdf)

Abstract: This report discusses the principles and performance of an advanced fluidized-bed incinerator installed with an independently controlled secondary swirl combustion chamber. The system we have developed employs a secondary combustion swirl chamber to incinerate unburned combustibles from the initial burning. The combustibles are carried into the secondary chamber by bed material. Discussion includes promotion of the combustion of char as a typical difficult-to-burn matter, and the successful control of carbon monoxide and dioxin emissions.

Also we were studied the behavior of dioxins and their precursors as well as their homologue distribution along the gas now. Good prospects of achieving an equivalent dioxin toxicity concentration of 0.5 TEQ ng/m3 N or less at the induced draft fan (IDF) outlet were realized through optimizing combustion conditions and maintaining a low flue gas temperature in the bag filter.

Ide, Y., Kashiwabara, K., Okada, S., Mori, T. and Hara, M. (1996), Catalytic decomposition of dioxin from MSW incinerator flue gas. *Chemosphere*, **32** (1), 189-198.

Full Text: [1996\Chemosphere32, 189.pdf](1996/Chemosphere32,%20189.pdf)

Abstract: An investigation was carried out on the decomposition of the dioxin and related compounds in Municipal Solid Waste (MSW) flue gas using a TiO2-V2O5-WO3 catalyst in a NOx selective catalytic reactor. Experiments were done at the flue gas temperature of 210°C. The dioxin and related compounds were classified as particulate and gaseous, and analyzed separately.

As a result, high decomposition conversion of dioxin of approximately 90% or higher was obtained. The decomposition conversion of gaseous components was shown to be higher than that of particulate components. Test results were also obtained on coplanar PCBs, which demonstrated behavior similar to the dioxin in the catalyst.

Choudhary, G. (1996), Human health perspectives on environmental exposure to benzidine: A review. *Chemosphere*, **32** (2), 267-291.

Full Text: [1996\Chemosphere32, 267.pdf](1996/Chemosphere32,%20267.pdf)

Abstract: Benzidine. an odorless, white re, slightly reddish-white crystalline organic compound, is an environmental contaminant that has been identified at about 30 National Priorities List (NPL) hazardous waste sites in the United States. In the environment, it is usually found attached to suspended particles either in its “free” state or as chloride or sulfate salts. In the past, U.S. industries used large quantities of benzidine to produce dyes for paper. clothes, and leather. Since the ban on its production and use in the United States in the 1970s, this compound is imported for specialty uses. People living near hazardous waste sites might be exposed to benzidine by drinking contaminated water, by inhaling contaminated air, or by swallowing or touching contaminated dust. People can also be exposed by using benzidine dyes on paper, clothes, and other materials. Human occupational data and studies of laboratory animals suggest that people exposed to benzidine may develop adverse systemic health effects or cancer. The U.S. Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services, the International Agency for Research on Cancer (IARC), and the World Health Organization (WHO) have classified benzidine as a carcinogen. Urinary bladder cancer is the most common form of cancer caused by exposure to benzidine. The stomach, kidneys, brain, mouth, esophagus, liver, and gallbladder might also be targets. Th information presented in the article may help public health officials, physicians, and toxicologists evaluate and develop the health information materials on the nature of benzidine in the environment and its potential impact on public health.

? ten Hulscher, Th.E.M. and Cornelissen, G. (1996), Effect of temperature on sorption equilibrium and sorption kinetics of organic micropollutants - A review. *Chemosphere*, **32** (4), 609-626.

Full Text: [1996\Chemosphere32, 609.pdf](1996/Chemosphere32,%20609.pdf)

Abstract: Temperature is an important parameter that can influence the equilibria and rates of environmental processes. in the present paper, a review of the influence of temperature on sorption equilibrium and sorption kinetics for organic micropollutants is presented. A fast and a slow process can be distinguished for sorption. For most compounds, equilibrium sorption decreases with increasing temperature. Some examples of increasing equilibrium sorption with increasing temperature and of no effect of temperature bn sorption equilibrium were also found. The rate of fast desorption increased with increasing temperature. Calculated activation energies for desorption were in the range of 10-50 kJ/mol. Also, examples of no influence of temperature on the rates of fast adsorption and desorption were reported.

In the present paper, the slow desorption step is assumed to be a diffusion process. Literature on the effect of temperature on the diffusion of organic compounds in polymeric structures is summarized Activation energies for diffusion in polymers average 60 kJ/mol. The reported values for the activation energy of slow desorption are comparable to those found for diffusion of organic micropollutants through organic polymers. This is an indication that diffusion causes nonequilibrium sorption effects.

Keywords: Nonequilibrium Sorption; Hydrophobic Pollutants; Thermodynamic Approach; Polymer Membranes; Natural Sediments; Calcareous Soil; Adsorption; Desorption; Matter; Hydrocarbons

Periasamy, K. and Namasivayam, C. (1996), Removal of copper(II) by adsorption onto peanut hull carbon from water and copper plating industry wastewater. *Chemosphere*, **32** (4), 769-789.

Full Text: [1996\Chemosphere32, 769.pdf](1996/Chemosphere32,%20769.pdf)

Abstract: Activated carbon prepared from peanut hull (PHC), an agricultural waste by-product, has been used for the adsorption of Cu(II) from aqueous solution. The adsorption obeyed Langmuir adsorption isotherm. The applicability of Lagergren kinetic model has also been investigated. Quantitative removal of Cu(II) from a solution containing 20 mg/L Cu(II) by 0.9 g PHC per litre was observed in the pH range 4.0 to 10.0. The suitability of PHC for treating copper plating industry wastewater was also testea. A comparative study with a coal based commercial granular activated carbon (GAG) showed that the adsorption capacity (Qo) of PHC was 18 times larger than that of GAG.

Keywords: Peanut Hull Carbon, Adsorption, Copper(II), Langmuir Isotherm, Kinetics, Aqueous-Solution, Equilibrium, Cadmium(II)

Tang, W.Z. and Chen, R.Z. (1996), Decolorization kinetics and mechanisms of commercial dyes by H2O2/iron powder system. *Chemosphere*, **32** (5), 947-958.

Full Text: [1996\Chemosphere32, 947.pdf](1996/Chemosphere32,%20947.pdf)

Abstract: The oxidation kinetics and mechanisms of Reactive Red 120, Direct Blue 160, and Acid Blue 40 by H2O2/iron powder system were investigated in a well-mixed batch reactor. Optimal pH ranged from 2.0 to 3.0 depending upon the dye molecular structure and the iron dissolution rate. The optimal ratio of H2O2 to iron metal was 0.001M to 1.0 g/L. The initial oxidation rates were obtained according to pseudo-first-order kinetics. Dye molecular structure is an important factor that influences decolorization kinetics. The results suggest that the structure chromophore including Azo bonds are the primary target oxidized by H2O2/Fe powder system. The less substituted anthraquinone ring in Acid Blue 40 is more readily to be destroyed than the Azo dyes. Dimerization may take place at high concentration of Acid Blue 40, which decreases the decolorization efficiency. In addition, the color change during decolorization processes may also result from the dye complexes with the iron species. As a result, H2O2/iron powder system is better than the Fenton’s reagent system, e.g., H2O2/Fe2+, due to the continuous dissolution of iron powder and the dye adsorption on the iron powder, despite the fact that Fenton’s reaction was the major process cohtributing to decolorization.

Keywords: Dye Decolorization, Iron Powder Hydrogen Peroxide, Hydroxyl Radical, pH, Fenton Reagent, Water

Jiménez, B., Eljarrat, E., Hernández, L.M., Rivera, J. and González, M.J. (1996), Polychlorinated dibenzo-*p*-dioxins and dibenzofurans in soils near a clinical waste incinerator in Madrid, Spain. Chemometric comparison with other pollution sources and soils. *Chemosphere*, **32** (7), 1327-1348.

Full Text: [1996\Chemosphere32, 1327.pdf](1996/Chemosphere32,%201327.pdf)

Abstract: Surface soils samples (0-5 cm) collected in the surroundings of a Clinical Waste Incinerator (CWI) were analysed for Polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). PCDDs and PCDFs were found at ppt levels at the 16 points sampled. The analytical data obtained reflect a slight contamination by PCDD/Fs in the area studied, but do not clarify whether the CWI plant is the only PCDD/F source responsible for that contamination. The PCDD/F patterns and profiles from the investigated soils were compared chemometricly with those reported in the available literature, and indicated that the investigated soils have a typical combustion profile and pattern. They were similar to typical emission combustion sources such as traffic, clinical waste incinerators, and combustion of materials containing polychlorinated biphenyls (PCBs) such as electrical wires and illegal scrap materials. Copyright (C) 1996 Elsevier Science Ltd.

Keywords: Nvironmental-Samples, Sewage-Sludge, Metal Reclamation, PCDDs, PCDFs, Sediments, Combustion, Emissions, Sites, PCBs

Thompson, L.J., Ebel, Jr., J.G., Manzell, K.L., Tyler, L., Gutenmann, W.H., Raid, C.M. and Lisk, D.J. (1996), Variation in elemental concentrations of veterinary college incinerator ashes with time of sampling. *Chemosphere*, **32** (9), 1855-1858.

Full Text: [1996\Chemosphere32, 1855.pdf](1996/Chemosphere32,%201855.pdf)

Abstract: An analytical survey of elements in ashes sampled nationwide from veterinary college incinerators was reported earlier (Thompson at al. 1995). It was of interest to observe the variation in the elemental composition of ashes sampled repeatedly with time from the same incinerator. In 1995, eleven samples of ash were taken It approximately weakly intervals from the incinerator at the college of Veterinary Medicine at Cornell University in Ithaca, New York. Twenty four elements were determined using several analytical procedures as well as organic matter, pH and soluble salts. In general, the concentrations of the various analytes are remarkably similar as a function of the time of sampling. Whereas the concentrations of most elements were well below those found in ashes from municipal solid waste incinerators, elements such as Ca, Mg and P were much higher, expectedly deriving from animal bones, teeth and other tissues. Factors affecting the chemistry of elements during incineration are discussed. (C) 1996 Elsevier Science Ltd

Keywords: Municipal

Tremolada, P., Burnett, V., Calamari, D. and Jones, K.C. (1996), A study of the spatial distribution of PCBs in the UK atmosphere using pine needles. *Chemosphere*, **32** (11), 2189-2203.

Full Text: [1996\Chemosphere32, 2189.pdf](1996/Chemosphere32,%202189.pdf)

Abstract: Past and current polychlorinated biphenyl (PCB) inputs to the environment, mainly in industrialized countries, continue to determine a global re-distribution of these contaminants. In order to better understand PCB transport and distribution phenomena, a number of large-scale distribution studies have been recently published in the literature. In this paper a nationwide survey of 28 pine needle samples taken across the UK is presented. Mean PCB concentrations of a number of latitudinal bands (transects) revealed the presence of a decreasing concentration gradient from southern England to northern Scotland of a factor of similar to 7. The pine needle data also provide evidence to suggest: 1) that there has been a decrease in the PCB concentration of the atmosphere in the southern UK; and 2) there is a relationship between regional mean needle PCB concentrations and population densities. Calculated air concentrations from the pine needle results were compared with measured literature data of a similar area to test the possibility of using bioconcentration factors (BCF) based on n-octanol: air partition coefficients (Koa) to predict air-leaf equilibrium of semivolatile organic compounds. A more detailed analysis, in accordance with some literature data, has revealed that uncertainties arise when leaf-air uptake of molecules with high Koa values (Log Koa > 8-9) is modelled.

Deng, N.S., Fang, T. and Tian, S.Z. (1996), Photodegradation of dyes in aqueous solutions containing Fe(III)-hydroxy complex. 1. Photodegradation kinetics. *Chemosphere*, **33** (3), 547-557.

Full Text: [1996\Chemosphere33, 547.pdf](1996/Chemosphere33,%20547.pdf)

Abstract: The photodegradation of five dyes, C.I. reactive red 2, C.I. reactive blue 4, C.I. reactive black 8, C.I. basic red 13 and C.I. basic yellow 2, were studied in an UV/Fe(II)-hydroxy system using a 30W UV disinfection lamp (lambda(max)=253.7nm). Photodegradation for C.I. reactive 2, C.I. reactive blue 4 and C.I. basic red 13 were pseudo-first order reactions while the others were pseudo-zero order reactions. The effects of the initial concentrations of the dyes on reaction kinetics were studied. Copyright (C) 1996 Elsevier Science Ltd

Keywords: Fe(III)-Hydroxy Complex, UV Irradiation, Dyes, Photodegradation, OH Radicals

Comber, S.D.W., Gardner, M.J., Gunn, A.M. and Whalley, C. (1996), Kinetics of trace metalsorption to estuarine suspended particulate matter. *Chemosphere*, **33** (6), 1027-1040.

Full Text: [1996\Chemosphere33, 1027.pdf](1996/Chemosphere33,%201027.pdf)

Abstract: Complex multi-step processes, with equilibration times varying from minutes to weeks, are observed to control trace metalsorption to particulate matter. A three-step first order reversible kinetic model is used to fit mesured data for sorption and desorption over periods of up to 200h. This is likely to perform better than the equilibrium partitioning approach under the rapidly changing environmental conditions which exist in estuaries.

Deml, E., Mangelsdorf, I., Greim, H. (1996), Chlorinated dibenzodioxins and dibenzofurans (PCDD/F) in blood and human milk of non occupationally exposed persons living in the vicinity of a municipal waste incinerator. *Chemosphere*, **33** (10), 1941-1950.

Full Text: [1996\Chemosphere33, 1941.pdf](1996/Chemosphere33,%201941.pdf)

Abstract: The concentrations of chlorinated dibenzodioxins and dibenzofurans (PCDD/F) in human blood and in milk from non-occupationally exposed persons living in the vicinity of a municipal waste incinerator were determined. As compared to background levels in the general population in Germany the results give no indication of an enhanced body burden of PCDD/F. This is in agreement with earlier investigations in the same area, showing normal background concentrations in soil, fruit and vegetables. In conclusion, no direct health hazard related to PCDD/F - emissions from a local municipal waste incinerator may be expected. Copyright (C) 1996 Elsevier Science Ltd

Ashley, J.T.F. (1996), Adsorption of Cu(II) and Zn(II) by Estuarine, Riverine and terrestrial humic acids. *Chemosphere*, **33** (11), 2175-2187.

Full Text: [1996\Chemosphere33, 2175.pdf](1996/Chemosphere33,%202175.pdf)

Abstract: Adsorption constant (Kads) values for CuO and Zn(II) adsorption from an artificial seawater matrix onto suspended humic acids were determined. The humic acids were extracted from estuarine and riverine surface sediments and from surface soils. Solution state C13 nuclear magnetic resonance (NMR) was used to characterize the humic acids. Values of Kads for Cu(II) onto suspended solid humic acids were found to be significantly greater than those for Zn(II), in agreement with the Irving-Williams series, suggesting that the process of metal adsorption by suspended humic acids is similar to the process of metal complexation by specific functional groups of dissolved humic acids. In general, greater Kads values were associated with lignin-rich humic acids as compared to lignin-poor humic acids.

Brevik, E.M., Grande, M., Knutzen, J., Polder, A. and Skaare, J.U. (1996), DDT contamination of fish and sediments from Lake Ørsjøen, southern Norway: Comparison of data from 1975 and 1994. *Chemosphere*, **33** (11), 2189-2200.

Full Text: [1996\Chemosphere33, 2189.pdf](1996/Chemosphere33,%202189.pdf)

Abstract: Long term DDT contamination is reported of a small lake which previously was recipient of the insecticide wastes from a plant nursery. 19 years after closing down of the outfall sum-DDT in perch and pike exceeds an assumed “high background level” by about 5-10 times. Gradient studies of sediments and perch indicated that deposits in the close vicinity of the former outfall still acted as a source for contamination of the more distant parts of the lake. Comparison with 1975 data nevertheless showed that DDT levels in fish had been reduced by about 90% and a rough estimate indicated a “half life” of DDT of 5-7 years. Copyright (C) 1996 Elsevier Science Ltd

Keywords: DDT, Organochlorines, Fish, Sediments, Freshwater, PCB, Pesticides, Areas

Lee, C.L., Chen, H.Y. and Chuang, M.Y. (1996), Use of oyster, *Crassostrea gigas* and ambient water to assess metal pollution status of the charting coastal area, Taiwan, after the 1986 green oyster incident. *Chemosphere*, **33** (12), 2505-2532.

Full Text: [1996\Chemosphere33, 2505.pdf](1996/Chemosphere33,%202505.pdf)

Abstract: Most of the oyster mariculture beds in Taiwan are in areas located along the west of the island. One of these areas is the Charting coast, where green oysters were found in 1986. During this incident, which became internationally notorious, mass mortality occurred in the Charting oyster beds. After this discovery, measures were taken by the authorities to counter pollution which lead to the problem. The effectiveness of these pollution control actions was evaluated in this study. Two water column indicators, particulate and sediment and oysters were sampled and analyzed for metals (Cu, Zn, Pb, Ni) in Charting and its neighboring areas, Kuen-Shen Lake and Shin-Da Harbor and the control area/station; Dah-Pen Wan. The current study shows that copper and zinc concentrations in both oysters and particulates significantly decreased in the Charting area, compared with concentrations found during the period of the green oyster incident. Six years after the incident, the copper concentration in oysters had fallen from a high of 4400 µg/g dry weight to an average of 300±69 µg/g dry weight, figures similar to the copper concentration in 1982. The pollution control actions taken after the incident are believed to be the cause of this recovery of the coastal environment. Nevertheless, Charting still produced oysters with the highest copper and zinc concentrations among the areas investigated. Further measures currently being taken by the government, including removing the sediment of some portions of Erhjin Chi, should be able to bring the oyster copper concentrations down to the levels similar to those observed in the neighboring area, (average concentration below 200 µg/g dry weight or all time maximum concentration below 500 µg/g dry weight).

Keywords: Green Oyster, Metals, Biomonitoring, Sediment, Erjin Chi, Heavy-Metals, Bivalves, Marine, River

Worrall, F., Parker, A., Rae, J.E. and Johnson, A.C. (1997), A study of the adsorption kinetics of isoproturon on soil and subsoil. *Chemosphere*, **34** (1), 71-86.

Full Text: [1997\Chemosphere33, 2505.pdf](1997/Chemosphere33,%202505.pdf)

Abstract: The aim of this study is to investigate the mechanisms of adsorption of isoproturon onto soil and to produce predictive relationships between the adsorption rate constant and the measurable properties of the soil. A batch technique was used to measure the rate of adsorption of isoproturon onto soils down a single soil profile. The major results were: simple predictive relationships could not be derived; use of linear-free energy relationships showed up the differences between different techniques for measuring adsorption rate constants; and the linear free energy plot of the data suggested that specific sorbate-sorbent interactions were an important adsorption mechanism for non-hydrophobic compounds in a batch methodology. An adsorption mechanism is proposed that suggests that adsorption of isoproturon to soils is the distribution of the compound between three phases: Dissolved in solution, bound to insoluble matter and adsorbed to organic colloids in suspension.

Keywords: Nonequilibrium Sorption, Humic-Acid, Transport, Equilibrium, Pesticides, Desorption, Picloram, Time, Models

Akimoto, Y., Nito, S. and Inouye, Y. (1997), Aromatic carboxylic acids generated from MSW incinerator fly ash. *Chemosphere*, **34** (2), 251-261.

Full Text: [1997\Chemosphere34, 251.pdf](1997/Chemosphere34,%20251.pdf)

Abstract: The total of 128 aromatic monocarboxylic acids (ACAs) including 36 mono- to tetrachlorinated compounds were qualitatively detected in fly ash from municipal solid waste incinerators (MSWIs) by GC/MS. They are structually classified into five groups; polycyclic aromatic hydrocarbons (PAHs), biphenyls, oxa-PAHs, oxo-PAHs, and hydroxy-PAHs. The demonstration of dicarboxylic acids was unsuccessful. ACAs might afford oxygenated PAHs by intramolecular dehydration and/or other reactions. The detection of polychlorinated benzoic acids and biphenyl carboxylic acids, possibly candidates for the precursors of polychlorinated dibenzo-p-dioxins and dibenzofurans, might imply the existence of novel pathways. (C) 1997 Elsevier Science Ltd.

Keywords: Dibenzo-Para-Dioxins, Organic-Compounds, Identification

Akimoto, Y., Aoki, T., Nito, S. and Inouye, Y. (1997), Oxygenated polycyclic aromatic hydrocarbons from MSW incinerator fly ash. *Chemosphere*, **34** (2), 263-273.

Full Text: [1997\Chemosphere34, 263.pdf](1997/Chemosphere34,%20263.pdf)

Abstract: The qualitative analysis of moderately polar organic compounds in fly ash from a municipal solid waste incinerator (MSWI) was carried out by GC/MS. NINETY SEVEN oxygenated polycyclic aromatic hydrocarbons (oxy-PAHs), including known toxic substances were detected. They were classified into five groups by their structures. Aldehydes and most ketones detected had already been reported as oxy-PAHs in fly ash; however, most quinones and pyrones and all dicarboxylic acid anhydrides were found for the first time. (C) 1997 Elsevier Science Ltd.

Keywords: Chromatography Mass-Spectrometry, Organic-Compounds, Identification, Ketones, Mutagenicity, Derivatives, Quinones, Toxicity

Namasivayam, C. and Senthilkumar, S. (1997), Recycling of industrial solid waste for the removal of mercury(II) by adsorption process. *Chemosphere*, **34** (2), 357-375.

Full Text: [1997\Chemosphere34, 357.pdf](1997/Chemosphere34,%20357.pdf)

Abstract: Fe(III)/Cr(III) hydroxide, a waste byproduct obtained from the treatment of Cr(VI) containing wastewaters in a fertilizer industry, has been used for the adsorption of Hg(II) from aqueous solution. The influence of various parameters such as metal ion concentration (10-40 mg/L), agitation time (1-180 min), adsorbent dosage (5-250 mgper 50 ml), temperature (24-44°C) and pH value (4-10) on the removal of Hg(II) has been studied. The adsorption follows both Langmuir and Freundlich isotherm models. The applicability of the Lagergren kinetic model has been investigated. Almost quantitative removal of Hg(II) from a solution containing 40 mg/L in a 50 al solution by 175 mg of adsorbent occurred at an initial pH of 5.8. Adsorption vas uniformaly high (91 %) in the initial pH range 4.0 to 10.0. Temperature studies shoved that the adsorption process vas endothermic in nature. Desorption of Hg(II) shoved that it is solubilised in 2 % KI to the extent of 85 %.

Keywords: Fe(III)/Cr(III) Hydroxide, Aqueous-Solution, Water, Equilibrium, Complex, Cd(II), Waste Fe(III)/Cr(III) Hydroxide, Hg(II) Adsorption, Isotherms, Kinetics

Namasivayam, C. and Kadirvelu, K. (1997), Agricultural solid wastes for the removal of heavy metals: Adsorption of Cu(II) by coirpith carbon. *Chemosphere*, **34** (2), 377-399.

Full Text: [1997\Chemosphere34, 377.pdf](1997/Chemosphere34,%20377.pdf)

Abstract: Adsorption studies of Cu(II) from aqueous solutions on carbonized coirpith were carried out under varying conditions of agitation time, metal ion concentration, adsorbent dose and pH. Adsorption equilibrium was reached in 25 min for 20-50 mg/L concentrations of copper(II). Kinetics of adsorption obeyed a first order rate equation. The per cent removal increased from 50 to 90 with the increase of pH from 2.0 to 4.0 and remained constant to pH 10.0 for a Cu(II) concentration of 20 mg/L. Adsorption equilibrium followed both Langmuir and Freundlich isotherms.

Keywords: Peanut Hull Carbon, Aqueous-Solution, Water, Ions, Equilibrium, Pb(II), Carbonized Coirpith, Adsorption, Copper(II), Isotherms, Kinetics

Namasivayam, C. and Arasi, D.J.S.E. (1997), Removal of Congo Red from wastewater by adsorption onto waste red mud. *Chemosphere*, **34** (2), 401-417.

Full Text: [1997\Chemosphere34, 401.pdf](1997/Chemosphere34,%20401.pdf)

Abstract: Waste red mud, an industrial byproduct, generated during the processing of bauxite ore, is recycled for the adsorption of Congo Red from aqueous solution. Adsorption kinetics were studied using the parameters such as dye concentration, adsorbent dose, agitation time and pH. Adsorption followed first rate expression. The equilibrium adsorption data obeyed both Langmuir and Freundlich isotherms. The adsorption capacity of the red mud for the dye was 4.05 mg/g. Adsorption was found to be nearly quantitative at pH 2.0. Effect of pH and desorption studies suggest that the mechanism of adsorption is mostly ion exchange.

Keywords: Aqueous-Solutions, Adsorbents, Water, Dye

Akimoto, Y., Nito, S. and Inouye, Y. (1997), Comparative study on formations of polychlorinated dibenzo-*p*-dioxins, polychlorinated dibenzofurans and related compounds in a fluidized bed solid waste incinerator using long term used sand and fresh sand. *Chemosphere*, **34** (4), 791-799.

Full Text: [1997\Chemosphere34, 791.pdf](1997/Chemosphere34,%20791.pdf)

Abstract: In a fluidized bed incinerator (FBI), municipal solid waste incinerated with the help of sand which had been repeatedly used for two months (worn-out sand) yielded one-order higher concentrations of polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), polychlorinated benzenes (PCBzs) and polychlorinated phenols (PCPs) in comparison with that incinerated on unused (fresh) sand. As metal concentrations in sand increased after each cycle of incineration, the worn-out sand used contained one to two-order higher amount of metals than the sand used for the first time. Taken together, these findings might imply that the accumulation of metals in worn-out sand is responsible for the increase in the amounts of polychlorinated compounds. (C) 1997 Elsevier Science Ltd.

Keywords: Hydrogen-Chloride, Flue-Gas, Combustion

Jiang, K., Li, L.J., Chen, Y.D. and Jin, J. (1997), Determination of PCDD/Fs and dioxin-like PCBs in Chinese commercial PCBs and emissions from a testing PCB incinerator. *Chemosphere*, **34** (5-7), 941-950.

Full Text: [1997\Chemosphere34, 941.pdf](1997/Chemosphere34,%20941.pdf)

Abstract: Large amounts of polychlorinated biphenyls (PCBs) had been produced in China. In order to dispose of them appropriately, a set of experimental PCB incinerators have been manufactured in China. The 2,3,7,8-substituted toxic polychlorinated dibenzodioxins and furans (PCDD/Fs) congeners in stack ash and bottom ash samples from the incinerator and technical products #1PCB and #2PCB (for the reason of comparison) were measured. In addition, the levels of these toxic congeners were converted to 2,3,7,8-TCDD TEQ. Moreover, levels of dioxin-like PCB congeners and 2,3,7,8-TCDD TEQ values in two types of commercial PCBs products and stack ash were determined. (C) 1997 Elsevier Science Ltd.

Gierthy, J.F., Arcaro, K.F. and Floyd, M. (1997), Assessment of PCB estrogenicity in a human breast cancer cell line. *Chemosphere*, **34** (5-7), 1495-1505.

Full Text: [1997\Chemosphere34, 1495.pdf](1997/Chemosphere34,%201495.pdf)

Abstract: Lower chlorinated, ortho substituted, non coplanar polychlorinated biphenyls (PCBs) are weakly estrogenic in rodents and in some in vitro assays. The estrogenic potency of six PCB congeners and one of their para-hydroxylated metabolites have been tested in an estrogen-responsive MCF-7 human breast-cancer cell-culture system, to evaluate the utility of this system for assessment of PCB and hydroxylated PCB estrogenic activity. This assay is based on the estrogen receptor-mediated induction of postconfluent cell proliferation. The results of the limited test series were generally consistent with, but not absolute in the requirement for ortho-chlorine substitution and parahydroxylation for estrogenic potency, demonstrating the usefulness of the MCF-7 focus assay for estrogenic structure-activity evaluation of PCBs. (C) 1997 Elsevier Science Ltd.

Keywords: Polychlorinated-Biphenyls, 2,3,7,8-Tetrachlorodibenzo-Para-Dioxin, Suppression, Stimulation, Responses, Analogs

Vermeire, T.G., Jager, D.T., Bussian, B., Devillers, J., den Haan, K., Hansen, B., Lundberg, I., Niessen, H., Robertson, S., Tyle, H. and van der Zandt, P.T. (1997), European Union System for the Evaluation of Substances (EUSES). Principles and structure. *Chemosphere*, **34** (8), 1823-1836.

Full Text: [1997\Chemosphere34, 1823.pdf](1997/Chemosphere34,%201823.pdf)

Abstract: In the European Union, Directive 92/32/EC and EC Council Regulation (EC) 793/93 require the risk assessment of new and existing substances, respectively. Principles for this risk assessment have been laid down, supported by a detailed package of Technical Guidance Documents. Against this background the European Union System for the Evaluation of Substances (EUSES) has been developed. This software can be used to carry out tiered risk assessments of increasing complexity on the basis of increasing data requirements. The exposure assessment, effects assessment and risk characterisation are carried out for environmental populations as well as for human beings, including workers, consumers and man exposed through the environment. EUSES is the result of a co-ordinated effort of EU Member States, the European Commission and the European Chemical Industry.

? Gawlik, B.M., Sotiriou, N., Feicht, E.A., SchulteHostede, S. and Kettrup, A. (1997), Alternatives for the determination of the soil adsorption coefficient, Koc, of non-ionicorganic compounds - A review. *Chemosphere*, **34** (12), 2525-2551.

Full Text: [1997\Chemosphere34, 2525.pdf](1997/Chemosphere34,%202525.pdf)

Abstract: The determination of the soil adsorption behaviour of an environmental chemical is very important to the evaluation of potential dangers for man and nature. One of the major problems for European regulators working in the field of environmental protection and risk assessment is the lack of complete and comparable soil sorption data, e.g. K-oc values. The large number of existing chemicals makes it necessary to develop and apply fast methods as an alternative to classical batch or column studies. Based on this context numerous approaches to estimate K, have been published during the past two decades. In this paper more than 200 existing relationships for K-oc estimations have been reviewed and divided into four categories. Regression equations for the most important classes of non-ionic organic environmental chemicals able to estimate soil adsorption coefficients are summarised, and the advantages and drawbacks of the different approaches are discussed briefly. Due to the fact that a broad application of the proposed approaches is limited by the quality and comparability of the underlying experimental K-oc values reference soils are postulated to create a common basis for the comparison of soil adsorption coefficients. (C) 1997 Elsevier Science Ltd.

Keywords: Adsorption, Aromatic-Hydrocarbons, Batch, Comparison, Complete, Compounds, Determination, Evaluation, Field, Hplc-Screening Method, Immobilized Humic-Acid, Ionic Organic-Compounds, Liquid-Chromatography, Molecular Connectivity Indexes, N-Octanol Water, Regression, Review, Risk Assessment, Science, Soil, Soils, Solvation Energy Relationships, Sorption, Sorption Coefficients, Water Partition-Coefficients

Deng, N.S., Wu, F., Tian, S.Z. and Fang, T. (1997), Photodegradation of dyes in aqueous solutions containing Fe(III)-hydroxy complex. 2. Solar photodegradation kinetics. *Chemosphere*, **34** (12), 2725-2735.

Full Text: [1997\Chemosphere34, 2725.pdf](1997/Chemosphere34,%202725.pdf)

Abstract: The solar photodegradation of five dyes, C.I. reactive red 2, C.I. reactive blue 4, C.I. reactive black 8, C.I. basic red 13, and C.I. basic yellow 2, were studied in a sunlight/Fe(III)-hydroxy system. It was observed that the photodegradation of these five dyes were pseudo-first order reactions, which has a little difference with the photodegradation kinetics of the dyes with UV-light as the irradiation source, The comparison between the two studies is also conducted. (C) 1997 Elsevier Science Ltd.

Keywords: Fe(III)-Hydroxy System, Sunlight Irradiation, Dyes, Photodegradation, Kinetics, Iron(III), Hydrolysis, Water, Ions, OH

Ishikawa, R., Buekens, A., Huang, H. and Watanabe, K. (1997), Influence of combustion conditions on dioxin in an industrial-scale fluidized-bed incinerator: Experimental study and statistical modelling. *Chemosphere*, **35** (3), 465-477.

Full Text: [1997\Chemosphere35, 465.pdf](1997/Chemosphere35,%20465.pdf)

Lo, S.L. and Chen, T.Y. (1997), Adsorption of Se(IV) and Se(VI) on an iron-coated sand from water. *Chemosphere*, **35** (5), 919-930.

Full Text: [1997\Chemosphere35, 919.pdf](1997/Chemosphere35,%20919.pdf)

Abstract: This study was aimed at developing a method for coating hydrated iron-oxide onto the surface of quartz sand. Two coating parameters were investigated: the pH at which iron-oxide was synthesized and the coating temperature. According to the results, a larger quantity of iron was coated onto quartz sand in the lower pH range (0.5-2.0). This iron-oxide-coated sand (IOCS) produced at low pH was more difficult to dissolve in acidic and basic solution and had better Se(IV) and Se(VI) adsorption efficiencies than did IOCS produced at high pH (8.0-11.0). Adsorption experiments showed that Se(IV) adsorption by IOCS was specific and Se(VI) adsorption was nonspecific. In kinetic experiments, pseudo-equilibrium of Se(IV) adsorption was attained within 10 minutes while Se(VI) adsorption needed 1.5 hours. Higher concentrations of NaOH solution could increase the desorption rate of Se(VI) but could not increase the total desorbed quantity. In addition, adsorption isotherm results indicated that the adsorption capacity of IOCS from pH 4.0 to 6.5 was 0.014-0.017 mmole Se/g sand for Se(IV) and was 0.013-0.014 mmole Se/g sand for Se(VI). (C) 1997 Elsevier Science Ltd.

Keywords: Metal-Bearing Wastes, Sorption, Oxide, pH, Adsorption, Coatings, Hydrated Iron Oxide, Sand, Selenate, Selenite

Tsuda, T., Kojima, M., Harada, H., Nakajima, A. and Aoki, S. (1997), Acute toxicity, accumulation and excretion of organophosphorous insecticides and their oxidation products in killifish. *Chemosphere*, **35** (5), 939-949.

Full Text: [1997\Chemosphere35, 939.pdf](1997/Chemosphere35,%20939.pdf)

Abstract: Acute toxicity, accumulation and excretion of four organophosphorous insecticides (diazinon, malathion, fenitrothion and EPN) and their oxidation products (diazinon oxon, malaoxon, fenitrothion oxon and EPN oxon) were studied for killifish (Oryzias latipes). The 48-hr LC50 was 4.4 mg l-1 for diazinon, 1.8 mg l-1 for malathion, 3.5 mg l-1 for fenitrothion, 0.58 mg l-1 for EPN, 0.22 mg l-1 for diazinon oxon, 0.28 mg l-1 for malaoxon, 6.8 mg l-1 for fenitrothion oxon, and 0.16 mg l-1 for EPN oxon. The bioconcentration factors (BCF) of diazinon oxon 0.5, malaoxon 1.1, fenitrothion oxon 2.3 and EPN oxon 11 in the whole body of the fish were much lower than those of diazinon 49, malathion 11, fenitrothion 122 and EPN 1124. As reference data, partition coefficients between n-octanol and water (Pow) were measured for these chemicals. The BCF values of each pesticide and its oxidation product were consistent with the Pow values. The excretion rate constants (k) from the whole body of the fish were 0.12 hr-1 for diazinon, 0.27 hr-1 for malathion, 0.11 hr-1 for fenitrothion, 0.02 hr-1 for EPN, 0.30 hr-1 for fenitrothion oxon and 0.59 hr-1 for EPN oxon. The rates of diazinon oxon and malaoxon could not be measured, but were presumed to be as rapid as or more rapid than those of fenitrothion oxon and EPN oxon. The results suggest that the contamination of fish and other aquatic organisms by the oxidation products in the environment is very low.

Vaal, M., van der Wal, J.T., Hermens, J. and Hoekstra, J. (1997), Pattern analysis of the variation in the sensitivity of aquatic species to toxicants. *Chemosphere*, **35** (6), 1291-1309.

Full Text: [1997\Chemosphere35, 1291.pdf](1997/Chemosphere35,%201291.pdf)

Abstract: Our aim in this study was to identify groups of species showing a similar pattern in their sensitivity to toxicants and to relate the patterns to the mode of toxic action and biological species characteristics. A data matrix was composed of acute toxicity data for 26 aquatic species and 21 compounds. Most of the variation in the toxicological data was due to differences in toxicity of compounds and not intrinsic differences between species, so that practically every species can be used to order compounds with respect to average toxicity. Compounds with high overall toxicity also had large interspecies variation in sensitivity. The toxicity of non-polar narcotics correlated well with the log Kow. Compounds with a specific or reactive mode of action were more than a factor 10 toxic than predicted by their log Kow. Patterns in species sensitivity were more diffuse because only part of the variance in species sensitivity could be explained. Fishes and amphibians were more sensitive to dieldrin, lindane and pentachlorophenol than were invertebrates. Among the arthropods, the Phyllopoda (daphnids) were the most sensitive species. They were very sensitive to aniline, the heavy metals, malathion and parathion.

Nito, S., Akimoto, Y., Imagawa, T. and Inouye, Y. (1997), Comparative study on formations of polychlorinated dibenzo-*p*-dioxin, polychlorinated dibenzofuran and related compounds by pyrolysis of some precursors on unused sand for fluidized bed incinerator and long term used sand. *Chemosphere*, **35** (8), 1717-1727.

Full Text: [1997\Chemosphere35, 1717.pdf](1997/Chemosphere35,%201717.pdf)

Abstract: The effect of wearing of sand in the furnaces of fluidized bed incinerators (FBIs) on the formation of polychlorinated dibenzo-p-dioxin (PCDD), polychlorinated dibenzofuran (PCDF) and their related compounds from polychlorinated biphenyl (PCB) and 1,2,3-trichlorobenzene (1,2,3-T3CBz) was studied experimentally using a pyrolysis apparatus consisting of an injection unit; a stainless steel tube, in which packed was either unused sand (virgin sand) or used for two months in FBI (worn-out sand), heated to 650°C by an electric furnace; and a sampling unit. Furthermore, polychlorinated diphenyl ether (PCDE) was pyrolyzed on worn-out sand in order to compare the formation mechanisms of PCDD and PCDF with those from PCBs.

Besides the generation of PCDD and PCDF, the hydroxylation of the starting compounds occurred. PCB was detected in the pyrolyzed samples of 1,2,3-T3CBz on both types of sand. In all cases, PCDF was in much higher yield than PCDD and pyrolysis on worn-out sand was more favorable for the formation of PCDD, PCDF and their relatives than pyrolysis on virgin sand. There was marked difference in metal concentrations between virgin and worn-out sand, implicating that the increased metal concentrations in sand would promote the formation of PCDD, PCDF and their related compounds in FBIs. (C) 1997 Elsevier Science Ltd.

Keywords: Fly-Ash, Waste Incineration, PCDD, Gas, Combustion

Nito, S. and Ishizaki, S. (1997), Identification of azaarenes and other basic compounds in fly ash from municipal waste incinerator by gas chromatography and mass spectrometry. *Chemosphere*, **35** (8), 1755-1772.

Full Text: [1997\Chemosphere35, 1755.pdf](1997/Chemosphere35,%201755.pdf)

Abstract: Fly ash obtained from a municipal solid waste incinerator was analyzed for aza heterocyclic hydrocarbons (azaarenes) by Gas Chromatography/Mass Spectrometry (GC/MS). After the treatment of the fly ash with water and HCl, basic and neutral compounds were extracted with benzene from both water solution and residue, and the basic and neutral fractions were separated by partition extraction from the benzene solution using HCl solutions. The neutral fraction, containing some azaarenes, was cleaned up by alumina, silica gel and dodecyl sulfuric acid-binding DEAE-sephadex (DS-Sephadex) column chromatography. Azaarenes and other basic compounds in both fractions were identified by GC/MS. Many kind of new azaarenes and other basic compounds were found. (C) 1997 Elsevier Science Ltd.

Keywords: Dibenzo-p-Dioxins, Organic-Compounds, Flue-Gas, Hydrocarbons, Sediments, System, Water

Schuhmacher, M., Granero, S., Llobet, J.M., deKok, H.A.M. and Domingo, J.L. (1997), Assessment of baseline levels of PCDD/F in soils in the neighbourhood of a new hazardous waste incinerator in Catalonia, Spain. *Chemosphere*, **35** (9), 1947-1958.

Full Text: [1997\Chemosphere35, 1947.pdf](1997/Chemosphere35,%201947.pdf)

Abstract: In order to determine the baseline contamination by polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) in an area from Catalonia (Spain), which will be under the influence of a new hazardous waste incinerator, PCDD/F concentrations were measured in 40 soil samples collected in the vicinity of the facility now under construction. Thirty samples represented rural soils and 10 samples urban soils. PCDD/F concentrations ranged between 0.08-8.4 ng I-TEQ/kg for rural soils and 0.63-24.2 ng I-TEQ/kg for urban soils. The mean value for the 40 samples was 1.64 ng I-TEQ/kg (dry matter). The current PCDD/F levels and profiles are comparable to those found in soils from other countries. The PCDD/F concentrations found in this study show that at present the contamination by PCDD/F in soils of the examined area is rather low. (C) 1997 Elsevier Science Ltd.

Keywords: PCDD, PCDF, Soils, Baseline Contamination Assessment, Catalonia (Spain), Dibenzo-p-Dioxins, Line Contamination Assessment, Resource Recovery Facility, Atmospheric Concentrations, Samples, PCDFs, Emissions, Patterns, Exposure, Germany

Omar, N.B., Merroun, M.L., Peñalver, J.M.A. and Muñoz, M.T.G. (1997), Comparative heavy metal biosorption study of brewery yeast and *Myxococcus xanthus* biomass. *Chemosphere*, **35** (10), 2277-2283.

Full Text: [1997\Chemosphere35, 2277.pdf](1997/Chemosphere35,%202277.pdf)

Abstract: The biosorption for La2+, Co2+, Mn2+, UO22+, Pb2+, Ag+, Zn2+, Cd2+ and Cr2+ by wet and dry biomass form *Myxococcus xanthus* obtained from laboratory cultures and *Saccharomyces cerevisiae* from the brewing industry has been studied. *M. xanthus* biomass was found to be the most efficient biosorbent for all of the metals assayed. However, due to the fact that *S. cerevisiae* is a low cost residual by-product from the brewing industry, and at the same time yields good levels of biosorption, it is considered in this work to be of great interest for use as a detoxifier of heavy metals contaminated waters. In addition, the use of sodium carbonate as a desorbent agent is discussed where it was possible to recover up to 94, 53 % of UO22+ by both *M. xanthus* and *S. cerevisiae* biomass. (C) 1997 Elsevier Science B.V. All rights reserved.

Den, N.S., Wu, F., Luo, F. and Liu, L. (1997), Photodegradation of dyes in aqueous solutions containing Fe(III)-oxalato complexes. *Chemosphere*, **35** (11), 2697-2706.

Full Text: [1977\Chemosphere35, 2697.pdf](1977/Chemosphere35,%202697.pdf)

Abstract: The photolysis of Fe(III)-oxalato complexes can produce active oxidant H2O2 and . OH radicals, which can oxidize organic compounds in the atmospheric waters. Fe(III)-oxalato complexes and its photochemical reactions were applied to exploratory research on waste water treatment by promoting the destruction of dye molecules and the discoloration of their solutions. The photodegradation kinetics of the five dyes (C.I. reactive red 2, C.I. reactive blue 4, C.I. reactive black 8. C.I. basic red 13 and C.I. basic yellow 2) in aqueous solutions containing Fe(III)-oxalato complexes were studied. Results showed that the photodegradation reactions of the five dyes were all pseudo-first order reactions. The effects of pH, dye concentration and the ratio Fe(III)/oxalato(Fe/OX) on the photodegradation rate of the dye (C.I. reactive red 2) were also inspected. (C) 1997 Elsevier Science Ltd.

Keywords: Fe(III)-Oxalato Complexes, UV Irradiation, Photodegradation, Dyes, Photochemistry, Kinetics, Waters

Tas, J.W., Balk, F., Ford, R.A. and van de Plassche, E.J. (1997), Environmental risk assessment of musk ketone and musk xylene in The Netherlands in accordance with the EU-TGD. *Chemosphere*, **35** (12), 2973-3002.

Full Text: [1997\Chemosphere35, 2973.pdf](1997/Chemosphere35,%202973.pdf)

Abstract: An environmental risk assessment has been carried out for musk ketone and musk xylene according to the EU Technical Guidance Document for Environmental Risk Assessment for New and Existing Substances [1]. Musk ketone and musk xylene are used in fragrances for cosmetics and household products. For the fragrance industry these are important fragrance ingredients because of their excellent substantivity as well as for their unique smell, which determines largely the odor of a product. The initial environmental risk assessment is based on information provided by the fragrance industry as represented in the Netherlands by its association NEA, by the Research Institute for Fragrance Materials (RIFM) and data reported in the international open literature. The risk assessment includes and evaluation of the risks for aquatic organisms in surface water and sediment and for soil organisms in soil after application of sewage sludge. Secondary poisoning of fish-eating birds and mammals is considered as well. For each compartment the Predicted Environmental Concentration (PEC) is compared to the Predicted No Effect Concentration (PNEC) to obtain PEC/PNEC ratios. Since monitoring data are available in water, sediment and fish, similar ratios are obtained with measured concentrations instead of the predicted ones. For both substances, PEC/PNEC ratios are at or below 0.1 for organisms in the aquatic environment, including sediment organisms. PEC/PNEC ratios for fish-eating predators are 0.01. Ratios based on monitoring data are below 0.01 for all of these organisms. For soil organisms the PEC/PNEC ratio is 0.5 for musk ketone and 1.3 for musk xylene. Although in the Netherlands (as well as in some other European countries), sewage sludge presently finds no application as fertilizer on agricultural soil, the aim of environmental policy is to upgrade the sludge quality to enable future applications on agricultural and grassland. The reliability of the predicted soil concentrations can be greatly improved by obtaining experimental data on fate and behaviour of musk ketone and musk xylene in digested sludge and soil. The risk assessment provides reassurance for the aquatic compartment while pointing the way for obtaining additional data for the soil compartment.

Notes: highly cited

? Halling-Sorensen, B., Nielsen, S.N., Lanzky, P.F., Ingerslev, F., Lutzhoft, H.C.H. and Jorgensen, S.E. (1998), Occurrence, fate and effects of pharmaceutical substances in the environment - A review. *Chemosphere*, **36** (2), 357-394.

Full Text: [1998\Chemosphere36, 357.pdf](1998/Chemosphere36,%20357.pdf)

Abstract: Medical substances (pharmaceuticals) are a group of substances that until recently have been exposed to the environment with very little attention. The reason why they may be interesting as environmental micropollutants, is that medical substances are developed with the intention of performing a biological effect. Especially antibiotics used as growth promoters, as feed additives in fish farms are anticipated to end up in the environment. Very little is known about the exposure routes of the medical substances to the environment. Only few investigations have reported findings of medical substances in other field samples than sediment or treated waste water samples. Several substances seem to be persistent in the environment. This paper outlines the different anticipated exposure routes to the environment, summarises the legislation on the subject and gives an outline of present knowledge of occurrence, fate and effect on both the aquatic and terrestrial environments of medical substances. Present knowledge does not reveal if regular therapeutic use may be the source of a substance carried by sewage effluent into the aquatic system even though clofibrate, a lipid lowering agent, has been identified in ground and tap water samples from Berlin. Further research would be necessary to assess the environmental risk involved in exposing medical substances and metabolites to the environment. (C) 1997 Elsevier Science Ltd.

Keywords: Antibiotics, Aquatic, Biological, Environment, Environmental, Environmental Fate, Environmental Risk, Exposure, Fate, Feed, Field, Fish, Fish Farms, Growth, Investigations, Knowledge, Legislation, Lipid, Medical, Medical Substances, Metabolites, Micropollutants, Pharmaceuticals, Research, Review, Risk, Science, Sediment, Sewage, Sewage Effluent, Source, Therapeutic, Toxicity, Waste, Waste Water, Water, Water Samples

Andersson, P. and Marklund, S. (1998), Emissions of organic compounds from biofuel combustion and influence of different control parameters using a laboratory scale incinerator. *Chemosphere*, **36** (6), 1429-1443.

Full Text: [1998\Chemosphere36, 1429.pdf](1998/Chemosphere36,%201429.pdf)

Abstract: This study aimed at spanning the range of different wood combustion conditions by varying primarily load and airfeed in a controlled fashion, thereby investigating different combustion situations in this system. This was done using an experimental design. The aim was to see how these parameters effected organic emissions of PCDD/F, PCBz and PAH and to what extent their formation could be explained by means of the control parameters and other measured data. These data include inorganic combustion gases such as CO, and NO and temperatures in the reactor. The results show that under the incineration conditions examined the organic emissions did vary but not in a way explainable by the parameters used here. Two samples were taken in parallel at different locations, before and after the convector region. The formation of PCDD/F and PCBz in the convector could be noted, suggesting similar mechanisms of secondary De Novo formation for the two compound classes. This formation is significant, in some experiments up to 1000 % higher than at the furnace exit. Also when using a fuel with bark mixed into it the increase was ten fold. (C) 1998 Elsevier Science Ltd.

Schuhmacher, M., Domingo, J.L., Llobet, J.M., Müller, L., Sünderhauf, W. and Jager, J. (1998), Baseline levels of PCDD/Fs in vegetation samples collected in the vicinity of a new hazardous waste incinerator in Catalonia, Spain. *Chemosphere*, **36** (12), 2581-2591.

Full Text: [1998\Chemosphere36, 2581.pdf](1998/Chemosphere36,%202581.pdf)

Abstract: Concentrations of polychlorinated dibenzo-p-dioxins (PCDD) and dibenzofurans (PCDF) were analysed by GC/MS in 40 vegetation samples collected in the neighbourhood of a hazardous waste incinerator (HWI) now under construction (Catalonia, Spain). Samples were collected at various sites within a radius of 7 km from the facility. Ten samples belonged to an urban area and 30 samples to a rural area. PCDD/F concentrations ranged between 0.24-1.22 ng I-TEQ/kg (dry matter), with a median and mean values of 0.53 and 0.61 ng I-TEQ/kg (dry matter), respectively. Principal Component Analysis (PCA) provided a two-dimensional model which would explain 67.0% of the variance in the data. The present results will be useful to determine the environmental impact of the HWI in future assessments of the plant. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: PCDD, PCDF, Vegetation, Baseline Contamination Assessment, Hazardous Waste Incineration, Catalonia (Spain), Line Contamination Assessment, Resource Recovery Facility, Atmospheric Concentrations, Health Risks, Emissions, Air, Dioxin, Germany, PCDF

Deng, N.S., Wu, F., Luo, F. and Xiao, M. (1998), Ferric citrate-induced photodegradation of dyes in aqueous solutions. *Chemosphere*, **36** (15), 3101-3112.

Full Text: [1998\Chemosphere36, 3101.pdf](1998/Chemosphere36,%203101.pdf)

Abstract: The photooxidation of dye solutions containing Fe(III)-citrate complexes was studied. The photodegradation under near-UV light of the five dyes, C, I. reactive red 2, C. I. reactive blue 4, C. I. reactive black 8, C. I. basic red 13 and C. I. basic yellow 2, in aqueous solutions at pH2.0 containing Fe(III)-citrate complexes was found to follow pseudo-first order kinetics. The photodegradation rates of the dye, C. I. reactive red 2, decreased with increasing the initial dye concentration in range of 20 -60 mg/L. A comparatively higher photodegradation efficiency of the dye was gained under the condition of pH2.0 and the Fe(III) to citrate ratio 1: 2. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Photodegradation, Dyes, Fe(III)-Citrate Complexes, Center Dot Oh Radicals, Iron(III), Complexes, Chemistry

Socias-Viciana, M.M., Hermosin, M.C. and Cornejo, J. (1998), Removing prometrone from water by clays and organic clays. *Chemosphere*, **37** (2), 289-300.

Full Text: [1998\Chemosphere37, 289.pdf](1998/Chemosphere37,%20289.pdf)

Abstract: The removing power of natural or inorganic clays and organoclays (OCls) for prometone from water was studied as related to the clay layer charge density, organic cation type and organic cation saturation degree of the clay. Two different natural smectites (high charge SAz and low charge SWy) and those treated with two alkylammonium cations (octadecylammonium and hexadecyltrimethylammonium) were assayed by measuring the adsorption isotherms and fitting the data to the Freundlich equation. The Freundlich parameter Kf, the distribution coefficients Kd(0.3) and, that on organic carbon basis, Koc were calculated and used as relative measures of the sorption capacity. The inorganic original smectites show low and medium prometrone adsorption (Kf(SAz) = 29 and Kf(SWy) = 138 mmol/kg) inversely proportional to their layer charge density, although the relative sorption capacity depends on the prometrone concentration level. The OCls generally adsorb more prometrone (Kf from 61 to 1031 mmol/kg) than the inorganic samples. The organoclay characteristics favouring the prometrone sorption are high charge density, quaternary alkylammonium in the interlayer and organic cation saturation slightly below CEC. However, for low charge smectite primary alkylammonium and organic cation saturation above CEC promoted herbicide adsorption. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Alkylammonium, Clay Minerals, Organic Clays, Layer Charge, Organic Pollutants, Pesticides, Remediation, Water Treatment, Sorption, Adsorption, Organoclays, Adsorbents, Atrazine, Smectite, Phenol

Chang, E.E., Chiang, P.C. and Lin, T.F. (1998), Development of surrogate organic contaminant parameters for source water quality standards in Taiwan, ROC. *Chemosphere*, **37** (4), 593-606.

Full Text: [1998\Chemosphere37, 593.pdf](1998/Chemosphere37,%20593.pdf)

Abstract: The objective of this research was to develop a rationale for selecting representative water quality parameters for organic contaminants and microorganisms and determining their respective contaminant level (or regulated value) for the source water quality standards in Taiwan. It was observed that chemical oxygen demand (COD) and total organic carbon (TOC) have strong correlation with UV254 in spite of the raw water which suggests, TOC and COD should be regarded as the surrogate parameters for water quality concerns. It was also proposed to implement 4.0 mg/L of TOC as a source water criteria at the present time and to adopt a more stringent value (2.0 mg/L of TOC) in the next phase (at 2002). The total coliform regulated from 10,000 to 20,000 most probable number (MPN)/100ml level appears to be the most economic and logical way to control trihalomethanes (THM) formation and disinfection efficiency at the water treatment plant in Taiwan. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Surrogate Parameter, Source Water Quality Standards, Total Organic Carbon, Chemical Oxygen Demand, Most Probable Number

Choudhary, G. and Hansen, H. (1998), Human health perspective on environmental exposure to hydrazines: A review. *Chemosphere*, **37** (5), 801-843.

Full Text: [1998\Chemosphere37, 801.pdf](1998/Chemosphere37,%20801.pdf)

Abstract: Hydrazines are colorless liquid compounds that have been found at various Department of Defense hazardous waste sites. They are designated as environmental contaminants causing adverse effects to public health and have been identified at many National Priorities List (NPL) hazardous waste sites and federal facilities sites in the United States. Three chemically similar hydrazines-hydrazine, 1,1-dimethylhydrazine, and 1,2-dimethylhydrazine--occur in the environment and cause adverse health effects to persons living near hazardous waste sites. Humans are exposed to hydrazines by drinking contaminated, water, by inhaling contaminated air, or by swallowing or touching contaminated dust. Human occupational data and studies in laboratory animals suggest that people exposed to hydrazines may develop adverse systemic health effects or cancer. Hydrazines have caused cancer in animals following acute-or intermediate-duration exposure by the oral and inhalation routes. The U.S. Environmental Protection Agency, the U.S. Department of Health and Human Services, the International Agency for Research on Cancer, and the World Health Organization have classified hydrazines as possible cancer-causing environmental contaminants.

? Benoit, P., Barriuso, E. and Calvet, R. (1998), Biosorption characterization of herbicides, 2,4-D and atrazine, and two chlorophenols on fungal mycelium. *Chemosphere*, **37** (7), 1271-1282.

Full Text: [1998\Chemosphere37, 1271.pdf](1998/Chemosphere37,%201271.pdf)

Abstract: Biosorption of the 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4-dichlorophenol (2,4-DCP), 4-chlorophenol (4-CP) and 2-chloro-ethylamino-6-isopropylamino-1,3 (atrazine) has been studied on the mycelium of Emericella nidulans and Penicillium miczynskii, isolated from composted wheat straw and a soil respectively. Results obtained with inactivated fungal biomass showed that a rapid adsorption on fungal cell walls surfaces was the main sorption phenomenon for the more hydrophobic molecules. This sorption was only partially reversible. With active living mycelia, additional phenomena were responsible for an increased sorption of all chemicals. This process was slow and depended on the chemical concentration. For 4-CP, it was attributed to biodegradation as demonstrated by the presence of degradation products in solution. Bioaccumulation inside the mycelium could also partially explained the results observed with living biomass for 4-CP, 2,4-DCP and 2,4-D. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Hazardous Organic Pollutants, White-Rot Fungi, Phanerochaete-Chrysosporium, Microbial Biomass, Inhibiting Action, Humic-Acid, Biodegradation, Pentachlorophenol, Adsorption, Removal

Schuhmacher, M., Granero, S., Xifró, A., Domingo, J.L., Rivera, J. and Eljarrat, E. (1998), Levels of PCDD/Fs in soil samples in the vicinity of a municipal solid waste incinerator. *Chemosphere*, **37** (9-12), 2127-2137.

Full Text: [1998\Chemosphere37, 2127.pdf](1998/Chemosphere37,%202127.pdf)

Abstract: Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) were determined in 24 soil samples collected near a municipal solid waste incinerator (Tarragona, Catalonia, Spain). Soil samples were obtained at various sites within 1.5 km from the stack. Total PCDD/F concentrations ranged from 0.225 to 5.80 ng TEQ/kg dry matter (d.m.) with a median value of 0.799 ng TEQ/kg and a mean value of 1.080 ng TEQ/kg. No remarkable PCDD/F contamination was found. The results were consistent and even lower than those reported in other international studies. Principal Component Analysis and hierarchical cluster analysis were used to compare these soil samples with a set of 10 additional samples collected outside the influence of the plant. Principal Component and hierarchical cluster analyses of soils in the vicinity of the incinerator provide patterns of PCDD/Fs quite similar from those obtained in soils collected far from the influence of that facility. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: PCDD/PCDF, Soils, Municipal Solid Waste Incinerator, Principal Component Analysis, Hierarchical Cluster Analysis, Dibenzo-p-Dioxins, Environment, Emissions, Patterns, Exposure, Bioaccumulation, Biotransfer, Sediments, Chickens, Furans

Lorber, M., Pinsky, P., Gehring, P., Braverman, C., Winters, D. and Sovocool, W. (1998), Relationships between dioxins in soil, air, ash, and emissions from a municipal solid waste incinerator emitting large amounts of dioxins. *Chemosphere*, **37** (9-12), 2173-2197.

Full Text: [1998\Chemosphere37, 2173.pdf](1998/Chemosphere37,%202173.pdf)

Abstract: The Columbus Municipal Waste-to-Energy (Columbus WTE) facility in Columbus, Ohio, began operation in June, 1983 and ceased operation in December, 1994. During its operation, it was estimated to have released nearly 1,000 grams of dioxin Toxic Equivalents (TEQs) per year. This compares to a 1994 estimate of 9, 300 g TEQ/yr from all sources emitting dioxins into the air in the United States (EPA, 1994), and to total releases of dioxins near or below 1,000 grams TEQ/yr for England (Eduljee and Keyke, 1996), Belgium (Wevers and De Fre, 1995), and West Germany (Fiedler and Hutzinger, 1992). Because of the magnitude of emissions from this single source, studies were undertaken to evaluate the impacts to air and soil near the incinerator. This paper presents analyses evaluating dioxin concentrations and profiles in four media: stack gas, ambient air within 3 km of the incinerator, soil samples up to 8 km from the incinerator, and incinerator ash. Principal findings include: 1) an “incinerator signature” profile, as defined by stack gas emissions, was found in the ash and in subsets of the air and soil matrices, 2) soil concentrations declined from directly outside the incinerator property to the city at large, 3) an urban background soil concentration of dioxin Toxic Equivalents (TEQs) was estimated at 4 pg/g, while concentrations generally within 2 km of the incinerator ranged from 4-60 pg TEQ/g, 4) an urban background air concentration was estimated at 0.05 pg TEQ/m3, while air concentrations at a specific location about 2 km in the downwind direction of the incinerator had concentrations of 0.17 and 0.35 pg TEQ/m3 during two sampling dates, 5) analysis of the soil monitoring data in combination with the stack test data suggests that less than 2% of emitted dioxins can be found in the soil near the incinerator, and 6) principal component analysis suggests that the fraction of total concentration of OCDD is the single feature explaining most of the variation of all concentration profiles. This paper discusses these and other findings, and their implications. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: PCDD

Tejima, H., Shibakawa, S., Osumi, K. and Kawashima, M. (1998), Dioxin emission behavior in MSW incinerator designed after Japanese guidelines for controlling dioxin. *Chemosphere*, **37** (9-12), 2309-2314.

Full Text: [1998\Chemosphere37, 2309.pdf](1998/Chemosphere37,%202309.pdf)

Chen, J.C., Wey, M.Y. and Lin, Y.C. (1998), The adsorption of heavy metals by different sorbents under various incineration conditions. *Chemosphere*, **37** (13), 2617-2625.

Full Text: [1998\Chemosphere37, 2617.pdf](1998/Chemosphere37,%202617.pdf)

Abstract: The emission of heavy metals can be controlled by adding solid sorbents into the combustion chamber during incineration processes. The objective of this work was to experimentally study the adsorption efficiency of different sorbents for heavy metals under various incineration conditions. Each sorbent has its optimum operating temperature. Kaolinite and aluminum oxide have the best adsorption efficiency at 800 °C, and bauxite is at 700 °C. The adsorption efficiencies of the three sorbents for the four heavy metals all follow the sequence of Pb > Cu > Cr > Cd. The presence of inorganic chloride (NaCl) and sulfate (Na2SO4) increases the adsorption efficiency of the sorbents, but organic chloride PVC decreases the adsorption efficiency. (C) 1998 Elsevier Science B.V. All rights reserved.

Abad, E., Caixach, J. and Rivera, J. (1999), Dioxin like compounds from municipal waste incinerator emissions: Assessment of the presence of polychlorinated naphthalenes. *Chemosphere*, **38** (1), 109-120.

Fuyll Text: [1999\Chemosphere38, 109.pdf](1999/Chemosphere38,%20109.pdf)

Abstract: Polychloronaphthalenes (PCN) were identified and quantified in emission samples Collected from five different municipal waste incinerators (MWI). Polychlorodibenzo-p-dioxins (PCDD) and polychlorodibenzofulans (PCDF) were also determined to find a possible relationship between these classes of organochlorinated compounds. The analyses of PCDD/PCDF and PCN were carried out by high resolution gas chromatography coupled with high resolution mass spectrometry using a positive electron ionization source and operating in the selected ion monitoring analyzer mode (HRGC-HRMS/EI(+)-SIM). The total levels of PCN varied from 1.08 up to 21.36 ng/Nm3) (mono-to octachlorinated) and 0.33 to 5.72 ng/Nm3 (tetra-to octachlorinated), whereas the levels of PCDD/PCDF ranged between 1.14 and 276.26 ng/Nm3 (0.01 and 5 ng I-TEQ/Nm3), depending on the type of the MWI. These findings do not corroborate a PCN and PCDD/PCDF correlation. (C)1998 Elsevier Science Ltd. All rights reserved.

Keywords: Chromatography, Biphenyls, Sediment, Samples, Biota

? Cao, J.S., Wei, L.P., Huang, Q.G., Wang, L.S. and Han, S.K. (1999), Reducing degradation of azo dye by zero-valent iron in aqueous solution. *Chemosphere*, **38** (3), 565-571.

Full Text: [1999\Chemosphere38, 565.pdf](1999/Chemosphere38,%20565.pdf)

Abstract: The reducing degradation kinetics of five ate dyes, Acid orange II, Acid orange IV, Acid orange GG, Acid red 3B and Orange I, by zero-valent iron powder in aqueous solution were studied. It showed that the degradation is a two-step reaction, with the first step being reversible. Solution acidity and iron surface area are the factors greatly influencing the degradation rates, and with increasing of acidity and iron surface area, the degradation rates increase. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Metal

Poon, C.S., Huang, Q. and Fung, P.C. (1999), Degradation kinetics of cuprophenyl yellow RL by UV/H2O2/ultrasonication (US) process in aqueous solution. *Chemosphere*, **38** (5), 1005-1014.

Full Text: [1999\Chemosphere38, 1005.pdf](1999/Chemosphere38,%201005.pdf)

Abstract: Experiments were conducted to study the kinetic aspects of the UV/H2O2/US treatment process for Cuprophenyl Yellow RL It was found that the reduction in absorbance of the dye solution followed the pseudo-first-order kinetic model at different pH and hydrogen peroxide dosages. The rate constants at different pH as well as hydrogen peroxide dosages were obtained. The TOC removal for the treatment process with different hydrogen peroxide dosages followed different kinetic patterns and it was inferred that they would follow different degradation pathways. When lower H2O2 dosage was used, there were intermediates produced, while the dye might be directly mineralized when higher H2O2 dosage was adopted (C) 1998 Elsevier Science Ltd. All right reserved.

Keywords: UV/H2O2/US, Degradation Kinetics, Dye, Cuprophenyl Yellow RL, Water Advanced Oxidation, Waste-Water, Hydrogen-Peroxide, Textile Wastes, Uv-Radiation, Ozone, Dyes

Cornelissen, G., van Zuilen, H. and van Noort, P.C.M. (1999), Particle size dependence of slow desorption of in situ PAHs from sediments. *Chemosphere*, **38** (10), 2369-2380.

Full Text: [1999\Chemosphere38, 2369.pdf](1999/Chemosphere38,%202369.pdf)

Abstract: The desorption kinetics of in situ contaminations of phenanthrene, anthracene, pyrene, benzo(a)anthracene, benzo(b)fluoranthene, and benzo(a)pyrene have been measured for four size fractions of three sediments, with a technique in which the porous polymer Tenax serves as an infinite sink for desorbed PAH. For one of the sediments, there appears to be a slight tendency of increasing (slowly + very slowly) desorbing fractions (Fslow+very slow) and decreasing first-order rate constants of slow desorption (k(d, slow)) with increasing particle size. However, for the two other sediments Fslow+very slow and k(d, slow) showed no relation with particle size. Fslow+very slow values ranged from 7 to 90% of the total extracted PAH amount; k(d, slow) ranged from 0.23.10-3 h-1 to 1.52.10-3 h-1. The present results indicate that whole-particle size and, thus, overall particle size distribution are not determinants for the slow desorption of organic chemicals. This means that it is probably not diffusion on the whole-grain scale which determines slow desorption of organic compounds from sediments. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Organic-Compounds, Polychlorinated-Biphenyls, Nonequilibrium Sorption, Atrazine Sorption, Aquifer Material, Kinetics, Soils, Model, Temperature, Adsorption

Ma, Y. and Yao, J.N. (1999), Comparison of photodegradative rate of rhodamine B assisted by two rinds of TiO2 films. *Chemosphere*, **38** (10), 2407-2414.

Full Text: [1999\Chemosphere38, 2407.pdf](1999/Chemosphere38,%202407.pdf)

Abstract: Rhodamine B (RB) was used as a molecular probe to make a comparison of the photocatalytic properties between a P-25 coated film and a dip-coated anatase TiO2 film. It was found that RE on the two illuminated TiO2 surfaces underwent very different changes. The reduction of RE concentration on a P-25 film showed pseudo first-order kinetics during all the reaction time. In contrast, the concentration of the RE aqueous solution with an anatase TiO2 film did not show exponential decay through overall illumination time, but the kinetics of RB (or rhodamine) disappearance was apparently first order with respect to time before and after blue shift of the maximum absorbance (corresponding to N-de-ethylation) ended separately. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Semiconductor Photocatalysis, Degradation, Surfaces, Acid, Photochemistry, Mechanisms, Oxidation, Water, Dye

Kartel, M.T., Kupchik, L.A. and Veisov, B.K. (1999), Evaluation of pectin binding of heavy metal ions in aqueous solutions. *Chemosphere*, **38** (11), 2591-2596.

Full Text: [1999\Chemosphere38, 2591.pdf](1999/Chemosphere38,%202591.pdf)

Abstract: Evaluation of adsorption performance of several industrially manufactured pectins towards some toxic heavy metals was carried out. Adsorption isotherms for divalent cations in simulant aqueous solutions were measured and corresponding distribution coefficients were calculated. The following selectivity sequences we found for pectins: Pb2+ >> Cu2+ > Co2+ > Ni2+ >> Zn2+ > Cd2+. It was shown that a beet pectin exhibits a high affinity for Pb2+ and Cu2+ ions, an apple pectin for Co2+ ion and a citrus pectin for Ni2+ ion. The binding properties of all pectins towards Zn2+ and Cd2+ ions are extremely poor. The quantitative data on adsorption performance of pectins suggest their applicability as food additives or remedies for efficient removal of Pb2+, Cu2+, Co2+, and Ni2+ ions from different biological systems, including human and animal organisms.

Liu, R.X., Tang, H.X. and Zhang, B.W. (1999), Removal of Cu(II), Zn(II), Cd(II) and Hg(II) from waste water by poly (acrylaminophosphonic)-type chelating fiber. *Chemosphere*, **38** (13), 3169-3179.

Full Text: [1999\Chemosphere38, 3169.pdf](1999/Chemosphere38,%203169.pdf)

Abstract: The distribution coefficients (D) for Cu(II), Cd(II), Zn(II) and Hg(II) ions and adsorption isotherms of Cd(II) and Hg(II) ions on the poly (acrylaminophosphonic)-type chelating fiber were investigated using the batch reactor system. It was found that D values for the tested metal ions were above the magnitude of 10 (3) at pH 5.0, and the order of metal ion affinities was: Hg(II) > Cu(II) > Zn(II) > Cd(II). At low pH value (2.0), D value for Hg(II) ion was higher than that of the other ions, above 103. The adsorption of Hg(II) and Cd(II) ions on the new chelating fiber followed a Langmuir-type adsorption isotherm. The elution of the metal ions from the chelating fiber column using dilute nitric and hydrochloric acid as eluent were examined. The results show that the elution for Cu(II), Cd(II) and Zn(II) ion was complete using appropriate concentration of hydrochloric acid, while the high concentration of dilute nitric acid was necessary for the quantitative desorption of I-Ig(II) ion. The breakthrough curves for the metal ions were determined, and the efficient removal of the listed metal ions from model or waste water by the newly developed fibrous sorbent was achieved.

Keywords: Solution Samples, Separation, Uranium, Poly (Acrylaminophosphonic)-Type Chelating Fiber, Metal Ion, Removal, Desorption

Lehmann, M., Zouboulis, A.I. and Matis, K.A. (1999), Removal of metal ions from dilute aqueous solutions: A comparative study of inorganic sorbent materials. *Chemosphere*, **39** (6), 881-892.

Full Text: [1999\Chemosphere39, 881.pdf](1999/Chemosphere39,%20881.pdf)

Abstract: Toxic metals produced and released by the technological activities of humankind pose a serious threat for the environment. The removal of chromate anions and zinc cations from dilute aqueous solutions by sorption was investigated in the present paper as typical examples of toxic metals, existing in many wastewater streams. Seven inorganic materials have been examined as sorbents and compared, under similar conditions, using batch sorption experiments. Four of the sorbents were applied in powdered form (magnesite mineral-consisting mainly from MgCO3-, titanium dioxide, hydrotalcite and goethite), while the other three where applied in granulated form (activated carbon, ferric hydroxide and goethite, which was granulated by freezing/crystallization). Main examined parameters were the pH value of metalsolutions and their initial concentrations: Due to the obtained results, goethite granulated by freezing/crystallization was selected for further (batch) sorption experiments, which were found to fit sufficient by the Langmuir isotherm equation.

Keywords: Activated Carbon, Heavy-Metals, Adsorption, Sorption, Hydrotalcite, Biosorption, Goethite, Recovery, Water, Inorganic Sorbents, Goethite, Zinc, Chromium (Hexavalent), Sorption Isotherm

Viraraghavan, T. and Slough, K. (1999), Sorption of pentachlorophenol on peat-bentonite mixtures. *Chemosphere*, **39** (9), 1487-1496.

Full Text: [1999\Chemosphere39, 1487.pdf](1999/Chemosphere39,%201487.pdf)

Abstract: Batch kinetic and isotherm studies were carried out to determine the adsorptive characteristics of peat and bentonite mixtures for pentachlorophenol, and to examine the hydraulic conductivity of peat-bentonite mixtures to determine if they are applicable for use as cutoff barriers. Batch kinetic studies showed that over 90% of PCP was removed from water spiked with approximately 1 mg/l of PCP using a peat-bentonite (5%) mixture. The equilibrium time was 8 hours. The optimum pH range for adsorption of PCP by the peat-bentonite mixture was found to be 3-3.5. Batch isotherm studies showed that the adsorption of PCP by the peat-bentonite mixture from aqueous solution was best described by the Freundlich isotherm equation. Batch adsorption studies using various ratios of bentonite in the mixture showed that the adsorption of PCP decreased linearly with increased amount of bentonite in the mixture, indicating that adsorption of PCP by the peat moss portion of the mixture was the dominant process. The inverse of the hydraulic conductivity was found to increase exponentially with an increase in the bentonite content of the mixture over the range studied. The minimum hydraulic conductivity observed was 3.3×10-7 cm/s for a 50% peat-50% bentonite mixture. Peat-bentonite mixtures can be used to successfully remove PCP from aqueous media and can be used effectively as a barrier to attenuate the migration of PCP through soil and groundwater systems.

Keywords: Sorption, Pentachlorophenol, Peat-Bentonite Mixtures, Groundwater Pollution

Miao, X.S., Chu, S.G. and Xu, X.B. (1999), Degradation pathways of PCBs upon UV irradiation in hexane. *Chemosphere*, **39** (10), 1639-1650.

Full Text: [1999\Chemosphere39, 1639.pdf](1999/Chemosphere39,%201639.pdf)

Abstract: The photodegradations of eight individual PCB congeners (5, 31, 52, 77, 87, 126, 138, 169) in hexane have been investigated employing a mercury lamp. All degradation reactions of the above mentioned PCS congeners are of the pseudo first order. The principal products of PCB decomposition are the less chlorinated biphenyls, and no PCB-solvent adducts are found. Symmetrical and coplanar PCB congeners show lower photoreactivities. The reactivities of the chlorine atoms at various positions of PCB rings are generally in the order: ortho > meta > para. Photodechlorinations occur mainly on the more substituted rings, when the numbers of chlorine atoms on the two phenyl rings are unequal, During photodegradation, some coplanar PCB congeners are formed, which make the TEQ of solutions to decrease slowly or even to increase. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Polychlorinated-Biphenyls Pcbs, Toxic Equivalency Factors, Coplanar Pcbs, Congeners, 2,2’,5,5’-Tetrachlorobiphenyl, Photodegradation, Photochemistry

Cornelissen, G., van der Pal, M., van Noort, P.C.M. and Govers, H.A.J. (1999), Competitive effects on the slow desorption of organic compounds from sediments. *Chemosphere*, **39** (11), 1971-1981.

Full Text: [1999\Chemosphere39, 1971.pdf](1999/Chemosphere39,%201971.pdf)

Abstract: Experiments were carried out concerning competition effects in slow desorption. Excess lab-added 1,2,4-trichlorobenzene (TCB) decreased the slowly desorbing amounts of aged in situ polychlorinated biphenyls (PCBs) and chlorobenzenes in sediment from Lake Ketelmeer (KM), The Netherlands, after 14 d of TCB-sediment contact time (factor of 1.2-2.7). Another experiment showed that the presence of large quantities of in situ oil (15 g/kg) and polycyclic aromatic hydrocarbons (PAHs; 1.5 g/kg) strongly inhibited the formation of slowly desorbing amounts of lab-added pentachlorobenzene, PCB-30 and PCB-65. These results imply that (i) freshly sorbed contaminants can influence the desorption behavior of aged contaminants within weeks, and (II) PAH, oil, PCBs and chlorobenzenes show competition for the same slow sorption sites in sediment. So, the occurrence of competitive effects on slow desorption indicates that the number of slow sorption sites is limited. This is in accordance with the recent finding that part of the sorption of organic compounds in soils and sediments occurs in a nonlinear way, the slowly desorbing fractions showing this nonlinear sorption. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Distributed Reactivity Model, Polychlorinated-Biphenyls, Sorption, Soils, Hydrocarbons, Adsorption, Fractions, Kinetics, Time

Wu, F., Deng, N.S. and Zuo, Y.G. (1999), Discoloration of dye solutions induced by solar photolysis of ferrioxalate in aqueous solutions. *Chemosphere*, **39** (12), 2079-2085.

Full Text: [1999\Chemosphere39, 2079.pdf](1999/Chemosphere39,%202079.pdf)

Abstract: The discoloration of four dyes, C.I. reactive red 2, C.I. reactive black 8, C.I. basic red 13 and C.I. basic yellow 2, were induced by solar photolysis of ferrioxalate in aqueous solutions. The discoloration of the dye solutions were all pseudo-first order reactions. The discoloration rates of the dye solutions in sunlight/ferrioxalate system is about the same as in UV/ferrioxalate system, while much higher than in sunlight/Fe(III)-hydroxy system. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Dye, Discoloration, Photolysis, Ferrioxalate, Sunlight, Photodegradation, Degradation, Complexes

Al-Asheh, S., Banat, F. and Mohai, F. (1999), Sorption of copper and nickel by spent animal bones. *Chemosphere*, **39** (12), 2087-2096.

Full Text: [1999\Chemosphere39, 2087.pdf](1999/Chemosphere39,%202087.pdf)

Abstract: Animal bone is able to adsorb copper and nickel ions from their single aqueous solutions. It was noted that a decrease in the sorbent concentration with constant copper or nickel concentration, or an increase in the copper or nickel concentration with a constant sorbent concentration resulted in a higher metal loading per unit weight of the sorbent. Increase in the initial pH of the metalsolution resulted in an increase in the metals uptake per unit weight of the sorbent. Freundlich isotherm model was found to be applicable for the experimental data of Cu2+ and Ni2+. The results showed that animals bones can be used for the adsorption of the Cu2+ and Ni2+ with higher affinity toward Cu2+ ions. The new sorbent was able to decrease copper concentration to a limit lower than the limit permitted by the environmental regulations.

Keywords: Ion-Exchange, Adsorption, Removal, Cadmium, Biomass, Metals, Carbon, Zinc, Lead, Sorption, Copper, Nickel, Animal Bones

? Hu, C. and Wang, Y.Z. (1999), Decolorization and biodegradability of photocatalytic treated azo dyes and wool textile wastewater. *Chemosphere*, **39** (12), 2107-2115.

Full Text: [1999\Chemosphere39, 2107.pdf](1999/Chemosphere39,%202107.pdf)

Abstract: The photodegradation and biodegradability have been investigated for four non-biodegradable commercial azo dyes, Reactive YellowKD-3G, Reactive Red 15, Reactive Red 24, Cationic Blue X-GRL, an indicator. Methyl Orange, and one industrial wool textile wastewater, using TiO2 suspensions irradiated with a medium pressure mercury lamp. The color removal of dyes solution and dyeing wastewater reached to above 90% within 20–30 min. of photocatalytic treatment. Biochemical oxygen demand (BOD) was found to increase, while chemical oxygen demand (COD), total organic carbon (TOC) decreased, so that the ratio of BOD5/COD of the wastewater increased from original zero up to 0.75. The result implies that photocatalytic oxidation enhanced the biodegradability of the dye-containing wastewater and therefore relationship between decolorization and biodegradability exists. When the color disappeared completely, the wastewater biodegraded normally and could be discharged for further treatment. The experimental results demonstrate that it is possible to combine photocatalysis with conventional biological treatment for the remedy of wastewater containing generally non-biodegradable azo dyes.

Keywords: Photocatalytic Oxidation, Titanium Dioxide, Color, Dyes, Textile Wastewater, Biodegradability

Lo, W.H., Chua, H., Lam, K.H. and Bi, S.P. (1999), A comparative investigation on the biosorption of lead by filamentous fungal biomass. *Chemosphere*, **39** (15), 2723-2736.

Full Text: [1999\Chemosphere39, 2723.pdf](1999/Chemosphere39,%202723.pdf)

Abstract: The removal of lead from aqueous solutions by adsorption on filamentous fungal biomass was studied. Batch biosorption experiments were performed to screen a series of selected fungal strains for effective read removal at different metal and biomass concentrations. Biosorption of the Pb2+ ions was strongly affected by pH. The fungal biomass exhibited the highest lead adsorption capacity at pH 6. Isotherms for the: biosorption of lead on fungal biomass were developed and the equilibrium data fitted well to the Langmuir isotherm model. At pH 6, the maximum lead biosorption capacity of Mucor rouxii estimated with the Langmuir model was 769 mg/g dry biomass, significantly higher than that of most microorganisms. Biomass of Mucor rouxii showed specific selectivity for Pb2+ over other metals ions such as Zn2+, Ni2+ and Cu2+. This fungal strain may be applied to develop potentially cost-effective biosorbent Ibr removing lead from effluents. The technique of scanning electron microscopy coupled with X-ray dispersion analysis shows that Pb2+ has exchanged with K+ and Ca2+ on the cell wall of Mucor rouxii, thereby suggesting ion exchange as one of the dominant mechanisms of metal biosorption for this fungal strain.

Keywords: Aqueous-Solutions, Heavy-Metals, Adsorption, *Ramigera*, arrhizus, Removal, Ions

Fytianos, K., Voudrias, E. and Kokkalis, E. (2000), Sorption–desorption behaviour of 2,4-dichlorophenol by marine sediments. *Chemosphere*, **40** (1), 3-6.

Full Text: [2000\Chemosphere40, 3.pdf](2000/Chemosphere40,%203.pdf)

Abstract: Batch kinetic and isotherm experiments were conducted to determine the sorption–desorption behavior of 2,4-dichlorophenol from seawater solutions by marine sediments containing various amounts of organic carbon (from 1.02% to 12.72% dry weight). The results indicated linear type isotherms for sorption and desorption in all marine sediments studied. The observed difference in linear sorption coefficients between sorption and desorption was indicative of sorption hysteresis. The kinetic experiments showed that equilibrium was established in less than 20 h. The study is significant with respect to sediment remediation in contaminated harbors and coastal areas. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Sorption, Desorption, Dichlorophenol, Marine Sediments

Srinivasan, P.T. and Viraraghavan, T. (2000), An analysis of the ‘Modified Sturm Test’ data. *Chemosphere*, **40** (1), 99-102.

Full Text: [2000\Chemosphere40, 99.pdf](2000/Chemosphere40,%2099.pdf)

Abstract: The ‘Modified Sturm Test’ uses carbon dioxide production as the primary end point in assessing the biodegradation potential of organic chemicals. This test was conducted by a commercial laboratory to assess the potential biodegradability of an oil stabilizer sample from an oil company in Canada. There was a high percentage conversion of total organic carbon present in the sample but carbon dioxide measured was low. Many possibilities were analyzed in this paper in order to understand the situation. The analysis showed that the test was subject to criticism from the point of view of CO2 measurement, 10-day window period, and aeration/mixing conditions. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Carbon-Dioxide, Biodegradability, Recovery

Schiewer, S. and Wong, M.H. (2000), Ionic strength effects in biosorption of metals by marine algae. *Chemosphere*, **41** (1-2), 271-282.

Full Text: [2000\Chemosphere41, 271.pdf](2000/Chemosphere41,%20271.pdf)

Abstract: Biosorption, the passive accumulation of metals by biomass, can be used as a cost-effective process for the treatment of metal polluted industrial effluents. The green alga *Ulva fascia* and the brown seaweeds *Sargassum hemiphyllum*, *Petalonia fascia*, and *Colpomenia sinuosa* were characterized in terms of their number of binding sites, their charge density and intrinsic proton binding constant (*pK*a) using pH titrations at different ionic strengths. The determined number of binding sites decreased in the order *Petalonia* ≥ *Sargassum* > *Colpomenia* > *Ulva*. Due to their high number of binding sites *Sargassum* and *Petalonia* are most promising for biosorption applications. The decrease of proton binding with increasing ionic strength and pH as well as the increase of Cu and Ni binding with increasing pH and decreasing ionic strength could be described by the Donnan model in conjunction with an ion exchange biosorption isotherm. (C) 2000 Elsevier Science B.V. All rights reserved.

Yu, Q.M., Kaewsarn, P. and Van Duong, L. (2000), Electron microscopy study of biosorbents from marine macro alga *Durvillaea* *potatorum*. *Chemosphere*, **41** (4), 589-594.

Full Text: [2000\Chemosphere41, 589.pdf](2000/Chemosphere41,%20589.pdf)

Abstract: Biosorbents derived from the biomass of marine algae have shown to have high uptake capacities for heavy metals and the internal structure has been generally assumed to be pseudo-homogenous. In this paper, the microstructures of biosorbents derived from Australian marine alga *Durvillaea* *potatorum* were analysed using scanning electron microscopy. The structural components of the biosorbent resembled fiber-like cylinders. The internal structure was a highly connected network of cylinders with varying sizes. Methods of drying and pre-treatment of the biomass also affected the details of the internal structure. Calcium chloride followed by thermal treatment provided the most uniform cylinder networks for the biosorbents. Heavy metal Cu2+ and Cd2+ binding in the biomass was confirmed by using an electron probe microanalyser. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Biosorbent Micro-Structure, Scanning Electron Microscopy, *Durvillaea potatorum*, Biomass of Marine Algae

Al-Asheh, S., Banat, F., Al-Omari, R. and Duvnjak, Z. (2000), Predictions of binary sorption isotherms for the sorption of heavy metals by pine bark using single isotherm data. *Chemosphere*, **41** (5), 659-665.

Full Text: [2000\Chemosphere41, 659.pdf](2000/Chemosphere41,%20659.pdf)

Abstract: The adsorption of three heavy metal ions by pine bark was studied. The study was divided into two parts; single component adsorption of the metals Cu2+, Cd2+ and Ni2+ and bisolute adsorption of the three binary systems Cu2+-Cd2+, Cu2+-Ni2+ and Cd2+-Ni2+. Extended Langmuir model, extended Freundlich model, Sips model and ideal adsorption solution theory (IAST) models were used to predict the equilibrium uptake for Cu2+, Cd2+ and Ni2+ in the binary diluted solutions using the single adsorption constants. The experimental data of single isotherm adsorption process were found to follow Langmuir isotherm model with less accuracy than Freundlich and Sips models. Whereas, the predictions of bisolute adsorption isotherms of the mentioned three systems, Cu2+-Cd2+, Cu2+-Ni2+ and Cd2+-Ni2+, showed good agreement with experimental data when using Extended-Langmuir, Extended-Freundlich and IAST. However, the only good fit of the Sips model was with the Cu2+-Cd2+ system. (C) 2000 Published by Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Bark, Biosorption Equilibria, Copper, Heavy Metal, Heavy Metal Ions, Heavy Metals, Heavy-Metal, Langmuir, Metal, Metal Ions, Metals, *Rhizopus-arrhizus* Biomass, Sorption

Tsuda, T., Takino, A., Kojima, M., Harada, H., Muraki, K. and Tsuji, M. (2000), 4-nonylphenols and 4-tert-octylphenol in water and fish from rivers flowing into Lake Biwa. *Chemosphere*, **41** (5), 757-762.

Full Text: [2000\Chemosphere41, 757.pdf](2000/Chemosphere41,%20757.pdf)

Abstract: Surveys of 4-nonylphenols (NOs) and 4-tert-octylphenol (OC) were performed for water and fish samples obtained from eight rivers flowing into Lake Biwa once every two months from April 1998 to March 1999. For water samples, NOs were detected all the year round (0.11-3.08 ng ml-1) at high frequency (48/48) in the eight rivers. OC was detected at lower concentrations (ND similar to 0.09 ng ml-1) and at lower frequency (23/48). The concentrations of NOs in the river water always showed minimum values at 5-8°C in winter. It was presumed that the formation of NOs by the biotransformation of nonylphenol polyethoxylates decreased much in the sludge treatment of nonionic surfactants at the low temperature (5-8°C) in winter. Average BCF values of NOs and OC in the six kinds of fish were calculated from the field data. The field BCF values of NOs 15-31 in the six kinds of fish were lower than the laboratory BCF Values of 167 in Killifish and 282 in Salmon. For OC, the field BCF values 129-297 for the three kinds of fish were nearly equal to the laboratory BCF value, 261, in Killifish. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Alkylphenol Polyethoxylate Surfactants, Aquatic Environment, Bioaccumulation, Transformation, Ethoxylates, Behavior, 4-Nonylphenols, 4-Tert-Octylphenol, River Water, Fish, Lake Biwa, BCF

? Kuan, W.H., Lo, S.L., Chang, C.M. and Wang, M.K. (2000), A geometric approach to determine adsorption and desorption kinetic constants. *Chemosphere*, **41** (11), 1741-1747.

Full Text: [2000\Chemosphere41, 1741.pdf](2000/Chemosphere41,%201741.pdf)

Abstract: A geometric method based on Langmuir kinetics has been derived to determine adsorption and desorption kinetic constants. In the conventional procedure, either the adsorption kinetic constant (kac) or desorption kinetic constant (kdc) is found from kinetic experiments and the other is calculated by their correlation with the equilibrium constant, i.e, kdc=Kcon/kac, where Kcon has been known from equilibrium studies. The determined constants (Kcon, kac, kdc), if based only on the conventional procedure, may not be accurate due to their mathematical dependence. Therefore, the objectives of this study are applying a geometric approach to directly determine Langmuir kinetic constants and describe adsorption behavior. In this approach, both adsorption kinetic constant (kag) and desorption kinetic constant (kdg) are obtained only from data of kinetic experiments, and a geometric equilibrium constant (Kgeo) is calculated by Kgeo=kag/kdg. The deviation between Kgeo and Kcon can prove the accuracy of kag and kdg which were determined by this method. This approach was applicable to selenate, selenite and Mg2+ adsorption onto SiO2 regardless of whether the adsorbate formed inner- or outer-sphere complexes. However, this method showed some deviation between Kcon and Kgeo for Mn2+ adsorption because of the formation of surface Mn(II)-hydroxide clusters, which was inconsistent with the basic assumption of this method of monolayer adsorption.

Keywords: Langmuir Kinetics, Adsorption, Desorption, Kinetic Constant, Equilibrium Constant

Hugl, H. and Gürtler, C. (2001), Chemical industry reduces emissions: From production to the consumer. *Chemosphere*, **43** (1), 17-20.

Full Text: [2001\Chemosphere43, 17.pdf](2001/Chemosphere43,%2017.pdf)

Abstract: Responsible care has always been an important issue at a chemical industry like Bayer. In recent years, the company has made extensive efforts to further improve its products and processes with regard to environmental protection and safety. In this contribution, a number of examples will highlight recent achievements of Bayer in the field of low or no emission processes and products. Examples are given in the fields of production-integrated environmental protection measures (new and improved processes e.g., for the production of adipic acid), the application of integrated environmental protection measures (2K-PUR water-borne coatings for cars) and product-integrated environmental protection measures (targeted application of insecticides/Attract and Kill) as a new low emission method to control insect pests. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Responsible Care, Environmental Protection, Adipic Acid, Water-Borne Coatings, Attract and Kill

? Gao, B., Wang, X.R., Zhao, J.C. and Sheng, G.Y. (2001), Sorption and cosorption of organic contaminant on surfactant-modified soils. *Chemosphere*, **43** (8), 1095-1102.

Full Text: [2001\Chemosphere43, 1095.pdf](2001/Chemosphere43,%201095.pdf)

Abstract: Three kinds of soils were modified with the cationic surfactants, hexadecyltrimethylammonium (HDTMA) bromide and tetramethylammonium (TMA) bromide to increase their sorptive capabilities. Sorption of chlorobenzene in simulated groundwater by these soils was investigated. HDTMA-modified soil has a higher ability to sorb chlorobenzene from simulated groundwater than unmodified soil. TMA-modified soil did not show the superiority. HDTMA thus can be used to modify soil to improve its sorption capability. Cosorption of chlorobenzene in simulated groundwater in the absence or presence of nitrobenzene and dichloromethane on HDTMA-modifed soil was also investigated. Nitrobenzene facilitated sorption of chlorobenzene on all HDTMA-modified soil. Dichloromethane did not influence the sorption of chlorobenzene by HDTMA-modified soil. The results suggest that HDTMA-modified soil is a highly effective sorbent for chlorobenzene and multiple organic compounds did not impede the uptake of chlorobenzene. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Cations, Chlorobenzene, Clays, Cosorption, Equilibria, Groundwater, Hdtma, Matter, Organic, Organic Compounds, Smectite, Soil, Soils, Sorption, Surfactants, Tma, Uptake, Water

Chang, C.M., Wang, M.K., Chang, T.W., Lin, C. and Chen, Y.R. (2001), Transport modeling of copper and cadmium with linear and nonlinear retardation factors. *Chemosphere*, **43** (8), 1133-1139.

Full Text: [2001\Chemosphere43, 1133.pdf](2001/Chemosphere43,%201133.pdf)

Abstract: The predictive accuracy of using the one-dimensional advection-dispersion equation to evaluate the fate and transport of solute in a soil column is usually dependent on the proper determination of chemical retardation factors. Typically, the distribution coefficient (Kd) obtained by fitting the linear sorption isotherm has been extensively used to consider general geochemical reactions on solute transport in a low-concentration range. However, the linear distribution coefficient cannot be adequately utilized to describe the solute fate at a higher concentration level. This study employed the nonlinear equilibrium-controlled sorption parameters to determine the retardation factor used in column leaching experiments. Copper and cadmium transportation in a lateritic silty-clay soil column was examined. Through the explicit finite-difference calculations with a third-order total-variation-diminishing (TVD) numerical solution scheme, all results of the theoretical copper and cadmium breakthrough curves (BTCs) simulated by using the Freundlich nonlinear retardation factors revealed good agreement with the experimental observations. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Cadmium, Copper, Miscible Displacement, Retardation Factor, Solute Transport, Oxide-Water Interface, Metal-Ions, Sorption, Soils, Adsorption, Complexation, Columns, Charge, Iron, pH

Tsui, S.M. and Chu, W. (2001), Quantum yield study of the photodegradation of hydrophobic dyes in the presence of acetone sensitizer. *Chemosphere*, **44** (1), 17-22.

Full Text: [2001\Chemosphere44, 17.pdf](2001/Chemosphere44,%2017.pdf)

Abstract: The photodegradation of hydrophobic disperse dyes with different chromophores in the presence of acetone (ACE) was investigated. In this study, the photodecay of dyes was carried out in the Rayonet (TM) RPR-200 merry-go-round photoreactor, with 253.7 nm monochromatic ultraviolet (UV) lamps. A typical ano disperse dye (CI disperse yellow 7-DY7) and an anthraquinone disperse dye (CI disperse orange - DO11) were used as the probe compounds. The results demonstrate that the addition of acetone increases the solubility of hydrophobic disperse dyes and enhances the photosensitization reaction simultaneously. More than ten times of quantum yield enhancement is observed in the presence of ACE photosensitizer than in water alone. The photodegradation of DY7 and DO11 is dominated by photoreduction, which follows pseudo first-order decay, and the rate constants strongly depend on the solvent system (i.e., ACE/H2O ratios) and the initial pH levels. The decay quantum yields of dyes are normally observed with the increase of the ACE/H2O ratio. The optimum quantum yields of DY7 and DO11 were determined at 0.5 (v/v) and 0.25 (v/v), respectively, in alkaline conditions. A further increase in the ACE: H2O ratio reduces the quantum yields, possibly due to light attenuation by excess acetone. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Acetone, Anthraquinone, Azo, Disperse Dye, Quantum Yield, Sensitizer, Ultraviolet, Chemical Coagulation, Azo Dyes, Photodechlorination, Decolorization, Degradation, Adsorption, Oxidation, Ozone

Topcuoğlu, S. (2001), Bioaccumulation of cesium-137 by biota in different aquatic environments. *Chemosphere*, **44** (4), 691-695.

Full Text: [2001\Chemosphere44, 691.pdf](2001/Chemosphere44,%20691.pdf)

Abstract: Macroalgae, isopods and fish species were exposed to Cs-137 in brackish and sea water conditions for 18 days to determine radionuclide concentration factors. The concentration factors of Cs-137 in, brown shrimp and polychaete species were also investigated under brackish water conditions. At equilibrium, the concentration factors in macroalgae, isopod, fish, brown shrimp and polychate samples were found to be 2.5, 33, 2, 16 and 11 at 16 degreesC in brackish water conditions, respectively. The accumulation rate in macroalgae species was influenced by temperatures between 6 degreesC and 16 degreesC. The bioaccumulation of Cs-137 in, isopods at low salinity regime was increased significantly. At the same time, the bioaccumulation rate in macroalgae species also showed slight increase at low salinity. On the other hand, the bioaccumulation rate of Cs-137 in, the fish species in sea water was higher than in brackish water. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Concentration Factor, Radiocesium, Bioindicator, Temperature, Salinity, Biokinetics, Depuration, Water

Li, D.C., Huang, S.B., Wang, W.H. and Peng, A. (2001), Study on the kinetics of cerium(III) adsorption-desorption on different soils of China. *Chemosphere*, **44** (4), 663-669.

Full Text: [2001\Chemosphere44, 663.pdf](2001/Chemosphere44,%20663.pdf)

Abstract: The kinetics of Ce(III) adsorption-desorption on four typical soils in China has been studied by using the batch method with the radioactive nuclide Ce-141. Results indicated that Ce(III) adsorption was rapid and nearly finished in less than 0.5 min. Desorption procedure was about completed in 1-30 min in the tested soils. Ce(III) desorption equilibrium times vary with different soils. The amounts of Ce(III) desorption on different soils in the same time were different. The Elovich equation proved to be the best models for fitting the data of Ce(III) desorption reactions in fluvoaquic soil and black soil; and the parabolic-diffusion equation was the best model in red earth and loess soil. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Ce(III), Soils, Adsorption-Desorption, Kinetics, Phosphate Release

Shen, Y.H. (2001), Preparations of organobentonite using nonionic surfactants. *Chemosphere*, **44** (5), 989-995.

Full Text: [2001\Chemosphere44, 989.pdf](2001/Chemosphere44,%20989.pdf)

Abstract: Due to hydrophilic environment at its surface, natural bentonite is an ineffective sorbent for nonpolar nonionic organic compounds in water even though it has high surface area. The surface properties of natural bentonite can be greatly modified by simple ion-exchange reactions with large organic cations (cationic surfactants) and this organobentonite is highly effective in removing nonionic organic compounds from water. Cationic surfactant derived organobentonites have been investigated extensively for a wide variety of environmental applications. In this study, the preparation of organobentonite using nonionic surfactants has been investigated for the first time. Results indicate that nonionic surfactants intercalates into the interlamellar space of bentonite and may demonstrate higher sorption capacity than cationic surfactant. It is possible to create large interlayer spacing and high organic carbon content organobentonite by use of nonionic surfactants with suitable balance between the hydrocarbon and ethylene oxide chain lengths. In addition, nonionic surfactant derived organobentonites are more chemically stable than cationic surfactant derived organobentonites. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Bentonite, Organoclays, Nonionic Surfactants, Adsorption, Tetrachloromethane Sorption, Organic Contaminants, Adsorption Behavior, Water, Clays, Cations

Borisover, M., Graber, E.R., Bercovich, F. and Gerstl, Z. (2001), Suitability of dye-clay complexes for removal of non-ionic organic compounds from aqueous solutions. *Chemosphere*, **44** (5), 1033-1040.

Full Text: [2001\Chemosphere44, 1033.pdf](2001/Chemosphere44,%201033.pdf)

Abstract: Aqueous sorption of phenol, atrazine and naphthalene was measured on complexes formed from Na-montmorillonite (Fischer bentonite) and the organic cationic dyes crystal violet and rhodamine-B. Sorption isotherms were found to be non-linear. This agrees well with the rigid nature of the dye-clay organic coverage, which provides a finite surface for adsorption. High values of organic carbon-normalized distribution coefficients reached 20,000-25,000 for atrazine on rhodamine-B-montmorillonite, 7000 for atrazine on crystal violet-montmorillonite, and 1500 for phenol on crystal violet-montmorillonite. As such, dye-clays may significantly extend the variety of organoclay sorbents that effectively reduce aqueous concentrations of non-ionic organic compounds. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Sorption Isotherm, Organoclay, Cationic Dye, Atrazine, K-Oc, Methylene-Blue, Crystal-Violet, Exchanged Clays, Adsorption, Sorption, Montmorillonite, Water, Photostabilization, Contaminants, Organoclays

Wefer-Roehl, A., Graber, E.R., Borisover, M.D., Adar, E., Nativ, R. and Ronen, Z. (2001), Sorption of organic contaminants in a fractured chalk formation. *Chemosphere*, **44** (5), 1121-1130.

Full Text: [2001\Chemosphere44, 1121.pdf](2001/Chemosphere44,%201121.pdf)

Abstract: Sorption capability of bedrock components from a fractured chalk province was evaluated using ametryn, phenanthrene, m-xylene, 2,4,6-tribromophenol, and 1,2-dichloroethane. Sorption isotherms for the four aromatic compounds were nonlinear on gray (unoxidized) chalk. Over the studied solution ranges, the distribution coefficient decreased by factor of 3 for phenanthrene and rn-xylene, a factor 4 for ametryn, and by an order of magnitude for 2,4,6-tribromophenol. In contrast, 1,2-dichloroethane displayed a linear isotherm. The importance of polar interactions for ametryn sorption was evaluated by normalizing sorption to an “inert” solvent, n-hexane. n-Hexane-normalized sorption of ametryn was much greater than that of phenanthrene, presumably due to ametryn participation in hydrogen bonding interactions. In sharp contrast to sorption to gray chalk, sorption to white (oxidized) chalk is 100- to 1000-fold lower at any given solution concentration. The much greater sorption on gray chalk cannot be explained by specific surface area, clay content, or organic matter content; thus, the nature of the organic matter is considered to control sorption in the chalk samples. Gray chalk sorption capacity estimates for ametryn and 2,4,6-tribromophenol are similar, which, together with evidence of competition for sorption sites, suggests that the limited capacity sorption domain for both compounds is similar. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Sorption Isotherm, Chalk, Organic Matter, Sorption Capacity, Specific Interactions, Chlorinated-Solvent Sorption, Activated Carbon, Competitive Sorption, Mineral Surfaces, Model Sorbents, Adsorption, Soils, Matter, Water, Hydrocarbons

Lai, C.H. and Chen, C.Y. (2001), Removal of metal ions and humic acid from water by iron-coated filter media. *Chemosphere*, **44** (5), 1177-1184.

Full Text: [2001\Chemosphere44, 1177.pdf](2001/Chemosphere44,%201177.pdf)

Abstract: Iron oxide is an excellent, regenerable adsorbent, and often controls free metals through adsorption reaction. The utilization of heating process for coating iron oxide on sand surface allowed the media to be used in a packed column. Iron-coated sand was investigated for adsorbing metal ions and natural organic matter from water by batch and column experiments. Chemical analysis (energy dispersive analysis of X-ray, EDAX) was used for characterizing the copper and lead adsorption sites on iron-coated sand. From the batch experiment results, the copper and lead ions could be removed simultaneously by the iron-coated sand in the competition adsorption system. The interaction between copper, lead ions and iron oxide on sand surface was primarily the chemical bonds. The maximum adsorption capacities of iron-coated sand for copper and lead were 0.259 mg Cu/g-sand and 1.211 mg Pb/g-sand, respectively. The presence of humic acid led to increase the adsorption of copper and lead. Results from column experiments indicated that the copper ions, lead ions and humic acid could be removed completely before the breakpoint. Consequently, the iron-coated sand may be applied for the adsorption/filtration of metal ions and natural organic matters from water. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Coating, Heavy Metal, Iron Oxide, Organic Matter, SEM/EDAX, Natural Organic-Matter, Drinking-Water, Adsorption, Oxide, Sand, Surface, Cadmium, Lead, Desorption, Filtration

Lin, C.J. and Chang, J.E. (2001), Effect of fly ash characteristics on the removal of Cu(II) from aqueous solution. *Chemosphere*, **44** (5), 1185-1192.

Full Text: [2001\Chemosphere44, 1185.pdf](2001/Chemosphere44,%201185.pdf)

Abstract: Fly ash is a particulate substance containing metal oxides, carbon and other microelements. In this study, fly ashes with different quantities of carbon and minerals prepared by a thermal process in the laboratory were used as adsorbents to investigate the contribution of precipitation and adsorption to the removal of aqueous Cu(II). Experimental results showed that the specific surface area of fly ash increased linearly with the quantity of carbon. The specific surface areas of the carbon and mineral fraction were 60 m2/g and 0.68 m2/g, respectively. The specific adsorption capacities of carbon ranged from 2.2 to 2.8 mg Cu/g carbon, while those for mineral were only about 0.63 similar to 0.81 mg Cu/g mineral. Consequently, the carbon fraction in fly ash was important in the removal of Cu(II) at pH 5. However, Cu(II) removal owing to precipitation increases with a decreasing carbon fraction and the contribution of copper precipitation was estimated to be approximately 23% similar to 82% of total removal, depending on the carbon fraction of fly ash. (C) 2001 Elsevier Science Ltd. AU rights reserved.

Keywords: Fly Ash, Carbon Fraction, Adsorption, Waste-Water, Organic Contaminants, Adsorption, Sorption, Chromium

Fuerhacker, M., Dürauer, A. and Jungbauer, A. (2001), Adsorption isotherms of 17β-estradiol on granular activated carbon (GAC). *Chemosphere*, **44** (7), 1573-1579.

Full Text: [2001\Chemosphere44, 1573.pdf](2001/Chemosphere44,%201573.pdf)

Abstract: The adsorption characteristics of three types of activated carbon for 17 beta -estradiol were studied by long term experiments to assess the time which is necessary to reach equilibrium between the solid and the liquid phase. The adsorption kinetics were measured by liquid scintillation counting using radio-labelled 17 beta -estradiol at various concentrations of 17 beta -estradiol in the ppt range. 17 beta -estradiol is quickly adsorbed and conditions close to equilibrium were reached after 50-180 min. The equilibrium concentrations were calculated to be at 49-81% of the initial concentration in the concentration range between 1 and 100 ng/l, with 0.51 ng/l for a I ng/l and between 5.9 and 14.6 ng/l for 100 ng/l initial concentration. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption Properties, Granular Charcoal, Activated Carbon, 17 Beta-Estradiol

Tsai, W.T., Chang, C.Y., Lin, M.C., Chien, S.F., Sun, H.F. and Hsieh, M.F. (2001), Adsorption of acid dye onto activated carbons prepared from agricultural waste bagasse by ZnCl2 activation. *Chemosphere*, **45** (1), 51-58.

Full Text: [2001\Chemosphere45, 51.pdf](2001/Chemosphere45,%2051.pdf)

Abstract: A series of activated carbons were prepared from agricultural waste sugarcane bagasse by chemical activation with zinc chloride (ZnCl2) as an activating agent at 500 degreesC and 0.5 It soaking time. The Langmuir surface area and total pore volume were used to estimate the average pore diameter of the carbon products. The values of the surface area and pore volume increased linearly with increase in the impregnation ratio (IR) up to 100 wt%. The adsorption capacities of the derived adsorbents for Acid Orange 10 were measured at 20 degreesC and 40 degreesC to gain further insights into the acidic surface oxides of the adsorbent from the results of Fourier transform infrared (FTIR) spectroscopy analysis and pH measurement. Adsorption isotherms of the acid dye on adsorbents prepared were determined and correlated with common isotherm equations. It was found that the Langmuir model appears to fit the isotherm data better than the Freundlich model. The physical properties of these adsorbents were consistent with the parameters obtained from the isotherm equations. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Sugarcane Bagasse, Acid Dye, Isotherm, Corn Cob, Removal, Equilibrium, Adsorbents, Dyestuffs, Pith

Müller, B. and Heal, M.R. (2001), The Henry’s law coefficient of 2-nitrophenol over the temperature range 278–303 K. *Chemosphere*, **45** (3), 309-314.

Full Text: [2001\Chemosphere45, 309.pdf](2001/Chemosphere45,%20309.pdf)

Abstract: Although 2-nitrophenol has been identified as an important environmental chemical there is scarcity in the literature regarding the temperature dependence of its Henry’s law coefficient, H. Here a bubble purge method was used to measure H for 2-nitrophenol over the temperature range 278-303 K. A novel approach in the data treatment allowed correction of the data for non-equilibrium partitioning in the apparatus to obtain the true equilibrium H value. The experimentally derived temperature-dependent expression for H of 2-nitrophenol is In H (M atm-1) = (6290/T (K)) -16.6. The standard enthalpy and entropy of gas-to-liquid transfer for 2-nitrophenol in aqueous solution are 52.3±8.1 kJ mol-1 and -138±28J mol-1 K-1, respectively. (Errors are 95% confidence intervals.) (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: 2-Nitrophenol, Gas-To-Liquid Partitioning, Bubble Column, Nitrated Phenols, Organic-Compounds, Nitrophenols, Pollutants, Atmosphere, Constants, Clouds, Water, Fate, Rain

Golfinopoulos, S.K., Lekkas, T.D. and Nikolaou, A.D. (2001), Comparison of methods for determination of volatile organic compounds in drinking water. *Chemosphere*, **45** (3), 275-284.

Full Text: [2001\Chemosphere45, 275.pdf](2001/Chemosphere45,%20275.pdf)

Abstract: Comparison of four methods including liquid-liquid extraction (LLE), direct aqueous injection (DAL), purge and trap (PAT) and head space (HS) were carried out in this work for determination of volatile organic compounds (VOCs) including trihalomethanes (THMs) in drinking water. This comparison is made especially to show the advantages and disadvantages and specifically the different detection limits (DL) that can be obtained for a given type of analysis. LLE is applicable only for determination of the THMs concentrations, while DAI, PAT, HS methods with different DL each of them are applicable for all VOCs, with PAT to be the most sensitive. Sampling apparatus and procedure for all these methods except of PAT are very simple and easy, but possible disadvantages for LLE and DAI are the low sensitivity and especially the detection only of THMs with LLE. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Volatile Organic Compounds, Trihalomethanes, Drinking Water, Liquid-Liquid Extraction, Direct Aqueous Injection, Purge and Trap, Headspace Method, Trihalomethanes, Athens, Greece

Nissinen, T.K., Miettinen, I.T., Martikainen, P.J. and Vartiainen, T. (2001), Molecular size distribution of natural organic matter in raw and drinking waters. *Chemosphere*, **45** (6-7), 865-873.

Full Text: [2001\Chemosphere45, 865.pdf](2001/Chemosphere45,%20865.pdf)

Abstract: The purpose of this study was to compare the molecular size distribution (MSD) of natural organic matter (NOM) in raw waters (RW) and drinking waters (DW), and to find out the differences between MSD after different water treatment processes. The MSD of NOM of 34 RW and DW of Finnish waterworks were determined with high-performance size-exclusion chromatography (HPSEC). Six distinct fractions were generally separated from water samples with the TSK G3000SW column, using sodium acetate at pH 7 as an eluent. Large and intermediate humic fractions were the most dominant fractions in surface waters (lakes and rivers), while in artificially recharged groundwaters and natural groundwaters intermediate and small fractions predominated. Water treatment processes removed the two largest fractions almost completely shifting the MSD towards smaller molecular size in DW. Granular activated carbon (GAC) filtration, ozonation, and their combination reduced all humic fractions compared to the conventional treatment. Humic fractions correlated with total organic carbon (TOC) content and chemical oxygen demand, this being especially true in RW. The results demonstrate that the HPSEC method can be applied for a qualitative and also for rough estimate quantitative analyzes of NOM directly from RW and DW samples without sample pretreatment. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Drinking Water (DW), High-Performance Size-Exclusion Chromatography (HPSEC), Humic Fractions, Natural Organic Matter (NOM), Tsk Column, Aquatic Humic Substances, Exclusion Chromatography, Activated Carbon, Thm Precursors, Removal, Chlorination, Filtration, Ozonation, Weight, Fractionation

Adachi, A., Takagi, S. and Okano, T. (2002), Adsorption and adsorption mechanism of rice bran for chloroform from tap water. *Chemosphere*, **46** (1), 87-92.

Full Text: [2002\Chemosphere46, 87.pdf](2002/Chemosphere46,%2087.pdf)

Abstract: We have found that rice bran effectively adsorbed chloroform from tap water. The amount of chloroform adsorbed was plotted against the equilibrium concentration of chloroform in solution on a logarithmic scale. A linear relationship was obtained, indicating that the adsorption reaction was a Freundlich type. The removal of chloroform by rice bran was attributed to the uptake into intracellular particles called spherosomes. (C) 2001 Elsevier Science Ltd. Ail rights reserved.

Keywords: Chloroform, Adsorption, Freundlich, Spherosomes, Degradation

Koch, M., Yediler, A., Lienert, D., Insel, G. and Kettrup, A. (2002), Ozonation of hydrolyzed azo dye reactive yellow 84 (CI). *Chemosphere*, **46** (1), 109-113.

Full Text: [2002\Chemosphere46, 109.pdf](2002/Chemosphere46,%20109.pdf)

Abstract: The combination of chemical and biological water treatment processes is a promising technique to reduce recalcitrant wastewater loads. The key to the efficiency of such a system is a better understanding of the mechanisms involved during the degradation processes. Ozonation has been applied to many fields in water and wastewater treatment. Especially for textile mill effluents ozonation can achieve high color removal, enhance biodegradability, destroy phenols and reduce the chemical oxygen demand (COD). However, little is known about the reaction intermediates and products formed during ozonation. This work deals with the degradation of hydrolyzed Reactive Yellow 84 (Color Index), a widely used azo dye in textile finishing processes with two monochlorotriazine anchor groups. Ozonation of the hydrolyzed dye in ultra pure water was performed in a laboratory scale cylindric batch reactor. Decolorization, determined by measuring the light absorbance at the maximum wavelength in the visible range (400 nm), was almost complete after 60 and 90 min with an ozone concentration of 18.5 and 9.1 mg/l, respectively. The TOC/TOC0 ratio after ozonation was about 30%, the COD was diminished to 50% of the initial value. The BOD5/COD ratio increased from 0.01 to about 0.8. Oxidation and cleavage of the azo group yield nitrate. Cleavage of the sulfonic acid groups of aromatic rings caused increases in the amount of sulfate. Formic acid and oxalic acid were identified as main oxidation products by high performance ion chromatography (HPIC). The concentrations of these major products were monitored at defined time intervals during ozonation, (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Ozone, Reactive Yellow 84, Dyeing Wastewater, Textile Industry, Textile Waste-Water, Ozone

Chiang, H.L., Huang, C.P. and Chiang, P.C. (2002), The adsorption of benzene and methylethylketone onto activated carbon: Thermodynamic aspects. *Chemosphere*, **46** (1), 143-152.

Full Text: [2002\Chemosphere46, 143.pdf](2002/Chemosphere46,%20143.pdf)

Abstract: The adsorption of volatile organic compounds (VOCs), exemplified by benzene and methylethylketone (MEK), onto seven different types of activated carbon was investigated. Results show that for benzene adsorption the adsorption characteristic energy, enthalpy, free energy and entropy are in the range 17.12-36.86, -20.8 to -44.7, -11.89 to -16.22 kJ/mole and -29.4 to -85.3 J/mole/K, respectively. For the adsorption of MEK, the adsorption characteristic energy, enthalpy, free energy and entropy are in the range 14.47-32.34, -18.3 to -40.8, -10.78 to -15.56 kJ/mole and -24.8 similar to -60.3 J/mole/K, respectively. The adsorption enthalpy can be calculated indirectly from statistical thermodynamic method and directly from the immersion enthalpy method. The adsorption characteristic energy is calculated by the Dubinin-Astokhov equation. The free energy is calculated by the measured equilibrium adsorption constant. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: VOCs, Adsorption, Activated Carbon, Thermodynamics, Molecular-Sieve, Micropores, Separation, Immersion

Notes: highly cited

? de Wit, C.A. (2002), An overview of brominated flame retardants in the environment. *Chemosphere*, **46** (5), 583-624.

Full Text: [2002\Chemosphere46, 583.pdf](2002/Chemosphere46,%20583.pdf)

Abstract: The presence of brominated flame retardant (BFR) chemicals, and particularly polybrominated diphenyl ethers (PBDEs), tetrabromobisphenol A (TBBPA) and hexabromocyclododecane (HBCD), has become of increasing concern to scientists over the past decade. Environmental studies conducted primarily in Europe, Japan and North America indicate that these chemicals are ubiquitous in sediment and biota. The levels of PBDEs seem to be increasing, and several trends, including in humans, indicate that this increase may be rapid. The occurrence of high concentrations of certain PBDE isomers may be sufficient to elicit adverse effects in some wildlife. There is also concern that levels could cause adverse effects in sensitive human populations such as young children, indigenous peoples, and fish consumers. However, our knowledge about these chemicals, their sources, environmental behavior, and toxicity is limited, making risk assessment difficult. In this paper, the current state of knowledge is reviewed and areas for further research recommended to improve future monitoring and risk assessment efforts. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Brominated Flame Retardants, Polybrominated Diphenyl Ethers, Tetrabromobisphenol A, Hexabromocyclododecane, Polybrominated Diphenyl Ethers, Polyhalogenated Aromatic-Hydrocarbons, Dibenzo-P-Dioxins, Pike Esox-Lucius, Biological Samples, Rainbow-Trout, Human Adipose, Developmental Neurotoxicity, Polychlorinated-Biphenyls, Cytochrome-P450 Activity

? Kaewsarn, P. (2002), Biosorption of copper(II) from aqueous solutions by pre-treated biomass of marine algae *Padina* sp. *Chemosphere*, **47** (10), 1081-1085.

Full Text: [2002\Chemosphere47, 1081.pdf](2002/Chemosphere47,%201081.pdf)

Abstract: Biosorption of heavy metals can be an effective process for the removal and recovery of heavy metal ions from aqueous solutions. The biomass of marine algae has been reported to have high uptake capacities for a number of heavy metal ions. In this paper, the adsorption properties of a pre-treated biomass of marine algae Padina sp. for copper(II) were investigated. Equilibrium isotherms and kinetics were obtained from batch adsorption experiments. The biosorption capacities were solution pH dependent and the maximum capacity obtained was 0.80 mmol/g at a solution pH of about 5. The biosorption kinetics was found to be fast, with 90% of adsorption within 15 min and equilibrium reached at 30 min. The effects of light metal ions on copper(II) uptake were studied and the presence of light metal ions did not affect copper(II) uptake significantly. Fixed-bed breakthrough curves for copper(II) removal were also obtained. This study demonstrated that the pre-treated biomass of Padina sp. could be used as an effective biosorbent for the treatment of copper(II) containing wastewater streams. (C) 2002 Published by Elsevier Science Ltd.

Keywords: Biosorption, Copper(II), Marine Algae, Padina sp., Wastewater Treatment, Metal-Ions, Vulgaris, Cadmium, Lead

? Wu, C.H., Kuo, C.Y., Lin, C.F. and Lo, S.L. (2002), Modeling competitive adsorption of molybdate, sulfate, selenate, and selenite using a Freundlich-type multi-component isotherm. *Chemosphere*, **47** (3), 283-292.

Full Text: [2002\Chemosphere47, 283.pdf](2002/Chemosphere47,%20283.pdf)

Abstract: This study examined the interactions of MoO42- + SO42-, MoO42- + SeO42-, and MoO42- + SeO32- systems on gamma-Al2O3 to better understand the competitive adsorption of these anions in the natural environment. The Freundlich isotherms of anionic adsorption onto gamma-Al2O3 in single and binary solutes were also investigated to estimate the competition between these anions. Experimental results indicate that a higher concentration of competitive solute yields a higher efficiency of the competitive solute’s prevention of MoO42- adsorption. The most significant result was found in the MoO42- + SeO32- system. The Freundlich isotherm constant (n) increases with the competitive solute concentration. The suitability of a Freundlich-type isotherm, the Sheindorf-Rebuhn-Sheintuch (SRS) equation, and the modified SRS equation in representing the competitive adsorption of MoO42-, SO42-, SeO42- and SeO32- on gamma-Al2O3 surface, was also examined. Each set of isotherm data was found to conform to linear SRS expressions, allowing competition coefficients to be derived on a concentration basis for each binary-solute system. The competition coefficient a(ij) and relative affinity coefficients ay can be seen as a way to quantify competitive interactions. The proposed SRS and modified SRS equations are simple mathematical expressions accounting for competitive interactions of anions present in a mixture for the range of concentrations over which each individual component exhibits Freundlich behavior. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Adsorption, Desorption, Anionic Adsorption, Arsenate, Binary-Solute Adsorption, Competition, Competition Coefficients, Competitive Adsorption, Desorption, Gamma-Al2O3, Goethite, Isotherm, Isotherms, Kinetics, Modified SRS Equation, Oxide, Phosphate, Pressure-Jump Technique, Relative Affinity Coefficients, Soils, Solute, SRS Equation

Terry, P.A. and Stone, W. (2002), Biosorption of cadmium and copper contaminated water by *Scenedesmus abundans*. *Chemosphere*, **47** (3), 249-255.

Full Text: [2002\Chemosphere47, 249.pdf](2002/Chemosphere47,%20249.pdf)

Abstract: Experiments were conducted comparing the individual removals ofcadmium and copper from water via biosorption using *Scenedesmus abundans*, a common green algae, to removal in a multi-component system to determine competitive effects, if any, between the metals. The goal was to characterize the biological treatment of water contaminated with heavy metals using live aquatic species. In addition, experiments were performed to measure cell viability as a function of metal concentration and also to compare metal removal using living species to that using nonliving ones.

It was shown that, while both living and nonliving *S. abundans* removed cadmium and copper from water, living algae significantly outperformed nonliving algae. Further, in characterizing biosorption by three concentrations of live S. abundans, capacity curves were created comparing the metal biosorbed per mass algae to the initial metal concentration in solution. The algae concentration was not a factor in the biosorption of either metal individually, such that the capacity of the algae for the metal increased with decreasing algae concentration. At the lowest algae concentration considered, competitive effects were observed at copper and cadmium concentrations above 4 mg/l each. At the highest algae concentration considered, no competitive effects were observed in the range of cadmium and copper concentrations studied (1–7 mg/l). It was concluded that biological treatment of heavy metal contaminated water is possible and that at adequately high algae concentrations, multi-component metal systems can be remediated to the same level as individual metals.

Keywords: Bioremediation, Biosorption, Heavy Metals

Katsoyiannis, I., Zouboulis, A., Althoff, H. and Bartel, H. (2002), As(III) removal from groundwaters using fixed-bed upflow bioreactors. *Chemosphere*, **47** (3), 325-332.

Full Text: [2002\Chemosphere47, 325.pdf](2002/Chemosphere47,%20325.pdf)

Abstract: The application of biological oxidation of iron and manganese, as a potential treatment method for the removal of arsenic from contaminated groundwaters, was examined in this paper. This method was based on the growth of certain species of indigenous bacteria, which are capable of oxidizing the soluble iron and manganese ions; the oxidized forms can be subsequently removed from the aqueous stream by over 97%, through their transformation to insoluble oxides and separation by a suitable filter medium. Arsenic was removed by around 80% under certain conditions, which were found to be sufficient for Fe(II) removal (dissolved oxygen 2.7 mg/l, redox 280-290 mV, pH 7.2, U 8.25 m/h). The specific treatment technique presents several advantages towards conventional physicochemical treatment methods, such as enhanced coagulation or direct adsorption since: (a) it does not require the addition of other chemicals for oxidizing and removing As(III), (b) it does not require close monitoring of a breakthrough point, as in conventional column adsorption processes and (c) it could find application for the removal of, at least, three groundwater contaminants (Fe, Mn. As). (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Arsenic, Biological Oxidation, Iron and Manganese Removal, Groundwater Treatment, Fixed-Bed Bioreactors, Drinking-Water, Arsenic Removal, Oxidation, Manganese, Filter, Iron, Fe, Mn

Texier, A.C., Andrès, Y., Faur-Brasquet, C. and Le Cloirec, P. (2002), Fixed-bed study for lanthanide (La, Eu, Yb) ions removal from aqueous solutions by immobilized *Pseudomonas aeruginosa*: Experimental data and modelization. *Chemosphere*, **47** (3), 333-342.

Full Text: [2002\Chemosphere47, 333.pdf](2002/Chemosphere47,%20333.pdf)

Abstract: A fixed-bed study was carried out by using cells of *Pseudomonas aeruginosa* immobilized in polyacrylamide gel as a biosorbent for the removal of lanthanide (La, Eu, Yb) ions from aqueous solutions. The effects of superficial liquid velocity based on empty column, particle size, influent concentration and bed depth on the lanthanum breakthrough curves were investigated. Immobilized biomass effectively removed lanthanum from a 6 mM solution with a maximum adsorption capacity of 342 μmol g−1 (±10%) corresponding closely to that observed in earlier batch studies with free bacterial cells. The Bohart and Adams sorption model was employed to determine characteristic parameters useful for process design. Results indicated that the immobilized cells of P. aeruginosa enable removal of lanthanum, europium and ytterbium ions from aqueous effluents with significant and similar maximum adsorption capacities. Experiments with a mixed cation solution showed that the sequence of preferential biosorption was Eu3+≥Yb3+>La3+. Around 96±4% of the bound lanthanum was desorbed from the column and concentrated by eluting with a 0.1 M EDTA solution. The feasibility of regenerating and reusing the biomass through three adsorption/desorption cycles was suggested. Neural networks were used to model breakthrough curves performed in the dynamic process. The ability of this statistical tool to predict the breakthrough times was discussed.

Keywords: Adsorption, Lanthanides, Immobilized Cells, Neural Network

? Jiang, J.Q., Cooper, C. and Ouki, S. (2002), Comparison of modified montmorillonite adsorbents - Part I: preparation, characterization and phenol adsorption. *Chemosphere*, **47** (7), 711-716.

Full Text: [2002\Chemosphere47, 711.pdf](2002/Chemosphere47,%20711.pdf)

Abstract: This study concerns with the development of modified montmorillonites as adsorbents for water treatment. Polymeric aluminium and iron intercalated forms of montmorillonites have been prepared in the absence and presence of an alkylammonium cationic surfactant (Hexdecyl-trimethyl-ammonium bromide, HDTMA). Montmorillonites intercalated with polymeric Al, Fe, Fe/Al (2:1 Fe to Al ratio in solution), possess large N-2 Brunauer-Emmett-Teller (BET) surface areas. XRD data also shows trace amounts of illite and plagioclase within the clay materials. Montmorillonites intercalated with HDTMA, polymeric Fe/HDTMA, polymeric Al/HDTMA and polymeric Fe/Al/HDTMA (1:1 metal to surfactant molar ratio in solution) undergo some losses of N-2 BET surface areas. Preliminary adsorption studies on phenol have shown that polymeric Al/HDTMA- and HDTMA-only-modified montmorillonites possess a good affinity for phenol, whereas the polymeric Al/Fe modified- and starting montmorillonites have little affinity for phenol adsorption. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Acidity, Adsorption, Cationic Surfactant, Characterization, Clay, Coagulant, Development, Iron, Materials, Modification, Montmorillonite, Phenol, Pilcs, Pillared Clays, Polymeric, Polymeric Al, Fe, Sorption, Surfactant, Surfactants, Treatment, Water, Water Treatment, Xrd

Notes: highly cited

? Li, A.M., Zhang, Q.X., Zhang, G.C., Chen, J.L., Fei, Z.H. and Liu, F.Q. (2002), Adsorption of phenolic compounds from aqueous solutions by a water-compatible hypercrosslinked polymeric adsorbent. *Chemosphere*, **47** (9), 981-989.

Full Text: [2002\Chemosphere47, 981.pdf](2002/Chemosphere47,%20981.pdf)

Abstract: A water-compatible hypercrosslinked polymeric adsorbent (NJ-8) for adsorbing and removing phenolic compounds from their aqueous solutions was prepared. This product can be used directly without a wetting process. Its adsorption property toward four phenolic compounds, phenol, p-cresol, p-chlorophenol, and p-nitrophenol was tested using the commercial Amberlite XAD-4 as a reference. The capacities of equilibrium adsorption for all four phenolic compounds on the NJ-8 from their aqueous solutions are around two times as high as that of Amberlite XAD-4 within the temperature range 283-323 K, which may contribute to their micropore structure and the partial polarity on the network. Freundlich isotherm equations, as well as relative adsorption capacities and isosteric adsorption enthalpies for the four phenolic compounds, indicate that the adsorption of phenolic compounds on the NJ-8 resin is a physical adsorption process. Mini-column adsorption studies for phenol on Amberlite XAD-4 and NJ-8 resins show that the breakthrough adsorption capacities are 0.54 and 0.99 mmol/ml, and the total capacities are 0.62 and 1.37 mmol/ml, while no extra acetone was needed to remove the adsorbed phenol from NJ-8 as from Amberlite XAD-4. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Hypercrosslinked Polymeric Adsorbent, Phenolic Compound, Adsorption, Synthesis, Adsorption Enthalpy, Solid-Phase Extraction, Naphthalene Derivatives, Sorption, Resins, Polystyrene, Copolymers

Kaewsarn, P. (2002), Biosorption of copper(II) from aqueous solutions by pre-treated biomass of marine algae *Padina* sp. *Chemosphere*, **47** (10), 1081-1085.

Full Text: [2002\Chemosphere47, 1081.pdf](2002/Chemosphere47,%201081.pdf)

Abstract: Biosorption of heavy metals can be an effective process for the removal and recovery of heavy metal ions from aqueous solutions. The biomass of marine algae has been reported to have high uptake capacities for a number of heavy metal ions. In this paper, the adsorption properties of a pre-treated biomass of marine algae *Padina* sp. for copper(II) were investigated. Equilibrium isotherms and kinetics were obtained from batch adsorption experiments. The biosorption capacities were solution pH dependent and the maximum capacity obtained was 0.80 mmol/g at a solution pH of about 5. The biosorption kinetics was found to be fast, with 90% of adsorption within 15 min and equilibrium reached at 30 min. The effects of light metal ions on copper(II) uptake were studied and the presence of light metal ions did not affect copper(II) uptake significantly. Fixed-bed breakthrough curves for copper(II) removal were also obtained. This study demonstrated that the pre-treated biomass of *Padina* sp. could be used as an effective biosorbent for the treatment of copper(II) containing wastewater streams.

Keywords: Biosorption, Copper(II), Marine Algae, *Padina* sp., Wastewater Treatment

? Salvestrini, S., Di Cerbo, P. and Capasso, S. (2002), Kinetics of the chemical degradation of diuron. *Chemosphere*, **48** (1), 69-73.

Full Text: [2002\Chemosphere48, 69.pdf](2002/Chemosphere48,%2069.pdf)

Abstract: The influence of pH and buffer concentration on the chemical degradation of diuron in water has been analysed over a wide temperature range. The process irreversibly gives 3,4-dichloroaniline as the only product containing the phenyl ring. H+, OH- and phosphate buffer are efficient catalysts of the reaction. The rate constant first increases rapidly at low buffer concentrations and then gradually levels off at higher ones. At 40 degreesC and high phosphate concentration (>0.01 M), or in the extreme pH regions, the half-life is approximately 4 months and the activation energy is 127 2 U mol-1. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activation, Activation Energy, Biodegradation, Buffer, Catalysts, Chemical, Concentration, Concentrations, Degradation, Diuron, Energy, Half-Life, Herbicide, Levels, Low, OH, OH-, Pesticide Degradation, Pesticide Hydrolysis, pH, Phenylurea Herbicide, Phosphate, Phosphate Buffer, Process, Range, Rate Constant, Reaction, Soil, Temperature, Water

Srinath, T., Verma, T., Ramteke, P.W. and Garg, S.K. (2002), Chromium(VI) biosorption and bioaccumulation by chromate resistant bacteria. *Chemosphere*, **48** (4), 427-435.

Full Text: [2002\Chemosphere48, 427.pdf](2002/Chemosphere48,%20427.pdf)

Abstract: In this study, strains that are capable of bioaccumulating Cr(VI) were isolated from treated tannery effluent of a common effluent treatment plant. The Cr(VI) concentration in this treated effluent was 0.96 mg/l, much above the statutory limit of 0.1 mg/l for discharge of industrial effluents into inland surface waters in India. In addition to the bioaccumulation, biosorption capabilities of living and dead cells were analysed. Two strains, identified as *Bacillus circulans* and *Bacillus megaterium* were able to bioaccumulate 34.5 and 32.0 mg Cr/g dry weight, respectively and brought the residual concentration of Cr(VI) to the permissible limit in 24 h when the initial concentration was 50 mg Cr(VI)/l. Our experimental design accounts for initial as well as final residual concentration of heavy metal while selecting heavy metal accumulating strains during batch studies. Biosorption of Cr(VI) was shown by *B. megaterium* and an another strain, *B. coagulans*. Living and dead cells of *B. coagulans* biosorbed 23.8 and 39.9 mg Cr/g dry weight, respectively, whereas, 15.7 and 30.7 mg Cr/g dry weight was biosorbed by living and dead cells of *B. megaterium*, respectively. Biosorption by the dead cells was higher than the living cells. This was due to prior pH conditioning (pH 2.5 with deionized water acidified with H*2*SO*4*) of the dead cells. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Bacillus, Bioaccumulation, Biosorption, Chromate, Resistance, Tannery

Wang, K.J. and Xing, B.S. (2002), Adsorption and desorption of cadmium by goethite pretreated with phosphate. *Chemosphere*, **48** (7), 665-670.

Full Text: [2002\Chemosphere48, 665.pdf](2002/Chemosphere48,%20665.pdf)

Abstract: The adsorption of Cd by oxides or soils have been extensively studied, however, the desorption has received relatively limited attention, especially in the presence of phosphate. In this study, a batch equilibration method was used to investigate Cd sorption and desorption by goethite pretreated with phosphate. Phosphate not only enhanced Cd adsorption, but also accelerated the adsorption process. Compared with Cd adsorption by goethite alone, phosphate substantially moved the adsorption curves (edges) to lower pH range, indicative of enhancement of Cd sorption. The Cd adsorption by the pretreated goethite reached apparent equilibrium within 24 h at 20 degreesC, while such equilibrium was not observed after 4 weeks in the absence of phosphate. Cadmium was more readily released from phosphate-treated goethite. It is believed that phosphate blocked the pores on goethite surface, which lead to the fast adsorption kinetics and high extraction percentage. These results provided strong support for the diffusion of Cd into goethite particles. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Cadmium, Adsorption, Desorption, Phosphate, Goethite, pH, Cobalt Desorption, Sorption, Kinetics, Time, Soil, Zinc, Iron, Adsorption/Desorption, Crystallinity, Temperature

Czinkota, I., Földényi, R., Lengyel, Z. and Marton, A. (2002), Adsorption of propisochlor on soils and soil components equation for multi-step isotherms. *Chemosphere*, **48** (7), 725-731.

Full Text: [2002\Chemosphere48, 725.pdf](2002/Chemosphere48,%20725.pdf)

Abstract: Static equilibrium measurements were performed for the study of propisochlor on three different kinds of soils at pH = 7.0 at 25 °C. The concentration of herbicide was changed from 30 to 300 μmol/l. The obtained two-step adsorption isotherms cannot be evaluated by using the Freundlich or Langmuir equations. New equation has been derived by making use of the usual mass balance and equilibrium relationships of the adsorption and by considering the possibility of the formation of associates of the hydrophobic solute molecules. The characteristic model parameters of each step of the adsorption isotherm were estimated for the studied systems by a non-linear least square regression. The calculated curves fit well to the experimentally obtained two-step isotherms and the parameters of the model can be used for the characterization of the pesticide–soil interactions and consequently the mobility of the propisochlor in soil/water systems.

Keywords: Adsorption, Pesticide, Two-Step Isotherm Equation, Soil–Pesticide Interaction

Orlando, U.S., Baes, A.U., Nishijima, W. and Okada, M. (2002), Preparation of agricultural residue anion exchangers and its nitrate maximum adsorption capacity. *Chemosphere*, **48** (10), 1041-1046.

Full Text: [2002\Chemosphere48, 1041.pdf](2002/Chemosphere48,%201041.pdf)

Abstract: Anion exchangers were prepared from different agricultural residues (AR) after reaction with epichlorohydrin and dimethylamine in the presence of pyridine and *N*, *N*-dimethylformamide (EDM method). Agricultural residues anion exchangers (AR-AE) produced by the EDM method were inexpensive and showed almost the same NO3- removal capacities as Amberlite IRA-900. AR-AE produced from AR with higher hemicelluloses, lignin, ash and extractive contents resulted in the lower yields. Sugarcane bagasse with the highest α-cellulose contents of 51.2% had the highest yield (225%) and lowest preparation cost. The highest maximum adsorption capacity (*Q*max) for nitrate was obtained from rice hull (1.21 mmol g-1) and pine bark natural exchangers (1.06 mmol g-1). No correlation was found between *Q*max and α-cellulose content in the original AR. AR-AE produced from different AR demonstrated comparable *Q*max due to the removal of non-active compounds such as extractives, lignin and hemicelluloses from AR during the preparation process. Similar preparation from pure cellulose and pure alkaline lignin demonstrated that the EDM method could not produce anion exchangers from pure lignin due to its solubilization after the reaction with epichlorohydrin.

Keywords: Agricultural Residues, Cellulose, Maximum Adsorption Capacity, Nitrate, Yields

Arias, M., Barral, M.T. and Mejuto, J.C. (2002), Enhancement of copper and cadmium adsorption on kaolin by the presence of humic acids. *Chemosphere*, **48** (10), 1081-1088.

Full Text: [2002\Chemosphere48, 1081.pdf](2002/Chemosphere48,%201081.pdf)

Abstract: The competitive adsorption equilibrium isotherms of Cu2+ and Cd2+ on kaolin have been measured at 298 K, in the presence and the absence of humic acids (HAs). HAs were found to enhance the metal adsorption capacity of mineral surfaces, in particular kaolin. This enhancement was also observed in the competitive adsorption of copper and cadmium on kaolin and kaolin-HA complex. This competitive adsorption shows that the presence of Cd2+ has not an important effect on Cu2+ adsorption, whereas a dramatic decrease is observed on the adsorption of Cd2+ in the presence of Cu2+. The Freundlich isotherm equation was found to provide an excellent fit to the experimental data. These results were compared with the independent adsorption of both heavy metals. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Cadmium, Copper, Kaolin, HA, Adsorption, Freundlich, Heavy-Metals, Aqueous-Solutions, Waste-Water, Sorption, Substances, Removal, Cu(II)

? Huang, K.C., Couttenye, R.A. and Hoag, G.E. (2002), Kinetics of heat-assisted persulfate oxidation of methyl *tert*-butyl ether (MTBE). *Chemosphere*, **49** (4), 413-420.

Full Text: [2002\Chemosphere49, 413.pdf](2002/Chemosphere49,%20413.pdf)

Abstract: The kinetics of heat-assisted persulfate oxidation of methyl tert-butyl ether (MTBE) in aqueous solutions at various pH, temperature, oxidant concentration and ionic strength levels was studied. The MTBE degradation was found to follow a pseudo-first-order decay model, The pseudo-first-order rate constants of MTBE degradation by persulfate (31.5 mM) at pH 7.0 and ionic strength 0.11 M are similar to0.13×10-4, 0.48×10-4, 2.4×10-4 and 5.8×10-4 s-1 at 20, 30, 40 and 50 degreesC, respectively. Under the above reaction conditions, the reaction has an activation energy of 24.5±1.6 kcal/ mol and is influenced by temperature, oxidant concentration, pH and ionic strength. Raising the reaction temperature and persulfate concentration may significantly accelerate the MTBE degradation. However, increasing both pH (over the range of 2.5-11) and ionic strength (over the range of 0.11-0.53 M) will decrease the reaction rate. Reaction intermediates including tert-butyl formate, tert-butyl alcohol, acetone and methyl acetate were observed. These intermediate compounds were also degraded by persulfate under the experimental conditions. Additionally, MTBE degradation by persulfate in a groundwater was much slower than in phosphate-buffer solutions, most likely due to the presence of bicarbonate ions (radical scavengers) in the groundwater. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Acetate, Acetone, Activation, Activation Energy, Alcohol, Anaerobic Biodegradation, Aqueous Solutions, Bicarbonate, Concentration, Decay, Degradation, Energy, Formate, Groundwater, Ionic Strength, Irradiation, Kinetics, Levels, Mechanism, Methyl Tert-Butyl Ether, Model, MTBE, MTBE Degradation, Oxidant, Oxidation, Persulfate, pH, Phosphate Buffer, Products, Radical, Range, Reaction, Reaction Rate, Solutions, Strength, TBA, TBF, Temperature, Tert-Butyl Alcohol, TiO2

Lee, J.J., Choi, J.Y. and Park, J.W. (2002), Simultaneous sorption of lead and chlorobenzene by organobentonite. *Chemosphere*, **49** (10), 1309-1315.

Full Text: [2002\Chemosphere49, 1309.pdf](2002/Chemosphere49,%201309.pdf)

Abstract: Clays or organoclays have been used as a barrier to prevent the transport of hazardous contaminants in landfills. However, clays are known to effectively sorb mostly inorganic contaminants, while organoclays are mainly used for organic contaminants. Since the organoclays are basically clay particles modified with cationic surfactants, there might exist an optimal coverage of cationic surfactant on the clay particles to sorb both inorganic and organic contaminants. In order to determine the optimal mass of cationic surfactants on the bentonites, sodium bentonites were treated with various ratios of hexadecyltrimethylammonium (HDTMA) to bentonites. Chlorobenzene and lead were selected as representative contaminants. When either chlorobenzene or lead exists as a single contaminant, chlorobenzene sorption increased with increasing HDTMA to bentonite ratios, and lead sorption decreased with increasing HDTMA to bentonite ratios. Sorption of chlorobenzene was a function of HDTMA coverage on the bentonites, while lead sorption was much more influenced by the initial lead concentration rather than the mass of HDTMA added to the bentonites. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Clay, Organoclay, Heavy Metal, Organic Contaminant, HDTMA

Wong, K.K., Lee, C.K., Low, K.S. and Haron, M.J. (2003), Removal of Cu and Pb by tartaric acid modified rice husk from aqueous solutions. *Chemosphere*, **50** (1), 23-28.

Full Text: [2003\Chemosphere50, 23.pdf](2003/Chemosphere50,%2023.pdf)

Abstract: A study on the modification of rice husk by various carboxylic acids showed that tartaric acid modified rice husk (TARH) had the highest binding capacities for Cu and Pb. The carboxyl groups on the surface of the modified rice husk were primarily responsible for the sorption of metal ions. A series of batch experiments using TARH as the sorbent for the removal of Cu and Pb showed that the sorption process was pH dependent, rapid and exothermic. The sorption process conformed to the Langmuir isotherm with maximum sorption capacities of 29 and 108 mg/g at 27±2 °C for Cu and Pb, respectively.

The uptake increased with agitation rate. Decrease in sorbent particle size led to an increase in the sorption of metal ions and this could be explained by an increase in surface area and hence binding sites. Metal uptake was reduced in the presence of competitive cations and chelators. The affinity of TARH for Pb is greater than Cu.

Keywords: Heavy Metal Removal, Rice Husk, Tartaric Acid, Modification, Sorption

Deliyanni, E.A., Bakoyannakis, D.N., Zouboulis, A.I. and Matis, K.A. (2003), Sorption of As(V) ions by akaganéite-type nanocrystals. *Chemosphere*, **50** (1), 155-163.

Full Text: [2003\Chemosphere50, 155.pdf](2003/Chemosphere50,%20155.pdf)

Abstract: A priority pollution problem, the removal of arsenate oxyanions from dilute aqueous solutions by sorption onto synthetic akaganéite (*β*-FeO(OH)) was the aim of the present study. This is an innovative inorganic adsorbent material prepared in the laboratory, following a new method of preparation. The effect of akaganéite and arsenate concentration, the contact time, temperature, solution pH value, and ionic strength variation on the treatment process was mainly investigated during this study. Typical adsorption isotherms were determined, which were found to fit sufficiently the typical Langmuir equation. The mechanism of sorption was examined by electrokinetic, X-ray diffraction, Fourier transmission infrared and scanning electron microscopy measurements. Promising results were obtained, due to the favourite characteristics of the adsorbent applied. (C) 2003 Elsevier Science B.V. All rights reserved.

Keywords: Arsenic, Arsenate, Akaganéite, Removal, Sorption, Adsorbent, Ionic Strength

Doğan, M. and Alkan, M. (2003), Adsorption kinetics of methyl violet onto perlite. *Chemosphere*, **50** (4), 517-528.

Full Text: [2003\Chemosphere50, 517.pdf](2003/Chemosphere50,%20517.pdf)

Abstract: This study examines adsorption kinetics and activation parameters of methyl violet on perlite. The effect of process parameters like contact time, concentration of dye, temperature and pH on the extent of methyl violet adsorption from solution has been investigated. Results of the kinetic studies show that the adsorption reaction is first order with respect to dye solution concentration with activation energy of 13.2 kJ mol-1. This low activation energy value indicates that the adsorption reaction is diffusion controlled. The activation parameters using Arrhenius and Eyring equations have been calculated. Adsorption increases with increase of variables such as contact time, initial dye concentration, temperature and pH. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Perlite, Methyl Violet, Activation Parameters, Kinetics of Adsorption, Dye, Intra-Particle Diffusion, Rate Constant, Activated Carbon, Organic-Chemicals, Aqueous-Solution, Reactive Dyes, Waste-Water, Mechanism, Sorption, Chitosan, Blue, Acid

Aksu, Z. and Dönmez, G. (2003), A comparative study on the biosorption characteristics of some yeasts for Remazol Blue reactive dye. *Chemosphere*, **50** (8), 1075-1083.

Full Text: [2003\Chemosphere50, 1075.pdf](2003/Chemosphere50,%201075.pdf)

Abstract: Biosorption capacities and rates of different kinds of dried yeasts (*Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, *Kluyveromyces marxianus*, *Candida* sp., C. *tropicalis*, C. *lipolytica*, C. *utilis*, C. *quilliermendii* and C. *membranaefaciens*) for Remazol Blue reactive dye from aqueous solutions were compared under laboratory conditions as a function of initial pH and initial dye concentration. Optimum initial biosorption pH was determined as 2 for all the yeasts. All the yeast species showed comparable and very high dye sorption at 100 mg/l initial dye concentration. The equilibrium sorption capacity of the biomass increased with increasing initial dye concentration up to 400 mg/l for *Candida* sp. C. *lipolytica* and C. *tropicalis*; up to 300 mg/l for C. quilliermendii and C. utilis and up to 200 mg/l for S. cerevisiae, S. pombe, K. marxianus and C. membranaefaciens while the adsorption yield of dye showed the opposite trend for all the yeasts. Among the nine yeast species, C. *lipolytica* exhibited the highest dye uptake capacity (Q0 = 250 mg/g). Both the Freundlich and Langmuir adsorption models were found suitable for describing the biosorption of the dye by all the Candida yeasts (except C. membranaefaciens). The results indicated that the dye uptake process followed the pseudo-second-order kinetics for each dye–yeast system.

Keywords: Biosorption, Remazol Blue, Reactive Dye, Yeast, Isotherms, Kinetics

Chiou, M.S. and Li, H.Y. (2003), Adsorption behavior of reactive dye in aqueous solution on chemical cross-linked chitosan beads. *Chemosphere*, **50** (8), 1095-1105.

Full Text: [2003\Chemosphere50, 1095.pdf](2003/Chemosphere50,%201095.pdf)

Abstract: A batch system was applied to study the adsorption of reactive dye (reactive red 189) from aqueous solutions by cross-linked chitosan beads. The ionic cross-linking reagent sodium tripolyphosphate was used to obtain more rigid chitosan beads. To stabilize chitosan in acid solutions, chemical cross-linking reagent epichlorohydrin (ECH), glutaraldehyde and ethylene glycol diglycidyl ether was used and ECH shows a higher adsorption capacity. The Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms at different particle sizes and isotherm constants were determined. The Langmuir model agrees very well with experimental data and its calculated maximum monolayer adsorption capacity has very large value of 1802–1840 (g/kg) at pH 3.0, 30 °C. The kinetics of the adsorption with respect to the initial dye concentration, temperature, pH, ionic strength, and wet/dry beads were investigated. The pseudo-first-order, second-order kinetic models and intraparticle diffusion model were used to describe the kinetic data and the rate constants were evaluated. The dynamical data fit well with the second-order kinetic model, except for the dry beads fitting better with the first-order model. The adsorption capacity increases largely with decreasing solution pH or with increasing initial dye concentration. Thermodynamic parameters such as change in free energy (Δ*G*0), enthalpy (Δ*H*0), entropy (Δ*S*0) and activation energy were also determined. The adsorption mechanism is shown to be the electrostatic interactions between the dye and chitosan beads. The desorption data shows that the removal percent of dye RR 189 from the cross-linked chitosan beads is 63% in NaOH solutions at pH 10.0, 30 °C. The desorbed chitosan beads can be reused to adsorb the dye and to reach the same capacity as that before desorption.

Keywords: Adsorption, Adsorption Capacity, Adsorption Rate, Behavior, Biosorption, Capacity, Chitin, Chitosan, Cross-Linking, Diffusion, Dyestuffs, Equilibrium, Experimental, Gel Beads, Isotherms, Kinetics, Macroporous Chitosan, Membranes, Model, Models, Pore Diffusion, Reactive Dye, Removal, Sorption, Temperature

Özacar, M. (2003), Adsorption of phosphate from aqueous solution onto alunite. *Chemosphere*, **51** (4), 321-327.

Full Text: [2003\Chemosphere51, 321.pdf](2003/Chemosphere51,%20321.pdf)

Abstract: The phosphate removal potential of alunite, a low cost and abundantly available material, has been investigated. The effects of calcination temperature and time of alunite, adsorbent particle size, pH and initial phosphate, concentration on the phosphate adsorption by the calcined alunite have been studied. Phosphate removal was seen to increase with increasing calcination temperature, decreasing adsorbent particle size and pH. Adsorption of phosphate followed first-order rate kinetics. Langmuir and Freundlich adsorption isotherm constants and correlation coefficients were calculated and compared. It was concluded that the adsorption data of phosphate onto calcined alunite fitted to the Langmuir model more than Freundlich model. Specific surface areas of the calcined alunite were calculated at different calcination temperatures and particle sizes. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Alunite, Phosphate Adsorption, Adsorption Isotherms, Adsorption Rate, Surface Area, Fly-Ash, Phosphorus Removal, Tnsac, Variables, Slags, Waste, Ore

Dong, D.M., Li, Y., Zhang, J.J. and Hua, X.Y. (2003), Comparison of the adsorption of lead, cadmium, copper, zinc and barium to freshwater surface coatings. *Chemosphere*, **51** (5), 369-373.

Full Text: [2003\Chemosphere51, 369.pdf](2003/Chemosphere51,%20369.pdf)

Abstract: Measurements were made regarding the adsorption of lead, cadmium, copper, zinc and barium to freshwater surface coatings (biofilms and associated minerals), which were collected in Nanhu Lake in Jilin Province, PR China, in order to investigate the variability of adsorption capacities of these heavy metals mentioned in the above surface coatings. The adsorption of lead and other heavy metals to the biofilms was observed to decrease in the following order: copper, lead, zinc, cadmium, and barium. Generally, the values of Γmax (the maximum adsorption, μmol/m2) increased with the standard electrode potential of metal elements used and were recorded as 166.7, 40.0, 29.4, 10.8, and 1.8 for copper, lead, zinc, cadmium and barium, respectively. The values of 1/Γmax increased linearly with the decrease in values of the standard electrode potential of metal elements with a significant correlation (*n*=5, *p*=0.01) and increased linearly with the increase in values of covalent radius of metal elements with a significant correlation (*n*=5, *p*=0.05). This indicates that standard electrode potential and covalent radius were two of the principal characteristics of metals employed, causing the variation of lead and other heavy metal adsorption to the surface coatings. (C) 2003 Elsevier Science B.V. All rights reserved.

Keywords: Heavy Metals, Variation in Adsorption, Biofilms, Natural Water

Calace, N., Nardi, E., Petronio, B.M., Pietroletti, M. and Tosti, G. (2003), Metal ion removal from water by sorption on paper mill sludge. *Chemosphere*, **51** (8), 797-803.

Full Text: [2003\Chemosphere51, 797.pdf](2003/Chemosphere51,%20797.pdf)

Abstract: Chromatographic columns packed with paper mill sludge are employed for metal ion recovery from water. The breakthrough curves show that cadmium, copper, lead and silver are removed from acid solutions (pH 2, 4); the affinity series is Pb(II)>Cu(II)>Ag(I)>Cd(II). Both the amount of metal retained and the metal–matrix interaction are pH dependent; the sorptive capacity increases with increasing pH. When the metals are present together at the same initial concentrations a competition among the different ions occurs although the affinity order remains unchanged. In metal recovery from the paper mill sludge column, the total amount of the cadmium and copper is displaced by HCl 1.0 M, 65% of the lead by HCl 0.1 M and 75% of the silver by HNO3 0.1 M. More than 95% of copper and lead and less than 20% of cadmium were recovered with HCl 0.1 M when the metals were present at the same time.

Keywords: Metals, Paper Mill Sludge, Sorption, Desorption

Zhang, Y., Yang, M. and Huang, X. (2003), Arsenic(V) removal with a Ce(IV)-doped iron oxide adsorbent. *Chemosphere*, **51** (9), 945-952.

Full Text: [2003\Chemosphere52, 945.pdf](2003/Chemosphere52,%20945.pdf)

Abstract: The removal of arsenic(V) by a new Ce–Fe adsorbent was evaluated under various conditions. Under an initial As(V) of 1.0 mg l-1, the adsorption capacity of the Ce–Fe absorbent was constant around a value of 16 mg g-1 over a wide pH range (3–7), while a maximum adsorption capacity of 8.3 mg g-1 was obtained over a narrow pH range around 5.5 for activated alumina, a conventional adsorbent. Kinetics of adsorption obeys a pseudo-first-order rate equation with the rate constant *K*ad as 1.84×10-3 min-1. The pattern of adsorption of As(V) by the adsorbent fitted well both the Langmuir and Freundlich models. A Langmuir *Q*0 of 70.4 mg g-1 was obtained at an initial pH of 5.0 and temperature of 20 °C, significantly higher than those of other adsorbents reported. Phosphate seriously inhibited the removal of As(V) while fluoride did not compete with As(V) even at an F/As molar ratio as high as 30, suggesting that the adsorption sites for As(V) and fluoride were different. Salinity, hardness, and other inorganic anions such as Cl-, NO3-, and SO42- had no apparent effect on As(V) adsorption. Fourier transform infrared spectra of Ce–Fe adsorbent before and after As(V) adsorption demonstrated that M–OH groups plays an important role for As(V) ions removal in the adsorption mechanisms of Ce–Fe adsorbent.

Keywords: Arsenic Removal, Adsorption, Groundwater, Iron Oxide, Cerium

Yardim, M.F., Budinova, T., Ekinci, E., Petrov, N., Razvigorova, M. and Minkova, V. (2003), Removal of mercury(II) from aqueous solution by activated carbon obtained from furfural. *Chemosphere*, **52** (5), 835-841.

Full Text: [2003\Chemosphere52, 835.pdf](2003/Chemosphere52,%20835.pdf)

Abstract: The adsorption of Hg(II) from aqueous solution at 293 K by activated carbon obtained from furfural is studied. The carbon is prepared by polymerization of furfural following carbonization and activation of the obtained polymer material with water vapor at 800 °C. Adsorption studies of Hg(II) are carried out varying some conditions: treatment time, metal ion concentration, adsorbent amount and pH. It is determined that Hg(II) adsorption follows both Langmuir and Freundlich isotherms. The adsorption capacity of the carbon is 174 mg/g. It is determined that Hg(II) uptake increases with increasing pH. Desorption studies are performed with hot water. The percent recovery of Hg(II) is 6%.

Keywords: Activated Carbon, Furfural, Mercury Adsorption

? Li, Y.M., Gu, G.W., Zhao, I., Yu, H.Q., Qiu, Y.L. and Peng, Y.Z. (2003), Treatment of coke-plant wastewater by biofilm systems for removal of organic compounds and nitrogen. Chemosphere, **52** (6), 997-1005.

Full Text: [2003\Chemosphere52, 997.pdf](2003/Chemosphere52,%20997.pdf)

Abstract: Coke-plant wastewater was treated by an anaerobic-anoxic-aerobic (A(1)-A(2)-O) biofilm system. and an anoxic-aerobic (A/O) biofilm system, respectively. At same or similar levels of hydraulic retention time (HRT), the two systems had almost identical chemical oxygen demand (COD) and NH3 removals, but a different organic-N removal. Set-up of an acidogenic stage benefited for the removal of organic-N and the A(1)-A(2)-O system was more useful for total nitrogen removal than the A-O system. HRT did not have a substantial effect. on the COD and NH3-N removal efficiencies, but considerably influenced the organic-N removal and distribution of oxidized nitrogen in the final effluent. The GC/MS analysis demonstrated that some refractory compounds were decomposed at the acidogenic stage and resulted in the production of some intermediates, which were more readily degraded in the subsequent aerobic stage. Hence, the A(1)-A(2)-O system had better effluent quality than the A-O system in terms of effluent composition. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Anaerobic Acidification, Coke Plant Wastewater, Coke-Plant Wastewater, Degradation, Denitrification, GC, MS, Nitrification, Organic Compounds, Refractory Compounds, Sequencing-Batch Reactors, Wastewater

Ng, J.C.Y., Cheung, W.H. and McKay, G. (2003), Equilibrium studies for the sorption of lead from effluents using chitosan. *Chemosphere*, **52** (6), 1021-1030.

Full Text: [2003\Chemosphere52, 1021.pdf](2003/Chemosphere52,%201021.pdf)

Abstract: The sorption of lead ions from aqueous solution onto chitosan has been studied. Equilibrium studies have been carried out to determine the capacity of chitosan for lead ions. The effects of solution pH and chitosan particle size on the sorption capacity have been studied.

The experimental data were analyzed using three equilibrium isotherm correlations, namely, Langmuir, Freundlich and Redlich–Peterson equations. The linear correlation coefficients were determined for each isotherm and the Freundlich provided the best fit. In addition, error functions have been used to determine the alternative single component equilibrium isotherm parameters by non-linear regression due to the inherent bias in using the correlation coefficient from the linearization. This technique enables the “best fit” isotherm parameters to be used in the equilibrium equations for the sorption of lead ions on chitosan within the limits and assumptions of the various error analysis methods.

Keywords: Chitosan, Lead, Adsorption

Law, W.M., Lau, W.N., Lo, K.L., Wai, L.M. and Chiu, S.W. (2003), Removal of biocide pentachlorophenol in water system by the spent mushroom compost of Pleurotus pulmonarius. *Chemosphere*, **52** (9), 1531-1537.

Full Text: [2003\Chemosphere52, 1531.pdf](2003/Chemosphere52,%201531.pdf)

Abstract: Pentachlorophenol (PCP) has been widely used as a wood preservative since 1980s. Although it has been banned worldwide, residues of PCP are still commonly found. The spent compost of oyster mushroom Pleurotus pulmonarius (SMC) which was a degraded paddy straw-based substrate, contained 25% chitin. Five percentage of the SMC could remove 89.0±0.4% of 100 mg PCP l-1 within 2 days at room temperature predominantly by biodegradation. The maximum removal capacity was 15.5±1.0 mg g-1 SMC. The sorption kinetics of PCP by SMC can be described by the Freundlich monolayer model with a theoretical sorption capacity similar to that found for chitin. A PCP-degradative bacterium was isolated from the SMC. Yet, biodegradation was predominantly contributed by the immobilized ligninolytic enzymes secreted by the mushroom to the SMC. Degradation of PCP involves dechlorination, methylation, carboxylation and ring cleavage as verified by GC-MSD and ion chromatography. Thus, the SMC has a potential for treating PCP-contaminated water. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Pentachlorophenol, Smc, Pleurotus, Degradation, Sorption, Spent Compost, Photocatalytic Degradation, Laccase, Enzymes, Bioremediation, Pollutants, Toxicity, Phenols, Fate, Soil, TiO2

Padmavathy, V., Vasudevan, P. and Dhingra, S.C. (2003), Thermal and spectroscopic studies on sorption of nickel(II) ion on protonated baker’s yeast. *Chemosphere*, **52** (10), 1807-1817.

Full Text: [2003\Chemosphere52, 1807.pdf](2003/Chemosphere52,%201807.pdf)

Abstract: Protonated form (Hy) of yeast was subjected to thermal analysis (TGA and DTG) in the temperature range 60–800 °C. Chemically bound water volatilizes around 200 °C and the matrix undergoes extensive oxidative decomposition at 450 °C, the weight loss reaching 75% at 800 °C. The sorption capacity of the matrix for nickel(II) ion increases on heat treatment from 60 to 200 °C (from 16.9 to 25.0 mg/g), but was reduced on heating to higher temperatures at an initial nickel(II) ion concentration of 1200 mg/g. The FTIR spectra of Hy and nickel(II) ion saturated yeast, indicated that biosorption occurs on the sugar and nucleic acid regions, possibly involving –COOH and –NH groups.

Keywords: Activated Carbon, Aqueous-Solution, Bacillus-Subtilis, Biosorption, Biosorption, Cell-Walls, Chlorrela-Vulgaris, FTIR Studies, Heavy-Metals, Nickel(II) Ion, *Rhizopus-Arrhizus*, *Saccharomyces-Cerevisiae*, TGA, Waste-Water, Yeast

Chuang, C.L., Chiang, P.C. and Chang, E.E. (2003), Modeling VOCs adsorption onto activated carbon. *Chemosphere*, **53** (1), 17-27.

Full Text: [2003\Chemosphere53, 17.pdf](2003/Chemosphere53,%2017.pdf)

Abstract: The activated carbon adsorption process is affected by the characteristics of adsorbent, adsorbate and environmental conditions. In this study, both adsorption and desorption processes are assumed to occur simultaneously and a numerical model was developed with a non-linear driving force in conjunction with the Langmuir model for predicting the overall adsorption process. The numerical model provides both adsorption and desorption rate constants and activation energies. The resultant equilibrium constants are of the same order of magnitude as reported by other studies. Results show that the model could well predict the adsorption isotherms and breakthrough curves under various conditions.

Keywords, Activated Carbon, VOCs, Adsorption, Desorption, Kinetics

? Jiang, J.Q. and Zeng, Z.Q. (2003), Comparison of modified montmorillonite adsorbents Part II: The effects of the type of raw clays and modification conditions on the adsorption performance. *Chemosphere*, **53** (1), 53-62.

Full Text: [2003\Chemosphere53, 53.pdf](2003/Chemosphere53,%2053.pdf)

Abstract: This paper builds on the preceding researches to study the effects of the type of clays (montmorillonites K10, KSF) and modifying conditions on the structure and adsorption behavior of resulting clay adsorbents. The raw clays were modified by polymeric Al/Fe species, hexadecyl-trimethylammonium (HDTMA) surfactant and a complex of polymeric Al/Fe-HDTMA. X-ray diffraction spectra was applied to analyze the structure of the raw and modified clays. After modification, the basal spacing of the clays varied, depending on the types of raw clay and modification conditions. Copper and phenol were selected as adsorbates for evaluating the adsorption performance of various clays, which was affected significantly by the types of raw clay and modification conditions. In general the inorganic contaminant (e.g., Cu) tend to be adsorbed by the polymeric Al/Fe modified clay and the organic impurities (e.g., phenol) will be preferably captured by the surfactant modified clay; both due to the specific surface properties resulting from introducing the modifiers. The complex modified clays possessed the ability of adsorbing both inorganic and organic contaminants. In addition, the d001 spacing of modified KSF was greater than that of K10; the adsorption performance with modified KSF was thus greater than that with the modified K10. Finally, the ratio of modifiers to the clay (metal: surfactant: clay) has been observed to affect the adsorption performance; the optimal conditions have been defined. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Aluminum, Behavior, Catalysts, Clay, Coagulant, Complex, Complexes, Contaminants, Inorganic, Modification, Montmorillonite, Organic, Organic Contaminants, Paper, Performance, Phenol, Pillared Clays, Polymeric, Polymeric Al, Fe Species, Properties, Removal, Smectite, Structure, Surface Properties, Surfactant, Water Treatment, Water-Treatment, X-Ray Diffraction

Nollet, H., Roels, M., Lutgen, P., Van der Meeren, P. and Verstraete, W. (2003), Removal of PCBs from wastewater using fly ash. *Chemosphere*, **53** (6), 655-665.

Full Text: [2003\Chemosphere53, 655.pdf](2003/Chemosphere53,%20655.pdf)

Abstract: Liquids and sludges containing polychlorinated biphenyls (PCBs) can be treated to concentrate the PCBs in a solid residue. The latter can then be handled to destroy the PCBs. A study on sorption kinetics of PCBs on fly ash was conducted in controlled batch systems. TCB and HeCB are removed at 25 °C by adsorption on fly ash up to 97% at pH 7, with an adsorbent dose of 5 g/l. An examination of the thermodynamic parameters shows that the adsorption of TCB and HeCB by fly ash is a process occuring spontaneously at ambient conditions. Activation energies for the sorption process ranged between 5.6 and 49.1 kJ/mol. It was observed that the rate at which TCB and HeCB are adsorbed onto fly ash showed a diffusion limitation. The uptake rate of TCB and HeCB increases with increasing initial concentration and gradually tends to a constant value. A decrease in the adsorption of TCB and HeCB was observed when interfering ions and other PCB congeners were present. Changing the pH in the aqueous solution from 2 to 10 had no effect on the adsorption process. Overall, fly ash can be used for an efficient removal of PCBs from several aqueous solutions.

Keywords: Polychlorinated Biphenyl, Fly Ash, Adsorption, Kinetics, Activation

Ko, D.C.K., Cheung, C.W., Choy, K.K.H., Porter, J.F. and McKay, G. (2004), Sorption equilibria of metal ions on bone char. *Chemosphere*, **54** (3), 273-281.

Full Text: [2004\Chemosphere54, 273.pdf](2004/Chemosphere54,%20273.pdf)

Abstract: The ability of bone char to adsorb three metal ions, namely, copper(II), zinc(II) and cadmium(II) ions from wastewater has been studied. Three single-component equilibrium systems and three binary equilibrium systems have been measured experimentally. The three single-component equilibrium data were analyzed using the Langmuir and the Sips equilibrium isotherm equations. The Sips isotherm gave a better fit of the experimental data than the Langmuir isotherm based on the sum of squares errors (SSE) analysis. The Cu–Zn, Cu–Cd and Cd–Zn binary equilibrium experimental data were examined by incorporating the Langmuir and the Sips isotherm equations into the ideal adsorbed solution theory (IAST). The solution methods and the predicted results for the three binary systems at different metal ion compositions have been evaluated. In addition, the application of the IAST to the model prediction for the fixed bed system is presented.

Keywords: Adsorption, Multicomponent Equilibrium Isotherm, Ideal Adsorbed Solution Theory, Copper, Cadmium, Zinc, Waste-Water, Heavy-Metals, Activated Carbon, Mass-Transfer, Fixed-Bed, Adsorption, Cadmium, Copper, Removal, Peat

Yu, Y., Zhuang, Y.Y., Wang, Z.H. and Qiu, M.Q. (2004), Adsorption of water-soluble dyes onto modified resin. *Chemosphere*, **54** (3), 425-430.

Full Text: [2004\Chemosphere54, 425.pdf](2004/Chemosphere54,%20425.pdf)

Abstract: Adsorption behavior of five kinds of water-soluble dyes onto functionalized resin NKY has been dynamically and thermodynamically investigated. The results showed that the adsorption rates of dye K-GN, K-2BP, KN-R, AAB and 2G are all controlled by liquid film diffusion and particle diffusion. Equilibrium adsorption data can be well described by three-parameter equation. The first layer adsorption is the physical enhanced by chemical effect but multilayer adsorption is typically physical adsorption. Standard free energy change Δ*G*0 and standard entropy change Δ*S*0 indicate the adsorption of the dyes onto NKY can occur spontaneously.

Keywords: Acid, Adsorption, Aqueous-Solutions, Behavior, Chemical, Chitosan, Color Removal, Cost, Diffusion, Dye, Dyes, Effluent, Energy, Entropy, Film, Kinetic and Thermodynamic, Modified Resin, Particle, Physical Adsorption, Reactive Dyes, Standard, Water-Soluble Dyes

Babel, S. and Kurniawan, T.A. (2004), Cr(VI) removal from synthetic wastewater using coconut shell charcoal and commercial activated carbon modified with oxidizing agents and/or chitosan. *Chemosphere*, **54** (3), 951-967.

Full Text: [2004\Chemosphere54, 951.pdf](2004/Chemosphere54,%20951.pdf)

Abstract: In this study, the technical feasibility of coconut shell charcoal (CSC) and commercial activated carbon (CAC) for Cr(VI) removal is investigated in batch studies using synthetic electroplating wastewater. Both granular adsorbents are made up of coconut shell (*Cocos nucifera* L.), an agricultural waste from local coconut industries. Surface modifications of CSC and CAC with chitosan and/or oxidizing agents, such as sulfuric acid and nitric acid, respectively, are also conducted to improve removal performance. The results of their Cr removal performances are statistically compared. It is evident that adsorbents chemically modified with an oxidizing agent demonstrate better Cr(VI) removal capabilities than as-received adsorbents in terms of adsorption rate. Both CSC and CAC, which have been oxidized with nitric acid, have higher Cr adsorption capacities (CSC: 10.88, CAC: 15.47 mg g-1) than those oxidized with sulfuric acid (CSC: 4.05, CAC: 8.94 mg g-1) and non-treated CSC coated with chitosan (CSCCC: 3.65 mg g-1), respectively, suggesting that surface modification of a carbon adsorbent with a strong oxidizing agent generates more adsorption sites on their solid surface for metal adsorption.

Keywords: Low Cost Adsorbent, Surface Oxidation, Nitric Acid, Sulfuric Acid, Electroplating Industry, Wastewater Treatment

Boving, T.B. and Zhang, W. (2004), Removal of aqueous-phase polynuclear aromatic hydrocarbons using aspen wood fibers. *Chemosphere*, **54** (7), 831-839.

Full Text: [2004\Chemosphere54, 831.pdf](2004/Chemosphere54,%20831.pdf)

Abstract: Roadway runoff derived polynuclear aromatic hydrocarbons (PAHs) impact the quality of surface and ground water. Inexpensive aspen wood fibers have been investigated as a means to remove dissolved PAH under laboratory conditions. Our isotherm experiments demonstrated that the uptake of naphthalene, fluorene, anthracene, and pyrene required up to 12.5 days to reach equilibrium. Aspen wood–water sorption coefficients, *K*ww, were linearly correlated to octanol–water partition coefficients and the molecular weight of the studied PAH compounds. The correlation between *K*ww and molecular weight was the most significant. Column experiments were carried out to study the sorption and desorption of fluorene, anthracene, and pyrene under dynamic conditions. The results indicate linear sorption, but non-linear desorption behavior. The degree of desorption was inversely correlated to a compound’s hydrophobicity. Flow interruption experiments showed that sorption and desorption was rate limited. A mass balance of the sorption and desorption tests indicated that sorptive uptake exceeded desorptive release over a given number of pore volumes. Further, absolute mass-removal efficiency increased with the molecular weight and hydrophobicity of the PAH compound. Batch and column studies demonstrated that aspen wood has the potential to become an effective remedial agent for PAH in stormwater runoff or other PAH contaminated waters.

Keywords: Remediation, Stormwater Runoff, Surface Water, Ground Water, Organic Contaminants

? Tarley, C.R.T. and Arruda, M.A.Z. (2004), Biosorption of heavy metals using rice milling by-products. Characterisation and application for removal of metals from aqueous effluents. *Chemosphere*, **54** (7), 987-995.

Full Text: [2004\Chemosphere54, 987.pdf](2004/Chemosphere54,%20987.pdf)

Abstract: The morphological characteristics as well as chemical composition of rice husks were evaluated by different techniques such as spectroscopy and thermogravimetry. The material, which is considered a by-product obtained from rice milling, was then investigated as a potential decontaminant of toxic heavy metals present in laboratory effluents. Studies using glass columns were carried out at room temperature employing 100 ml of synthetic solutions containing Cd(II) and Pb(II) at 100 mg l-1 in order to study the effects of pH, flow rate and particle size on Cd(II) and Pb(II) adsorption. After establishing the optimised conditions, the potentiality of rice husks for removing Cd(II) and Pb(II) ions from 100 ml of laboratory effluent, presenting concentrations before treatment of 22 and 12 mg l-1, respectively, was evaluated. The ability to take up other metals species, such as Al(III), Cu(II) and Zn(II), present in this effluent was also studied. According to the data obtained, under the optimised conditions (pH = 4.0, flow rate of 8.0 ml min-1 and less than or equal to 355 μm rice husk particle size), 30 g of husks were necessary to attain the permissible limits for effluent release, as recommend by the EPA, for those species evolved in this work (Al, Cd, Cu, Pb and Zn). (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Rice Husks, Effluent Treatment, Heavy Metals, Industrial Effluents, Silica-Gel, Ions, Biomass, Cadmium, Lead, Decontamination, Adsorption, Chromium, Chitosan

Bae, H.S., Yamagishi, T. and Suwa, Y. (2004), An anaerobic continuous-flow fixed-bed reactor sustaining a 3- chlorobenzoate-degrading denitrifying population utilizing versatile electron donors and acceptors. *Chemosphere*, **55** (1), 93-100.

Full Text: [2004\Chemosphere55, 93.pdf](2004/Chemosphere55,%2093.pdf)

Abstract: An anaerobic continuous-flow fixed-bed column reactor capable of degrading 3-chlorobenzoate (3-CBA) under denitrifying conditions was established, and its rate reached 2.26 mM d-1. The denitrifying population completely degraded 3-CBA when supplied at 0.1-0.54 mM, but its activity was partly suppressed when 3-CBA was supplied at 0.89 mM. Nitrate was concomitantly consumed throughout the operation of the reactor, the amount of which was similar to or up to 35% higher than the theoretical stoichiometric value that was calculated by assuming that 3-CBA degradation is coupled with denitrification. Batch incubation experiments proved that nitrate is strictly required for 3-CBA degradation in the absence of molecular oxygen. The population also degraded 3-CBA aerobically. Benzoate and 4-CBA were degraded under denitrifying conditions as well as 3-CBA, but 2- CBA was not. Considering that the previously reported denitrifying 3-CBA-degrading cultures do not exhibit 4-CBA degradation under denitrifying conditions, nor aerobic 3-CBA degradation [FEMS Microbiol. Lett. 144 (1996) 213, Appl. Environ. Microbiol. 66 (2000) 3446], the microbial population developed in this experiment was physiologically versatile with respect to the utilization of both electron donors and electron acceptors. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: 3-Chlorobenzoate, Anaerobic Degradation, Benzoic-Acids, Column, Degradation, Denitrification, Enrichment Culture, Fixed Bed, Fixed Bed Column, Fixed-Bed Column, Nitrate, Nitrate Reduction, Sediments, Soils, Variety

Işık, M. and Sponza, D.T. (2004), A batch kinetic study on decolorization and inhibition of Reactive Black 5 and Direct Brown 2 in an anaerobic mixed culture. *Chemosphere*, **55** (1), 119-128.

Full Text: [2004\Chemosphere55, 119.pdf](2004/Chemosphere55,%20119.pdf)

Abstract: Decolorization and inhibition kinetic characteristics of two azo dyes namely Reactive Black 5 (RB 5) and Direct Brown 2 (DB 2) were investigated with partially granulated anaerobic mixed culture using glucose (3000 mg l-1 COD) as carbon source and electron donor during batch incubation. Monod, zero-, first-, and second-order reaction kinetic models were tested in order to determine the most suitable rate model of substrate and color removal kinetic. The course of the decolorization and substrate removal process approximates to first-order kinetic model under batch conditions. Decolorization, and substrate removal were achieved effectively under test conditions but ultimate removal of azo dyes and substrate were not observed at high dye concentrations. Aromatic amine and volatile fatty acid accumulation were observed proportionally at a higher azo dye concentration. A competitive kinetic model that describes the anaerobic co-metabolism of increasing RB 5 and DB 2 dye concentrations with glucose as co-substrate has been developed based on the experimental data.

Keywords: Azo Dyes, Reactive Black 5, Direct Brown 2, Decolorization, Competitive Inhibition

Bennicelli, R., Stępniewska, Z., Banach, A., Szajnocha, K. and Ostrowski, J. (2004), The ability of *Azolla caroliniana* to remove heavy metals (Hg(II), Cr(III), Cr(VI)) from municipal waste water. *Chemosphere*, **55** (1), 141-146.

Full Text: [2004\Chemosphere55, 141.pdf](2004/Chemosphere55,%20141.pdf)

Abstract: The aim of this paper was to investigate the capacity of a small water fern, *Azolla caroliniana* Willd. (*Azollaceae*), to purify waters polluted by Hg and Cr. Many plants are capable of accumulating heavy metals (called hyperaccumulators) and one of them is the water fern *A. caroliniana*. During 12 days of the experiment the fern was grown on the nutrient solution containing Hg2+, Cr3+ and CrO42- ions, each in a concentration 0.1, 0.5 and 1.0 mg dm-3. The presence of these ions caused a 20–31% inhibition of *A. caroliniana* growth, the highest in the presence of Hg(II) ions, in comparison to the control. After day 12 of the experiment, metal contents the solution decreased to 0–0.25 mg dm-3, and this decrease comprised between 74 (Cr3+ 1.0 mg dm-3 treatment) and 100% (CrO42- 0.1 mg dm-3 treatment). The fern took a lesser quantity of the metals from 0.1 mg dm-3 treatments compared to 0.5 and 1.0 mg dm-3 treatments. In the *A. caroliniana* tissues the concentration of heavy metals under investigation ranged from 71 to 964 mg kg-1 dm; the highest level being found for Cr(III) containing nutrient solution.

Keywords: *Azolla*, Chromium, Mercury, Phytoremediation

Weber, J.B., Wilkerson, G.G. and Reinhardt, C.F. (2004), Calculating pesticide sorption coefficients (*K*d) using selected soil properties. *Chemosphere*, **55** (2), 157-166.

Full Text: [2004\Chemosphere55, 157.pdf](2004/Chemosphere55,%20157.pdf)

Abstract: Pesticide soil/solution distribution coefficients (*K*d values), commonly referred to as pesticide soil sorption values, are utilized in computer and decision aid models to predict soil mobility of the compounds. The values are specific for a given chemical in a given soil sample, normally taken from surface soil, a selected soil horizon, or at a specific soil depth, and are normally related to selected soil properties. Pesticide databases provide *K*d values for each chemical, but the values vary widely depending on the soil sample on which the chemicals were tested. We have correlated *K*d values reported in the literature with the reported soil properties for an assortment of pesticides in an attempt to improve the accuracy of a *K*d value for a specific chemical in a soil with known soil properties. Mathematical equations were developed from regression equations for the related properties. Soil properties that were correlated included organic matter content, clay mineral content, and/or soil pH, depending on the chemical properties of the pesticide. Pesticide families for which *K*d equations were developed for 57 pesticides include the following: Carboxy acid, amino sulfonyl acid, hydroxy acid, weakly basic compounds and nonionizable amide/anilide, carbamate, dinitroaniline, organochlorine, organophosphate, and phenylurea compounds. Mean *K*d values for 32 additional pesticides, many of which had *K*d values that were correlated with specific soil properties but for which no significant *K*d equations could be developed are also included.

Keywords: *K*d Value, Pesticide Sorption, Pesticide Retention, Pesticide Binding, Leaching Potential

Griffiths, R.A. (2004), Sorption and desorption by ideal two-compartment systems: Unusual behavior and data interpretation problems. *Chemosphere*, **55** (3), 443-454.

Full Text: [2004\Chemosphere55, 443.pdf](2004/Chemosphere55,%20443.pdf)

Abstract: This paper examines the current practices of fitting curves to sorption, desorption, and equilibrium data obtained from laboratory experiments. Systems of equations incorporating Freundlich isotherms and first-order kinetics for two different idealized sorbents, one “fast” and one “slow, “ were solved numerically to produce “data”. Two-compartment curves were then fit to the data by nonlinear regression, and the parameters computed by the regression are compared with the original parameters used to produce the data.

The results show that a sorbent with fast kinetics will not steadily accumulate sorbate until it reaches the equilibrium value but will overshoot equilibrium, accumulating an excess of sorbate. This overshoot will cause the sorption rates for both sorbents and the distribution between the fast and slow sorbents to be estimated incorrectly. The system may appear to be at equilibrium by external measures, but sorbate will slowly be redistributing from the fast to the slow sorbent. An isotherm constructed from data acquired during this process will have an incorrect coefficient and exponent. Consequently, the meaning of the results obtained by curve fitting may often be questionable and may say little about the phenomena occurring within the sorbate-sorbent-liquid system. Possible physical explanations for the effects observed are offered. Published by Elsevier Ltd.

Keywords: Kinetics, Isotherm, Regression, Curve Fitting, Two-Compartment, Soil, Sediment, Distributed Reactivity Model, Phase-Distribution Relationships, Hydrophobic Organic-Compounds, Intraparticle Heterogeneity, Nonequilibrium Conditions, Irreversible Adsorption, Contaminated Sediments, Natural Sediments, Kinetics, Soils

Tsai, W.T., Lai, C.W. and Hsien, K.J. (2004), Adsorption kinetics of herbicide paraquat from aqueous solution onto activated bleaching earth. *Chemosphere*, **55** (6), 829-837.

Full Text: [2004\Chemosphere55, 829.pdf](2004/Chemosphere55,%20829.pdf)

Abstract: In the present study, the activated bleaching earth was used as adsorbent for the herbicide paraquat adsorption in a batch adsorber. The rate of adsorption has been investigated under the controlled process parameters like agitation speed, initial paraquat concentration, adsorbent dosage and temperature. A batch kinetic model, based on the assumption of a pseudo-second order mechanism, has been tested to predict the rate constant of adsorption, equilibrium adsorption capacity, time of half-adsorption, and equilibrium concentration by the fittings of the experimental data. The results of the kinetic studies show that the adsorption process can be well described with the pseudo-second order equation. Based on the isotherm data obtained from the fittings of the adsorption kinetics, Freundlich model appears to fit the adsorption better than Langmuir model. In addition, the effective diffusion coefficient has also been estimated based on the restrictive diffusion model.

Keywords: Activated Bleaching Earth, Paraquat, Liquid-Phase Adsorption, Kinetic Modeling, Effective Diffusion Coefficient

Tao, Q.H. and Tang, H.X. (2004), Effect of dye compounds on the adsorption of atrazine by natural sediment. *Chemosphere*, **56** (1), 31-38.

Full Text: [2004\Chemosphere56, 31.pdf](2004/Chemosphere56,%2031.pdf)

Abstract: The overall objective of this research is to investigate competitive adsorption between atrazine (AT) and dye compounds in the natural aquatic sediment. The sorbent was sediment obtained from Guanting Reservoir (Beijing, China), which contained 25% sand, 67% silt, 8% clay, and 2.06% organic carbon. Batch adsorption experiments were conducted at various Ca2+ concentration, pH levels, temperatures, and introducing conditions of dye compounds. Compared with the dye-free system, both of dyes including Congo red (CR) and Methylene blue (MB) reduce the adsorption of atrazine over the range of dye concentrations examined, with the adsorption percentage of atrazine decreasing about 14–30%. And the competition between AT and MB is much stronger than that between AT and CR. The adsorption experimental data points have been fitted to the Freundlich equation in order to calculate the adsorption capacities (*K*f) of the samples; *K*f values range from 1.669 μmol/kg for the MB–AT sample up to 3.738 μmol/kg for the AT-alone sample. By contrast with the single-solute adsorption isotherm, both simultaneous adsorption and dye preloading inhibit the adsorption of atrazine. As for AT preloading, the impacts of CR and MB are different on the desorption of atrazine. As compared to the atrazine desorption without dye compounds, a certain amounts of atrazine molecules are replaced by MB in AT preloading system, while in CR solution AT is adsorbed strongly on the sediment and could not be replaced by CR. The result suggests that micropore constriction by CR reduces the desorption rate of atrazine.

Keywords: Dyes, Pesticide, Natural Sorbent, Competitive, Adsorption

Kang, S.Y., Lee, J.U., Moon, S.H. and Kim, K.W. (2004), Competitive adsorption characteristics of Co2+, Ni2+, and Cr3+ by IRN-77 cation exchange resin in synthesized wastewater. *Chemosphere*, **56** (2), 141-147.

Full Text: [2004\Chemosphere56, 141.pdf](2004/Chemosphere56,%20141.pdf)

Abstract: Adsorption properties of Co2+, Ni2+, and Cr3+ on an Amberlite IRN-77 cation exchange resin were investigated in batch systems. Levels of adsorption rapidly approached an equilibrium state within 1 h. The adsorption characteristics of each metal onto the resin were accurately represented by Langmuir isotherms. Co2+ and Ni2+, which have an equivalent electrovalence, displayed similar levels of adsorption onto the resin when they coexisted in the solution. However, when Cr3+ was added to the solution it competitively replaced Co2+ and Ni2+ ions that had been previously adsorbed onto the resin, resulting in the desorption of these metals into the solution. The result was likely due to a higher adsorption affinity of Cr3+ relative to Co2+ and Ni2+. This implies that interactively competitive adsorption of multi-cations onto the resin should be thoroughly considered when contemplating the efficient operation of an ion exchange process in the treatment of industrial wastewater.

Keywords: Cation Exchange Resin, Heavy Metals, Langmuir Sorption Isotherm, Competitive Adsorption

Jiang, J.Q., Zeng, Z.Q. and Pearce, P. (2004), Evaluation of modified clay coagulant for sewage treatment. *Chemosphere*, **56** (2), 181-185.

Full Text: [2004\Chemosphere56, 181.pdf](2004/Chemosphere56,%20181.pdf)

Abstract: The use of modified clays as coagulants for sewage treatment was investigated in this study. The raw clays were montmorillonites K10 and KSF, and were modified by polymeric Al or Fe and/or Al/Fe mixing polymeric species. The comparative performance of modified clays and aluminium sulphate and ferric sulphate were evaluated in terms of the removal of turbidity, suspended solids, UV254-abs, colour, and total and soluble CODs. The results demonstrated that after being modified with mixing polymeric Al/Fe species, two montmorillonite clays possess greater properties to remove the particles (as suspended solids) and organic pollutants (as COD and UV254-abs) from the sewage and to enhance the particle settling rate significantly.

Keywords: Clay, Modification, Coagulation, Sewage and Wastewater Treatment

Valix, M., Cheung, W.H. and McKay, G. (2004), Preparation of activated carbon using low temperature carbonisation and physical activation of high ash raw bagasse for acid dye adsorption. *Chemosphere*, **56** (5), 493-501.

Full Text: [2004\Chemosphere56, 493.pdf](2004/Chemosphere56,%20493.pdf)

Abstract: Activated carbons were prepared from bagasse through a low temperature (160 degreesC) chemical carbonisation treatment and gasification with carbon dioxide at 900 degreesC. The merit of low temperature chemical carbonisation in preparing chars for activation was assessed by comparing the physical and chemical properties of activated carbons developed by this technique to conventional methods involving the use of thermal and vacuum pyrolysis of bagasse. In addition, the adsorption properties (acid blue dye) of these bagasse activated carbons were also compared with a commercial activated carbon. The results suggest that despite the high ash content of the precursor, high surface areas (614-1433 m2 g-1) and microporous (median pore size from 0.45 to 1.2 nm) activated carbons can be generated through chemical carbonisation and gasification. The micropore area of the activated carbon developed from chars prepared by the low temperature chemical carbonisation provides favourable adsorption sites to acid blue dye (391 mg g-1 of carbon). The alkalinity of the carbon surface and total surface area were shown to have complementary effects in promoting the adsorption of acid blue dye. Adsorption of the anionic coloured component of the acid dye was shown to be promoted in carbon exhibiting alkaline or positively charged surfaces. This study demonstrates that activated carbons with high acid dye adsorption capacities can be prepared from high ash bagasse based on low temperature chemical carbonisation and gasification. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Gasification, Acid Dye, Adsorption, Reactive Dyes, Cane Bagasse, Removal, Anthracite, Effluent, Products

Lee, T.Y., Park, J.W. and Lee, J.H. (2004), Waste green sands as reactive media for the removal of zinc from water. *Chemosphere*, **56** (6), 571-581.

Full Text: [2004\Chemosphere56, 571.pdf](2004/Chemosphere56,%20571.pdf)

Abstract: Waste green sands are industrial byproducts of the gray iron foundry industry. These green sands are composed of fine silica sand, clay binder, organic carbon; and residual iron particles. Because of their potential sorptive and reactive properties, tests were performed to determine the feasibility of using green sands as a low cost reactive medium in permeable reactive barriers (PRBs). Serial batch kinetic tests and conventional batch sorption tests were conducted to determine the removal characteristics for zinc in aqueous solutions. Removal characteristics for zinc in the presence of green sands are comparable to those of Peerless iron, a common reactive medium used in PRBs. High removal capacities for zinc of green sands are attributed to clay, organic carbon, and residual iron particles, which are known sorptive media for heavy metals. Furthermore, high pH values in the presence of clay and residual iron particles enhanced sorption and precipitation of zinc. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Waste Green Sands, Reactive Media, Zinc, Permeable Reactive Barriers, Iron Particles, Situ Groundwater Remediation, Aqueous-Solutions, Heavy-Metals, Iron, Drainage

Sivaci, E.R., Sivaci, A. and Sökmen, W. (2004), Biosorption of cadmium by *Myriophyllum spicatum* L. and *Myriophyllum triphyllum* orchard. *Chemosphere*, **56** (11), 1043-1048.

Full Text: [2004\Chemosphere56, 1043.pdf](2004/Chemosphere56,%201043.pdf)

Abstract: The aim of this study was to characterize the biological treatment of heavy metal-contaminated water employing *Myriophyllum species*, namely *M. spicatum* L. and *M. triphyllum*. Both species were found to be capable of removing cadmium (Cd) from water; the latter significantly outperformed. *Myriophyllum species* were treated with 0, 2, 4, 6, 8, 16 mg l-1 cadmium solutions for 24, 48, 72, 96 h, respectively. Cd uptake of both species was the lowest at 2 mg l-1 and the highest at 16 mgl-1. Concentration related cadmium stress on both species exhibit significant difference on pigment levels (8-16 mg l-1). These findings contribute to the fact that submerged aquatic plants can be used for the removal of heavy metals. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Aquatic Plants, Biosorption, Cadmium Uptake, Carotenoid, Chlorophyll, Constructed Wetlands, Metal Accumulation, Macrophytes, Removal, Zinc, Acidification, Copper, Plants, Water

Chu, W., Chan, K.H., Kwan, C.Y. and Lee, C.K. (2004), The system design of UV-assisted catalytic oxidation process-degradation of 2,4-D. *Chemosphere*, **57** (3), 171-178.

Full Text: [2004\Chemosphere56, 171.pdf](2004/Chemosphere56,%20171.pdf)

Abstract: Unlike the conventional first- or second-order model, a novel approach to design for the removal of 2,4-dichlorophenoxy (2,4-D) by the UV-catalytic oxidation process (UVCOP) was investigated. Two distinctive parameters, initial decay rate and maximum oxidative capacity, were characterized. By using these parameters, the performance of the degradation of 2,4-D by UVCOP regarding to the reagent dosages could be successfully predicted. Low concentrations of ferrous ion was found to be a rate-limiting factor for the process while the dosage of hydrogen peroxide was concluded as a dominant species in determining the maximum oxidation capacities. This information can be used to optimize the treatment process and achieve the expected performance target; an “optimal-dose model” was developed accordingly. The model is an intelligent and useful tool to evaluate the optimal doses of hydrogen peroxide with the minimum dose of ferrous ion, which leads to a better design of the treatment process. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: 2,4-D, Catalytic Oxidation, Design, Fenton, Herbicide, Optimization, UV, 2,4-Dichlorophenoxyacetic Acid, Hydrogen-Peroxide, Fentons Process, Atrazine, Water, Decomposition, UV/H2O2, Reagent, Removal, H2O2

Ayranci, E. and Hoda, N. (2004), Adsorption of bentazon and propanil from aqueous solutions at the high area activated carbon-cloth. *Chemosphere*, **57** (8), 755-762.

Full Text: [2004\Chemosphere57, 755.pdf](2004/Chemosphere57,%20755.pdf)

Abstract: Removal of the pesticides bentazon and propanil from single and bisolute solutions by adsorption at the high area activated carbon-cloth was investigated. Kinetics of adsorption was followed and adsorption isotherms of the two pesticides were determined. A special V-shaped cell with an UV cuvette attached to it was used for adsorption studies. With this cell it was possible to follow the concentration of pesticide molecule by in situ UV spectroscopy as it is adsorbed at the carbon-cloth. It was found that concentration of pesticides decreased from the same initial concentration of 4.5×10-5 to 1.1×10-5 for bentazon and to 9.5×10-6 for propanil in about 2h. The fits of experimental adsorption isotherm data to Langmuir and Freundlich isotherm equations were almost equally successful. Monolayer capacities determined from Langmuir isotherms of pesticides showed that bentazon has greater monolayer capacity than propanil. This conclusion was also confirmed through the 1/n parameter of Freundlich equation. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Bentazon, Propanil, Adsorption, Carbon-Cloth, Removal, Water Treatment, Waste-Water Purification, Felt Electrodes, Removal, Electrosorption, Pesticides, Mechanisms, Behavior, Anions

Ertli, T., Marton, A. and Földényi, R. (2004), Effect of pH and the role of organic matter in the adsorption of isoproturon on soils. *Chemosphere*, **57** (8), 771-779.

Full Text: [2004\Chemosphere57, 771.pdf](2004/Chemosphere57,%20771.pdf)

Abstract: Equilibrium measurements were carried out with the herbicide isoproturon on natural adsorbents (brown forest-, chernozem-, sandy soils and quartz) in different buffered media (pH 5, 7, 8 phosphate buffer). Adsorption isotherms were fitted by a multi-step adsorption equation providing numerical information used in the environmental propagation models and risk assessment works. In the adsorption of the slightly polar isoproturon the dissolved organic matter of the soil and the pH play an important role. At molecular level, results are interpreted by taking into consideration the hydrophobic interaction and the formation of hydrogen bonds between the surface and the solute. The observed adsorption behavior indicates that the organic matter content of the soils and its soluble fulvic acid, alkaline soluble humic acid and insoluble humin fractions were considerable different. The chernozem soil containing the highest amount of insoluble organic fraction proved to be a very efficient adsorbent. The brown forest and the sandy soils exhibit rather similar adsorbent properties but at pH 7 the latter containing more fulvic acid adsorbs less isoproturon due to the enhanced solubility of the soil organic matter. In alkaline conditions the negatively charged solute and the surface repel each other and the hydrophobic interactions are also weaker than in neutral media.

Keywords: Herbicide, Hydrogen Bonding,Hydrophobic Interaction, Multiple-Step Isotherm, TOC, UV Absorbance

? Miretzky, P., Saralegui, A. and Cirelli. A.F. (2004), Aquatic macrophytes potential for the simultaneous removal of heavy metals (Buenos Aires, Argentina). *Chemosphere*, **57** (8), 997-1005.

Full Text: [2004\Chemosphere57, 997.pdf](2004/Chemosphere57,%20997.pdf)

Abstract: Heavy metal removal from water has been approached by using different technologies. Phytotechnologies, with an increasing development during the last two decades, involve using plants for metal removal. Three autochthonous floating macrophytes, common in pampean shallow lakes (Argentina), *Pista stratiotes*, *Spirodela intermedia* and *Lemna minor* were used in laboratory experiences for the simultaneously removal of several heavy metals (Fe, Cu, Zn, Mn, Cr and Pb) resulting from anthropogenic activity, in order to simulate a naturally polluted environment. The experiences were performed for different concentrations of metals along 15 days. High metal removal percentages were obtained for the 3 species and metals. *L. minor* did not survive the conditions of the experiment. High correlation between the final water and the macrophytes metal concentration was obtained, deviations were due to PbCrO4 precipitation. The rate of metal uptake was dependent on the metal concentration for the 3 species studied.

Keywords: Macrophytes, Metal Removal, Removal Rate, Pampean Shallow Lakes

Lee, C.I., Yang, W.F. and Hsieh, C.I. (2004), Removal of Cu(II) from aqueous solution in a fluidized-bed reactor. *Chemosphere*, **57** (9), 1173-1180.

Full Text: [2004\Chemosphere57, 1173.pdf](2004/Chemosphere57,%201173.pdf)

Abstract: In this study, a fluidized-bed reactor (FBR) was employed to treat copper-containing wastewater by mean of copper precipitation on the surface of sand grains. The conditions for optimum copper removal efficiency were also investigated. This technology was controlled so as to keep supersaturation low to induce the nucleated precipitation of copper coating on the sand surface in an FBR. The effects of relevant parameters, such as the pH value, the molar ratio of [C-T] to [Cu2+], hydraulic loading and the types of chemical reagents used, were examined. The experimental results indicated that 96% copper removal efficiency could be achieved when the influent copper concentration was 10 mg l-1. The optimum chemical reagent was Na2CO3; the molar ratio of [C-T]/[Cu2+] was 2, and the optimal hydraulic loading was not be more than 25 m h-1. In addition, preventing homogeneous nucleation in the FBR was an important operation parameter. Homogeneous nucleation and molecular growth would lead to undesirable microparticle formation in the effluent. A good mixture of carbonate and copper in the presence of sand grains could reduce the level of homogeneous nucleation in the bottom of the reactor. Energy dispersive analysis (EDS) of X-rays provided insight into the copper coating on the sand surface, and element analysis indicated the weight percentages of CuCO3 and Cu(OH)2 in precipitate. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Fluidized-Bed Reactor, Copper, Supersaturation, Precipitation, Homogeneous Nucleation, Waste-Water, Sludge Generation, Crystallization, Copper

Kalyani, S., Rao, P.S. and Krishnaiah, A. (2004), Removal of nickel(II) from aqueous solutions using marine macroalgae as the sorbing biomass. *Chemosphere*, **57** (9), 1225-1229.

Full Text: [2004\Chemosphere57, 1225.pdf](2004/Chemosphere57,%201225.pdf)

Abstract: In the present study biosorption technique, the passive accumulation of metals by biomass, is used for the removal of nickel from aqueous medium. The brown algae, Sargassum sp., in its natural and acid treated forms are used as a low cost sorbent. The adsorption characteristics of nickel on Sargassum sp. are evaluated as a function of time, pH, adsorbent dosage and initial concentration of nickel. The equilibrium adsorption data are fitted to Freundlich and Langmuir adsorption isotherm models and the model parameters are evaluated. Both the models represent the experimental data satisfactorily. The adsorption follows Lagergren first order kinetic model. The monolayer adsorption capacities of natural and acid treated forms of algae as obtained from Langmuir adsorption model are found to be 181 and 250 mg g-1 respectively. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Marine Algae, Sargassum sp., Biosorption, Nickel(II), Isotherm, Kinetics, Heavy-Metals, Biosorption, Adsorption, Ni(II), Carbon, Algae, Lead

Mustafa, G., Singh, B. and Kookana, R.S. (2004), Cadmium adsorption and desorption behaviour on goethite at low equilibrium concentrations: Effects of pH and index cations. *Chemosphere*, **57** (10), 1325-1333.

Full Text: [2004\Chemosphere57, 1325.pdf](2004/Chemosphere57,%201325.pdf)

Abstract: The transport and bioavailability of cadmium is governed mainly by its adsorption–desorption reactions with minerals such as goethite—a common iron oxide mineral in variable charged and highly weathered tropical soils. Soil factors such as pH, temperature, solution Cd concentration, ionic strength and ageing affect Cd adsorption on goethite. The desorption behaviour of Cd from goethite at low concentrations is not fully understood. This study investigates the adsorption–desorption of Cd at low Cd concentrations (Cd adsorbed on goethite from 20 to 300 μM Cd solutions) in Na and Ca nitrate solutions of 0.03 M nominal ionic strengths.

Synthetic goethite prepared by ageing a ferric hydroxide gel at high pH and room temperature was used for Cd adsorption and desorption studies. For desorption experiment 10 successive desorptions were made for the whole range of initial Cd concentrations (20–300 μM) in the presence of 0.01 M Ca(NO3)2 or 0.03 M NaNO3 solutions.

Cadmium adsorption was found to be higher in Na+ than Ca2+ probably due to the competition of Ca2+ ions with Cd2+ ions for adsorption sites on the surfaces of goethite. The effect of index cation on Cd adsorption diminished with increase in pH from 5.0 to 6.0. Cadmium desorption decreased with increase in pH from 5.0 to 6.0 in both Na and Ca systems. After 10 successive desorptions with 0.03 M NaNO3 at the lowest initially adsorbed Cd approximately 45%, 20% and 7% of the adsorbed Cd was desorbed at pH 5.0, 5.5 and 6.0, respectively. The corresponding desorptions in the presence of 0.01 M Ca(NO3)2 were 49%, 22% and 8%, respectively. The Freundlich parameter, *k*, based on each progressive step of desorption at different adsorbed concentration increased with increasing desorption step, which may indicates that a fraction of Cd was resistant to desorption. Low Cd desorbability from goethite may be due to its specific adsorption and/or possibly as a result of Cd entrapment in the cracks or defects in goethite structure.

Keywords: Cadmium, Adsorption, Desorption, Goethite, pH, Index Cations

Lazaridis, N.K., Bakoyannakis, D.N. and Deliyanni, E.A. (2005), Chromium(VI) sorptive removal from aqueous solutions by nanocrystalline akaganeite. *Chemosphere*, **58** (1), 65-73.

Full Text: [2005\Chemosphere58, 65.pdf](2005/Chemosphere58,%2065.pdf)

Abstract: In this study, akaganèite (β-FeO(OH)) an ironoxyhydroxide material, was used as a low-cost potential adsorbent for the removal of hexavalent chromium from aqueous solutions. The influence of agitation speed, solution pH, initial chromium concentration, sorbent concentration and temperature were evaluated at batch kinetic runs. It was shown that the solid diffusion model, in comparison to simple reaction kinetic models, described better the sorption kinetics. Freundlich and Frumkin isotherm best fitted the equilibrium results. Akaganèite presented a sorption capacity approximately 80 mg Cr(VI) g−1, under the conditions studied. Flotation was used as a downstream process for the effective removal of the loaded material.

Keywords: Akaganèite, Chromium(VI), Flotation, Isotherms, Kinetics, Sorption, Diffusion-Model, Adsorption, Kinetics, Ions, Goethite, Cr(VI), Separation, Arsenate, Metals

Zhou, C.F. and Zhu, J.H. (2005), Adsorption of nitrosamines in acidic solution by zeolites. *Chemosphere*, **58** (1), 109-114.

Full Text: [2005\Chemosphere58, 109.pdf](2005/Chemosphere58,%20109.pdf)

Abstract: Adsorption of N-nitrosopyrrolidine (NPYR) by zeolite NaZSM-5, Hβ and NaZSM-11 in acidic solution with pH of 1 was investigated. The NPYR uptake process obeyed the first-rate Lagegren kinetic equation describing adsorption, and the equilibrium data were fitted to the Langmuir or Freundlich adsorption equation. Zeolite ZSM-5, Hβ and NaZSM-11 possessed a higher adsorption capacity than amorphous silica or ordered mesoporous siliceous SBA-15, implying their potential application for adsorption of nitrosamines in gastric juice to anti-cancer.

Keywords: N-Nitrosopyrrolidine, Acidic Solution, Adsorption, Zeolite, Anti-Cancer

Gong, R.M., Ding, Y., Liu, H.J., Chen, Q.Y. and Liu, Z.L. (2005), Lead biosorption and desorption by intact and pretreated *Spirulina* *maxima* biomass. *Chemosphere*, **58** (1), 125-130.

Full Text: [2005\Chemosphere58, 125.pdf](2005/Chemosphere58,%20125.pdf)

Abstract: In order to search for locally available and untried biomaterials in China with high removal capacity of heavy metals from wastewater, the feasibility of *Spirulina maxima* as biosorbent for lead removal and recovery from aqueous solution was investigated. The lead biosorption was studied by using intact biomass and pretreated biomass of *S. maxima*. The effects of operational conditions (e.g. pH, contact time, biomass concentration etc.) on lead biosorption were investigated. The biosorption was solution pH dependent and the maximum adsorption was obtained at a solution pH of about 5.5. The adsorption equilibrium was reached in 60 min. The biosorption followed the Freundlich isotherm model. The maximum removal ratios of lead were about 84% in intact biomass and 92% in pretreated biomass. The lead adsorbed could be desorbed effectively by 0.1 M nitric acid, EDTA and hydrochloric acid. The results in this study indicated that pretreated biomass of *S. maxima* was a promising candidate for removing lead from wastewater.

Keywords: Biosorption, Desorption, Lead, Pretreatment, *Spirulina Maxima*

Rio, S., Faur-Brasquet, C., Le Coq, L., Courcoux, P. and Le Cloirec, P. (2005), Experimental design methodology for the preparation of carbonaceous sorbents from sewage sludge by chemical activation––application to air and water treatments. *Chemosphere*, **58** (4), 423-437.

Full Text: [2005\Chemosphere58, 423.pdf](2005/Chemosphere58,%20423.pdf)

Abstract: The objective of this study is to optimize experimental conditions of sorbent preparation from sewage sludge using experimental design methodology. Series of carbonaceous sorbents have been prepared by chemical activation with sulfuric acid. The sorbents produced were characterized, and their properties (surface chemistry, porous and adsorptive properties) were analyzed as a function of the experimental conditions (impregnation ratio, activation temperature and time). Carbonaceous sorbents developed from sludge allow copper ion, phenol and dyes (Acid Red 18 and Basic Violet 4) to be removed from aqueous solution as well as VOC from gas phase. Indeed, according to experimental conditions, copper adsorption capacity varies from 77 to 83 mg g−1, phenol adsorption capacity varies between 41 and 53 mg g−1 and VOC adsorption capacities (acetone and toluene) range from 12 to 54 mg g−1. Each response has been described by a second-order model that was found to be appropriate to predict most of the responses in every experimental region. The most influential factors on each experimental design response have been identified. Regions in which optimum values of each factor were achieved for preparation of activated carbons suitable for use in wastewater and gas treatments have been determined using response surfaces methodology. In order to have a high mass yield and to minimize the energetic cost of the process, the following optimal conditions, 1.5 g of H2SO4 g−1 of sludge, 700 °C and 145 min are more appropriate for use of activated carbon from sludge in water and gas treatments.

Keywords: Sewage Sludge, Valorization, Activated Carbon, Chemical Activation, Porosity, Adsorption, Pore Structure, H2S Removal, Adsorption, Carbons, Surface, Adsorbents, Waste, Pyrolysis, Fibers, Matter

? van Hullebusch, E.D., Peerbolte, A., Zandvoort, M.H. and Lens, P.N.L. (2005), Sorption of cobalt and nickel on anaerobic granular sludges: Isotherms and sequential extraction. *Chemosphere*, **58** (4), 493-505.

Full Text: [2005\Chemosphere58, 493.pdf](2005/Chemosphere58,%20493.pdf)

Abstract: The objective of this study was to investigate the sorption capacity and the fractionation of sorbed nickel and cobalt onto anaerobic granular sludges. Two different anaerobic granular sludges (non-fed, pH = 7) were loaded with nickel and cobalt in. adsorption experiments (monometal and competitive conditions). The combination of sequential extraction with the sorption isotherm analysis allowed the assessment of the sorption capacity of individual fractions present in the anaerobic granular sludges. The operational fractionation of the sorbed heavy metals was determined using a modified Tessier sequential extraction procedure. The sorption characteristics of each extracted fraction (exchangeable, carbonates, organic matter/sulfides and residual fractions) fitted well to the Langmuir model. The organic matter/sulfides fraction showed the highest affinity for cobalt and nickel in both sludges investigated compared to the other operationally defined fractions. The presence of iron negatively affected cobalt and nickel accumulation in this organic matter/sulfides fraction. The trace metals-iron sulfide interactions are likely to be the key process in controlling the distribution of cobalt and nickel during sorption onto non-fed methanogenic granules due to the high affinity of iron sulfides towards the metals studied. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Anaerobic Granular Sludge, Cobalt, Nickel, Iron, Sorption, Sequential Extraction, Heavy-Metals, Extracellular Polymers, Methanol Degradation, Divalent Metals, Blanket Reactor, Waste-Water, Adsorption, Bioreactor, Biofilms, FES

Yu, Y. and Zhou, Q.X. (2005), Adsorption characteristics of pesticides methamidophos and glyphosate by two soils. *Chemosphere*, **58** (6), 811-816.

Full Text: [2005\Chemosphere58, 811.pdf](2005/Chemosphere58,%20811.pdf)

Abstract: Contributions of organic matter and minerals in soil were evaluated by comparing changes in adsorption of methamidophos (MDP) and glyphosate (GPS) before and after removal of organic matter from argaltoll (mollisol) and typustalf (alfisol) soils. Adsorption isotherms of MDP and GPS by the two soils comforted to Freundlich equation, and the adsorption capacity of GPS by argaltoll soil was higher than that of MDP. Due to the removal of organic matter from soils, *K*f values of MDP and GPS adsorbed by argaltoll soil, which were calculated from Freundlich equations and the measure of adsorption capacity, decreased by 46.1% and 75.0%, and these by typustalf soil decreased by 34.9% and 52.5%, respectively. Results from this study suggested that soil organic matter made greater contributions to adsorption of GPS, but soil minerals could provide more available adsorption sites for MDP.

Keywords: Methamidophos, Glyphosate, Adsorptive Isotherm, Organic Matter

Adachi, A., Hamamoto, H. and Okano, T. (2005), Use of lees materials as an adsorbent for removal of organochlorine compounds or benzene from wastewater. *Chemosphere*, **58** (6), 817-822.

Full Text: [2005\Chemosphere58, 817.pdf](2005/Chemosphere58,%20817.pdf)

Abstract: Lees materials such as wheat bran, rapeseed, linseed, okara (lees of bean curd), and sakekasu (sake lees) were found to effectively adsorb organochlorine compounds. The amounts of these compounds such as chloroform, dichloromethane, and benzene adsorbed were plotted against the equilibrium concentration of substances in solution on a logarithmic scale. A linear relationship was obtained, indicating that the adsorption reactions were of the Freundlich type. When the lees materials were applied to wastewater (pH: 10) containing 0.1 g/l of dichloromethane, dichloromethane was removed from the wastewater in the range of 70–90% efficiency after 90 min. There was a high correlation between the removal efficiency and the number of spherosomes, which are intracellular particles attributed to the uptake of organochlorine compounds.

Keywords: Dichloromethane, Wheat Bran, Okara, Sakekasu, Spherosome

Notes: highly cited

? Dąbrowski, A., Podkościelny, P., Hubicki, Z. and Barczak, M. (2005), Adsorption of phenolic compounds by activated carbon: A critical review. *Chemosphere*, **58** (8), 1049-1070.

Full Text: [2008\Chemosphere58, 1049.pdf](2008/Chemosphere58,%201049.pdf)

Abstract: Adsorption of phenol and its derivatives on activated carbons is considered based on numerous papers related to this issue. Special attention is paid to the effects of carbon surface functionalities, pH of solution and heterogeneity effects that accompany adsorption of phenolic compounds. Moreover, in this paper the most important aspects are overviewed referring to irreversible adsorption of phenols and impact of different substituents of phenolic compounds on their uptake by activated carbons is considered. Finally, some remarks pertaining to applications of novel adsorbents for phenol adsorption are discussed and illustrated by means of a few examples. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Adsorption of Phenols, Activated Carbon, Irreversible Adsorption, Activated Carbon Fibers, Liquid-Phase Adsorption, Energy-Distribution Functions, Surface Functional-Groups, Dilute Aqueous-Solutions, Solute Adsorption, Irreversible Adsorption, Substituted Phenols, General Treatment, Dissolved-Oxygen, Heterogeneity

? Chakraborty, S., De, S., Das Gupta, S. and Basu, J.K. (2005), Adsorption study for the removal of a basic dye: Experimental and modeling. *Chemosphere*, **58** (8), 1079-1086.

Full Text: [2005\Chemosphere58, 1079.pdf](2005/Chemosphere58,%201079.pdf)

Abstract: An effective adsorbent is developed from saw dust and its various adsorption characteristics are studied for removing a basic dye (crystal violet) from its aqueous solution. Equilibrium data are fitted to various adsorption isotherms. It is seen that about 341 mg of crystal violet can be removed using 1 g of the adsorbent at 298 K. kinetic study is also carried out to observe the effects of various process parameters viz. particle size of the adsorbent, initial concentration of the dye, temperature and adsorbent amount. a generalized two-resistance mass transfer model, which includes a film mass transfer coefficient (k(f)) and an internal effective diffusivity (D-p), is used to interpret the adsorption kinetic data. The model parameters (k(f) and D-p) are estimated by fitting the experimental data to the model. The evaluated parameters are used to predict the concentration profiles at various other operating conditions. The average deviation of the predicted values lies within 10% in all the cases. Sensitivity analysis is performed to observe the sensitivity of the model to the variations in the model parameters. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Dye, Saw Dust, Mass Transfer Coefficient, Effective Diffusivity, Aqueous-Solutions, Activated Carbon, Barley Husk, Effluent, Adsorbent, Sawdust, Wastes, Water

Shibi, I.G. and Anirudhan, T.S. (2005), Adsorption of Co(II) by a carboxylate-functionalized polyacrylamide grafted lignocellulosics. *Chemosphere*, **58** (8), 1117-1126.

Full Text: [2005\Chemosphere58, 1117.pdf](2005/Chemosphere58,%201117.pdf)

Abstract: A new adsorbent (PGBS-COOH) having carboxylate functional group at the chain end was synthesized by graft copolymerization of acrylamide onto banana stalk, BS (*Musa Paradisiaca*) using ferrous ammonium sulphate/H2O2 redox initiator system. The efficiency of the adsorbent in the removal of cobalt [Co(II)] from water was investigated using batch adsorption technique. The adsorbent exhibits very high adsorption potential for Co(II) and under optimum conditions more than 99% removal was achieved. The maximum adsorption capacity was observed at the pH range 6.5–9.0. The equilibrium isotherm data were analysed using three isotherm models, Langmuir, Freundlich and Scatchard, to determine the best fit equation for the sorption of Co(II) on the PGBS-COOH. A comparative study with a commercial cation exchanger, Ceralite IRC-50, having carboxylate functional group showed that PGBS-COOH is 2.8 times more effective compared to Ceralite IRC-50 at 30 °C. Synthetic nuclear power plant coolant water samples were also treated by the adsorbent to demonstrate its efficiency in removing Co(II) from water in the presence of other metal ions. Acid regeneration was tried for several cycles to recover the adsorbed metal ions and also to restore the sorbent to its original state.

Keywords: Graft Copolymerization, Banana Stalk, Co(II) Removal, Adsorption Kinetics and Isotherm, Regeneration

Chojnacka, K., Chojnacki, A. and Górecka, H. (2005), Biosorption of Cr3+, Cd2+ and Cu2+ ions by blue–green algae *Spirulina* sp.: Kinetics, equilibrium and the mechanism of the process. *Chemosphere*, **59** (1), 75-84.

Full Text: [2005\Chemosphere59, 75.pdf](2005/Chemosphere59,%2075.pdf)

Abstract: The process of biosorption of heavy metal ions (Cr3+, Cd2+, Cu2+) by blue–green algae *Spirulina* sp. is discussed in this paper. *Spirulina* sp. was found to be a very efficient biosorbent. The aim of the present study was to investigate quantitatively the potential binding sites present at the surface of *Spirulina* sp., using both potentiometric titrations and adsorption isotherms. The kinetic experiments showed that the process equilibrium was reached quickly, in less than 5–10 min. It was found that the equilibrium dependence between biosorption capacity and bulk metal ion concentration could be described with Langmuir equation. This suggests that the mechanism of biosorption is rather chemisorption than physical adsorption and was further confirmed by the low surface area associated with physical adsorption and by the presence of cations that appeared in the solution after biosorption. The maximum contribution of physical adsorption in the overall biosorption process was evaluated as 3.7%. It was proposed that functional groups on the cell surface contributed to the binding of metal ions by a biosorbent via equilibrium reaction. Three functional groups capable of cation exchange were identified on the cell surface. The biomass was described as weakly acidic ion exchanger. Since deprotonation of each functional group depends on pH, the process of biosorption is strongly pH-dependent. This was confirmed in the biosorption experiments carried out at different pH. The contribution of functional groups in the biosorption process was confirmed by chemical modification of the groups. Chemically blocked groups did not show neither biosorption nor ion-exchange capabilities. It has been shown that growth conditions can affect the metal adsorption properties of microalgae. The paper also discusses desorption characteristics of the biosorbent. The criteria for desorption were high elution efficiency and preservation of biosorptive properties. Desorbent that possessed these characteristics was nitric acid.

Keywords: Algae, *Spirulina* sp., Metal Ions Biosorption, Ion-Exchange, Metal-Binding Sites, Desorption

Zhou, D.M., Hao, X.Z., Wang, Y.J., Dong, Y.H. and Cang, L.. (2005), Copper and Zn uptake by radish and pakchoi as affected by application of livestock and poultry manures. *Chemosphere*, **59** (2), 167-175.

Full Text: [2005\Chemosphere59, 167.pdf](2005/Chemosphere59,%20167.pdf)

Abstract: Environmental safety of agricultural utilization of livestock and poultry manures from intensive farming is attracting great attention because the manures often contain high concentrations of heavy metals and organic pollutants. Pot experiments, in which a pig manure (PM), a chicken manure (CM) and a commercial organic manure (OM) with different concentrations of Cu and Zn to simulate soil metal accumulation by manure application for different times were utilized in a garden soil at a rate of 2% (W/W), were conducted to study the effect of application of these livestock and poultry manures on growth of radish (*Raphanus sativus* L.) and pakchoi (*Brassica chinensis* L.) as well as their Cu and Zn uptake. The results exhibit that the manures except the PM improved the growth of radish and pakchoi. The difference of biomass among the same manure treatments containing different concentrations of Cu and Zn, however, was insignificant. In addition, application of the livestock and poultry manures significantly increased soil pHs and electric conductivities (EC) compared with the control, which is ascribed that these manures had high pH and contained large amounts of inorganic ions. The available soil Zn concentrations in the PM were higher than that in the CM and OM, and the extractable soil Cu concentrations in the three manures were almost the same after radish growth in the garden soil but were different after pakchoi growth. Zinc and Cu concentrations in the radish and pakchoi tissues increased when the soil Zn and Cu concentrations increased by manures application, but were still within a safe value. An except is the treatment PM4 in which the Zn concentration of the above-ground part of radish was 28.7 mg kg−1, exceeding the Chinese Food Hygiene Standard of 20 mg kg−1 based on fresh weight. Good correlation was obtained between the extractable soil Zn (or Cu) concentrations extracted by 1.0 mol l−1 NH4NO3 and the Zn (or Cu) concentrations in radish and pakchoi tissues, which was expected to be effective in forecasting Cu and Zn availability to radish and pakchoi in manure agronomic utilization.

Keywords: Livestock, Poultry, Manure, Plant Uptake, Heavy Metal, Radish, Pakchoi

Chojnacka, K. (2005), Equilibrium and kinetic modelling of chromium(III) sorption by animal bones. *Chemosphere*, **59** (3), 315-320.

Full Text: [2005\Chemosphere59, 315.pdf](2005/Chemosphere59,%20315.pdf)

Abstract: The paper discusses sorption of Cr(III) ions from aqueous solutions by animal bones. Animal bones were found to be an efficient sorbent with the maximum experimentally determined sorption capacity in the range 29–194 mg g−1 that depended on pH and temperature. The maximum experimentally determined sorption capacity was obtained at 50 °C, pH 5. Batch kinetics and equilibrium experiments were performed in order to investigate the influence of contact time, initial concentration of sorbate and sorbent, temperature and pH. It was found that sorption capacity increased with increase of Cr(III) concentration, temperature and initial pH of metal solution. Mathematical models describing kinetics and statics of sorption were proposed. It was found that process kinetics followed the pseudo-second-order pattern. The influence of sorbent concentration was described with Langmuir-type equation and the influence of sorbate concentration was described with empirical dependence. The models were positively verified.

Keywords: Sorption, Animal Bones, Modelling, Kinetics, Equilibrium

? Nguyen-Thanh, D., Block, K. and Bandosz, T.J. (2005), Adsorption of hydrogen sulfide on montmorillonites modified with iron. *Chemosphere*, **59** (3), 343-353.

Full Text: [2005\Chemosphere59, 343.pdf](2005/Chemosphere59,%20343.pdf)

Abstract: Sodium-rich montmorillonite was modified with iron in order to introduce active centers for hydrogen sulfide adsorption. In the first modification, interlayer sodium cations were exchanged with iron. In another modification, iron oxocations were introduced to the clay surface. The most elaborated modification was based on doping of iron within the interlayer space of aluminum-pillared clay. The modified clay samples were tested as hydrogen sulfide adsorbents. Iron-doped samples showed a significant improvement in the capacity for H2S removal, despite of a noticeable decrease in microporosity compared to the initial pillared clay. The smallest capacity was obtained for the clay modified with iron oxocations. Variations in adsorption capacity are likely due to differences in the chemistry of iron species, degree of their dispersion on the surface, and accessibility of small pores for H2S molecule. The results suggest that on the surface of iron-modified clay hydrogen sulfide reacts with Fe+3 forming sulfides or it is catalytically oxidized to SO2 on iron (hydro)oxides. Subsequent oxidation may lead to sulfate formation. (c) 2004 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Capacity, Clay, Dispersion, Fe, Hydrogen, Hydrogen Sulfide, Iron, Lead, Microporosity, Microporosity, Model, Montmorillonite, Oxidation, Pillared Clays, Pillared Clays, SO2, Sodium, Sulfate, Sulfate Formation, Sulfide, Sulfides, Transition-Metal Cations

? Vijayaraghavan, K., Jegan, J., Palanivelu, K. and Velan, A. (2005), Biosorption of copper, cobalt and nickel by marine green alga Ulva reticulata in a packed column. *Chemosphere*, **60** (3), 419-426.

Full Text: [2005\Chemosphere60, 419.pdf](2005/Chemosphere60,%20419.pdf)

Abstract: Biosorption of copper, cobalt and nickel by marine green alga Ova reticulata were investigated in a packed bed upflow column. The experiments were conducted to study the effect of important design parameters such as bed height and flow rate. At a bed height of 25 ern, the metal-uptake capacity of U. reticulata for copper, cobalt and nickel was found to be 56.3±0.24, 46.1±0.07 and 46.5±0.08 mg g-1, respectively. The Bed Depth Service Time (BDST) model was used to analyze the experimental data. The computed sorption capacity per unit bed volume (NO) was 2580, 2245 and 1911 mgl-1 for copper, cobalt and nickel, respectively. The rate constant (K-a) was recorded as 0.063, 0.081 and 0.275 l mg-1 h-1 for copper, cobalt and nickel, respectively. In flow rate experiments, the results confirmed that the metal uptake capacity and the metal removal efficiency of U reticulata decreased with increasing flow rate. The Thomas model was used to fit the column biosorption data at different flow rates and model constants were evaluated. The column regeneration studies were carried out for three sorption-desorption cycles. The elutant used for the regeneration of the biosorbent was 0.1 M CaCl2 at pH 3 adjusted using HCI. For all the metal ions, a decreased breakthrough time and an increased exhaustion time were observed as the regeneration cycles progressed, which also resulted in a broadened mass transfer zone. The pH variations during both sorption and desorption process have been reported. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Biomass, Effluent Treatment, Heavy Metals, Heavy-Metal Removal, Marine Algae, Regeneration, Thomas Model

? Kadirvelu, K., Karthika, C., Vennilamani, N. and Pattabhi, S. (2005), Activated carbon from industrial solid waste as an adsorbent for the removal of Rhodamine-B from aqueous solution: Kinetic and equilibrium studies. *Chemosphere*, **60** (8), 1009-1017.

Full Text: [2005\Chemosphere60, 1009.pdf](2005/Chemosphere60,%201009.pdf)

Abstract: The activated carbon was prepared using industrial solid waste called sago waste and physico-chemical properties of carbon were carried out to explore adsorption process. The effectiveness of carbon prepared from sago waste in adsorbing Rhodamine-B from aqueous solution has been studied as a function of agitation time, adsorbent dosage, initial dye concentration, pH and desorption. Adsorption equilibrium studies were carried out in order to optimize the experimental conditions. The adsorption of Rhodamine-B onto carbon followed second order kinetic model. Adsorption data were modeled using both Langmuir and Freundlich classical adsorption isotherms. The adsorption capacity *Q*0 was 16.12 mg g−1 at initial pH 5.7 for the particle size 125–250 μm. The equilibrium time was found to be 150 min for 10, 20 mg l−1 and 210 min for 30, 40 mg l−1 dye concentrations, respectively. A maximum removal of 91% was obtained at natural pH 5.7 for an adsorbent dose of 100 mg/50 ml of 10 mg l−1 dye concentration and 100% removal was obtained when the pH was increased to 7 for an adsorbent dose of 275 mg/50 ml of 20 mg l−1 dye concentration. Desorption studies were carried out in water medium by varying the pH from 2 to 10. Desorption studies were performed with dilute HCl and show that ion exchange is predominant dye adsorption mechanism. This adsorbent was found to be both effective and economically viable.

Keywords: Sago Waste, Adsorption Equilibrium, pH, Particle Size, Desorption

? Shin, E.W. and Rowell, R.M. (2005), Cadmium ion sorption onto lignocellulosic biosorbent modified by sulfonation: The origin of sorption capacity improvement. *Chemosphere*, **60** (8), 1054-1061.

Full Text: [2005\Chemosphere60, 1054.pdf](2005/Chemosphere60,%201054.pdf)

Abstract: Juniper (*Juniperus monosperma*), a small-diameter underutilized material, has been studied as a lignocellulosic biosorbent for removing heavy metals from water. In this study, juniper wood was modified by sulfonation to enhance sorption capacity for cadmium in water. The origin of the enhancement was investigated by observing the sorption behaviors and the change in surface functional group concentrations. Cadmium sorption by all juniper wood biosorbents studied was fast and the sorption capacity decreased with decreasing pH, similar to results found for other biosorbents. Sulfonated juniper was found to have at least twice the sorption capacity for cadmium removal from water compared to that of untreated juniper, though the sorption capacity increased with increasing pH. A slight increase in carboxylate content after sulfonation was likely responsible for a small portion of the enhancement. Elemental analysis showed an increase in sulfur content after sulfonation. Diffuse reflectance infrared Fourier transform (DRIFT) spectra showed a decrease in the band at 1660 cm−1 in the range of carbonyl groups as a result of sulfonation. This indicates that coniferaldehyde groups in the lignin of juniper wood corresponding to this band were substituted into sulfonic acid groups after sulfonation. This interpretation was supported by both the color forming reaction with phloroglucinol–hydrochloric acid and the reaction mechanisms from the acid sulfite pulping process. Consequently, the enhancement of cadmium sorption capacity of juniper wood by sulfonation mainly originated from the production of sulfonic acid groups, which are binding sites for heavy metals.

Keywords: Adsorption, Analysis, Binding, Biomass, Biosorbent, Biosorption, Cadmium, Cadmium Removal, Capacity, Carbonyl, Carboxylate, Cell-Wall, Coniferaldehyde Group, Drift, Esterification, Exchange, FT-IR, Heavy Metals, Heavy-Metal Ions, Ion, Juniper Wood, Lignin, Lignocellulosic Biosorbent, Mechanisms, Metals, pH, Production, Pulping, Range, Reaction, Reaction Mechanisms, Reflectance, Sites, Sorption, Sorption Capacity, Spectroscopy, Sulfite, Sulfonic Acid Group, Sulfur, Water, Wood

? Brás, I., Lemos, L., Alves, A. and Pereira, M.F.R. (2005), Sorption of pentachlorophenol on pine bark. *Chemosphere*, **60** (8), 1095-1102.

Full Text: [2005\Chemosphere60, 1095.pdf](2005/Chemosphere60,%201095.pdf)

Abstract: The minimization of pentachlorophenol (PCP) transport in the environment driven by industrial wastewater discharges can be accomplished by sorption in natural, available and low cost by-products like pine bark. Taking into account that PCP is a chemical which behaviour is highly dominated by the surrounding features, this work intended to evaluate the sorption kinetics and equilibrium parameters according to the pH and temperature as well as the pine bark particle size. The PCP uptake by pine bark showed to be faster in the initial phase followed by a slower process, being 24 h the suitably time to reach the sorption equilibrium in the range of pH studied. The neutral PCP species showed to have higher binding capacity to pine bark than the anionic PCP, which was reflected in a decrease in the distribution coefficient (*K*d) of the linear sorption isotherm with the increase of solution pH from 2 to 7. On the other hand, between 10 °C and 35 °C, the temperature does not seem to play a significant role in the PCP sorption by pine bark, while the sorbent size is a key parameter to enhance the overall process.

Keywords: Pentachlorophenol (PCP), Pine Bark, Sorption Equilibrium, Sorption Kinetics, Hydrophobic Ionizable Organic Compound (HIOC)

? Zhang, K., Cheung, W.H. and Valix, M. (2005), Roles of physical and chemical properties of activated carbon in the adsorption of lead ions. *Chemosphere*, **60** (8), 1129-1140.

Full Text: [2005\Chemosphere60, 1129.pdf](2005/Chemosphere60,%201129.pdf)

Abstract: Elucidation of the roles of chemical and physical properties of activated carbons is an important basis for the systematic development of adsorbents with optimal properties specific for certain applications. Such an understanding has challenged most researchers and this has been attributed with the difficulty in decoupling the effect of chemical and physical properties that characterize activated carbons. This study proposed empirical modeling in resolving the effects of individual carbon properties in lead adsorption. A model based on lead adsorption and carbon properties including total surface area, mean pore size and heteroatom concentrations has been shown to adequately describe the lead adsorption onto activated carbons prepared from bagasse. To support this investigation a series of activated carbons were prepared from bagasse by physical and by chemical activation techniques. The surface chemical properties of the carbons were inferred from carbon pH and heteroatom concentrations. The physical characterizations of the carbons included total surface area by the BET technique and mean pore size measured using the Horvath-Kawazoe equation. Adsorption tests were conducted using a low concentration of lead (5 ppm) and the solution pH was maintained at 1.0 to maintain lead speciation to the un-complexed Pb2+ ion. The adequacy of the proposed empirical models was statistically assessed. This form of analysis was shown to provide valuable information in tailor making adsorbents and selecting appropriate adsorbents for lead adsorption. (C) 2005 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Bagasse, Lead, Adsorption, Waste Utilization, Surface Area, Heteroatoms, Surface Functional-Groups, Metal-Ions, Removal, Acidity, Bagasse, Copper, Precipitation, Equilibrium, Adsorbent,Sites

? Choy, K.K.H. and McKay, G. (2005), Sorption of cadmium, copper, and zinc ions onto bone char using Crank diffusion model. *Chemosphere*, **60** (8), 1141-1150.

Full Text: [2005\Chemosphere60, 1141.pdf](2005/Chemosphere60,%201141.pdf)

Abstract: The rates of adsorption of cadmium, copper and zinc ions onto bone char have been studied in three single component systems using an agitated batch adsorber. The effects of initial metal ion solution concentration and bone char mass have been studied. The capacities of the three metals on bone char are 0.477, 0.709 and 0.505 mmol g−1 for cadmium, copper and zinc respectively which are much higher than most other adsorbents reported in the literature for these three metals. In order to model the experimental concentration decay curves, a film-surface diffusion equation proposed by Crank (1979) has been solved. The model results correlate the experimental better than a previously applied film-pore diffusion model. However, the results indicate that the surface diffusion coefficient was a variable function of initial metal ion concentration. The surface diffusivities vary from 3.00×10−9 to 8.80×10−9 cm2 s−1, 2.11×10−9 cm2 s−1 to 5.4×10−9 cm2 s−1 and 3.10×10−9 to 8.49×10−9 cm2 s−1 for cadmium, copper and zinc respectively, for metal ion solution concentrations of 2.10–5.40 mmol dm−3.

Keywords: Surface Diffusion, Crank Solution Model, Adsorption, Bone Char, Metal Ions

? Wang, S.B., Boyjoo, Y. and Choueib, A. (2005), A comparative study of dye removal using fly ash treated by different methods. *Chemosphere*, **60** (10), 1401-1407.

Full Text: [2005\Chemosphere60, 1401.pdf](2005/Chemosphere60,%201401.pdf)

Abstract: The effect of different methods for fly ash treatment using conventional chemical, sonochemical and microwave method on dye adsorption in aqueous solution was investigated. Three basic dyes, Methylene blue, crystal violet and rhodamine B, are employed for adsorption testing. It is found that fly ash shows different adsorption capacity depending on type of dyes. Chemical treatment using HCl will increase the adsorption capacity. The adsorption capacity of HCl treated fly ash varies with the preparation conditions. Microwave treatment is a fast and efficient method while producing the sample with the highest adsorption capacity. Solution pH and inorganic salts in dye solution can significantly influence the adsorption. The adsorption data have been analysed using Langmuir, Freundlich and Redlich–Peterson isotherms. The results indicate that the Freundlich and Redlich–Peterson models provide the better correlations with the experimental data.

Keywords: Fly Ash, Sonochemical Treatment, Microwave Heating, Basic Dyes, Wastewater, Adsorption

? Kwon, J.S., Yun, S.T., Kim, S.O., Mayer, B. and Hutcheon, I. (2005), Sorption of Zn(II) in aqueous solutions by scoria. *Chemosphere*, **60** (10), 1416-1426.

Full Text: [2005\Chemosphere60, 1416.pdf](2005/Chemosphere60,%201416.pdf)

Abstract: We conducted kinetic and equilibrium sorption experiments on removal of Zn(II) from aqueous solutions by scoria (a vesicular pyroclastic rock with basaltic composition) from Jeju Island, Korea, in order to examine its potential use as an efficient sorbent. The batch-type kinetic sorption tests under variable conditions indicated that the percentage of Zn(II) removal by scoria increases with decreasing initial Zn(II) concentration, particle size, and sorbate/sorbent ratio. However, the sorption capacity decreases with the decrease of the initial Zn(II) concentration and sorbate/sorbent ratio. Equilibrium sorption tests show that Jeju scoria has a larger capacity and affinity for Zn(II) sorption than commercial powdered activated carbon (PAC); at initial Zn(II) concentrations of more than 10 mM, the sorption capacity of Jeju scoria is about 1.5 times higher than that of PAC. The acquired sorption data are better fitted to the Langmuir isotherm than the Freundlich isotherm. Careful examination of ionic concentrations in sorption batches suggests that the sorption behavior is mainly controlled by cation exchange and typically displays characteristics of ‘cation sorption’. The Zn(II) removal capacity decreases when solution pH decreases because of the competition with hydrogen ions for sorption sites, while the Zn(II) removal capacity increases under higher pH conditions, likely due to hydroxide precipitation. At an initial Zn(II) concentration of 5.0 mM, the removal increases from 70% to 96% with the increase of initial pH from 3.0 to 7.0. We recommend Jeju scoria as an economic and efficient sorbent for Zn(II) in contaminated water. (C) 2005 Elsevier Ltd. All rights reserved.

Keywords: Scoria, Jeju Island, Korea, Zinc Removal, Sorption, Cation Exchange, Langmuir And Freundlich Isotherms, Heavy-Metal Ions, Organic-Matter, Removal, Adsorption, Waste, Exchange, Sludge, Oxides, Zinc, TUFF

? Bhattacharyya[a](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V74-4FVH40S-1&_user=1495547&_handle=V-WA-A-W-WA-MsSAYVA-UUW-U-AACECAEAAZ-AACDUEEEAZ-EVWDEVEB-WA-U&_fmt=summary&_coverDate=09%2F30%2F2005&_rdoc=18&_orig=browse&_srch=%23toc%235832%232005%23999399989%23603027!&_cdi=5832&view=c&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=bb040cdcd0a2aa1a4345492981f17f0b#aff1#aff1), P., Chakraborty, A., Chakrabarti[c](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V74-4FVH40S-1&_user=1495547&_handle=V-WA-A-W-WA-MsSAYVA-UUW-U-AACECAEAAZ-AACDUEEEAZ-EVWDEVEB-WA-U&_fmt=summary&_coverDate=09%2F30%2F2005&_rdoc=18&_orig=browse&_srch=%23toc%235832%232005%23999399989%23603027!&_cdi=5832&view=c&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=bb040cdcd0a2aa1a4345492981f17f0b#aff3#aff3), K., Tripathy[a](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6V74-4FVH40S-1&_user=1495547&_handle=V-WA-A-W-WA-MsSAYVA-UUW-U-AACECAEAAZ-AACDUEEEAZ-EVWDEVEB-WA-U&_fmt=summary&_coverDate=09%2F30%2F2005&_rdoc=18&_orig=browse&_srch=%23toc%235832%232005%23999399989%23603027!&_cdi=5832&view=c&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=bb040cdcd0a2aa1a4345492981f17f0b#aff1#aff1), S. and Powell, M.A. (2005), Chromium uptake by rice and accumulation in soil amended with municipal solid waste compost. *Chemosphere*, **60** (10), 1481-1486.

Full Text: [2005\Chemosphere60, 1481.pdf](2005/Chemosphere60,%201481.pdf)

Abstract: Effect of addition of municipal solid waste compost (MSWC) on chromium (Cr) content of submerged rice paddies was studied. Experiments were conducted during the three consecutive wet seasons from 1997 to 1999 on rice grown under submergence, at the Experimental Farm of Calcutta University, India. A sequential extraction method was used to determine the various chromium fractions in MSWC and cow dung manure (CDM). Chromium was significantly bound to the organic matter and Fe and Mn oxides in MSWC and CDM. Chromium content in rice straw was higher than in rice grain. Chromium bound with organic matter in MSWC best correlated with straw Cr (*r* = 0.99\*\*) followed by Fe and Mn oxides (*r* = 0.97\*) and water soluble as well as exchangeable fractions (*r* = 0.96\*). The water soluble and the exchangeable fractions in MSWC best correlated with grain Cr (*r* = 0.98\*). The Cr content of rice grain had the highest correlation with water soluble and exchangeable Cr (*r* = 0.99\*\*) while the straw Cr best correlated with the Fe and Mn oxides (*r* = 0.98\*). Both the carbonate bound and residual fractions in MSWC and CDM did not significantly correlate with rice straw and grain Cr. MSWC would be a valuable resource for agriculture if it can be used safely, but long-term use may require the cessation of the dumping by the leather tanneries and other major contributors of pollutants.

Keywords: Chromium, Municipal Solid Waste Compost, Rice, Submergence

? Turan, M., Mart, U., Yüksel, B. and Çelik, M.S. (2005), Lead removal in fixed-bed columns by zeolite and sepiolite. *Chemosphere*, **60** (10), 1487-1492.

Full Text: [2005\Chemosphere60, 1487.pdf](2005/Chemosphere60,%201487.pdf)

Abstract: The removal efficiency of zeolite (clinoptilolite) and sepiolite from lead containing aqueous solutions was investigated. A series of experiments were conducted in batch-wise and fixed-bed columns. Synthetic wastewaters containing lead (50 mg l-1) and acetic acid. (0.001 N) along with untreated and regenerated clinoptilolites and sepiolites were used in the adsorption studies. Batch tests were mainly conducted to isolate the magnitude of lead precipitation from real adsorption. Adsorption isotherms for both abstraction and adsorption were constructed. The removal of lead is found to be a sum of adsorption induced by ion exchange and precipitation of lead hydroxide. The breakthrough curves were obtained under different conditions, by plotting the normalized effluent lead concentration (C/Co) versus bed volume (BV). The ion exchange capacity of sepiolite and clinoptilolite for lead removal showed good performance up to approximately 100 and 120 BV where the C/C-o remained below 0. 1, respectively. The lead removal capacity of clinoptilolite bed from wastewater containing only lead yielded 45% higher performance compared to that of acetic acid partly due to a decrease in, the effluent pH and consequently in precipitation. Also, the presence of acetic acid in the sepiolite column decreased the bed volumes treated by about 40%. Removal efficiency of lead-acetic system both in untreated clinoptilolite and sepiolite columns was found higher than that in regenerated columns. (C) 2005 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Azo Dyes, Breakthrough Curves, Clinoptilolite, Cobalt, Fixed Bed, Ion Exchange, Lead, Removal, Sepiolite, Wastewater, Wastewater Treatment

? Namasivayam, C. and Sangeetha, D. (2005), Kinetic studies of adsorption of thiocyanate onto ZnCl2 activated carbon from coir pith, an agricultural solid waste. *Chemosphere*, **60** (11), 1616-1623.

Full Text: [2005\Chemosphere60, 1616.pdf](2005/Chemosphere60,%201616.pdf)

Abstract: The adsorption of thiocyanate onto ZnCl2 activated carbon developed from coir pith was investigated to assess the possible use of this adsorbent. The influence of various parameters such as agitation time, thiocyanate concentration, adsorbent dose, pH and temperature has been studied. Adsorption followed second-order rate kinetics. Two theoretical adsorption isotherms, namely, Langmuir and Freundlich were used to describe the experimental results. The Langmuir adsorption capacity (*Q*0) was found to be 16.2 mg g−1 of the adsorbent. The per cent adsorption was maximum in the pH range 3.0–7.0. pH effect and desorption studies showed that ion exchange and chemisorption mechanism are involved in the adsorption process. Thermodynamic parameters such as Δ*G*0, Δ*H*0 and Δ*S*0 for the adsorption were evaluated. The negative values of Δ*H*0 confirm the exothermic nature of adsorption. Effects of foreign ions on the adsorption of thiocyanate have been investigated. Removal of thiocyanate from ground water was also tested.

Keywords: Isotherms, pH Effect, Temperature Effect, Effect of Foreign Ions

? Chuang, C.L., Fan, M., Xu, M., Brown, R.C., Sung, S., Saha, B. and Huang, C.P. (2005), Adsorption of arsenic(V) by activated carbon prepared from oat hulls. *Chemosphere*, **61** (4), 478-483.

Full Text: [2005\Chemosphere61, 478.pdf](2005/Chemosphere61,%20478.pdf)

Abstract: The efficiency of self-manufactured activated carbon (AC) produced from oat hulls in adsorbing arsenic(V) was tested in a batch reactor. The results indicated that the adsorptive capacity of AC was affected by initial pH value, with adsorption capacity decreasing from 3.09 to 1.57 mg As g−1 AC when the initial pH values increased from 5 to 8. A modified linear driving force model conjugated with a Langmuir isotherm was created to describe the study’s kinetics. The test results show that rapid adsorption and slow adsorption exist simultaneously when AC is used to remove arsenic(V).

Keywords: Arsenic, Activated Carbon, Adsorption, Oat Hulls

? Mall, I.D., Srivastava, V.C., Agarwal, N.K. and Mishra, I.M. (2005), Removal of Congo red from aqueous solution by bagasse fly ash and activated carbon: Kinetic study and equilibrium isotherm analyses. *Chemosphere*, **61** (4), 492-501.

Full Text: [2005\Chemosphere61, 492.pdf](2005/Chemosphere61,%20492.pdf)

Abstract: Present investigation deals with the utilisation of bagasse fly ash (BFA) (generated as a waste material from bagasse fired boilers) and the use of activated carbons—commercial grade (ACC) and laboratory grade (ACL), as adsorbents for the removal of congo red (CR) from aqueous solutions. Batch studies were conducted to evaluate the adsorption capacity of BFA, ACC and ACL and the effects of initial pH (pH0), contact time and initial dye concentration on adsorption. The pH0 of the dye solution strongly affected the chemistry of both the dye molecules and BFA in an aqueous solution. The effective pH0 was 7.0 for adsorption on BFA. Kinetic studies showed that the adsorption of CR on all the adsorbents was a gradual process. Equilibrium reached in about 4 h contact time. Optimum BFA, ACC and ACL dosages were found to be 1, 20 and 2 g l−1, respectively. CR uptake by the adsorbents followed pseudo-second-order kinetics. Equilibrium isotherms for the adsorption of CR on BFA, ACC and ACL were analysed by the Freundlich, Langmuir, Redlich–Peterson, and Temkin isotherm equations. Error analysis showed that the R–P isotherm best-fits the CR adsorption isotherm data on all adsorbents. The Freundlich isotherm also shows comparable fit. Thermodynamics showed that the adsorption of CR on BFA was most favourable in comparison to activated carbons.

Keywords: Dye removal, Bagasse Fly Ash, BFA, Congo Red, CR, Adsorption Kinetics, Isotherms, Error Analyses

? Cai, J.G., Li, A.M., Shi, H.Y., Fei, Z.H., Long, C and Zhang, Q.X. (2005), Equilibrium and kinetic studies on the adsorption of aniline compounds from aqueous phase onto bifunctional polymeric adsorbent with sulfonic groups. *Chemosphere*, **61** (4), 502-509.

Full Text: [2005\Chemosphere61, 502.pdf](2005/Chemosphere61,%20502.pdf)

Abstract: In the present study, a hydrophilic bifunctional polymeric resin (LS-2) with sulfonic groups was synthesized, and the adsorption performance of three aniline compounds, aniline, 4-methylaniline, and 4-nitroaniline onto LS-2 was compared with that on the commercial Amberlite XAD-4. The uptake of the aniline compounds on LS-2 is a procedure of coexistence of physisorption and chemisorption and obeys the pseudo-second order rate equation, while the uptake of the compounds on XAD-4 is merely a physical adsorption and follows the pseudo-first order rate equation. All the isothermal data fit well with the Freundlich model, and the values of *K*F of the compounds adsorbing on LS-2 are much higher than those on XAD-4 suggesting the higher adsorbing capacities on LS-2 than those on XAD-4, which may be attributed to the microporous structure and the polar groups on the network of LS-2 resin. Dynamic adsorption and desorption studies for aniline on LS-2 show that the breakthrough adsorption capacity and the total adsorption capacity are 0.96 and 1.24 mmol per milliliter resin, respectively. Nearly 100% regeneration efficiency for the adsorbent was achieved by 5% hydrochloric acid.

Keywords: Adsorption, Bifunctional Polymeric Adsorbent, Aniline, Kinetics, Coexistence

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Full Text: [2005\Chemosphere61, 510.pdf](2005/Chemosphere61,%20510.pdf)

Abstract: The potential of loofa sponge discs to immobilize fungal biomass of *Phanerochaete chrysosporium* (a known biosorbent) was investigated as a low cost biosorbent for the removal of Cd(II) ions from aqueous solution. A comparison of the biosorption of Cd(II) by immobilized and free fungal biomass from 10 to 500 mg l−1 aqueous solutions showed an increase in uptake of over 19% when the biomass is immobilized (maximum biosorption capacity of 89 and 74 mg Cd(II) g−1 biomass for immobilized and free biomass respectively at a solution pH of 6). Equilibrium was established within 1 h and biosorption was well defined by the Langmuir isotherm model. The immobilized biomass could be regenerated using 50 mM HCl, with up to 99% metal recovery and reused in ten biosorption–desorption cycles without significant loss of capacity. This study suggests that such an immobilized biosorbent system has the potential to be used in the industrial removal/recovery of cadmium and other pollutant metal ions from aqueous solution.

Keywords: Immobilization, Biosorption, Cadmium, Loofa Sponge, *Phanerochaete Chrysosporium*, Fixed-Bed Bioreactor

? Ciani, A., Goss, K.U. and Schwarzenbach, R.P. (2005), Determination of molar absorption coefficients of organic compounds adsorbed in porous media. *Chemosphere*, **61** (10), 1410-1418.

Full Text: [2005\Chemosphere61, 1410.pdf](2005/Chemosphere61,%201410.pdf)

Abstract: The kinetics of direct photochemical transformations of organic compounds in light absorbing and scattering media has been sparsely investigated. This is mostly due to the experimental difficulties to assess the major parameters: light intensity in porous media, the reaction quantum yield and the molar absorption coefficient of the adsorbed compound, *εi*(*λ*). Here, we propose a method for the determination of the molar absorption coefficient of compounds adsorbed to air-dry surfaces using the Kubelka–Munk model for the description of radiative transfer. To illustrate the method, the molar absorption coefficients of three compounds, i.e. 4-nitroanisole (PNA), the herbicide trifluralin and the flame retardant decabromodiphenyl ether (DecaBDE), were determined on air-dry kaolinite. The measured diffuse reflectance spectra were evaluated with the Kubelka–Munk model and with previously determined Kubelka–Munk absorption and scattering coefficients (*k* and *s*), for kaolinite. For all compounds the maximum absorption band was found to be red shifted and the corresponding *εi*(*λ*) values were significantly greater than those determined in solvents. Together with the absorption and scattering coefficient of the medium, the measured *εi*(*λ*) can be used to determine the quantum yield of the photochemical reaction in this medium from experimentally determined reaction kinetics.

Keywords: Photolysis, Kubelka–Munk, Trifluralin, 4-Nitroanisole, Decabromodiphenyl ether, Kaolinite, Integrating sphere, Diffuse reflectance

? Rahman, Md.M. and Worch, E. (2005), Nonequilibrium sorption of phenols onto geosorbents: The impact of pH on intraparticle mass transfer. **61** (10), 1419-1426.

Full Text: [2005\Chemosphere61, 1419.pdf](2005/Chemosphere61,%201419.pdf)

Abstract: While the pH effect on sorption equilibrium of weak acids on natural sorbents was investigated in a number of studies, less is known about the pH dependence of sorption kinetics. This paper investigates the impact of pH on sorption kinetics during the transport of some selected phenols through a sandy aquifer material. Breakthrough curves measured in column experiments were analyzed using a mass transfer based nonequilibrium model designated as dispersed flow, film and particle diffusion model (DF-FPDM). In this model, the rate limiting intraparticle diffusion is characterized by the mass transfer coefficient, *k*S*a*V, which can be determined from breakthrough curves by curve fitting. The experimental results indicate that the *k*S*a*V is pH-dependent and inversely correlated with the pH-dependent distribution coefficient, *K*d,app. Regression equations are presented that may be used to estimate approximate values of intraparticle mass transfer coefficients on the basis of experimentally determined or LFER predicted distribution coefficients.

Keywords: Geosorbents, Nonequilibrium Sorption, Phenols, Intraparticle Mass Transfer, pH-Dependent Sorption, LFER

? Metts, T.A. and Batterman, S.A. (2006), Effect of VOC loading on the ozone removal efficiency of activated carbon filters. *Chemosphere*, **62** (1), 34-44.

Full Text: [2006\Chemosphere62, 34.pdf](2006/Chemosphere62,%2034.pdf)

Abstract: Activated carbon (AC) filters are used widely in air cleaning to remove volatile organic compounds (VOCs) and ozone (O3). This paper investigates the O3 removal efficiency of AC filters after previous exposure to VOCs. Filter performance was tested using coconut shell AC and two common indoor VOCs, toluene and d-limonene, representing low and high reactivities with O3. AC dosed with low, medium and high loadings (28-100% of capacity) of VOCs were exposed to humidified and ozonated air. O3 breakthrough curves were measured, from which O3 removal capacity and parameters of the Elovich chemisorption equation were determined. VOC-loaded filters were less efficient at removing O3 and had different breakthrough behavior than unloaded filters. After 80 h of exposure, VOC-loaded AC samples exhibited 75-95% of the O3 removal capacity of unloaded samples. O3 breakthrough and removal capacity were not strongly influenced by the VOC-loading rate. Toluene-loaded filters showed rapid O3 breakthrough due to poisoning of the AC, while pseudo-poisoning (initially higher O3 adsorption rates that rapidly decrease) is suggested for limonene-loaded filters. Overall, VOC loadings provide an overall reduction in chemisorption rates, a modest reduction in O3 removal capacity, and sometimes dramatic changes in breakthrough behavior, important considerations in filter applications in environments where both O3 and VOCs are present. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Air Quality, Filter, Limonene, Ozone, Poisoning, Volatile Organic Compounds, Oxidation, Air, Chemisorption, Adsorption, Ozonation, Charcoal

? Kuzawa, K., Jung, Y.J., Kiso, Y., Yamada, T., Nagai, M. and Lee, T.G. (2006), Phosphate removal and recovery with a synthetic hydrotalcite as an adsorbent. *Chemosphere*, **62** (1), 45-52.

Full Text: [2006\Chemosphere62, 45.pdf](2006/Chemosphere62,%2045.pdf)

Abstract: Phosphate removal is important to control eutrophication and an ion exchange process is one of several treatment processes for this purpose. Hydrotalcite compounds (HTALs) are useful as adsorbents for phosphate removal because of their ion exchange properties. In this study, the adsorption properties of a granular synthetic HTAL for phosphate and the method of regeneration of the granular HTAL were examined. The adsorption isotherm of the granular HTAL was approximated by a modified Langmuir type, and the maximum adsorption capacity was 47.3 mg P g−1, which corresponded to the content of HTAL in the granular one. Phosphate adsorbed on the HTAL was effectively desorbed with alkaline NaCl solutions and the HTAL was regenerated with 25 w/v% MgCl2 solution. The regenerated HTAL could be reused repeatedly for the phosphate removal. Phosphate in the exhausted desorption solution was recovered as a precipitate of calcium phosphate by addition of CaCl2, and the residual exhausted desorption solution could be also reused after supplying NaOH. The results suggest the possibility of an effective system for phosphate removal and recovery, which includes the following processes: adsorption, desorption, recovery of phosphate, and regeneration of the HTAL and the desorption solution.

Keywords: Hydrotalcite (HTAL), Phosphate Removal, Phosphate Recovery, Regeneration, Human Excreta Treatment Facility

? Miretzky, P., Saralegui, A. and Cirelli, A.F. (2006), Simultaneous heavy metal removal mechanism by dead macrophytes. *Chemosphere*, **62** (2), 247-254.

Full Text: [2006\Chemosphere62, 247.pdf](2006/Chemosphere62,%20247.pdf)

Abstract: The use of dead, dried aquatic plants, for water removal of metals derived from industrial activities as a simple biosorbent material has been increasing in the last years. The mechanism of simultaneous metal removal (Cd2+, Ni2+, Cu2+, Zn2+ and Pb2+) by 3 macrophytes biomass (*Spirodela intermedia*, *Lemna minor* and *Pistia stratiotes*) was investigated. *L. minor* biomass presented the highest mean removal percentage and *P. stratiotes* the lowest for all metals tested. Pb2+ and Cd2+ were more efficiently removed by the three of them. The simultaneous metal sorption data were analysed according to Langmuir and Freundlich isotherms. Data fitted the Langmuir model only for Ni and Cd, but Freundlich isotherm for all metals tested, as it was expected. The *K*F values showed that Pb was the metal more efficiently removed from water solution. The adsorption process for the three species studied followed first order kinetics. The mechanism involved in biosorption resulted ion exchange between monovalent metals as counter ions present in the macrophytes biomass and heavy metal ions and protons taken up from water. No significant differences were observed in the metal exchange amounts while using multi-metal or individual metal solutions.

Keywords: Dead Macrophytes, Heavy Metal Removal, Ionic Exchange, Metal Adsorption

? Selcuk, H., Sarikaya, H.Z., Bekbolet, M. and Anderson, M.A. (2006), Bromate formation on the non-porous TiO2 photoanode in the photoelectrocatalytic system. *Chemosphere*, **62** (5), 715-721.

Full Text: [2006\Chemosphere62, 715.pdf](2006/Chemosphere62,%20715.pdf)

Abstract: The increasing use of ozone in water disinfection processes has been the focus of considerable concern in regards to inorganic disinfection by product formation of bromate in waters containing bromide. Due to the public health risk caused by the presence of bromate as a suspected carcinogen, attention had been addressed to the conditions under which bromate is formed. In this study, photoanodic bromine generation and bromate (BrO3-) formation were investigated using a TiO2 electrode in a photoelectrocatalytic (PEC) treatment process. The separation of anodic and cathodic reactions in the PEC system resulted in a pH decrease from 9.3 to 3.0 in the photoanode compartment and an increase to 11.0 in the cathode compartment. Under a photo-illumination intensity of 5.7 mW cm−2 UV, a biasing potential of +1.0 V vs SCE, a pH of 6.0 and at a NaBr concentration of 1.0×10−2 M, active bromine formation increased over time with 2.4×10−6 M min−6 rate and reached a steady-state concentration of 1.44×10−4 M in 60 min. Bromate formation was detected after a lag-period of 15 min and exhibited a continuous increasing trend with respect to irradiation time. No bromate formation was observed below pH 6.5 whereas an increasing bromate concentrations and pH up to pH = 8.5 were noted.

Keywords: Photoelectrocatalytic, Titanium Dioxide, Photoanode, By-Product; Bromine Generation, Bromate Formation

? Geng, C.N., Zhu, Y.G., Tong, Y.P., Smith, S.E. and Smith, F.A. (2006), Arsenate (As) uptake by and distribution in two cultivars of winter wheat (*Triticum aestivum* L.). *Chemosphere*, **62** (4), 608-615.

Full Text: [2006\Chemosphere62, 608.pdf](2006/Chemosphere62,%20608.pdf)

Abstract: Two cultivars of winter wheat (*Triticum aestivum* L.) (Jing 411 and Lovrin 10) were used to investigate arsenate (As) uptake and distribution in plants grown in hydroponic culture and in the soil. Results showed that without As addition, Lovrin 10 had higher biomass than Jing 411 in the soil pot experiment; in the hydroponic experiment Lovrin 10 had similar root biomass to and lower shoot biomass than Jing 411. Increasing P supply from 32 to 161 μM resulted in lower tissue As concentrations, and increasing As supply from 0 to 2000 μM resulted in lower tissue P concentrations. Increasing P supply tended to increase shoot-to-root ratios of As concentrations, and increasing As supply tended to decrease shoot-to-root ratios of As concentrations. Both cultivars invested more in root production under P deficient conditions than under P sufficient conditions. Lovrin 10 invested more biomass production to roots than Jing 411, which might be partly responsible for higher shoot P and As concentrations and higher shoot-to-root ratios of As concentrations. Moreover, Lovrin 10 allocated less As to roots than Jing 411 and the difference disappeared with decreasing P supply.

Keywords: Triticum Aestivum, Arsenic (As), P Efficiency, As Uptake, As Distribution

? Chiou, M.S. and Chuang, G.S. (2006), Competitive adsorption of dye Metanil yellow and RB15 in acid solutions on chemically cross-linked chitosan beads. *Chemosphere*, **62** (5), 731-740.

Full Text: [2006\Chemosphere62, 731.pdf](2006/Chemosphere62,%20731.pdf)

Abstract: One kind of adsorbent with a high adsorption capacity for anionic dyes was prepared using ionically and chemically cross-linked chitosan beads. A batch system was applied to study the adsorption behavior of one acid dye (MY, metanil yellow) and one reactive dye (RB15, reactive blue 15) in aqueous solutions by the cross-linked chitosan beads. The adsorption capacities was 3.56 mmol g−1 (1334 mg g−1) for dye MY and 0.56 mmol g−1 (722 mg g−1) for dye RB15 at pH 4, 30 °C. The Langmuir model agreed very well with the experimental data (*R*2 > 0.996). The kinetics of adsorption for a single dye and the kinetics of removal of ADMI color value in mixture solutions at different initial dye concentrations were evaluated by the nonlinear first-order and second-order models. The first-order kinetic model fits well with the dynamical adsorption behavior of a single dye for lower initial dye concentrations, while the second-order kinetic model fits well for higher initial dye concentrations. The competitive adsorption favored the dye RB15 in the mixture solution (initial conc. (mM): MY = 1.34; RB15 = 1.36); while it favored the dye MY in the mixture solution (initial conc. (mM): MY = 3.00; RB15 = 1.34) and the adsorption kinetics for dye RB15 has the tendency to shift to a slower first order model.

Keywords: Adsorption Capacity, Anionic Dyes, Cross-Linked Chitosan Beads, Langmuir Isotherm, Competitive Adsorption

? Rajkumar, M., Nagendran, R., Lee, K.J., Lee, W.H. and Kim, S.Z. (2006), Influence of plant growth promoting bacteria and Cr6+ on the growth of Indian mustard. *Chemosphere*, **62** (5), 741-748.

Full Text: [2006\Chemosphere62, 741.pdf](2006/Chemosphere62,%20741.pdf)

Abstract: The Cr6+ resistant plant growth promoting bacteria (PGPB), *Pseudomonas* sp. PsA4 and *Bacillus* sp. Ba32 were isolated from heavy metal contaminated soils and their plant growth promoting activity on the Indian mustard (*Brassica juncea*) were assessed with different concentrations of Cr6+ in soil. Production of siderophores and the solubilization of phosphate were observed in both strains, PsA4 and Ba32. Production of IAA was only observed in strain PsA4. Inoculation of PsA4 or Ba32 promoted the growth of plants at 95.3 and 198.3 μg of Cr6+g−1 soil. The maximum growth was observed in the plants inoculated with strain PsA4. Both strains, PsA4 and Ba32 did not influence the quantity of accumulation of chromium in root and shoot system. The present observations showed that the strains PsA4 and Ba32 protect the plants against the inhibitory effects of chromium, probably due to the production of IAA, siderophores and solubilization of phosphate.

Keywords: *Brassica juncea*, Chromium, Siderophore, Rhizosphere bacteria

? Deepa, K.K., Sathishkumar, M., Binupriya, A.R., Murugesan, G.S., Swaminathan, K. and Yun, S.E. (2006), Sorption of Cr(VI) from dilute solutions and wastewater by live and pretreated biomass of *Aspergillus flavus*. *Chemosphere*, **62** (5), 833-840.

Full Text: [2006\Chemosphere62, 833.pdf](2006/Chemosphere62,%20833.pdf)

Abstract: Sorption of Cr(VI) was carried out from dilute solutions using live and pretreated biomass in a batch mode. Effects of agitation time, adsorbent dosage and pH were examined. The autoclaved biomass that showed maximum adsorption capacity (*Q*0 = 0.335 mg g−1) was used as an adsorbent in column studies. The optimized flow rate of 2.5 ml min−1 and bed height 10 cm were used to determine the effect of metal ion concentration on removal of Cr(VI). Applying the BDST model to calculate the adsorption capacity (*N*0) of column, which showed 4.56×10−5, 7.28×10−5, 6.89×10−5, 3.07×10−5, 2.80×10−5 mg g−1 for 4, 8, 12, 16 and 20 mg dm−3 of Cr(VI), respectively. Batch sorption proved to be more efficient than the column sorption and hence batch sorption was used to remove Cr(VI) from a textile dyeing industry wastewater. The phytotoxic effect of treated and untreated wastewater was studied against *Zea mays*. Toxicity was reduced by 50% in the treated effluent.

Keywords: *Aspergillus Flavus*, Chromium, Biomass Pretreatment, Adsorption, Phytotoxicity

? Kumar, M. and Philip, L. (2006), Adsorption and desorption characteristics of hydrophobic pesticide endosulfan in four Indian soils. *Chemosphere*, **62** (7), 1064-1077.

Full Text: [2006\Chemosphere62, 1064.pdf](2006/Chemosphere62,%201064.pdf)

Abstract: Adsorption and desorption characteristics of endosulfan in four Indian soils were studied extensively. The soils used were clayey soil (CL—lean clay with sand), red soil (GM—silty gravel with sand), sandy soil (SM—silty sand with gravel) and composted soil (PT—peat) as per ASTM (American Society for Testing and Materials) standards. Adsorption and desorption rates were calculated from kinetic studies. These values varied for alpha and beta endosulfan depending on the soil type. Maximum specific adsorption capacities (qmax) for different soils were calculated by Langmuir model. The values varied from 0.1 to 0.45 mg g−1 for alpha endosulfan and 0.0942–0.2722 mg g−1 for beta endosulfan. Maximum adsorption took place in clay soil followed by composted soil and red soil. Adsorptions of alpha and beta endosulfan were negligible in sand. The binding characteristics of various functional groups were calculated using Scatchard plot. Effect of functional groups was more predominant in clayey soil. Organic matter also played a significant role in adsorption and desorption of endosulfan. Endosulfan adsorption decreased drastically in clay soil when the pH was reduced. Desorption was higher at both acidic and alkaline pH ranges compared to neutral pH. Results indicated that alpha endosulfan is more mobile compared to beta endosulfan and mobility of endosulfan is maximum in sandy soil followed by red soil. It can be inferred that crystal lattice of the clay soil plays a significant role in endosulfan adsorption and desorption. Immobilization of endosulfan is more advisable in clay soil whereas biological and or chemical process can be applied effectively for the remediation of other soil types.

Keywords: Endosulfan, Sorption, Rate Constants, Clay And Silt Content, Organic Matter, Mobility

? Shemer, H., Kunukcu, Y.K. and Linden, K.G. (2006), Degradation of the pharmaceutical Metronidazole via UV, Fenton and photo-Fenton processes. *Chemosphere*, **63** (2), 269-276.

Full Text: [2006\Chemosphere63, 269.pdf](2006/Chemosphere63,%20269.pdf)

Abstract: Degradation rates and removal efficiencies of Metronidazole using UV, UV/H2O2, H2O2/Fe2+, and LTV/H2O2/Fe2+ were studied in de-ionized water. The four different oxidation processes were compared for the removal kinetics of the antimicrobial pharmaceutical Metronidazole. It was found that the degradation of Metronidazole by UV and UV/H2O2 exhibited pseudo-first order reaction kinetics. By applying H2O2/Fe2+, and UV/H2O2/Fe2+ the degradation kinetics followed a second order behavior. The quantum yields for direct photolysis, measured at 254 mn and 200400 nm, were 0.0033 and 0.0080 mol E-1, respectively. Increasing the concentrations of hydrogen peroxide promoted the oxidation rate by UV/H2O2. Adding more ferrous ions enhanced the oxidation rate for the H2O2/Fe2+ and UV/H2O2/Fe2+ processes. The major advantages and disadvantages of each process and the complexity of comparing the various advanced oxidation processes on an equal basis are discussed. (c) 2005 Published by Elsevier Ltd.

Keywords: Advanced Oxidation, Pharmaceuticals, Fenton, Photolysis, Ultraviolet, Advanced Oxidation Processes, Aquatic Environment, Therapeutic Drugs, Water, Fate, Residues, Hormones, Removal, Sewage

? Gokulakrishnan, N., Pandurangan, A. and Sinha, P.K. (2006), Effective uptake of decontaminating agent (citric acid) from aqueous solution by mesoporous and microporous materials: An adsorption process. *Chemosphere*, **63** (3), 458-468.

Full Text: [2006\Chemosphere63, 458.pdf](2006/Chemosphere63,%20458.pdf)

Abstract: The presence of citric acid in decontamination waste can cause complexation of the radioactive cations resulting in interferences in their removal by various treatment processes such as chemical precipitation, ion-exchange, etc., which are employed for the removal of radioactivity and may cause potential danger to the environment. Mesoporous Al-MCM-41 (Si/Al = 30, 51, 72 and 97) and Si-MCM-41 molecular sieves were synthesized hydrothermally and characterized by XRD, BET (surface area) and FT-IR to evaluate the removal of citric acid through an adsorption process. Adsorption of citric acid over Al-MCM-41 shows the applicability of Freundlich and Langmuir isotherm and follows first order kinetics. The effects of contact time, concentration of citric acid, adsorbents (various Si/Al ratios of Al-MCM-41, Si-MCM-41, Hβ zeolite and commercial carbon) and pH have been investigated. It has been found that the amount of citric acid adsorbed per unit gram of catalyst followed the order Al-MCM-41 (Si/Al = 30) > Al-MCM-41 (Si/Al = 51) > activated charcoal > Al-MCM-41 (Si/Al = 72) > Al-MCM-41 (Si/Al = 97) > Si-MCM-41 > Hβ zeolite.

Keywords: Al-MCM-41, Si-MCM-41, Hβ Zeolite, Activated Charcoal, Citric Acid

? Robberson, K.A., Waghe, A.B., Sabatini, D.A. and Butler, E.C. (2006), Adsorption of the quinolone antibiotic nalidixic acid onto anion-exchange and neutral polymers. *Chemosphere*, **63** (6), 934-941.

Full Text: [2006\Chemosphere63, 934.pdf](2006/Chemosphere63,%20934.pdf)

Abstract: Pharmaceutical products are being found in surface and ground waters around the world. While the consequences to human health are unknown, it is suspected that these contaminants adversely alter aquatic ecosystems. This study presents adsorption results for one pharmaceutical product, nalidixic acid (NA), on neutral and anion-exchange polymers at three pH values. The adsorption of NA below and above its p*K*a of 〜6 on polymers with different matrices, forms, and degrees of polarity were evaluated. By comparing the Freundlich constants *K*F and *n*, the results show that the neutral form of NA adsorbs to a greater extent on neutral polymers, and that the anionic form of NA adsorbs more to anion-exchange polymers. Also, results of the adsorption experiments suggest that aromatic ring interactions between NA and the surface of both neutral and anion-exchange polymers are important in the adsorption process. These results have important implications for the treatment of pharmaceutical-contaminated water, as many pharmaceutical contaminants are ionizable and have aromatic rings in their structure. This study illustrates the importance of pH and sorbate and sorbent structure in considering polymer sorption for treatment of pharmaceutical-contaminated aqueous systems.

Keywords: Ion-Exchange, Polymer Adsorption, PPCP, Water Treatment, Resin

? Pagnanelli, F., Bornoroni, L., Moscardini, E. and Toro, L. (2006), Non-electrostatic surface complexation models for protons and lead(II) sorption onto single minerals and their mixture. *Chemosphere*, **63** (7), 1063-1073.

Full Text: [2006\Chemosphere63, 1063.pdf](2006/Chemosphere63,%201063.pdf)

Abstract: Potentiometric titrations and lead sorption tests were conducted using muscovite, clinochlore, hematite, goethite, quartz, and a mixture of these same minerals. Mechanistic models were developed to represent and interpret these data. The aim was isolating the specific contribution of each mineral in proton and lead binding. Acid–base properties of each single mineral as well as their mixture were represented by discrete models, which consider the dissociation of *n* monoprotic sites (*n*-site/*n*-*K*H models). A one-site/one-*K*H model (log *K*H1 = 10.69) was chosen for quartz (dissociation of SiOH edge hydroxyl groups). Goethite and hematite (FeOH groups) were represented by the same one-site/one-*K*H model (log *K*H1 = 10.35). Three-site/three-*K*H models were used for muscovite (log *K*H1 = 4.18; log *K*H2 = 6.65; log *K*H3 = 9.67) and clinochlore (log *K*H1 = 3.84; log *K*H2 = 6.57; log *K*H3 = 9.71) assuming that SiOH and AlOH of the aluminosilicate matrix dissociate in the acid-neutral pH range while SiOH groups of quartz inclusions dissociate in the basic range. Similarly, the mixture of these minerals was represented by a three-site/three-*K*H model (log *K*H1 = 3.39; log *K*H2 = 6.72; log *K*H3 = 10.82). According to crossed comparisons with single minerals, the first two sites of the mixture were associated with the aluminosilicate matrix (SiOH and AlOH respectively) and the third site with iron oxides (FeOH) and quartz groups. Additivity of proton binding in the mixture was demonstrated by simulating the mixture’s titration curve. A unified model for the entire set of titration curves (single minerals and mixture) was also developed introducing a three-peak distribution function for proton affinity constants. Experimental data for lead sorption onto the mixture and individual minerals in 3–5 pH range denoted the competition between protons and metallic ions. The entire set of lead isotherms (individual mineral and mixture data) was represented adequately by a unified model taking into account both monodentate and bidentate complexes with the three active sites (additivity of lead binding). Experimental data of metal distribution in solid and liquid phases were successfully simulated by implementing the protonation and the surface complexation constants into the database of a dedicated software for chemical equilibria.

Keywords: Mineral Mixture, Titration, Lead, Equilibrium Modeling, Metal Speciation

? Rao, P.H. and He, M. (2006), Adsorption of anionic and nonionic surfactant mixtures from synthetic detergents on soils. *Chemosphere*, **63** (7), 1214-1221.

Full Text: [2006\Chemosphere63, 1214.pdf](2006/Chemosphere63,%201214.pdf)

Abstract: Adsorption of anionic surfactant (sodium dodecylbenzenesulfonate, SDBS) and nonionic surfactant (an alcohol ethoxylates with 12 carbons and 9 oxyethyl groups, A12E9) mixtures, widely used as the major constituents of synthetic detergents in China and become the most common pollutants in the environment, on soils was conducted to investigate the behavior of mixed surfactants in soils. The effects of addition order and mixing ratios of two surfactants, associated with pH and ion strength in solutions, on adsorptions were considered. The results show that saturated adsorption amount of SDBS and A12E9 on soils decreased respectively when A12E9 was added into soils firstly compared with that secondly, possibly resulting from the screening of A12E9 to part adsorption sites on soils and the hydrocarbon chain–chain interactions between SDBS and A12E9. The adsorption of SDBS and A12E9 on soils was enhanced each other at pre-plateau region of isotherms. At plateau region of isotherms, the adsorption of SDBS on soils decreased with the increase of molar fraction of A12E9 in mixed surfactant solutions, while that of A12E9 increased except the molar ratio of SDBS to A12E9 0.0:1.0. With the increase of pH in mixed surfactant solutions, adsorption amount of SDBS and A12E9 on soils decreased, respectively. The reduction of ion strength in soils resulted in the decrease of adsorption amount of SDBS and A12E9 on soils, respectively.

Keywords: Addition Order, Adsorption, Molar Ratio, Soil, Surfactant Mixtures

? Li, W., Zhang, S.Z., Jiang, W. and Shan, X.Q.*Chemosphere*, **63** (8), 1235-1241.

Full Text: [2006\Chemosphere63, 1235.pdf](2006/Chemosphere63,%201235.pdf)

Abstract: Interactions between anions and cations are important to understand the chemical processes of pollutants in environment. In this study, batch experiments were carried out to investigate the simultaneous adsorption of Cu and Cd on hematite as affected by phosphate. Phosphate pretreatment suppressed the maximum adsorption of Cu and Cd on hematite and moved the adsorption pH edges to a higher pH range. Phosphate application time had a marked impact on Cu and Cd adsorption and longer contact time resulted in more reduction of Cu and Cd adsorption. Results of back-titration, Fourier transform infrared (FTIR) spectroscopy study and ionic strength effect on the adsorption revealed that Cu and Cd were adsorbed on hematite mainly through the inner-sphere complex formation mechanism and phosphate treatment reduced the inner-sphere adsorption sites, thus decreasing Cu and Cd adsorption on hematite.

Keywords: Cu, Cd, Adsorption/Desorption, Phosphate, Hematite

Notes: highly cited

? Tahir, S.S. and Rauf, N. (2006), Removal of a cationic dye from aqueous solutions by adsorption onto bentonite clay. *Chemosphere*, **63** (11), 1842-1848.

Full Text: [2006\Chemosphere63, 1842.pdf](2006/Chemosphere63,%201842.pdf)

Abstract: The ability of bentonite 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. Maximum adsorption of the dye, i.e. > 90% has been achieved in aqueous solutions using 0.05 g of bentonite at a pH of 9. Thermodynamic parameters such as ΔH°, ΔS° and ΔG° were calculated from the slope and intercept of the linear plots of ln K-D against 1/T. Analysis of adsorption results obtained at 298, 308, 318 and 328 K showed that the adsorption pattern on bentonite seems to follow the Langmuir, Freundlih and D-R isotherms. The temperature increase reduces adsorption capacity by bentonite, due to the enhancement of the desorption step in the mechanism. The numerical values of sorption free energy (E-a) of 1.00-1.12 kJ mol-1 indicated physical adsorption. The kinetic data indicated an intraparticle diffusion process with sorption being first order. The rate constant k was 0.526 min-1. The concentration of malachite green oxalate was measured before and after adsorption by using UV-Vis spectrophotometer. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Adsorption Capacity, Langmuir, Freundlich, D-R Isotherm, Kinetics, Surface Charge, Bentonite, Malachite Green, Reactive Dyes, Rice Husk, Sorption, Biosorption, Adsorbent, Pb(II), UO22+

? Liang, C.S., Dang, Z., Xiao, B.H., Huang, W.L. and Liu, C.Q. (2006), Equilibrium sorption of phenanthrene by soil humic acids. *Chemosphere*, **63** (11), 1961-1968.

Full Text: [2006\Chemosphere63, 1961.pdf](2006/Chemosphere63,%201961.pdf)

Abstract: This study investigated the effect of chemical heterogeneity of humic acids (HAs) on the equilibrium sorption of phenanthrene by HA extracts. Six HA samples were extracted from three different soils with 0.5 M NaOH and 0.1 M Na4P2O7 and were characterized with elemental analysis, infrared spectrometry, and solid-state 13C nuclear magnetic resonance (NMR) spectrometry. The equilibrium sorption measurements were carried out with a batch technique and using the six HA solids as the sorbents and phenanthrene as the sorbate. The measured sorption isotherm data were fitted to the Freundlich equation. The results showed that, for the same soil, (i) the total HA mass extracted with Na4P2O7 was 13.7–22.6% less than that extracted with NaOH, (II) the Na4P2O7-extracted HA had higher O/C atomic ratio, greater content of polar organic carbons (POC), and lower aliphatic carbon content than the NaOH-extracted HA, and (iii) the Na4P2O7-extracted HA exhibited greater sorption isotherm linearity and but not dramatic difference in sorption capacities than the NaOH extracted HA. The differences in the HA properties resulting from the two different extraction methods may be because NaOH can hydrolyze insoluble HA fractions such as fatty acid like macromolecules bound on soils whereas Na4P2O7 could not. As a result, the HAs extracted with the two different methods had different polarity and functionality which affected their sorption property for phenanthrene.

Keywords: Phenanthrene, Humic Acid, Sorption

? Trivunac, K. and Stevanovic, S. (2006), Removal of heavy metal ions from water by complexation-assisted ultrafiltration. *Chemosphere*, **64** (3), 486-491.

Full Text: [2006\Chemosphere64, 486.pdf](2006/Chemosphere64,%20486.pdf)

Abstract: Toxic heavy metals in air, soil and water are global problems that are growing threat to the environment. Therefore, the removal and separation of toxic and environmentally relevant heavy metal ions are a technological challenge with respect to industrial and environmental application. A promising process for the removal of heavy metal ions from aqueous solutions involves bonding the metals to a bonding agent (such as macromolecular species), and then separating the loaded agents from wastewater by separation processes such as membrane filtration.

The choice of water-soluble macroligands remains important for developing this technology. The effects of type of complexing agent, pH value and applied pressure on retention coefficients of Zn(II) and Cd(II) complexes were investigated. At best operating conditions (pH = 9.0, p = 300 kPa) using diethylaminoethyl cellulose, the removal of Cd2+ and Zn2+ was more than 95% and 99%, respectively.

Keywords: Membrane Filtration, Complexation, Wastewater, Cadmium and Zinc Removal

? Makris, K.C., Sarkar, D. and Datta, R. (2006), Evaluating a drinking-water waste by-product as a novel sorbent for arsenic. *Chemosphere*, **64** (4),730-741.

Full Text: [2006\Chemosphere64, 730.pdf](2006/Chemosphere64,%20730.pdf)

Abstract: Arsenic (As) carcinogenicity to humans and other living organisms has promulgated extensive research on As treatment technologies with varying levels of success; generally, the most efficient methods come with a significantly higher cost burden and they usually perform better in removing As(V) than As(III) from solution. In the reported study, a novel sorbent, a waste by-product of the drinking-water treatment process, namely, drinking-water treatment residuals (WTRs) were evaluated for their ability to adsorb both As(V) and As(III). Drinking-WTRs can be obtained free-of-charge from drinking-water treatment plants, and they have been successfully used to reduce soluble phosphorus (P) concentrations in poorly P-sorbing soils. Phosphate and arsenate molecules have the same tetrahedral geometry, and they chemically behave in a similar manner. We hypothesized that the WTRs would be effective sorbents for both As(V) and As(III) species. Two WTRs (one Fe- and one Al-based) were used in batch experiments to optimize the maximum As(V) and As(III) sorption capacities, utilizing the effects of solid:solution ratios and reaction kinetics. Results showed that both WTRs exhibited high affinities for soluble As(V) and As(III), exhibiting Freundlich type adsorption with no obvious plateau after 2-d of reaction (15 000 mg kg−1). The Al-WTR was highly effective in removing both As(V) and As(III), although As(III) removal was much slower. The Fe-WTR showed greater affinity for As(III) than for As(V) and reached As(III) sorption capacity levels similar to those obtained with the Al-WTR-As(V) system (15 000 mg kg−1). Arsenic sorption kinetics were biphasic, similar to what has been observed with P sorption by the WTRs. Minimal (<3%) desorption of sorbed As(III) and As(V) was observed, using phosphate as the desorbing ligand. Dissolved Fe2+ concentrations measured during As(III) sorption were significantly correlated (*r*2 = 0.74, *p* < 0.005) with the amount of As(III) sorbed by the Fe-WTR. Lack of correlation between Fe2+ in solution and sorbed As(V) (*r*2 = 0.2) suggests reductive dissolution of the Fe-WTR mediating As(III) sorption. Results show promising potential for the WTRs in irreversibly retaining As(V) and As(III) that should be further tested in field settings.

Keywords: Arsenic, Adsorption, Desorption, Drinking-Water Treatment Residual, Remediation

? Moreno, A.M., Quintana, J.R., Pérez, L. and Parra, J.G. (2006), Factors influencing lead sorption–desorption at variable added metal concentrations in Rhodoxeralfs. *Chemosphere*, **64** (5),758-763.

Full Text: [2006\Chemosphere64, 758.pdf](2006/Chemosphere64,%20758.pdf)

Abstract: The response of ten soils of the lithic Rhodoxeralf type to the supply of lead at concentrations of 500, 1000, 2000, 3000, 4000, 5000 and 6000 mg kg−1 was examined in batch sorption–desorption tests. Lead availability in the soils was found to depend on its partitioning between the soil solution and the solid phase as reflected in adsorption isotherms. The isotherms, of the H type, were consistent with a high affinity of the sorbent for the metal, with which it forms stable inner-sphere complexes on the soil surface. Sorption–desorption tests revealed that some properties of the soils such as their pH (mean = 8) and high contents in clays (particularly in kaolinite) and crystalline iron oxides significantly influence Pb sorption, the effect being especially marked at high added metal concentrations. Added lead is largely retained by crystalline iron oxides and the soil clay fraction; the pH of the soil favours the release of variably-charged sites from both. The extent of Pb desorption was small, particularly at the lowest added levels (500 and 1000 mg kg−1). Desorption increased with increasing added Pb concentration and exceeded 50% at 5000 and 6000 mg kg−1; this suggests that Pb is present not only as inner-sphere complexes, but also as outer-sphere complexes and, partly, as precipitates. The desorption isotherms consist of three segments that exhibit significant differences depending on the added Pb concentration, namely: 500–1000, 2000–4000 and 5000–6000 mg kg−1.

Keywords: Lead Sorption–Desorption, Spiked Soils, Rhodoxeralf, Batch Test, Isotherms

? Mustafa, G., Kookana, R.S. and Singh, B. (2006), Desorption of cadmium from goethite: Effects of pH, temperature and aging. *Chemosphere*, **64** (5), 856-865.

Full Text: [2006\Chemosphere64, 856.pdf](2006/Chemosphere64,%20856.pdf)

Abstract: Cadmium is perhaps environmentally the most significant heavy metal in soils. Bioavailability, remobilization and fate of Cd entering in soils are usually controlled by adsorption–desorption reactions on Fe oxides. Adsorption of Cd on soil colloids including Fe oxides has been extensively studied but Cd desorption from such soil minerals has received relatively little attention. Some factors that affect Cd adsorption on goethite include pH, temperature, aging, type of index cations, Cd concentrations, solution ionic strength and presence of organic and inorganic ions. This research was conducted to study the influence of pH, temperature and aging on Cd desorption from goethite.

Batch experiments were conducted to evaluate Cd desorption from goethite with 0.01 M Ca(NO3)2. In these experiments Cd desorption was observed at 20, 40 and 70 °C in combination with aging for 16 h, 30, 90 and 180 d from goethite that adsorbed Cd from solutions containing initial Cd concentrations of 20, 80 and 180 μM. Following the adsorption step Cd desorption was measured by 15 successive desorptions after aging at various temperatures.

At the lowest amount of initially adsorbed Cd and equilibrium pH 5.5, cumulative Cd desorption decreased from 71% to 17% with aging from 16 h to 180 d and the corresponding decrease at equilibrium pH 6.0 was from 32% to 3%. There was a substantial decrease in Cd desorption with increasing equilibration temperature. For example, in goethite with the lowest amount of initial adsorption at equilibrium pH 5.5, cumulative Cd desorption decreased from 71% to 31% with increase in temperature from 20 to 70 °C, even after 16 h. Dissolution of Cd adsorbed goethite in 1 M HCl, after 15 successive desorptions with 0.01 M Ca(NO3)2, indicated that approximately 60% of the Cd was surface adsorbed. Overall, dissolution kinetics data revealed that 23% to 88% Cd could not be desorbed, which could possibly be diffused into the cracks and got entrapped in goethite crystals. At elevated temperature increased equilibrium solution pH favoured the formation of CaCO3 and CdCO3 which reasonably decreased Cd desorption. Cadmium speciation showed the formation of calcite and otavite minerals at 40 and 70 °C due to increase in pH (>9.5) during aging. X-ray diffraction analysis (XRD) of these samples also revealed the formation of CaCO3 at elevated temperatures with aging. While mechanisms such as Cd diffusion and/or entrapment into fissures and cracks in goethite structure with increase in temperature and aging are possible.

Keywords: Desorption, Hysteresis, Cadmium, Temperature, Aging, Dissolution, Goethite

? Qiu, Y.P. and Ling, F. (2006), Role of surface functionality in the adsorption of anionic dyes on modified polymeric sorbents. *Chemosphere*, **64** (6), 963-971.

Full Text: [2006\Chemosphere64, 963.pdf](2006/Chemosphere64,%20963.pdf)

Abstract: While synthetic polymeric sorbents effectively treat dye wastewaters by adsorption, the underlying mechanisms remain to be understood. This work determined the adsorption of an anionic dye by three polymers differing significantly in surface functionality. Surface functional groups of polymers were indicated in FTIR spectra and quantified by the Boehm titration. In reference to the commercial sorbent XAD-4 with a low degree of functionality, the laboratory synthesized NG-8 had primarily acidic functional groups, whereas its aminated product MN-8 had mainly basic amino groups. Electrophoresis determined the points of zero charge of 4.18, 3.23, and 4.51 for XAD-4, NG-8, and MN-8, respectively. The adsorption of Reactive Black 5 dye (RB5) by all the sorbents on a unit surface area basis increased with decreasing pH. At the same low pH (≤ 4.40), the adsorption by NG-8 was similar to that by XAD-4, indicating little influence of protonated (neutral) surface functional groups. In contrast, the adsorption by NG-8 at pH 6.05 was 75% lower than that by XAD-4, resulting apparently from the strong electrostatic repulsion between RB5 and deprotonated (negative) groups. Amination substantially enhanced RB5 adsorption by eliminating acidic groups and creating a positive charge on the surface of MN-8. The adsorptive enhancement was also achieved in the presence of CaCl2, due presumably to the neutralization of negative surface charge by Ca2+ and the RB5-Ca2+ pairing. These results manifest the important role of surface functionality in the adsorption of dyes by synthetic polymers.

Keywords: Activated Carbon, Adsorption, Anionic Dyes, Aqueous-Solutions, Dye, Dyes, Equilibrium, FTIR, Functional Groups, Ions, Mechanism, Mechanisms, pH, Phenolic-Compounds, Polymeric, Polymeric Sorbents, Polymers, Reactive Black 5 Dye, Sorption, Styrene-Divinylbenzene Copolymers, Surface Area, Surface Functionality, Titration, Waste-Water, Xad-4 Resin, Zero Charge

? Mechichi, T., Mhiri, N. and Sayadi, S. (2006), Remazol Brilliant Blue R decolourization by the laccase from *Trametes trogii*. *Chemosphere*, **64** (6), 998-1005.

Full Text: [2006\Chemosphere64, 998.pdf](2006/Chemosphere64,%20998.pdf)

Abstract: The decolourization of the recalcitrant dye RBBR by the culture filtrate of *Trametes trogii* and its isolated laccase was investigated. Both filtrates from Cu-induced cultures as well as purified laccase decolourized the dye RBBR. The purified laccase decolourized the dye down to 97% of 100 mg l−1 initial concentration of RBBR when only 0.2 U ml−1 of laccase was used in the reaction mixture. The effects of different physicochemical parameters were tested and optimal decolourization rates occurred at pH 5 and at a temperature of 50 °C. Decolourization of RBBR occurred in the presence of metal ions which could be found in textile industry effluents. Of all the metal ions tested, FeCl2 was the most inhibiting for the decolourization.

HBT was shown to have no effect on the decolourization of RBBR at low concentration, while at a concentration of 5 mM it slightly inhibited decolourization. The presence of aromatic compounds was found to be inhibiting for the decolourization at a concentration of 10 mM, but not at 0.1 mM, while at 1 mM only *ortho*-diphenols were inhibiting. Probing the effect of methanol it was found that higher concentrations caused a decrease in the decolourization rate of RBBR.

The effect of laccase inhibitors on the decolourization of RBBR was tested with l-cysteine, SDS and EDTA. It was demonstrated that l-cysteine was the most inhibiting substrate for the decolourization while SDS was only inhibiting at 10 mM concentration and ETDA was not inhibiting at all tested concentrations.

Keywords: Laccase, Synthetic Dyes, Remazol Brilliant Blue R (RBBR), *Trametes trogii*, Decolourization

? Chaturvedi, P.K., Seth, C.S. and Misra, V. (2006), Sorption kinetics and leachability of heavy metal from the contaminated soil amended with immobilizing agent (humus soil and hydroxyapatite) *Chemosphere*, **64** (7), 1109-1114.

Full Text: [2006\Chemosphere64, 1109.pdf](2006/Chemosphere64,%201109.pdf)

Abstract: Release of heavy metals onto the soil as a result of agricultural and industrial activities may pose a serious threat to the environment. This study investigated the kinetics of sorption of heavy metals on the non-humus soil amended with (1:3) humus soil and 1% hydroxyapatite used for in situ immobilization and leachability of heavy metals from these soils. For this, a batch equilibrium experiment was performed to evaluate metal sorption in the presence of 0.05 M KNO3 background electrolyte solutions. The Langmuir isotherms applied for sorption studies showed that the amount of metal sorbed on the amended soil decreased in the order of Pb2+ > Zn2+ > Cd2+. The data suggested the possibility of immobilization of Pb due to sorption process and immobilization of Zn and Cd by other processes like co-precipitation and ion exchange. The sorption kinetics data showed the pseudo-second-order reaction kinetics rather than pseudo-first-order kinetics. Leachability study was performed at various pHs (ranging from 3 to 10). Leachability rate was slowest for the Pb2+ followed by Zn2+ and Cd2+. Out of the metal adsorbed on the soil only 6.1–21.6% of Pb, 7.3–39% of Zn and 9.3–44.3% of Cd leached out from the amended soil.

Keywords: Adsorption, Apatite, Behavior, Clay, Desorption, Heavy Metals, Immobilization, Immobilizing Agents, Ion Exchange, Isotherms, Kinetic Studies, Kinetics, Leachability, Lead Immobilization, Pseudo-Second-Order, Sludge, Sorption

? Luo, F., Liu, Y.H., Li, X.M., Xuan, Z.X. and Ma, J.T. (2006), Biosorption of lead ion by chemically-modified biomass of marine brown algae *Laminaria japonica*. *Chemosphere*, **64** (7), 1122-1127.

Full Text: [2006\Chemosphere64, 1122.pdf](2006/Chemosphere64,%201122.pdf)

Abstract: In this paper, marine brown algae *Laminaria japonica* was chemically-modified by crosslinking with epichlorohydrin (EC1, EC2), or oxidizing by potassium permanganate (PC), or only washed by distilled water (DW). They were used for equilibrium sorption uptake studies with lead. As can be seen from the experimental results that biosorption equilibriums were rapidly established in about 2 h. The lead adsorption was strictly pH dependent, and maximum removal of lead on biosorbents were observed at pH 5.3. The effects solid/liquid ratio on lead biosorption was also investigated. The maximum lead uptakes were 1.67 mmol g−1, 1.62 mmol g−1, 1.54 mmol g−1 and 1.21 mmol g−1, respectively for EC1, EC2, PC and DW. The order of maximum lead uptakes for different pretreated and raw alga was EC1 > EC2 > PC > DW. A comparison of different isotherm models revealed that the combination of Langmuir and Freundlich (L–F) isotherm model fitted the experimental data best.

Keywords: Biosorption, Algae, Lead, Chemically Modification, Adsorption Isotherm Model

? Valente, J.P.S., Padilha, P.M. and Florentino, A.O. (2006), Studies on the adsorption and kinetics of photodegradation of a model compound for heterogeneous photocatalysis onto TiO2. *Chemosphere*, **64** (7), 1128-1133.

Full Text: [2006\Chemosphere64, 1128.pdf](2006/Chemosphere64,%201128.pdf)Abstract: An investigation was made on the adsorption and kinetics of photodegradation of potassium hydrogenphthalate in an aqueous suspension of TiO2. Two models, Langmuir and Freundlich, were used to describe the adsorption process and the model proposed by Langmuir–Hinshelwood (L–H) was employed to describe the kinetics of the photodecomposition reactions of hydrogenphthalate. The results of the adsorptions were fitted to the models proposed by Langmuir and Freundlich. Adsorption was found to be a function of the temperature, with adsorption capacity increasing from 2.4 to 4.5 mg/g when the temperature rose from 20 to 30 °C. The kinetic model indicates that the rate constant, *k*, of the first order reaction, is high in the 10.0 to 100 mg/l interval, which is coherent with the low value of the adsorption constant, *K*. The results fitted to the L–H model led to an equation that, within the range of concentrations studied here, theoretically allows one to evaluate the photodegradation rate.

Keywords: Potassium Hydrogenphthalate, TiO2, Adsorption-Kinetics, Langmuir, Freundlich, Langmuir–Hinshelwood

? Juang, L.C., Wang, C.C. and Lee, C.K. (2006), Adsorption of basic dyes onto MCM-41. *Chemosphere*, **64** (11), 1920-1928.

Full Text: [2006\Chemosphere64, 1920.pdf](2006/Chemosphere64,%201920.pdf)

Abstract: The adsorption of two basic dyes, Basic Green 5 (BG5) and Basic Violet 10 (BV10), onto MCM-41 was studied to examine the possible effect of interactions between large adsorbates and MCM-41 on the pore structure stability of MCM-41 and the potential of MCM-41 for the removal of basic dyes from wastewater. The revolutions of surface characteristics and pore structure of MCM-41 induced by dyes adsorption were characterized based on the analyses of the nitrogen isotherms, the XRD patterns, and the FTIR spectra. It was experimentally concluded that when the effect of interactions between large dyes (such as BV10) and MCM-41 on the pore structure stability of MCM-41 was insignificant, MCM-41 might be a good adsorbent for the removal of basic dyes from wastewater. The adsorption of BV10 on MCM-41 with respect to contact time, pH, and temperature was then measured to provide more information about the adsorption characteristics of MCM-41. Both Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms and the pseudo-second-order kinetic model was used to describe the kinetic data, from which some adsorption thermodynamic parameters were also evaluated.

Keywords: MCM-41, Basic Dyes, Adsorption, Pore Structure Stability, Interaction

? Wang, S.B., Li, H.T., Xie, S.J., Liu, S.L. and Xu, L.Y. (2006), Physical and chemical regeneration of zeolitic adsorbents for dye removal in wastewater treatment. *Chemosphere*, **65** (1), 82-87.

Full Text: [2006\Chemosphere65, 82.pdf](2006/Chemosphere65,%2082.pdf)

Abstract: Natural zeolite and synthetic zeolite, MCM-22, were employed as effective adsorbents for a basic dye, Methylene blue, removal from wastewater. Two methods, Fenton oxidation and high temperature combustion, have been used for regeneration of used materials. It is found that MCM-22 exhibits equilibrium adsorption at 1.7×10−4 mol g−1, much higher than the adsorption of natural zeolite (5×10−5 mol g−1) at initial dye concentration of 2.7×10−5 M and 30 °C. Solution pH will affect the adsorption behaviour of MCM-22. Higher solution pH results in higher adsorption capacity. The regenerated adsorbents show different capacity depending on regeneration technique. Physical regeneration by high temperature combustion will be better than chemical regeneration using Fenton oxidation in producing effective adsorbents. Regeneration of MCM-22 by high temperature treatment can make the adsorbent exhibit comparable or superior adsorption capacity as compared to the fresh sample depending on the temperature and time. The optimal temperature and time will be 540 °C and 1 h. The Fenton oxidation will recover 60% adsorption capacity. For natural zeolite, regeneration can not fully recover the adsorption capacity with the two techniques and the regenerated natural zeolites by the two techniques are similar, showing 60% adsorption capacity of fresh sample. Kinetic studies indicate that the adsorption follows pseudo-second-order kinetics.

Keywords: MCM-22, Natural Zeolite, Regeneration, Dye Adsorption, Kinetics

? Arami, M., Limaee, N.Y. and Mahmoodi, N.M. (2006), Investigation on the adsorption capability of egg shell membrane towards model textile dyes. *Chemosphere*, **65** (11), 1999-2008.

Full Text: [2006\Chemosphere65, 1999.pdf](2006/Chemosphere65,%201999.pdf)

Abstract: Adsorption isotherms of Direct Red 80 (DR80) and Acid Blue 25 (AB25) on the egg shell membrane (ESM) were performed at 20±1°C. Physical characteristics of ESM such as surface area and presence of functional groups were verified. The Fourier transform infra-red (FTIR) spectra proved the presence of factional groups such as hydroxyl, amine and carbonyl groups in ESM. The surface area of ESM was found to be 2.2098 m2 g. The effects of operational parameters such as initial dye concentration, pH(0), contact time, particle size and ESM doses were studied. The Langmuir, Freundlich, BET, Redlich-Peterson and Temkin adsorption models were applied to describe the equilibrium isotherms. The pseudo-first-order and pseudo-second-order kinetics models were examined to evaluate the kinetics data at different pH(0) values (2-12) and the rate constants were calculated. Maximum desorption of >= 81.8% was achieved for both dyes in aqueous solution at pH(0) 12. Also scanning electron micrographs (SEM) of the treated and untreated adsorbent were performed. Results indicate that ESM could be employed as a natural and Eco-Friendly adsorbent material for the removal of trace organics in solutions. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Component Systems, Dye, Dye Removal, Dyes, Equilibrium, Equilibrium Isotherm, Esm, Isotherms, Kinetics, Membrane, Metal-Ions, Methylene-Blue, Model, Natural Adsorbent, Orange Peel, Parameters, Photocatalytic Degradation, Reactive Dyes, SEM, Surface Area, Waste-Water

? Aguilar-Carrillo, J., Garrido, F., Barrios, L. and García-González, M.T. (2006), Sorption of As, Cd and T1 as influenced by industrial by-products applied to an acidic soil: Equilibrium and kinetic experiments. *Chemosphere*, **65** (11), 2377-2387.

Full Text: [2006\Chemosphere65, 2377.pdf](2006/Chemosphere65,%202377.pdf)

Abstract: In situ stabilization of toxic elements in contaminated soils by the addition of amendments is being considered as an effective technique for remediation. In this paper, we performed both kinetics and equilibrium-based sorption experiments of three toxic elements (As, Cd and T1) in soils amended with two by-products (hosphogypsum and sugar foam, rich in gypsum and calcium carbonate, respectively) to ascertain the feasibility of their application for improving the sorption capacity of As, Cd and T1 from the soil at 25, 35 and 50°C. Kinetic studies indicated that the sorption follows a pseudo-second-order (PSO) kinetics and the sorption is a two-step diffusion process where both film and intraparticle diffusion played important roles in the sorption mechanisms of the elements. The Langmuir isotherms applied for sorption studies showed that the estimated maximum sorption capacity of the elements in control and amended soils decreased in the order of Cd > As > T1. Using the thermodynamic equilibrium parameters obtained at different temperatures, the thermodynamic constants of sorption (Delta G, Delta H and Delta S) were also evaluated, indicating spontaneous and endothermic nature of the process, except T1 which was exothermic. An optimal scaling procedure was undertaken to determine the relationships between the kinetic and equilibrium sorption parameters. By means of statistical analysis it was seen that these inter-parametric relationships are dependent on the element nature. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Analysis, Aqueous-Solutions, Arsenate, Calcium, Control, Diffusion, Equilibrium, Film, Fly-Ash, Heavy-Metals, Isotherms, Kinetic, Kinetics, Mineralogical Implications, Optimal Scaling, Parameters, Red Mud, Removal, Scaling, Soil, Soil Amendments, Soils, Sorption, Sorption Capacity, Sorption Isotherms, Sorption Kinetics, Sugar, Thermodynamics, Toxic Elements, Waste-Water

? Fu, F.L., Xiong, Y., Xie, B.P. and Chen, R.M. (2007), Adsorption of Acid Red 73 on copper dithiocarbamate precipitate-type solid wastes. *Chemosphere*, **66** (1), 1-7.

Full Text: [2007\Chemosphere66, 1.pdf](2007/Chemosphere66,%201.pdf)

Abstract: Three solid wastes, copper *N*,*N*’-bis(dithiocarboxy)piperazine ([CuBDP]*n*), copper diethyldithiocarbamate (Cu(DDTC)2) and copper dimethyldithiocarbamate (Cu(DMTC)2), were prepared and tested as adsorbents to remove Acid Red 73 from wastewater. It was found that the three precipitates all could effectively adsorb the dye but their adsorption abilities were rather different. The maximum adsorption amounts of the coordination polymer precipitate [CuBDP]*n* reached as high as 364 mg g−1, much greater than those of Cu(DDTC)2 and Cu(DMTC)2 (42.9 and 37.8 mg g−1, respectively). The investigation of adsorption models showed these adsorption processes followed the pseudo-second-order kinetic equation and the adsorption balances could be described with both Langmuir and Freundlich isotherms, but the latter seemed to be more suitable. Their adsorption nature was inferred to be physical adsorption and mainly depended on the hydrophobic interaction between these precipitates and Acid Red 73. This is the first example for the reutilization of metal dithiocarbamate precipitates as solid wastes to date.

Keywords: Dye Wastewater, Adsorption, Dithiocarbamate, Precipitates, Acid Red 73

? Anirudhan, T.S. and Unnithan, M.R. (2007), Arsenic(V) removal from aqueous solutions using an anion exchanger derived from coconut coir pith and its recovery. *Chemosphere*, **66** (1), 60-66.

Full Text: [2007\Chemosphere66, 60.pdf](2007/Chemosphere66,%2060.pdf)

Abstract: The performance of a new anion exchanger (AE) prepared from coconut coir pith (CP), for the removal of arsenic(V) [As(V)] from aqueous solutions was evaluated in this study. The adsorbent (CP–AE) carrying dimethylaminohydroxypropyl weak base functional group was synthesized by the reaction of CP with epichlorohydrin and dimethylamine followed by treatment of hydrochloric acid. IR spectroscopy results confirm the presence of −NH+(CH3)2Cl− group in the adsorbent. XRD studies confirm the decrease of crystallinity in CP–AE compared to CP, and it favours the protrusion of the functional group into the aqueous medium. Batch experiments were conducted to examine the efficiency of the adsorbent on As(V) removal. Maximum removal of 99.2% was obtained for an initial concentration of 1 mg l−1 As(V) at pH 7.0 and an adsorbent dose of 2 g l−1. The kinetics of sorption of As(V) onto CP–AE was described using the pseudo-second-order model. The equilibrium isotherms were determined for different temperatures and the results were analysed using the Langmuir equation. The temperature dependence indicates an exothermic process. Utility of the adsorbent was tested by removing As(V) from simulated groundwater. Regeneration studies were performed using 0.1 N HCl. Batch adsorption–desorption studies illustrate that CP–AE could be used to remove As(V) from ground water and other industrial effluents.

Keywords: Arsenic, Coir Pith, Epichlorohydrin, Psuedo-Second-Order, Langmuir Equation, Desorption

? Su, C.M. and Puls, R.W. (2007), Removal of added nitrate in cotton burr compost, mulch compost, and peat: Mechanisms and potential use for groundwater nitrate remediation. *Chemosphere*, **66** (1), 91-98.

Full Text: [2007\Chemosphere66, 91.pdf](2007/Chemosphere66,%2091.pdf)

Abstract: We conducted batch tests on the nature of removal of added nitrate in cotton burr compost, mulch compost, and sphagnum peat that may be potentially used in a permeable reactive barrier (PRB) for groundwater nitrate remediation. A rigorous steam autoclaving protocol (121 °C for 2 h each day for three consecutive days) for the cotton burr compost and autoclaving of all labware and the nitrate working solutions resulted in drastically different results compared to the non-autoclaved treatment. In the non-autoclaved cotton burr compost, added nitrate at 20 mg N l−1 decreased rapidly and was not detected after 3 d; whereas, the autoclaved cotton burr compost showed persistent nitrate above 15.5 mg N l−1 even after 10 d, which is comparable with nitrate concentrations above 17.6 mg N l−1 in a treatment using NaN3 at 1000 mg l−1. Dewaxed cotton burr compost showed decreased nitrate reduction compared to the pristine cotton burr compost. No nitrate reduction was detected in the dewaxed sphagnum peat. It is concluded that nitrate removal in the organic media is controlled by microbiologically mediated processes. The use of readily available cotton burr and mulch composts may offer a cost-effective method of nitrate removal from contaminated groundwater.

Keywords: Groundwater Nitrate, Remediation, Denitrification, Cotton Burr Compost, Mulch Compost, Peat

? Kitis, M., Kaplan, S.S., Karakaya, E., Yigit, N.O. and Civelekoglu, G. (2007), Adsorption of natural organic matter from waters by iron coated pumice. *Chemosphere*, **66** (1), 130-138.

Full Text: [2007\Chemosphere66, 130.pdf](2007/Chemosphere66,%20130.pdf)

Abstract: Natural pumice particles were used as granular support media and coated with iron oxides to investigate their adsorptive natural organic matter (NOM) removal from waters. The impacts of natural pumice source, particle size fraction, pumice dose, pumice surface chemistry and specific surface area, and NOM source on the ultimate extent and rate of NOM removal were studied. All adsorption isotherm experiments were conducted employing the variable-dose completely mixed batch reactor bottle-point method. Iron oxide coating overwhelmed the surface electrical properties of the underlying pumice particles. Surface areas as high as 20.6 m2 g−1 were achieved after iron coating of pumice samples, which are above than those of iron coated sand samples reported in the literature. For all particle size fractions, iron coating of natural pumices significantly increased their NOM uptakes both on an adsorbent mass- and surface area-basis. The smallest size fractions (<63 μm) of coated pumices generally exhibited the highest NOM uptakes. A strong linear correlation between the iron contents of coated pumices and their Freundlich affinity parameters (*K*F) indicated that the enhanced NOM uptake is due to iron oxides bound on pumice surfaces. Iron oxide coated pumice surfaces preferentially removed high UV-absorbing fractions of NOM, with UV absorbance reductions up to 90%. Control experiments indicated that iron oxide species bound on pumice surfaces are stable, and potential iron release to the solution is not a concern at pH values of typical natural waters. Based on high NOM adsorption capacities, iron oxide coated pumice may be a promising novel adsorbent in removing NOM from waters. Furthermore, due to preferential removal of high UV-absorbing NOM fractions, iron oxide coated pumice may also be effective in controlling the formation of disinfection by-products in drinking water treatment.

Keywords: Adsorption, Coating, Iron, Natural Organic Matter, Pumice

? Ternes, T.A., Bonerz, M., Herrmann, N., Teiser, B. and Andersen, H.R. (2007), Irrigation of treated wastewater in Braunschweig, Germany: An option to remove pharmaceuticals and musk fragrances. *Chemosphere*, **66** (5), 894-904.

Full Text: [2007\Chemosphere66, 894.pdf](2007/Chemosphere66,%20894.pdf)

Abstract: In this study the fate of pharmaceuticals and personal care products which are irrigated on arable land with treated municipal waste-water was investigated. In Braunschweig, Germany, wastewater has been irrigated continuously for more than 45 years. In the winter time only the effluent of the sewage treatment plant (STP) of Braunschweig is used for irrigation, while during summer digested sludge is mixed with the effluent. In the present case study six wells and four lysimeters located in one of the irrigated agricultural fields were monitored with regard to the occurrence of 52 pharmaceuticals and two personal care products (PPCPs; e.g. betablockers, antibiotics, antiphlogistics, carbamazepine, musk fragrances, iodinated contrast media (ICM) and estrogens). No differences in PPCP pollution of the groundwater were found due to irrigation of STP effluents with and without addition of digested sludge, because many polar compounds do not sorb to sludge and lipophilic compounds are not mobile in the soil-aquifer. Most of the selected PPCPs were never detected in any of the lysimeter or groundwater samples, although they were present in the treated wastewater irrigated onto the fields. In the groundwater and lysimeter samples primarily the ICM diatrizoate and iopamidol, the antiepileptic carbamazepine and the antibiotic sulfamethoxazole were detected up to several μg l-1, while the acidic pharmaceuticals, musk fragrances, estrogens and betablockers were likely sorbed or transformed while passing the top soil layer. Potential estrogenic effects are likely to disappear after irrigation, since the most potent steroid estrogens were not measurable. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Soil-Aquifer Treatment, Estrogens, Antibiotics, Antiphlogistics, Contrast Media, Musk Fragrances, Aquatic Environment, Estrogenic Hormones, Contrast-Media, Partition-Coefficients, Agricultural Soils, Treatment Plants, Sewage, Sludge, Fate, 17-Beta-Estradiol

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Full Text: [2007\Chemosphere67, 1618.pdf](2007/Chemosphere67,%201618.pdf)

Abstract: Binding affinity of proanthocyanidin (PA) purified from Pinus radiata bark waste onto bovine Achilles tendon collagen (type I) was studied. Adsorption of PA onto the collagen was optimized by examining pH, contact time and temperature. The adsorption was pH-dependent. The maximum adsorption capacity (Q0) of PA on collagen was found to be 211 mg g-1 using the Langmuir isotherm. Comparison between two adsorbents also showed that collagen had higher adsorptivity of approximately 20% more than PVPP (polyvinyl polypyrrolidone). The high affinity between PA and collagen was further confirmed in solvent solubility experiments. The observed solvent resistance was thought to be mainly due to a hydrophobic stacking mechanism reinforced by hydrogen bonding. FT-IR spectra clearly indicated the presence of PA adsorbed on collagen. The results have interesting implications that PA can be a good protective agent for collagen against collagenase and other enzymes. 2006 Elsevier Ltd. All rights reserved.

Keywords: Pinus Radiata, Waste Bark, Proanthocyanidin, Collagen, Adsorption

? Araújo, G.C.L., Lemos, S.G., Ferreira, A.G., Freitas, H. and Nogueira, A.R.A. (2007), Effect of pre-treatment and supporting media on Ni(II), Cu(II), Al(III) and Fe(III) sorption by plant root material. *Chemosphere*, **68** (3), 537-545.

Full Text: [2007\Chemosphere68, 537.pdf](2007/Chemosphere68,%20537.pdf)

Abstract: In this work Paspalum notatum root material was used to elucidate the influence of acid leaching pre-treatment and of sorption medium on metal adsorption. Ground P. notatum root was leached with 0.14 M HNO3. Leached root material (LRM) and non-leached root material (NLRM) were employed to flow sorption of Ni(II), Cu(II), Al(III) and Fe(III) in 0.5 M CH3COONH4 medium at pH 6.5. For LRM the sorption was also studied in 0.5 M KNO3 medium. The acid pre-treatment increased the sorption capacity (SC) for all ions studied. For the KNO3 medium, Cu(II) and Fe(III) sorption was higher than in CH3COONH4 and the type of the Ni(II) isotherm’s model changed. The Freundlich model was the most representative isotherm model to describe metallic ions sorption. The H-1 NMR spectra showed differences between LRM and NLRM and the acid-basic potentiometric titration elucidated that acid-leaching procedure affected the root material sorption sites once only two predominant sorption sites were found for LRM (phenolic and amine, both able cations sorption) and five sorption sites (two carboxylic, amine and two phenolic) were founded for NLRM. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Biosorption, Pre-Treatment Effect, Supporting Media, Sorption Sites Investigation, Paspalum, Heavy-Metals, Biosorption, Algae, Biomass, Water, Ions, Acid, Preconcentration, Adsorption, Speciation

? Vijayaraghavan, K., Han, M.H., Choi, S.B. and Yun, Y.S. (2007), Biosorption of Reactive black 5 by *Corynebacterium glutamicum* biomass immobilized in alginate and polysulfone matrices. *Chemosphere*, **68** (10), 1838-1845.

Full Text: [2007\Chemosphere68, 1838.pdf](2007/Chemosphere68,%201838.pdf)

Abstract: Corynebacterium glutamicum, a lysine fermentation industry waste, showed promise for the removal of Reactive black 5 (RB5). Due to practical difficulties in solid-liquid separation, the free biomass was immobilized in two polymer matrices: calcium alginate and polysulfone. Initially, the optimization of biomass loading in polymeric beads and bead dosage were examined. Of the different combinations examined, 4% (with bead dosage of 2 g per 40 ml) and 14% (with bead dosage of I g per 40 ml) in the case of alginate and polysulfone beads, respectively, were identified as the optimal conditions. According to the Langmuir model, at pH 1, the maximum RB5 uptakes of 352, 282 and 291 mg g-1 were observed for free, alginate and polysulfone-immobilized biomass, respectively. According to the Weber-Morris model, intraparticle diffusion was found to be the potential rate limiting step for the immobilized beads. Regeneration experiments, with 0.01 M NaOH and Na2CO3 as eluents, revealed that polysulfone beads exhibited invariable RB5 uptake capacity and very high mechanical stability even at the end of twentieth cycle, confirming the technical feasibility of the biosorption process for industrial applications. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Alginate, Applications, Bead, Beads, Biomass, Biomass Immobilization, Biosorption, Calcium, Calcium Alginate, Capacity, Copper, Corynebacterium Glutamicum, Diffusion, Dosage, Dye, Equilibrium, Experiments, Fermentation, Fermentation Industry, Immobilized, Industrial, Intraparticle, Intraparticle Diffusion, Isotherm, Kinetics, Langmuir, Langmuir Model, Loading, Lysine, Mechanical, Metals, Model, Naoh, Nickel, Optimal Conditions, Optimization, pH, Polymer, Polymeric, Polymeric Beads, Polysulfone, Potential, Process, Rate, Rate Limiting, Rate Limiting Step, Rb5, Regeneration, Removal, Separation, Solid Liquid Separation, Solid-Liquid Separation, Stability, Systems, Uptake, Waste, Wastewater Treatment, Weber-Morris Model

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Full Text: [2007\Chemosphere68, 1883.pdf](2007/Chemosphere68,%201883.pdf)

Abstract: A novel technology of wastewater treatment was proposed based on simultaneously synthesis of organobentonite and removal of organic pollutants such as phenols from water in one-step, which resulted that both surfactants and organic pollutants were removed from water by bentonite. The effects of contact time, pH and inorganic salt on the removal of phenols were investigated. Kinetic results showed that phenols and cetyltrimethylammonium bromide (CTMAB) could be removed by bentonite in 25 min. The removal efficiencies were achieved at 69%, 92% and 99%, respectively, for phenol, p-nitrophenol and beta-naphthol at the initial amount of CTMAB at about 120% cation exchange capacity of bentonite. Better dispersion property and more rapid bentonite sedimentation were observed in the process. The results indicated that the one-step process is an efficient, simple and low cost technology for removal of organic pollutants and cationic surfactants from water. The proposed technology made it possible that bentonite was applied as sorbent for wastewater treatment in industrial scale. (C) 2007 Published by Elsevier Ltd.

Keywords: Sorption, Phenols, Surfactant, Bentonite, Wastewater Treatment, One-Step Process, Organic Contaminants, P-Nitrophenol, Sorption, Bentonite, Cation, Adsorption, Clay, Adsolubilization, Surfactants, Organoclays

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Full Text: [2007\Chemosphere68, 2040.pdf](2007/Chemosphere68,%202040.pdf)

Abstract: A new and simple equation has been presented here for calculation of adsorption and desorption rate constants of Langmuir Freundlich kinetic equation, The derivation of new equation is on the basis of extension and correction to the geometric method which has been presented by Kuan et al. [Kuan, W.-H., Lo, S.-L., Chang, C.M., Wang, M.K.. 2000. A geometric approach to determine adsorption and desorption kinetic constants. Chemosphere 41, 1741- 17471 for the kinetics of adsorption/desorption in aqueous solutions. The correction is to consider that the concentration of solute is not constant and changes as adsorption proceeds. The extension is that we applied Langmuir-Freundlich kinetic model instead of Langmuir kinetic model to consider the heterogeneity and therefore it is more applicable to the real systems. For solving Langmuir-Freundlich kinetic model, some geometric methods and also Taylor expansion were used and finally a simple and novel equation was derived (Eq. (20)) for calculation of adsorption rate constant. This new method was named “extended geometric method”. The input data of the obtained equation can be simply derived from initial data of adsorption kinetics. Finally the adsorption of methyl orange onto granular activated carbon was carried out at dynamic and equilibrium conditions and the capabilities of extended geometric method were examined by the experimental data. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Langmuir-Freundlich, Adsorption Kinetics, Adsorption Rate Constant, Extended Geometric Method, Divalent Metal-Ions, Aqueous-Solution, Sorption, Isotherm, Models, Equilibrium, Removal, Copper, Peat, Dye

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Full Text: [2007\Chemosphere69, 262.pdf](2007/Chemosphere69,%20262.pdf)

Abstract: Investigations were carried out in batch modes for studying the immobilization behavior of polyphenol oxidase (PPO) on two different mesoporous activated carbon matrices, MAC400 and MAC200. The PPO was immobilized onto MAC400 and MAC200 at various enzyme activities 5×104, 10×104, 20×104, 30×104 U 1-1, at pH 5-8, and at temperature ranging from 10 to 40°C. The intensity of immobilization of PPO increased with increase in temperature and initial activities, while it decreased with increase in pH. Immobilization onto MAC400 followed the Langmuir model while Langmuir and Freundlich models could fit MAC200 data. Non-linear pseudo first order, pseudo second order and intraparticle diffusion models were evaluated to understand the mechanism of immobilization. The free and immobilized enzyme kinetic parameters (K-m and V-max) were determined by Michaelis-Menten enzyme kinetics. The K-m values for free enzyme, PPO immobilized in MAC400 and in MAC200 were 0.49, 0.41 and 0.65 mM, respectively. The immobilization of PPO in carbon matrices was confirmed using FT-IR spectroscopy and scanning electron microscopy. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Adsorption Isotherms, Batch, Behavior, Biosensor, Carbon, Diffusion, Diffusion Models, Electron Microscopy, Enzyme, Enzyme Activities, Enzyme Kinetics, First Order, Freundlich, FT-IR, FT-IR Spectroscopy, FTIR, Ftir Spectroscopy, Immobilization, Immobilized, Immobilized Enzyme, Intensity, Intraparticle Diffusion, Kinetic, Kinetic Models, Kinetic Parameters, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Mechanism, Mesoporous, Mesoporous Activated Carbon, Microscopy, Model, Models, Order, Organic-Solvents, Oxidase, Parameters, pH, Phenols, Polyphenol Oxidase, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Scanning Electron Microscopy, Second Order, Spectroscopy, Temperature, Tyrosinase, V-Max, Waste-Water

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Full Text: [2007\Chemosphere69, 595.pdf](2007/Chemosphere69,%20595.pdf)

Abstract: The adsorption of fluorene onto TiO2 has been investigated by conducting equilibrium and kinetic experiments. Adsorption isotherms have been evaluated at two different pHs in the range of temperatures 296-325 K. The type III isotherm shapes obtained were modelled by considering several expressions taken from the literature. Temperature exerted a positive influence in fluorene uptake. Addition of phosphates involved a negative effect when computing the final equilibrium fluorene removal. The kinetic experiments carried out at 296 K corroborated the competitiveness of phosphates to occupy the active sites on the titania surface. Nevertheless, equilibrium conditions are faster achieved at pH 2 than at pH 5.

The photocatalysis of fluorene at different initial concentrations of the parent compound revealed a slight improvement of the process at pH 5 if compared to the results obtained at pH 2. A Langmuir-Hinselwood representation of the data confirms the previous statement. Catalyst load shows an optimum, concentration values of the photocatalyst above the optimum provoke a decrease in the fluorene abatement rate. Reutilisation of the catalyst indicates that fluorene is completely eliminated from the solid, i.e. it is suggested that fluorene and intermediates are surface oxidised. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Titanium Dioxide, Fluorene, Adsorption, Photocatalysis, Isosteric Heat, Adsorption, Degradation

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Full Text: [2007\Chemosphere69, 1136.pdf](2007/Chemosphere69,%201136.pdf)

Abstract: Decaying organic matter plays an important role in the cycling of metals in wetland ecosystems. Sorption kinetics of Cu(II) on Phragmites australis leaf and stem litter were studied. Fresh leaf and stem litter was sampled from a surface flow wetland at the end of the growing season. The effect of decomposition stage was studied with litter that had been decomposing for a period of 5 months. The Lagergren pseudo-first-order model, the pseudo-second-order model, the Elovich equation and two diffusion models based on spherical intra-particle diffusion were fitted to the experimental data. The sorption capacity was significantly affected by the decomposition of the litter. The sorption process was best described by the pseudo-second-order kinetics (R-2 similar to 0.99) but the rate constant was strongly dependent on the initial Cu concentration. The intra-particle diffusion model fitted the data only slightly less (R-2 > 0.95) than the pseudo-second-order model. A theoretical comparison revealed that the good fit with the pseudo-second-order kinetics could be indicative of intra-particle diffusion. Sorption kinetics observed for the leaf and stem litter at different metal concentrations showed a fast initial sorption followed by a slow sorption phase. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Bone Char, Cadmium, Capacity, Comparison, Concentration, Concentrations, Cu, Cu(II), Cu(II) Sorption, Cycling, Decaying Leaves, Decomposition, Diffusion, Diffusion Model, Diffusion Models, Ecosystems, Elovich, Elovich Equation, Experimental, Experimental Data, Flow, Intra Particle Diffusion, Intra-Particle Diffusion, Intra-Particle Diffusion Model, Intraparticle, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetic, Kinetic Study, Kinetics, Lagergren, Leaf, Litter, Matter, Metal, Metal-Ions, Metals, Model, Models, Myriophyllum-Spicatum, Nonliving Biomass, Organic, Organic Matter, Phragmites, Phragmites Australis, Process, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-First-Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Pseudo-Second-Order Model, Rate, Rate Constant, Removal, Role, Season, Sorption, Sorption Capacity, Stem, Surface, Surface Flow, Water, Wetland

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Full Text: [2007\Chemosphere69, 1151.pdf](2007/Chemosphere69,%201151.pdf)

Abstract: The adsorption of three acid dyes, Acid Red 97, Acid Orange 61 and Acid Brown 425 onto activated carbon was studied for the removal of acid dyes from aqueous solutions at room temperature (25°C. The adsorption of each dye with respect to contact time was then measured to provide information about the adsorption characteristics of activated carbon. The rates of adsorption were found to conform to the pseudo-second-order kinetics with a good correlation. The experimental isotherms obtained, except for Acid Orange 61 studied in mixture, were of the S-type in terms of the classification of Giles and co-workers. The best fit of the adsorption isotherm data was obtained using the Freundlich model. When a comparative study was made of the results obtained with single and mixed dyes, it can be seen that some of them affect others and modify their behavior in the adsorption process. The results indicate that activated carbon Could be employed for the removal of dyes from wastewater. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Acid, Acid Dye, Acid Dyes, Activated Carbon, Adsorption, Adsorption Characteristics, Adsorption Isotherm, Adsorption Process, Affect, Aqueous Solutions, Aqueous-Solutions, Behavior, Carbon, Characteristics, Classification, Comparative Study, Congo Red, Contact Time, Correlation, Decolorization, Dye, Dye Removal, Dyes, Effluents, Equilibrium, Experimental, Freundlich, Freundlich Model, Information, Isotherm, Isotherm Data, Isotherms, Kinetics, Made, Mixture, Model, Multivariate Curve Resolution, Orange, Process, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Removal of Dyes, Room Temperature, Solid-Waste, Solutions, Sorption, Temperature, Time, Waste-Water, Wastewater

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Full Text: [2008\Chemosphere70, 1366.pdf](2008/Chemosphere70,%201366.pdf)

Abstract: Activated carbon adsorption and chemical oxidation followed by activated carbon adsorption of resorcinol in water has been studied. Three chemical oxidants have been used: hypochlorite, permanganate and Fenton’s reagent. The influence of concentrations of resorcinol and activated carbon on adsorption removal rates has been investigated. Both isotherm and adsorption kinetics have been studied. Results are fit well by Freundlich isotherms and adsorption rates of resorcinol were found to follow a pseudo-second-order kinetic model. However, pyrogallol, an intermediate of resorcinol oxidation with permanganate and Fenton’s reagent, showed an unfavourable isotherm type. At the conditions investigated, chemical oxidation allows slight reductions of TOC and intermediates formed were found to inhibit the adsorption rate of TOC in the case of permanganate and Fenton’s reagent oxidation, likely due to formation of some polymer pyrogallol product. The adsorption process was found to be controlled by pore internal diffusion, which justifies the poor affinity of oxidation intermediates toward activated carbon since molecules of larger size should diffuse rapidly for the adsorption to be effective. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activated Carbon Adsorption, Adsorption, Adsorption Kinetics, Aquatic Humic Material, Aqueous Chlorination, Carbon, Diffusion, Drinking-Water, Fenton’s Reagent, Hypochlorite, Internal Diffusion, Isotherm, Isotherms, Kinetic, Kinetics, Model Compounds, Oxidation, Oxidation Byproducts, Ozonation, Permanganate, Permanganate, Precursors, Removal, Resorcinol, Size, Thm Formation, Trihalomethane Formation, Water

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Full Text: [2008\Chemosphere71, 2121.pdf](2008/Chemosphere71,%202121.pdf)

Abstract: In the present contribution sorption kinetics experiments under static conditions were utilized in three selected ionic liquids cations (1-ethyl-3-methylimidazolium, 1-butyl-3-methylimidazolium, 1-hexyl-3-methylimidazolium chlorides) study with five type of soil, differing in total organic carbon (TOC) content. the experimental results indicate the sorption capacity growth with increase in toc content and hydrophobicity of ionic liquid cation. the obtained kinetic sorption parameters as well as distribution coefficients (K-d) were used to estimate the sorption properties of the soil types towards the ionic liquids in question. The Gibbs free energy values indicate that ionic liquid cations sorption on soils could be generally considered as a physical adsorption with exothermic effect. But the values of -dG for studied cations sorption on soil with very high of TOC content in soil (45%) may testify to nature of chemical adsorption. Sorption of the analyzed compounds occurs probably by means of hydrogen bonds, electrostatic and pi center dot center dot center dot pi interaction with the organic matter and the clay minerals of the soils. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Sorption Kinetics Experiments, Ionic Liquid Cations, Distribution Coefficient, Total Organic Carbon, Soil Acidity, Interaction Types, Distribution Coefficients, Chromatography, Cations, Separation

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Full Text: [2008\Chemosphere71, 398.pdf](2008/Chemosphere71,%20398.pdf)

Abstract: The reaction sequence for the photocatalytic degradation of monochlorobenzene (MCB) in UV/TiO2 process, including substrate adsorption, degradation, and mineralization, was studied. The theoretical maximum quantity of MCB that could be adsorbed onto TiO2 surface in aqueous phase was 0.18±0.04 μmol m-2 of TiO2. In accordance with the upper limit of the relative surface coverage of MCB molecules to surface hydroxyls of TiO2 was around 2.2%. the water molecules as the major adjacent species near TiO2 surface would compete with MCB molecules. Increasing the initial substrate concentration to an appropriate value or enhancing the affinity between the MCB and the TiO2 surface by adjusting the solution pH would promote the photocatalytic degradation. Experimental results revealed that the neutral medium was beneficial for the degradation of MCB. In comparison, the mineralization was most improved at acidic condition. Generally, 90% of the total organic carbon (TOC) was mineralized after 240 min illumination time in the examined pH range except solution pH 11. The suppressed mineralization of MCB at solution pH 11 was ascribed to the lack of adsorption. A simplified 2-step consecutive kinetic model was used to simulate the mineralization. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Acid, Adsorption, Adsorption, Degradation, Heterogeneous Photocatalysis, Kinetics, Mineralization, Monochlorobenzene, Organic Contaminants, Oxidation, Suspensions, TiO2 Surface, Titanium Dioxide, UV-Radiation, Waste-Water

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Full Text: [2009\Chemosphere75, 1483.pdf](2009/Chemosphere75,%201483.pdf)

Abstract: In the present study, the effects of biosorbent *Aspergillus niger* dosage, initial solution pH and initial Ni(II) concentration on the uptake of Ni(II) by NaOH pretreated biomass of A. niger from aqueous solution were investigated. Batch experiments were carried out in order to model and optimize the biosorption process. The influence of three parameters on the uptake of Ni(II) was described using a response surface methodology (RSM) as well as Langmuir and Freundlich isotherm models. Optimum Ni(II) uptake of 4.82 mg Ni(II) g-1 biomass (70.30%) was achieved at pH 6.25, biomass dosage of 2.98 g L-1 and initial Ni(II) concentration of 30.00 mg L-1 Ni(II). Langmuir and Freundlich were able to describe the biosorption isotherm fairly well. However, prediction of Ni(II) biosorption using Langmuir and Freundlich isotherms was relatively poor in comparison with RSM approaches. The biosorption mechanism was also investigated by using Fourier transfer infrared (FT-IR) analysis of untreated, NaOH pretreated, and Ni(II) loaded A. niger biomass. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: A. Niger, Bakers-Yeast, Biosorption, Cadmium Biosorption, Fungal Biomass, Heavy-Metal Biosorption, Langmuir And Freundlich Isotherms, Ni(II) Removal, Optimization, Pseudomonas-Aeruginosa, Removal, RSM, *Saccharomyces-cerevisiae*, *Streptomyces-rimosus* Biomass, Waste Biomass

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Full Text: [2009\Chemosphere76, 433.pdf](2009/Chemosphere76,%20433.pdf)

Abstract: The purpose of this work was to explore the kinetics of naphthalene adsorption on an activated carbon from aqueous and organic solutions. Kinetic curves were fitted to different theoretical models, and the results have been discussed in terms of the nature and properties of the solvents, the affinity of naphthalene to the solutions, and the accessibility to the porosity of the activated carbon. Data was fitted to the pseudo-second order kinetic model with good correlation coefficients for all the solution media. The faster adsorption rate was obtained for the most hydrophobic solvent (heptane). The overall adsorption rate of naphthalene seems to be controlled simultaneously by external (boundary layer) followed by intraparticle diffusion in the porosity of the activated carbon when water, ethanol and cyclohexane are used as solvents. In the case of heptane, only two stages were observed (pore diffusion and equilibrium) suggesting that the limiting stage is the intraparticle diffusion. The low value of the boundary thickness supports this observation. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Rate, Basic-Dyes, Boundary Layer, Carbon, Correlation, Cyclohexane, Diffusion, Equilibrium, Ethanol, Hydrophobicity, Intraparticle Diffusion, Kinetic, Kinetic Model, Kinetics, Mechanism, Media, Methylene-Blue, Model, Models, Naphthalene, Observation, Organic, Organic Solvents, Polarity, Polycyclic Aromatic Hydrocarbons, Polycyclic Aromatic-Hydrocarbons, Pore Diffusion, Porosity, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Purpose, Removal, Rights, Solution, Solutions, Sorption, Theoretical Models, Value, Water, Work

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Full Text: [2009\Chemosphere77, 842.pdf](2009/Chemosphere77,%20842.pdf)

Abstract: A simple, economical and green methodology has been developed for the adsorption of malachite green using cellulose powder as the adsorbent. Batch experimental procedures were conducted to investigate the adsorption ability of this bio-polymer to remove malachite green from aqueous medium. The adsorbed dye on cellulose was characterized by Fourier transform-infra red spectroscopy (FT-IR). The various analytical parameters such as the effect of contact time, pH, temperature, etc. were optimized. The adsorption was efficient at a neutral pH (7.2) and both Langmuir and Freundlich isotherm models showed good fit into the experimental data. The adsorption kinetics indicated that the adsorption proceeds according to pseudo-second-order model. The adsorption of malachite green was found to be exothermic and it was accompanied by decrease in the entropy. Column studies were performed and the regeneration of the adsorbent was done easily using environmentally benign polyethylene glycol-400. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Agricultural Waste Material, Aqueous Medium, Aqueous Solution, Basic-Dyes, Bentonite, Biopolymer, Cellulose, Color Removal, Column, Column Studies, Data, Dye, Entropy, Equilibrium, Exothermic, Experimental, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Isotherm, Isotherm Model, Isotherm Models, Kinetics, Langmuir, Malachite Green, Methodology, Model, Models, pH, Photodegradation, Polyethylene, Polyethylene Glycol, Procedures, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Reaction Kinetics, Regeneration, Removal, Rights, Solution, Sorption, Spectroscopy, Temperature

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Full Text: [2009\Chemosphere77, 1453.pdf](2009/Chemosphere77,%201453.pdf); [2009\Chemosphere77, 1453A.pdf](2009/Chemosphere77,%201453A.pdf) [2009\Chemosphere 2009.pdf](2009/Chemosphere%202009.pdf); [2009\Chemosphere 2009.pdf](2009/Chemosphere%202009.pdf)

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Full Text: [2009\Chemosphere77, 1454.pdf](2009/Chemosphere77,%201454.pdf)

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Full Text: [2010\Chemosphere78, 688.pdf](2010/Chemosphere78,%20688.pdf)

Abstract: Perfluorinated compound as one of the emerging pollutants has caused great attention in recent years. In this study, the organo-montmorillonites (organo-Mts) with different amounts and arrangements of hexadecyltrimethylammonium bromide (HDTMAB) were prepared as effective sorbents for PFOS removal from water. Batch sorption experiments including sorption kinetics, sorption isotherm as well as effect of solution pH were studied. The Elovich and pseudo-second-order models were selected to fit the kinetic data and the latter described the sorption kinetic better. Sorption isotherms showed that the sorption amount of PFOS increased with increasing amount of HDTMAB loaded in the montmorillonites. indicating that hydrophobic interaction played an important role in the sorption process. Comparative sorption of other perfluorinated compounds (PFCs) with different length of C-F chains and different functional groups further verified that hydrophobic interaction was the main force for the sorption of PFCs on the organo-Mts. X-ray diffraction (XRD) analysis demonstrated the significant decrease of interlayer distance after PFOS sorption, suggesting that the HDTMAB molecules were rearranged in the interlayer of organo-Mts. The PFOS molecules first diffused into the organo-Mts via hydrophobic interaction, and then the rearrangement occurred through electrostatic interaction between the two surfactants, resulting in the microstructure change within the organo-Mts. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Analysis, Aqueous-Solution, Bromide, Cation, Data, Electrostatic Attraction, Elovich, Experiments, First, Force, Functional Groups, Hexadecyltrimethylammonium, Hydrophobic Interaction, Imprinted Polymer Adsorbents, Interaction, Isotherm, Isotherms, Kinetic, Kinetics, Length, Microstructure, Models, Organo-Montmorillonites, Organobentonite, P-Nitrophenol, Perfluorinated Surfactants, PFOS, pH, Pollutants, Pseudo Second Order, Pseudo-Second-Order, Removal, Rights, Role, Solution, Sorbents, Sorption, Sorption Isotherm, Sorption Isotherms, Sorption Kinetics, Sorption Mechanism, Sorption Process, Surfactants, Water, X-Ray, X-Ray Diffraction, XRD

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Full Text: [2010\Chemosphere79, 1019.pdf](2010/Chemosphere79,%201019.pdf)

Abstract: Batch experiment was carried out to study the sorption behavior of polysorbate 80 (Tween-80) on marine sediments collected from three different sites in Bohai Sea, China. The sorption of Tween-80 reached equilibrium within 3 h and the sorption kinetic curve could be divided into two sections: the rapid sorption part and the slow sorption part. The initial sorption rate increased with the organic carbon (OC) content of the sediment. For the sediments treated by HCl and H2O, sorption behaviors of Tween-80 fit the linear model very well (R-2: 0.9516-0.9862) at 298 K. The sorption occurred primarily due to partition function of the hydrophobic chains of Tween-80 into the organic carbon of the sediments. Sorption of Tween-80 on H2O2-treated sediments followed the Freundlich model (R-2: 0.9565-0.9732), which indicated that the surface function of clay minerals and other inorganic solids in the sediment played a key role. Moreover, the dependence of sorption on salinity and temperature was examined and the thermodynamic parameters were evaluated. It was found that the sorption was favorably influenced by the increasing salinity and decreasing temperature of seawater. The changes of Gibbs free energy (Delta G(0) = -15.33 similar to -17.54 kJ mol(-1)), enthalpy (Delta H-0 = -62.23 kJ mol(-1)) and entropy (Delta S-0 = -151.68 J mol(-1) K-1) of the sorption were also determined. The negative Delta G(0) and Delta H-0 values indicated that the sorption process was spontaneous and exothermic. The negative Delta S-0 value suggested that the degree of freedom decreased during the sorption process. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Tween-80, Nonionic Surfactant, Seawater, Sediment, Sorption Isotherm, Distributed Reactivity Model, Nonionic Surfactants, Anionic Surfactant, Different Soils, Water, Adsorption, Phenanthrene, Kinetics, Dye, Bioaccumulation

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Full Text: [2010\Chemosphere80, 647.pdf](2010/Chemosphere80,%20647.pdf)

Abstract: Perfluorooctane sulfonate (PFOS) is the latest chemical categorized as persistent organic pollutants (POPS) PFOS appears in the environmental water and tap water in ng L-1 level. The process of adsorption has been identified as an effective technique to eliminate PFOS in water. Three non-ion-exchange polymers (DowV493. DowL493 and AmbXAD4), two ion-exchange polymers (DowMarathonA and AmblRA400) and one granular activated carbon (GAC) (Filtersorb400) were tested with regard to their sorption kinetics and isotherms at low PFOS concentrations (100-1000 ng L-1 equilibrium concentrations) The sorption capacities at 1 jig L-1 equilibrium concentration decreased in the following order Ion-exchange polymers > non-ion-exchange polymers > GAC. but at further low equilibrium concentration (100 rig L-1) non-ion-exchange polymers showed higher adsorption capacity than other adsorbents In the case of sorption kinetics. GAC and ion-exchange polymers reached the equilibrium concentration within 4 h and AmbXAD4 within 10 h DowV493 and DowL493 took more than 80 h to reach equilibrium concentration AmbIRA400 was identified as the best filter material to eliminate PFOS at equilibrium concentration >1000 ng L. Considering both adsorption isotherms and adsorption kinetics. AmbXAD4 and DowMarathonA were recommended to eliminate PFOS at ng L-1 equilibrium concentration. (C) 2010 Elsevier Ltd All rights reserved.

Keywords: Acid, Activated Carbon, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Capacity, Carbon, Chemical, Comparative Study, Concentration, Decomposition, Environmental, Equilibrium, GAC, Granular Activated Carbon, Ion Exchange, Ion-Exchange, Ionexchange, Isotherms, Japan, Kinetics, L1, Organic, Organic Pollutants, Perfluorinated Surfactants, Persistent Organic Pollutants, PFOS, Pollutants, Polymers, Removal, Rights, Sorption, Sorption Isotherm, Sorption Kinetics, Sorption Kinetics and Isotherms, Tap Water, Water

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Full Text: [2010\Chemosphere80, 1328.pdf](2010/Chemosphere80,%201328.pdf)

Abstract: Activated carbons (ACs) can be used not only for liquid but also for vapour phase applications, such as water treatment, deodorisation, gas purification and air treatment. In the present study, activated carbons produced from agricultural residues (olive kernel, corn cobs, rapeseed stalks and soya stalks) via physical steam activation were tested for the removal of Bromopropylate (BP) from water. For the characterization of the activated carbons ICP, SEM, FTIR and XRD analyses were performed. Adsorption kinetics and equilibrium isotherms were investigated for all biomass activated carbons in aqueous solutions. Experimental data of BP adsorption have fitted best to the pseudo 2nd-order kinetic model and Langmuir isotherm. The study resulted that corn cobs showed better adsorption capacity than the other biomass ACs. Comparison among ACs from biomass and commercial ones (F400 and Norit (R) GL50) revealed that the first can be equally effective for the removal of BP from water with the latter. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Acaricide Residues, Activated Carbons, Activation, Adsorption, Adsorption Capacity, Adsorption Kinetics, Agricultural, Agricultural Residues, Air, Analyses, Aqueous Solutions, Aqueous-Solution, Biomass, Bromopropylate, Capacity, Characterization, Corn, Data, Equilibrium, Equilibrium Isotherms, First, FTIR, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Liquid, Model, Pesticide, Pesticides, Physical, Physical Activation, Preparation, Purification, Pyrolysis, Removal, Rights, SEM, Solid-Phase Extraction, Solutions, Steam Activation, Surface Waters, Temperature, Treatment, Waste Materials, Water, Water Treatment, XRD

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Full Text: [2011\Chemosphere82, 1367.pdf](2011/Chemosphere82,%201367.pdf)

Abstract: Chemically prepared activated carbon material derived from palm flower was used as adsorbent for removal of Amido Black dye in aqueous solution. Batch adsorption studies were performed for the removal of Amido Black 10B (AB10B), a di-azo acid dye from aqueous solutions by varying the parameters like initial solution pH, adsorbent dosage, initial dye concentration and temperature with three different particle sizes such as 100 μm, 600 μm and 1000 μm. The zero point charge was pH 2.5 and the maximum adsorption occurred at the pH 2.3. Experimental data were analyzed by model equations such as Langmuir, Freundlich and Temkin isotherms and it was found that the Freundlich isotherm model best fitted the adsorption data and the Freundlich constants varied from (K-F) 1.214, 1.077 and 0.884 for the three mesh sizes. Thermodynamic parameters such as ΔG, ΔH and ΔS were also calculated for the adsorption processes and found that the adsorption process is feasible and it was the endothermic reaction. Adsorption kinetics was determined using pseudo first-order, pseudo second-order rate equations and also Elovich model and intraparticle diffusion models. The results clearly showed that the adsorption of AB10B onto lignocellulosic waste biomass from palm flower (LCBPF) followed pseudo second-order model, and the pseudo second-order rate constants varied from 0.059 to 0.006 (g mg(-1) min) by varying initial adsorbate concentration from 25 mg L-1 to 100 mg L-1. Analysis of the adsorption data confirmed that the adsorption process not only followed intraparticle diffusion but also by the film diffusion mechanism. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Amido Black, Aqueous-Solutions, Bentonite, Chemical Activation, Chitosan, Dye, Equilibrium, Freundlich, Freundlich Isotherm, Kinetics, Langmuir, Malachite Green, Methylene-Blue, pH, Surface-Chemistry, Thermodynamic, Thermodynamics, Water

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Full Text: [2011\Chemosphere83, 1313.pdf](2011/Chemosphere83,%201313.pdf)

Abstract: Perfluorooctane sulfonate (PFOS), as one of emerging contaminants, has been attracting increasing concerns in recent years. Sorption of PFOS by maize straw- and willow-derived chars (M400 and W400), maize straw-origin ash (MA) as well as three carbon nanotubes (CNTs) was studied in this work. The sorption kinetics of PFOS by the six adsorbents was well fitted by the pseudo-second-order model. CNTs reached equilibrium in 2 h, much faster than those by chars (384 h) and ash (48 h). According to the sorption isotherms, both single-walled carbon nanotubes (SWCNT) and MA had high sorption capacities (over 700 mg g-1), while the two chars had low sorption capacities (below 170 mg g-1) caused by their small BET surface area. In the case of MA, due to its positively charged surface, both hydrophobic interaction and electrostatic attraction involved in the sorption, and the formation of hemi-micelles further favored the sorption. This study suggested that SWCNT and MA were effective adsorbents for PFOS removal from water. Compared to SWCNT, MA is low cost and easy to obtain, so it could be a preferred adsorbent for PFOS removal. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Ash, Bet Surface Area, Black Carbon, Carbon Nanotubes, Chars, Equilibrium, Granular Activated Carbon, Groundwater, Isotherms, Kinetics, Perfluorinated Surfactants, PFOS, Quantitative Characterization, Reactive Dye, Removal, Reverse-Osmosis, Sorption, Sorption Isotherms, Sorption Kinetics, Waste-Water, Water

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Full Text: [2011\Chemosphere83, 1539.pdf](2011/Chemosphere83,%201539.pdf)

Abstract: In addition to increasing the mobility of metal ions in the soil solution, chelating agents such as EDTA have been reported to alter both the total metal accumulated by plants and its distribution within the plant structures. Here, mature Mini-Sun Hybrid dwarf sunflowers exposed to 300 mu M Cd(2+) in hydroponic solution had initial translocation rates of at least 0.12 mmol kg(-1) h(-1) and reached leaf saturation levels within a day when a 3-fold molar excess of EDTA was used. EDTA also promoted cadmium transfer from roots to the shoots. A threefold excess of EDTA increased the translocation factor (TF) 100-fold, resulting in cadmium levels in the leaves of 580 mu g g(-1) and extracting 1400 mu g plant(-1). When plants were exposed to dissolved cadmium without EDTA, the vast majority of the metal remained bound to the exterior of the root. The initial accumulation could be successfully modeled with a standard biosorption pseudo second-order kinetic equation. Initial accumulation rates ranged from 0.0359 to 0.262 mg g(-1) min(-1). The cadmium binding could be cycled, and did not show evidence of saturation under the experimental conditions employed, suggesting it might be a viable biosorbant for aqueous cadmium. (c) 2011 Elsevier Ltd. All rights reserved.

Keywords: Aqueous-Solution, Assisted Phytoextraction, Biosorption, Cd, Citric-Acid, Heavy Metals, Heavy-Metal Uptake, Helianthus Annuus, Helianthus-Annuus, Hydroponic, Hyperaccumulator, Impact, Indian Mustard, Phytoremediation, Phytoremediation, Pseudo-Second-Order, Soil

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Full Text: [2011\Chemosphere85, 1269.pdf](2011/Chemosphere85,%201269.pdf)

Abstract: In the water treatment field, activated carbons (ACs) have wide applications in adsorptions. However, the applications are limited by difficulties encountered in separation and regeneration processes. Here, activated carbon/Fe3O4 nanoparticle composites, which combine the adsorption features of powdered activated carbon (PAC) with the magnetic and excellent catalytic properties of Fe3O4 nanoparticles, were fabricated by a modified impregnation method using HNO3 as the carbon modifying agent. The obtained composites were characterized by X-ray diffraction, scanning and transmission electron microscopy, nitrogen adsorption isotherms and vibrating sample magnetometer. Their performance for methyl orange (MO) removal by adsorption was evaluated. The regeneration of the composite and PAC-HNO3 (powdered activated carbon modified by HNO3) adsorbed MO by hydrogen peroxide was investigated. The composites had a high specific surface area and porosity and a superparamagnetic property that shows they can be manipulated by an external magnetic field. Adsorption experiments showed that the MO sorption process on the composites followed pseudo-second order kinetic model and the adsorption isotherm date could be simulated with both the Freundlich and Langmuir models. The regeneration indicated that the presence of the Fe3O4 nanoparticles is important for a achieving high regeneration efficiency by hydrogen peroxide. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Adsorption Isotherms, Aqueous-Medium, Carbons, Dyes, Freundlich, Iron Oxide, Isotherm, Isotherms, Kinetic, Langmuir, Methyl Orange, Microwave, Nitrogen Adsorption, Oxidation, Oxidation, P-Nitrophenol, Phenol, Regeneration, Sorption, Thermal Regeneration, Water, X-Ray Diffraction

# Title: Chemphyschem

Full Journal Title: [Chemphyschem](http://www3.interscience.wiley.com/cgi-bin/jhome/72514732)

ISO Abbreviated Title: Chemphyschem

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ISSN: 1439-4235

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

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Full Text: [2001\Chemphyschem2, 78.pdf](2001/Chemphyschem2,%2078.pdf)

Abstract: Carbon nanotubes were discovered soon after the successful laboratory synthesis of fulferenes. Since their discovery in 1997, there has been intensive research activity in the area of carbon nanotubes, not only because of their fascinating structural features and properties, but also because of their potential technological applications. There is increasing experimental evidence to show that carbon nanotubes may find use in nanoelectronic devices, displays, and in hydrogen storage. in this article, we discuss various important aspects related to the synthesis, structure, characterization, and mechanism of formation of multi-wailed and single-walled carbon nanotubes, followed by a presentation of the important electronic, mechanical, hydrogen storage, and other properties of the nanotubes. Doping, as well as other chemical manipulations with boron and nitrogen, bring about significant changes in the properties of the nanotubes. Carbon nanotubes also serve as useful templates to make other nanostructures. Layered metal chalcogenides, boron nitride, and other materials form nanotubes and provide considerable scope for study.

Keywords: Carbon; Field Emission; Fullerenes; Hydrogen Storage; Nanostructures, Walled Carbon Nanotubes; Chemical-Vapor-Deposition; Inorganic Fullerene-Like; Scanning-Tunneling-Microscopy; Field-Emission Properties; Large-Scale Synthesis; Boron-Nitride Nanotubes; B-C-N; Single-Wall; Aligned Carbon

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Full Text: [2005\Chemphyschem6, 2295.pdf](2005/Chemphyschem6,%202295.pdf)

Abstract: Fluorescence spectroscopy is employed to follow the ion exchange of an emissive dye - a carboxylated perylene imide - on a layered double hydroxide. The exchange of the carboxylate ions starts at the edges of the layered double hydroxide crystals and is followed by diffusion to the basal plane. Such space-resolved observations provide a solid basis for modelling and studying the mechanisms of exchange.

Keywords: Fluorescence Spectroscopy, Ion Exchange, Kinetics, Layered Compounds, Time-Resolved Spectroscopy, Layered Double Hydroxides, Molecular-Sieves, Hydrotalcite, Nanocomposites, Intercalation, Clays

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Full Text: [2009\Chemphyschem10, 2193.pdf](2009/Chemphyschem10,%202193.pdf)

Keywords: Citation Analysis, Citations, Economics Journals, History, Impact Factor, Journal Impact, LIS Journals, Rank, Relative Impacts, Relevance, Scientific Journal, Scientometrics

# Title: Chemtech

Full Journal Title: Chemtech

ISO Abbreviated Title: Chemtech

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ISSN: 0009-2703

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Journal Country/Territory: United States

Language: English

Publisher: Amer Chemical Soc

Publisher Address: 1155 16th St, NW, Washington, DC 20036

Subject Categories:

Chemistry, Applied: Impact Factor 1.250, 13/55 (2000)

Magee, T.R.A. and McKay, G. (1981), Corrosion: Monitoring and prevention. *Chemtech*, **11**, February, 104-107.

# Title: Chest

Full Journal Title: [Chest](http://www.chestjournal.org/)

ISO Abbreviated Title: Chest

JCR Abbreviated Title: Chest

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

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Full Text: [1997\Chest128, 1710.pdf](1997/Chest128,%201710.pdf)

Abstract: Revisions in stage grouping of the TNM subsets (T=primary tumor, N=regional lymph nodes, M=distant metastasis) in the International System for Staging Lung Cancer have been adopted by the American Joint Committee on Cancer and the Union Internationale Contre le Cancer, These revisions were made to provide greater specificity for identifying patient groups with similar prognoses and treatment options with the least disruption of the present classification: T1N0M0, stage IA; T2N0M0, stage IB; T1N1M0, stage IIA; T2N1M0 and T3N0M0, stage IIB; and T3N1M0, T1N2M0, T2N2M0, T3N2M0, stage IIIA. The TNM subsets in stage IIIB-T4 any N M0, any T N3M0, and in stage IV-any T any N M1, remain the same, Analysis of a collected database representing all clinical, surgical-pathologic, and follow-up information for 5,319 patients treated for primary lung cancer confirmed the validity of the TNM and stage grouping classification schema.

Keywords: End Results, Lung Cancer, Neoplasm Staging, Survival

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Full Text: [2005\Chest128, 3993.pdf](2005/Chest128,%203993.pdf)

Abstract: Study objectives: To evaluate the contribution of different world regions in respiratory research productivity. Methods: The world was divided into nine regions based on a combination of geographic, economic, and scientific criteria. Using the PUBMED database, we retrieved information about the origin of articles from 30 journals included in the Respiratory System category of the journal Citation Reports database for a 9-year period (1995 to 2003). We estimated the total number of publications, their mean impact factor, the product of these two parameters, and the research productivity per million of population of the world area divided by, the gross national income per capita (GNIPC), for every year and the whole period of the study, for all defined world regions. Measurements and results: Data on the country of origin of the publications was available for 48,614 of 49,382 retrieved articles (98.5%). The majority of articles published between 1995 and 2003 originated from Western Europe (40.4%) and the United States (35.4%). The research productivity compared to population and the GNIPC was found to be higher for Canada and Oceania compared to the United States and Western Europe. The rate of increase of the total published research product (number of published articles multiplied by the impact factor) was higher in the United States and Europe. The total research contribution of Asia, Eastern Europe, Central and Latin America, and Africa regarding the number of published articles was notably very low (approximately 8%). Conclusions: The data suggest that there was a significant research activity in the field of respiratory medicine during the studied period. Although leaders of production of respiratory medicine research were from Western Europe and the United States, Canada, and Oceania hail the best performance after adjustment for population and GNIPC.

Keywords: Africa, Analysis, Asia, Bibliometric, Bibliometric Analysis, Canada, Country, Country of Origin, Criteria, Data, Database, Eastern Europe, Economic, Europe, Field, Gross National Income, Impact, Impact Factor, Information, Journal, Journals, Latin America, Medicine, Origin, Performance, Population, Productivity, Publications, PUBMED, Research, Research Productivity, United States, World

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Full Text: 2009\Chest136, 787.pdf

Abstract: Background: Inconsistent information exists about factors associated with daytime hypercapnia in obese patients with obstructive sleep apnea (OSA). We systematically, evaluated these factors in this population. Methods: We included studies evaluating the association between clinical and physiologic variables and daytime hypercapnia (Paco(2), >= 45 mm Hg) in obese patients (body mass index [BMI], >= 30 kg/m(2)) With OSA (apnea-hypopnea index [AHI], >= 5) and with a < 15% prevalence of COPD. Two investigators conducted independent literature searches using MEDLINE, Web of Science, and Scopus until July 31, 2008. The association between individual factors and hypercapnia was expressed as the mean difference (MD). Random effects models were used to account for heterogeneity. Results: Fifteen studies (n = 4,250) fulfilled the selection criteria. Daytime hypercapnia was present in 788 patients (19%). Age and gender were not associated with hypercapnia. Patients with hypercapnia had higher BMI (MD, 3.1 kg/m(2); 95% confidence interval [CI], 1.9 to 4.4) and AHI (MD, 12.5; 95% CI, 6.6 to 18.4) than eucapnic patients. Patients with hypercapnia had lower percent predicted FEV(1) (MD, -11.2; 95% CI, -15.7 to -6.8), lower percent predicted vital capacity (MD, -8.1; 95% CI, -11.3 to -4.9), and lower percent predicted total lung capacity (MD, -6.4; 95% CI, -10.0 to -2.7). FEV(1)/FVC percent predicted was not different between hypercapnic and eucapnic patients (MD, -1.7; 95% CI, -4.1 to 0.8), but mean overnight pulse oximetric saturation was significantly lower in hyercapnic patients (MD, -4.9; 95% CI, -7.0 to -2.7). Conclusions: In obese patients with OSA and mostly without COPD, daytime hypercapnia was associated with severity of OSA, higher BMI levels, and degree of restrictive chest wall mechanics. A high index of suspicion should be maintained in patients with these factors, as early recognition and appropriate treatment can improve outcomes. (CHEST 2009; 136:787-796).

Keywords: Age, Bmi, Body Mass Index, Cohort Studies, Copd, Cpap, Daytime Hypercapnia, Determinants, Diurnal Hypercapnia, Drive, Gender, Hypopnea Syndrome, Hypoventilation-Syndrome, Information, Literature, Methods, Outcomes, Positive Airway Pressure, Prevalence, Pulmonary-Hypertension, Review, Science, Scopus, Systematic, Systematic Review, Treatment, Ventilatory Response, Web of Science

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Full Text: 2011\Chest139, 279.pdf

Abstract: Background: Remote coverage of ICUs is increasing, but staff acceptance of this new technology is incompletely characterized. We conducted a systematic review to summarize existing research on acceptance of tele-ICU coverage among ICU staff. Methods: We searched for published articles pertaining to critical care telemedicine systems (aka, tele-ICU) between January 1950 and March 2010 using PUBMED, Cumulative Index to Nursing and Allied Health Literature, Global Health, Web of Science, and the Cochrane Library and abstracts and presentations delivered at national conferences. Studies were included if they provided original qualitative or quantitative data on staff perceptions of tele-ICU coverage. Studies were imported into content analysis software and coded by tele-ICU configuration, methodology, participants, and findings (eg, positive and negative staff evaluations). Results: Review of 3,086 citations yielded 23 eligible studies. Findings were grouped into four categories of staff evaluation: overall acceptance level of tele-ICU coverage (measured in 70% of studies), impact on patient care (measured in 96%), impact on staff (measured in 100%), and organizational impact (measured in 48%). Overall acceptance was high, despite initial ambivalence. Favorable impact on patient care was perceived by >82% of participants. Staff impact referenced enhanced collaboration, autonomy, and training, although scrutiny, malfunctions, and contradictory advice were cited as potential barriers. Staff perceived the organizational impact to vary. An important limitation of available studies was a lack of rigorous methodology and validated survey instruments in many studies. Conclusions: Initial reports suggest high levels of staff acceptance of tele-ICU coverage, but more rigorous methodologic study is required. CHEST 2011;139(2):279-288.

Keywords: Acceptance, Analysis, Barriers, Citations, Cochrane, Collaboration, Content Analysis, Coverage, Critical Care, EICU, Evaluation, Health, Hospitals, ICU, Ill Patients, Impact, Intensive-Care-Unit, Length-of-Stay, Methodology, Methods, Mortality, Nursing, Outcomes, Perceptions, PUBMED, Quantitative, Research, Review, Science, Software, Survey, Systematic, Systematic Review, Telemedicine Program, Training, Web of Science

# Title: CHI2009: Proceedings of the 27th Annual CHI Conference on Human Factors in Computing Systems

Full Journal Title: CHI2009: Proceedings of the 27th Annual CHI Conference on Human Factors in Computing Systems

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Bartneck, C. and Hu, J. (2009), Scientometric analysis of the CHI Proceedings. *CHI2009: Proceedings of the 27th Annual CHI Conference on Human Factors in Computing Systems*, **1-4**, 699-708.

Abstract: The CHI conference has grown rapidly over the last 26 years. We present a quantitative analysis on the countries and organizations that contribute to its success. Only 7.8 percent of the countries are responsible for 80 percent of the papers in the CHI proceedings, and the USA is clearly the country with most papers. But the success of a country or organization does not depend only on the number of accepted papers, but also on their quality. We present a ranking of countries and organizations based on the h-index, an indicator that tries to balance the quantity and quality of scientific output based on a. bibliometric analysis. The bibliometric analysis also allowed us to demonstrate the difficulty of judging quality. The papers acknowledged by the best paper award committee were not cited more often than a random sample of papers from the same years. The merit of the award is therefore unclear, and it might be worthwhile to allow the visitor to the conference to vote for the best paper.

Keywords: Analysis, Balance, Bibliometric, Bibliometric Analysis, Bibliometrics, CHI, Citation Analysis, Committee, Country, Counts, g-Index, Google-Scholar, H Index, h-Index, History, Impact, Index, Indicator, Organization, Organizations, Papers, Quality, Quality, Quality of, Quantitative Analysis, Random Sample, Ranking, Science, Scientific Output, Scopus, Success, USA, Web

# Title: Chia-Nan Annual Bulletin

Full Journal Title: Chia-Nan Annual Bulletin

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yang, J.M., Chang, N.W. and Nan, Y.J. (2003), In vitro studies on the adsorption removal of paraquat by eggshell membrane and other adsorbents. *Chia-Nan Annual Bulletin*, **29**, 77-86.

Abstract: The aim of this study was to investigate the possibility of eggshell membrane (ESM) being applied as the adsorption remover for paraquat in vitro. Meanwhile, the absorption capacities of ESM as well as other Absorbents including bentonite, activated clay and un-activated clay were compared at different pH environments. The results showed that the activated clay was far superior than other adsorbents in the removal of paraquat in the aqueous solutions with different pH values. In order to clarify the factors that contribute to the results, the pore characteristics and the adsorption kinetics were also analyzed by liquid nitrogen adsorption/desorption method and batch method under the controlled conditions, respectively. From the experiment data, the BET surface area and total pore volume of ESM were 0.69 m2/gand 0.002 cm3/g, respectively, which were far smaller than those of activated clay, indicating that ESM is possibly a nonporous material. In addition, the adsorption kinetics of ESM and activated clay could be well described with the pseudo-second order model, and the amount of paraquat adsorbed at equilibrium under controlled conditions was found to be 1.759 mg/g, which was very small compared to that of activated clay (40 mg/g), although the adsorption half-lives of both were nearly similar. In conclusion, ESM seems not applicable to be used as paraquat remover in clinical treatment, on the contrary, activated clay could be worthy of further investigation on the clinical usage.

Keywords:Adsorption, Eggshell Membrane, Bentonite, Activated Clay, Un-Activated Clay, Paraquat

# Title: Child Abuse & Neglect

Full Journal Title: Child Abuse & Neglect

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lalor, K. (2004), Child sexual abuse in sub-Saharan Africa: A literature review. *Child Abuse & Neglect*, **28** (4), 439-460.

Full Text: [2004\Chi Abu Neg28, 439.pdf](2004/Chi%20Abu%20Neg28,%20439.pdf)

Abstract: Objective: This article reviews the English-language literature on child sexual abuse in sub-Saharan Africa (SSA). The focus is on the sexual abuse of children in the home/community, as opposed to the commercial sexual exploitation of children. Methods: English language, peer-reviewed papers cited in the Social Sciences Citation Index (SSCI) are examined. Reports from international and local NGOs and UN agencies are also examined. Results: Few published studies on the sexual abuse of children have been conducted in the region, with the exception of South Africa. Samples are predominantly clinical or University based. A number of studies report that approximately 5% of the sample reported penetrative sexual abuse during their childhood. No national survey of the general population has been conducted. The most frequent explanations for the sexual abuse of children in SSA include rapid social change, AIDS/HIV avoidance strategies and the patriarchal nature of society. Child sexual abuse is most frequently perpetrated by family members, relatives, neighbors or others known to the child. Conclusions: There is nothing to support the widely held view that child sexual abuse is very rare in SSA-prevalence levels are comparable with studies reported from other regions. The high prevalence levels of AIDS/HIV in the region expose sexually abused children to high risks of infection. It is estimated that, approximately .6-1.8% of all children in high HIV-incidence countries in Southern Africa will experience penetrative sexual abuse by an AIDS/HIV infected perpetrator before 18 years of age. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Abuse, Africa, Age, Child, Childhood, Children, Clinical, Experience, Family, Family Members, General, Infected, Infection, International, Literature, Literature Review, Local, National Survey, NGOS, Papers, Peer-Reviewed, Population, Prevalence, Review, Reviews, Rights, Risks, Sexual Abuse, Social, Social Change, Society, South Africa, SSCI, Sub-Saharan Africa, Support, Survey

# Title: Child Care Health and Development

Full Journal Title: [Child Care Health and Development](http://webbackup.epnet.com/HJAFdetail.asp?tb=1&_ug=dbs+3+ln+en%2Dus+sid+C6318672%2DE49D%2D43AC%2DAA21%2DCDC437E1BF92%40sessionmgr3%2Dsessionmgr4+146B&_uh=btn+N+idb+pbhish+jdb+pbhjnh+op+phrase+ss+ID++6NX+8A4F&_us=db+3+sm+ES+8673&); [Child Care Health and Development](http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=cch)

ISO Abbreviated Title: Child Care Health Dev.

JCR Abbreviated Title: Child Care Hlth Dev

ISSN: 0305-1862

Issues/Year: 6

Journal Country/Territory: England

Language: English

Publisher: Blackwell Science Ltd

Publisher Address: PO Box 88, Osney Mead, Oxford OX2 0NE, Oxon, England

Subject Categories:

Pediatrics: Impact Factor

? el Tahir Taha, T., Abdel Wahab, M.M. and Wallace, H.M. (1986), Morbidity patterns in a new paediatric hospital in Juba, Sudan. *Child Care Health and Development*, **12** (2), 111-120.

Abstract: A study of morbidity patterns in a new paediatric hospital in Juba, Sudan, showed malaria, gastroenteritis, pneumonia, dysentery and infections of the eye, ear, and skin to be the commonest conditions. During the entire period of the study, these conditions constituted more than 90% of the outpatient load. In a group of inpatients interviewed, immunization coverage was 22%, 46% of the mothers had been enrolled in school at some time, and only 17% of the families had a latrine at home. The mean number of living children per family was four and of those not surviving was two. These findings are related to an inadequate environment, lack of public health information, and low socioeconomic status. Immediate and long-term strategies are necessary to provide safe water, adequate latrines, better immunization coverage, income-generating practices, increase in female education, and general health education of females, children and youth.

? Spencer, N.J. and Coe, C. (1996), The development and validation of a measure of parent-reported child health and morbidity: The Warwick Child Health and Morbidity Profile. *Child Care Health and Development*, **22** (6), 367-379.

Full Text: [C\Chi Car Hea Dev22, 36.pdf](C/Chi%20Car%20Hea%20Dev22,%2036.pdf)

Abstract: Objective: to validate a simple instrument for the measurement of parent-reported health and morbidity in infancy and childhood suitable for research and service planning purposes and capable of measuring both cross-sectional and longitudinal health and morbidity experience in a child population. Setting: child health clinic (CHC), child development unit (CDU) and paediatric outpatient department (OPD) in Coventry. Design: 3-phase field testing to establish test-retest reliability, validity and inter-observer variation of the instrument. Field testing samples: phases 1 and 2; 188 parents of pre-school children attending one of the three health service settings-CHC, CDU or paediatric OPD; phase 3; 40 parents of preschool children attending CHCs. Methods: test-retest reliability of each domain of the WCHMP was estimated using weighted Kappa; criterion validity was estimated for selected domains against health records; construct validity against medically plausible constructs was tested by comparing responses between domains; inter-observer variation was estimated using weighted Kappa. Results: the test-retest reliability of the WCHMP varied from ‘moderate’ for behaviour, functional health and life quality status to ‘very good’ for acute significant illness and hospital admission status; criterion and construct validity were high; weighted Kappas for all domains for inter-observe variation between the researcher and family health visitor were in the ‘good’ to ‘very good’ range and inter-observer variation remained unaffected by change in the order of administration of the WCHMP. Conclusions: the WCHMP is a simple measure of parent-reported health and illness which, on field-testing, has been shown to be reliable and valid with low inter-observer variation. After further development and validation including incorporation into the parent-held record, it should be suitable for use in infancy and early childhood to collect cross-sectional and longitudinal health and morbidity data for research and service planning purposes.

Keywords: Child Health, Child Morbidity, Parent-Reported Child Health and Illness Experiences

? Whittingham, K., Wee, D. and Boyd, R. (2011), Systematic review of the efficacy of parenting interventions for children with cerebral palsy. *Child Care Health and Development*, **37** (4), 475-483.

Full Text: 2011\Chi Car Hea Dev37, 475.pdf

Abstract: This systematic review aims to evaluate the efficacy of parenting interventions (i.e. behavioural family intervention and parent training) with parents of children with cerebral palsy (CP) on child behavioural outcomes and parenting style/skill outcomes. The following databases were searched: MEDLINE (1950-April 2010), PUBMED (1951-April 2010), PsycINFO (1840-April 2010), CINAHL (1982-April 2010) and Web of Science (1900-April 2010). No randomized clinical trials of parenting interventions with parents of children with CP were identified. Three studies were identified that involved the examination of a targeted parenting intervention via a pre-post design. Interventions utilized included the implementation of parenting interventions in conjunction with behavioural intervention and oral motor exercises for children with CP and feeding difficulties, the Hanen It Takes Two to Talk programme and a Functional Communication Training programme for parents. All studies found changes in relevant child behavioural outcomes. The studies reviewed suggest that parenting interventions may be an effective intervention for parents of children with CP. However, the current research is limited to pre-post designs of targeted parenting interventions (e. g. parenting interventions focused upon communication). A randomized controlled trial of parenting interventions for families of children with CP is urgently needed to address this paucity in the literature and provide families of children with CP with an evidence-based intervention to address child behavioural and emotional problems as well as parenting challenges.

Keywords: Behavior, Behavioural Family Intervention, Cerebral Palsy, Child, Children, Clinical Trials, Communication, Databases, Disabilities, Efficacy, Families, Intervention, Interventions, Literature, Outcomes, Parent, Parenting, Parenting Interventions, Parents, PUBMED, Randomized Clinical Trials, Randomized Controlled Trial, Research, Review, Science, Systematic, Systematic Review, Training, Web of Science

# Title: Chimia

Full Journal Title: [Chimia](http://www.ingentaconnect.com/content/scs/chimia;jsessionid=1jkvbh04lfaiu.alice)

ISO Abbreviated Title: Chimia

JCR Abbreviated Title: Chimia

ISSN: 0009-4293

Issues/Year: 10

Journal Country/Territory: Switzerland

Language: Multi-Language

Publisher: New Swiss Chemical Soc

Publisher Address: C/O Novartis AG, K-25 1 45, CH-4002 Basel, Switzerland

Subject Categories:

Chemistry: Impact Factor 1.253, 32/121

? (1993), Responsible care: Progress with responsibility: An initiative of the chemical-industry for safety, health and environmental-protection. *Chimia*, **47** (12), 497.

Full Text: Chimia47, 497.pdf

? Jucker, W. (1998), Implementation of legal requirements in self-responsibility. *Chimia*, **52** (12), 694-697.

Full Text: Chimia52, 694.pdf

Abstract: In Switzerland, legal aspects of the handling of highly reactive substances is regulated by the Law of Labour (Arbeitsgesetz), the Law of Environmental Protection (Umweltschutzgesetz) with their corresponding ordinances and some other laws. Discussions on the use of highly reactive substances are focussed to incidents. Therefore, the ordinance on the protection against major accidents (StFV) plays a central role. It’s the duty of the managing director to overcome emergencies. The chemical industry commits to the principles of sustainable development and to the Responsible Care Programme. As a consequence, not only legal requirements but also responsibility for safety and environmental protection influence the production processes.

A successful emergency management is based on professional and well-tested guidances and plans. General emergency concepts for incidents with hazardous materials and radioactive substances are well-known. As an example of responsible implementation of legal requirements, the general guidance of handling incidents in bio-areas (areas with biological materials) of F. Hoffmann-La Roche Ltd. is presented.

? Amrhein, H., Glauser, M. and Matthes, M. (2000), Motivation of employees: A cornerstone for higher ECO-efficiency in wastewater treatment. *Chimia*, **54** (9), 514-516.

Full Text: Chimia54, 514.pdf

Abstract: Various production processes at Roche AG, Sisseln generate large quantities of wastewater, which is treated in the company’s own wastewater treatment plant. Although all statutory requirements are being met, the plant has set itself an ambitious target to increase eco-efficiency as part of the Responsible Care Program. After two years, the first net benefits are becoming clear. Over this period, it has been possible to achieve a 27% reduction in the solvent load of wastewater, which has had not only environmental benefits but also measurable economic benefits. This has been achieved by various measures in the production plants, supported by an interdepartmental working team and direct employee participation in the resultant cost savings.

Keywords: ECO-Efficiency, Green Chemistry, Motivation, Responsible Care, Wastewater Treatment

? Molinie, A. and Bodenhausen, G. (2008), America, America! *Chimia*, **62** (4), 291-299.

Full Text: Chimia62, 291.pdf

Abstract: This account was written during a four-month stay in Berkeley from May to August 2007. It was partly inspired by a diary published by Simone de Beauvoir after her four-month lecture tour to the US in 1947.([1]) We could not resist the temptation of writing a few pages about our impressions. This text is not intended as an essay about anthropological or chemical sciences. We merely tried to understand the conditions of the bubbling creativity that we have so often witnessed in Berkeley. Some of our comments are more or less voluntarily naive, as if Voltaire’s Candide had made a trip to America. Our impressions may appear a bit franchouillardes, and perhaps a trifle rude to our American hosts, whose kindness does not deserve such a harsh treatment.

Keywords: Bibliometrics, Creativity, Cultural Misunderstandings, Funding of Scientific Research, Impact, Sciences, Treatment, US

? Meyer, V.R. (2009), The h index - Help or hype? *Chimia*, **63** (1-2), 66-68.

Full Text: Chimia63, 66.pdf

Abstract: Three years ago a bibliometric index for the qualification of a person’s scientific output was proposed by Hirsch, the so-called h index. This is an integer number which combines the number of papers of an author and the number of citations they gathered. Thus the h index is an indicator for both the productivity and the impact of a scientist. This paper presents the properties of the h index and the great attention it attracted within a short time. Numerous other indices, claimed to be better than the original, were proposed in the meantime. These developments are discussed critically.

Keywords: Attention, Bibliometric, Bibliometry, Citations, h Index, h-Index, Hirsch, Hirsch Index, Hirsch Index, Impact, Index, Index Inflation, Indicator, Indices, Papers, Productivity, Scientific Output, Time

? Molinie, A. and Bodenhausen, G. (2010), Bibliometrics as weapons of mass citation. *Chimia*, **64** (1-2), 78-89.

Full Text: Chimia64, 78.pdf

Abstract: The allocation of resources for research is increasingly based on so-called ‘bibliometrics’. Scientists are now deemed to be successful on the sole condition that their work be abundantly cited. This world-wide trend appears to enjoy support not only by granting agencies (whose task is obviously simplified by extensive recourse to bibliometrics), but also by the scientists themselves (who seem to enjoy their status of celebrities). This trend appears to be fraught with dangers, particularly in the area of social sciences, where bibliometrics are less developed, and where monographs (which are not taken into account in citation indexes) are often more important than articles published in journals. We argue in favour of a return to the values of ‘real science’, in analogy to the much-promised return to a ‘real economy’. While economists may strive towards a more objective evaluation of the prospects of a company, a market, or an industrial sector, we scientists can only base our appraisal on a responsible practice of peer review. Since we fear that decision-takers of granting agencies such as the FNRS, CTI, EPFL, ETHZ, ANR, CNRS, NIH, NSF, DOE,([1]) etc. will be too busy to read our humble paper in Chimia, we appeal to scientists of all countries and disciplines to unite against the tyranny of bibliometrics.

Keywords: Articles, Bibliometrics, Citation, Citation Indexes, Citation Indices, Eigenfactors, Enhancement, Evaluation, Extensive, Fun Factors, h-Factors, Impact Factors, Journals, Magnetic-Resonance, Multiple-Quantum Coherence, Networks, Nmr-Spectroscopy, Peer Review, Peer-Review, Proteins, Research, Resolution, Review, Science, Science Policy, Shifts, Social Sciences, Spectra, Support, Task, Teaching Factors, Trend

? Molinie, A. and Bodenhausen, G. (2011), The kinship or k-Index as an antidote against the toxic effects of h-Indices. *Chimia*, **65** (6), 433-436.

Full Text: 2011\Chimia65, 433.pdf

Abstract: In a bilingual paper entitled ‘Bibliometrics as weapons of mass citation - La bibliometrie comme arme de citation massive’,([1]) recently translated into English,([2]) we have argued that the current fashion of ranking people, papers and journals is anything but harmless. The point was forcefully supported by Richard Ernst in a post-face entitled ‘The Follies of Citation Indices and Academic Ranking Lists.([3,4]) We received a surprising number of passionate responses, such as ‘It’s written out of my heart’ (TH); ‘Je soutiens cette entreprise courageuse de tout coeur’ (VT); ‘Impact Faktoren sind ein Marktinstrument gewisser Verlage (FS); ‘II y a un combat a mener’ (SB). Some thoughtful responses have been incorporated into this Essay, albeit in attenuated form. We suggest that the ‘fertility’ of individual scientists be appreciated in terms of kinship rather than through personalized indices.

Keywords: Bibliometrics, Citation, h-Indices, Journals, K-Indices, Papers, Ranking

# Title: Chimica & L Industria

Full Journal Title: Chimica & L Industria

ISO Abbreviated Title:

JCR Abbreviated Title: Chim Ind Milan

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

: Impact Factor

? Pulidori, F., Borghesani, G., Pedriali, R. and Bighi, C. (1975), Adsorption and kinetic surface-waves in polarography. *Chimica & L Industria*, **57** (1), 47.

# Title: Chimica Oggi-Chemistry Today

Full Journal Title: Chimica Oggi-Chemistry Today

ISO Abbreviated Title: Chim. Oggi-Chem. Today

JCR Abbreviated Title: Chim Oggi

ISSN: 0392-839X

Issues/Year: 9

Journal Country/Territory: Italy

Language: English

Publisher: Teknoscienze Publ

Publisher Address: Via Aurelio Saffi 23, 20123 Milan, Italy

Subject Categories:

Biotechnology & Applied Microbiology Chemistry: Impact Factor

? Bracco, D. (1995), Responsible care in Italy. *Chimica Oggi-Chemistry Today*, **13** (4-5), 9-10.

? (1996), Rohm and Haas’s commitment to responsible care. *Chimica Oggi-Chemistry Today*, **14** (11-12), 74.

? (1998), CREANOVA and SIVENTO leaders in responsible care implementation. *Chimica Oggi-Chemistry Today*, **16** (10), 100.

? (1999), Co-operation with chemical workers in the implementation of responsible care. *Chimica Oggi-Chemistry Today*, **17** (3-4), 59.

? Zhou, P. and Leydesdorff, L. (2009), Chemistry in China - a bibliometric view. *Chimica Oggi-Chemistry Today*, **27** (6), 19-22.

Full Text: 2009\Chi Ogg-Che Tod27, 19.pdf

Abstract: Based on bibliometric analysis, this paper explores China’s publication activity in chemistry. China develops fast in chemical research and has taken a leading position in publishing journal papers. International collaboration plays a role in the Chinese chemical community, but this role varies among subfields.

Keywords: Science, Korea

? Alvarez, E.C. and Anegon, F.D. (2009), Chemistry in Spain bibliometric analysis through Scopus. *Chimica Oggi-Chemistry Today*, **27** (6), 61-64.

Full Text: 2009\Chi Ogg-Che Tod27, 19.pdf

Abstract: A bibliometric analysis of data from the Scopus database was performed to assess Chemistry publishing activity in Spain. Results show a slight decrease in Chemistry publication output with respect to total output in Spain, similar to that observed in other regions in the world, and a slight increase in the number of citations.

# Title: China Basic Science

Full Journal Title: [China Basic Science](http://c.wanfangdata.com.cn/periodical-zgjckx.aspx)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Chen, J. (2009), Statistics on original research papers published in *Pain* by Chinese Mainland during 1975-2008. *China Basic Science*, **11** (2), 40-45.

Full Text: [2009\Chi Bas Sci11, 40.pdf](2009/Chi%20Bas%20Sci11,%2040.pdf)

Abstract: Based upon the search results through PUBMED Web with the aid of Note Express and the data published by Mogil et al. (Pain, 2009, 142: 48—58) which examined every one of the 4525 original Research Papers published in the journal, Pain, from 1975 (the first issue) to the end of 2007, each of the 44 original Research Papers contributed to the journal Pain by Chinese researchers till March 1, 2009 were reanalyzed. In this report, only those papers coming from institutions in the mainland of People’s Republic of China were considered. The present data provided with a basic frame outlining how important our country was to the development of pain research, what was the regional difference in research interests across the mainland, and who were highly cited institutions and authors in terms of contribution to the journal, Pain. This report suggested that Chinese pain researchers had been and would be playing an important role in the development of pain research although their influence was still limited to some specific aspects.

Keywords: Pain Research, Chinese Pain Researchers, Chinese Mainland

# Title: China Economic Review

Full Journal Title: [China Economic Review](http://www.sciencedirect.com/science/journal/1043951X)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Prasad, E.S. (2009), Is the Chinese growth miracle built to last? *China Economic Review*, **20** (1), 103-123.

Full Text: [2009\Chi Wor Eco20, 103.pdf](2009/Chi%20Wor%20Eco20,%20103.pdf)

Abstract: Is the Chinese growth miracle-a remarkably high growth rate sustained for over two decades likely to persist or are the seeds of its eventual demise contained in the policies that have boosted growth? For all its presumed flaws, the particular approach to macroeconomic and structural policies that has been adopted by the Chinese government has helped to deliver high productivity and output growth, along with a reasonable degree of macroeconomic stability. There comes a point, however, when the policy distortions needed to maintain this approach could generate imbalances, impose potentially large welfare costs, and themselves become a source of instability.

The traditional risks faced by emerging market economies, especially those related to having an open capital account, do not loom large in the case of China. In the process of securing protection against external risks, however, Chinese policymakers may have increased the risks of internal instability. There are a number of factors that could trigger unfavorable economic dynamics that, even if they don’t rise to the level of a crisis, could have serious adverse repercussions on growth and welfare. The flexibility and potency of macroeconomic tools to deal with such negative shocks is constrained by the panoply of policies that has supported growth so far. (C) 2008 Elsevier Inc. All rights reserved.

Keywords: Exchange Rate Flexibility, Capital Account Liberalization, Growth Model, Macroeconomic Policies, Financial Sector Reforms

# Title: China Environmental Science

Full Journal Title: [China Environmental Science](http://e32.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZGHJ&NaviLink=%e4%b8%ad%e5%9b%bd%e7%8e%af%e5%a2%83%e7%a7%91%e5%ad%a6)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1000-6923

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zeng, A.Y., Yan, C.Z., Jin, X.C., Wang, S.R. and Ma, X.F. (2005), The character of Cu2+ biosorption by *Ceratophyllum demersum*. *China Environmental Science*, **25** (6), 691-684.

Full Text: [2005\Chi Env Sci25, 691.pdf](2005/Chi%20Env%20Sci25,%20691.pdf)

Abstract: The sorption kinetics and thermodynamics characters of submersed aquatic plant Ceratophyllum demersum for Cu2+ were studied. Cu2+ sorption by C. demersum reached balance within 20 min, the test results of sorption kinetics conformed to the pseudo second order kinetics equation, with its relativity coefficient reaching 0.9937, this sorption was a complicated process of simultaneous action of many reactions. The test results of sorption thermodynamic that used Langmuir and Freundlich sorption isotherms for fit

Keywords: Submerged Aquatic Plants, Biosorption, Cu2+, Pseudo Second Order Kinetics Equation, Sorption Isotherm

? Tu, X., Zeng, G.M., Chen, G.Q. and Huang, G.H. (2006), Sorption of Pb2+ in waters by culture medium waste of mushroom. *China Environmental Science*, **26** (Suppl.), 45-47.

Full Text: [2006\Chi Env Sci26, 45.pdf](2006/Chi%20Env%20Sci26,%2045.pdf)

Abstract: The mechanism and function of sorption of Pb2+ in waters by culture mushroom waste was studied. The carboxyl, phosphoryl, phenolic in the waste were the main functional groups causing the sorption speed quicker, 30~50 min could reach equilibrium, the actual sorption process was identical relatively with pseudo-second-order Lagergren model. When the pH values were 4.09~6.00, the sorption efficiency was high relatively. When Pb2+ concentrations were 20, 50, 100 mg/L, the best use amounts of absorbent were 1, 2, 5 g/L respectively. The greatest sorption amount was 714.29 mg/g, when Langmiur isothermal sorption equation was used to estimated sorption.

Keywords: Biosorption, Culture Medium Waste of Mushroom, Lead, Water Treatment

# Title: China Medical Education Technology

Full Journal Title: [China Medical Education Technology](http://e29.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZYXJ&NaviLink=%e4%b8%ad%e5%9b%bd%e5%8c%bb%e5%ad%a6%e6%95%99%e8%82%b2%e6%8a%80%e6%9c%af)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1004-5287

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhao, J.P., Wang, H. and Feng, B. (2004), Quantitative analysis of the establishment and development of shared resources of library information. *China Medical Education Technology*, **18** (4), 203-206.

Full Text: [2004\Chi Med Edu Tec18, 203.pdf](2004/Chi%20Med%20Edu%20Tec18,%20203.pdf)

Abstract: After retrieving the articles published during years 1987～2002 concerning the establishment of network of shared library resources, we made a quantitative analysis of the process of its advancement, formation and promotion. We then assessed the development of the network, summarized experience and discussed our realistic problems. We suggested that efforts should be made to standardize the network of shared literature resources through systemic and unified regulation and coordination so as to promote the development of shared literature resources in China.

Keywords: Bibliometric Statistical Analysis, Library Information, Shared Resources, Internet Environment

# Title: China Mining Magazine

Full Journal Title: [China Mining Magazine](http://e36.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZGKA&NaviLink=%e4%b8%ad%e5%9b%bd%e7%9f%bf%e4%b8%9a)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1004-4051

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhan, Y.Z., Yang, X.D., Zhang, P.P., Liu, J.Y. and Chen, Y.L. (2006), A study on removal of chromium(VI) from water by adsorption onto modified clinoptilolite. *China Mining Magazine*, **15** (8), 57-62.

Full Text: [2006\Chi Min Mag15, 57.pdf](2006/Chi%20Min%20Mag15,%2057.pdf)

Abstract: Clinoptilolite modified by hydrotalcite was studied by static adsorption method to assess it scapacity for the adsorption of chromium(VI) f rom synthetic solutions. Influence of pH, contact time, adsorbent dose and initial concent ration on the adsorption was investigated. The modified clinoptilolite was found to adsorb chromium(VI) rapidly. The maximum amount of adsorption nearly reached in 30 minutes. The dependence of the adsorption on the pH was studied to achieve the optimum p H2value and the adsorption mechanism was explained. The maximum adsorption took place at pH 2 value of 4～6. Langmuir equations could describe the adsorption isotherms data, the amount of saturate adsorption calculated was 4.52 mg/g. Pseudo-second-order kinetics equation was used to describe the adsorption rate and adsorption rate constant was calculated.

Keywords: Chromium(VI) Removal, Adsorption, Modified Clinoptilolite, Adsorption isotherm, Adsorption Kinetics

# Title: China Science & Technology Resources Review

Full Journal Title: China Science & Technology Resources Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1674-1544

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yang, S.L. and Han, R.Z. (2011), Distributions, hotspots and fronts of research on citation analysis. *China Science & Technology Resources Review*, **43** (4), 47-56.

Full Text: [2011\Chi Sci Tec Res Rev43, 47.pdf](2011/Chi%20Sci%20Tec%20Res%20Rev43,%2047.pdf)

Abstract: Using knowledge visualization software CiteSpace II, 2863 papers on citation analysis collected during 1975-2010 by Web of Science (SCI-E, SSCI) are studied. The distributions of citation analysis research categoried by time, region, institution, journal and discipline, as well as the representatives of each discipline and their typical research works are analyzed to intuitively reveal the current status of the citation analysis research. Research hotspots are identified by analyzing the appearance frequency and co-appearance of the keywords. Research fronts are depicted on the basis of the developing trend of the subject words.

Keywords: Citation Analysis, CiteSpace, Knowledge Visualization, Research Hotspot, Research Front

# Title: China & World Economy

Full Journal Title: [China & World Economy](http://www3.interscience.wiley.com/journal/118001863/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhang, M. (2009), China’s New International Financial Strategy amid the Global Financial Crisis. *China & World Economy*, **17** (5), 22-35.

Full Text: [2009\Chi Wor Eco17, 22.pdf](2009/Chi%20Wor%20Eco17,%2022.pdf)

Abstract: The Chinese Government has stepped up its drive to reconstruct its international financial strategy after the sub-prime crisis developed into a global financial crisis in 2008. The main aim of the strategy is to reduce the country’s dependence on the US dollar in foreign trade, cross-border capital flows and foreign exchange reserve management. The strategy can be divided into three tiers: renminbi internationalization, regional monetary cooperation and reconstruction of the international monetary regime. So far, the Chinese Government has fared well in the application of all three tiers. We hold that the Chinese Government should continue in the same direction in a coordinated manner despite various challenges it faces.

Keywords: Global Financial Crisis, Global Financial Strategy, Renminbi Internationalization, Regional Monetary Cooperation, F33, F36, F42, F55

? Sun, M.C. (2009), China: Unscathed through the Global Financial Tsunami. *China & World Economy*, **17** (6), 24-42.

Full Text: [2009\Chi Wor Eco17, 24.pdf](2009/Chi%20Wor%20Eco17,%2024.pdf)

Abstract: This paper investigates the reasons behind the resilience of China’s economy to the global financial tsunami. China’s economy is lowly leveraged in its banking, household, public and external sectors and, therefore, is less plagued by the global deleveraging than most developed economies. Chinese domestic sectors have improved significantly over the past decade, giving them larger capacity to cope with external shocks than during the Asian financial crisis a decade ago. Contrary to the conventional wisdom that China’s economic growth is highly dependent on exports, we find that the main growth engine for China is domestic demand. Destocking, rather than falling exports, was the main cause of the sharp economic slowdown in China in late 2008 and early 2009. Therefore, the global economic slowdown should have limited impact on China’s economy. We forecast a sustained economic recovery in China in 2009-2011, with real GDP growth exceeding 10 percent in 2010.

Keywords: Deleverage, Economic Growth, Export, Financial Crisis, E44, E51, F43, G19

# Title: Chinese Agricultural Science Bulletin

Full Journal Title: [Chinese Agricultural Science Bulletin](http://e45.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZNTB&NaviLink=%e4%b8%ad%e5%9b%bd%e5%86%9c%e5%ad%a6%e9%80%9a%e6%8a%a5)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhang, Y., Sun, Y.G. (2007), Bibliometric analysis of pear literatures published during the period of 1994—2004. *Chinese Agricultural Science Bulletin*, **23** (3), 448-453.

Full Text: [2007\Chi Agr Sci Bul23, 448.pdf](2007/Chi%20Agr%20Sci%20Bul23,%20448.pdf)

Abstract: 13 Pyrus species are native to China, the main commercial cultivations attribute to P. pyrifolia (Chinese sand pear), P. ussuriensis (Ussurian pear), P. bretschneideri (Chinese white pear), P. sikiangensis (Xinjiang pear) and P. communis. P. pashia has fewness cultivations. Pear are planted in 30 provinces of China, and its production is next to apple. Bibliometric analysis of Pear literatures published in professional journals during the period from 1994 to 2002 showed the the gross volume of literat

Keywords: Pear, Literature, Bibiometric Analysis, Core Author, Core Journal

? Zhang, Y., Qin Z.H. and Shen, G.N. (2007), Bibliometric analysis of gingkgo literatures published during the period of 1994-2004. *Chinese Agricultural Science Bulletin*, **23** (4), 419-425.

Full Text: [2007\Chi Agr Sci Bul23, 419.pdf](2007/Chi%20Agr%20Sci%20Bul23,%20419.pdf)

Abstract: Gingkgo is native to China, has 1 family, 1 genus and 1 species, but has some mutations, e. g. G. biloba var. pendula Carr., G. biloba var. lacinia Carr., G. biloba var. aurea Beiss., G. biloba var varie Carr., G. biloba var. epiphylla Mak. and G. biloba var. heterophylla T. B. Chao et Z. X. Chen. Commercial cultivation began in the seventies of the 20th century, but cultivation and research has been developed rapidly. Bibliometric analysis of gingkgo literatures published in professional journals during the perio

Keywords: Gingkgo, Literature, Bibiometric Analysis, Core Author, Core Journal

# Title: Chinese Chemical Letters

Full Journal Title: [Chinese Chemical Letters](http://www.wanfangdata.com.cn/qikan/periodical.Articles/zghxkb/index.html)

ISO Abbreviated Title: Chin. Chem. Lett.

JCR Abbreviated Title: Chinese Chem Lett

ISSN: 1001-8417

Issues/Year: 12

Journal Country/Territory: Peoples R China

Language: English

Publisher: Chinese Chemical Society

Publisher Address: C/O Dept Int Affairs, Secretary of Chem Soc, Po Box 2709, Beijing 100080, Peoples R China

Subject Categories:

Chemistry, Multidisciplinary: Impact Factor 0.355, 103/125 (2005)

? Fu, G.Q., Shi, K.Y., Yuan, Z., Niu, W.Q., He, B.L., Liu, B., Shen, B. and Liu, Y. (2004), A modified chitosan adsorbent for selective removal of low density lipoprotein. *Chinese Chemical Letters*, **15** (3), 347-349.

Full Text: [2004\Chi Che Let15, 347.pdf](2004/Chi%20Che%20Let15,%20347.pdf)

Abstract: A modified chitosan adsorbent was synthesized through a simple preparation procedure, and it demonstrated good adsorption performance for selective removal of low density lipoprotein in human plasma. Phase inversion technique was employed to form chitosan beads, to which epoxy groups were then introduced by reacting with ethyleneglycol diglycidylether, and tryptophan was subsequently coupled to the epoxy-activated beads.

Keywords: Chitosan Bead, Low Density Lipoprotein, Cholesterol, Adsorption, Tryptophan

? Liang, Z.P., Feng, Y.Q., Liang, Z.Y. and Meng, S.X. (2005), Kinetic of adsorption of urea nitrogen onto chitosan coated dialdehyde cellulose under catalysis of immobilized urease. *Chinese Chemical Letters*, **16** (5), 697-700.

Full Text: [2005\Chi Che Let16, 697.pdf](2005/Chi%20Che%20Let16,%20697.pdf)

Abstract: The adsorption of urea nitrogen onto chitosan coated dialdehyde cellulose (CDAC) under catalysis of immobilized urease in gelatin membrane (IE) was studied in batch system. The pseudo first-order and second-order kinetic models were used to describe the kinetic data, and the rate constants were evaluated. The experimental data fitted well to the second-order kinetic model.

? Qiao, R.P., Ma, Y.M., Qi, X.H., Li, N., Jin, X.C., Wang, Q.S. and Zhuang, Y.Y. (2005), Degradation of microcystin-RR by combination of UV/H2O2 technique. *Chinese Chemical Letters*, **16** (9), 1271-1274.

Full Text: [2005\Chi Che Let16, 1271.pdf](2005/Chi%20Che%20Let16,%201271.pdf)

Abstract: The experiments were performed to investigate the degradation of microcystins in order to assess the effectiveness and feasibility of UV/H2O2 system for the disinfection of water polluted by microcystins. The influence factors such as H2O2, pH and UV light intensities were investigated respectively. Degradation of microcystin-RR (MC-RR) could be fitted by either the pseudo-first-order or second-order rate equations. This homogenous system could significantly enhance the degradation rate due to the synergetic effect between UV and H2O2. The degradation mainly followed the mechanism of direct photolysis and center dot OH oxidation reactions. Experimental results showed that 94.83% of MC-RR was removed under optimal experimental conditions and the UV/H2O2 system provided an alternative to promote the removal of microcystins in drinking water supplies.

Keywords: Microcystin-RR, Degradation, Kinetics, UV/H2O2 Photo-Oxidation, Water-Treatment Processes, Hydrogen-Peroxide, Ultraviolet-Radiation, Kinetic-Model, UV-Radiation, Destruction, Oxidation, Ozone

? Meng, S.M., Feng, Y.Q., Li, W.J., Yin, C.X. and Deng, J.P. (2006), The adsorption effect of quaternized chitosan derivatives on bile acid. *Chinese Chemical Letters*, **17** (7), 981-984.

Full Text: [2006\Chi Che Let17, 981.pdf](2006/Chi%20Che%20Let17,%20981.pdf)

Abstract: Three quaternized chitosan derivatives were synthesized and their adsorption performance of bile acid from aqueous solution was studied. The adsorption capacities and rates of bile acid onto quaternized chitosan derivatives were evaluated. The kinetic experimental data properly correlated with the second-order kinetic model, which indicated that the chemical sorption is the rate-limiting step. The results showed that the quaternized chitosan derivatives are favorable adsorbents for bile acid.

Keywords: Adsorption, Bile Acid, Chitosan, Chloride, Humic-Acid, Kinetic Model, Model, Quaternized Chitosan Derivative, Second-Order, Sorption

? Guo, Z., Wang, L.F., Gao, Z. and Zhang, W.W. (2007), Equilibrium and kinetic studies on the adsorption of VB12 onto CMK-3. *Chinese Chemical Letters*, **18** (2), 233-236.

Full Text: [2007\Chi Che Let18, 233.pdf](2007/Chi%20Che%20Let18,%20233.pdf)

Abstract: the adsorption of VB12 onto CMK-3 was studied as a function of temperature and initial VB12 concentration. The highest VB12 adsorption capacity was determined as 353.4 mg/g at 40°C. Adsorption data were well described by the Langmuir model, although they could be modelled by the Freundlich equation. The pseudo-first-order and pseudo-second-order kinetic models were applied to test the experimental data. The pseudo-second-order kinetic model provided the best correlation of the experimental data compared to the pseudo-first-order model. (c) 2007 Zhuo Guo. Published by Elsevier B.V. on behalf of Chinese Chemical Society. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Capacity, Carbon Molecular-Sieves, Chinese, CMK-3, Concentration, Correlation, Equilibrium, Freundlich, Kinetic, Kinetic Model, Kinetic Models, Langmuir, Model, Models, Pseudo-Second-Order, Temperature, Test, VB12

# Title: Chinese Economic Studies

Full Journal Title: Chinese Economic Studies

ISO Abbreviated Title: Chinese. Econ. Stud.

JCR Abbreviated Title: Chinese Econ Stud

ISSN: 0009-4552

Issues/Year:

Journal Country/Territory:

Language:

Publisher: M E Sharpe Inc, Armonk

Publisher Address:

Subject Categories:

: Impact Factor

? Zou, G. and Ma, J. (1992), Promoting overall cooperation between Chinese coastal areas and the East-Asian economy. *Chinese Economic Studies*, **25** (3), 67-83.

Abstract: Effective utilization of comparative advantage as a result of cooperation between Guangdong Province and Hong Kong has supported the economic prosperity of both in recent years. Other Chinese coastal provinces, however, are far from tapping their potentials in this respect, especially in cooperating with their natural trade partners. In this essay, the authors advance the following framework for cooperation between China’s coast and the East Asian countries and regions: Close cooperation should immediately be developed between areas on China’s coastline and neighboring East Asian industrial countries and regions. This would include cooperation between the Pearl River Delta and Hong Kong, the Southern Fujian Delta and Taiwan, Liaoning and Shandong and South Korea, Hainan Island and the ASEAN countries, and the Yangtze River Delta and Japan. Once this happens, the East Asian economy will not just be the “four little dragons, of Asia” that have attracted attention but one large dragon with the capital and technology of the East Asian industrial countries and regions at its head and China’s coastal manpower and resources as its body.

# Title: Chinese Hospital Management

Full Journal Title: [Chinese Hospital Management](http://e48.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=YYGL&NaviLink=%e4%b8%ad%e5%9b%bd%e5%8c%bb%e9%99%a2%e7%ae%a1%e7%90%86)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? He, W. and Qi, Y. (2006), A bibliometric analysis of correlative subject headings on the studies of hospital administration. *Chinese Hospital Management*, **26** (12), 32-35.

Full Text: [2007\Chi Hos Man26, 32.pdf](2007/Chi%20Hos%20Man26,%2032.pdf)

Abstract: Objective To investigate the status and trends of hospital administration. Method A new dedical biblione tric analysis method, correlative subject headings (CoSH) assay, is used to ananlyze all relevant publications of subject HOSPITAL ADMINISTRATION on their CoSH in major MeSH fields of document database from MEDLINE CD-ROM 2000-2005. Results The hot topics of studies focuses on the subject such as hospital emergency service, hospital information systems?quality of health care and the art of hospital administra...

Keywords: Hospital Administration, Correlative Subject Analyze, Information

# Title: Chinese Journal of Analytical Chemistry

Full Journal Title: [Chinese Journal of Analytical Chemistry](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%2333067%232010%23999619998%231831702%23FLP%23&_cdi=33067&_pubType=J&_auth=y&_acct=C000053662&_version=1&_urlVersion=0&_userid=1553416&md5=8abe0b90500ff391598698be4dd99825)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0253-3820

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liu, S.M., Li, J.N. and Mao, X. (2004), Determination of zirconium by second-order derivative adsorption voltammetry of zirconium(IV)-morin complex at a carbon paste electrode. *Chinese Journal of Analytical Chemistry*, **32** (2), 195-197.

Full Text: [2004\Chi J Ana Che32, 195.pdf](2004/Chi%20J%20Ana%20Che32,%20195.pdf)

Abstract: A new method was presented for the determination of zirconium based on adsorptive oxidation of the zirconium(IV)-morin complex in the positive potential range of a carbon paste electrode (CPE). Optimal analytical conditions were found to be: 2.0 mol/L HCI, 1.0×10-5 mol/L morin, a 0 V (vs. SCE) accumulation potential and a 250 mV/s scan rate. The concentration of Zr(IV) was directly proportional to the second-order derivative peak height at about 0.74 V. The linear range was 6.0×10-9 similar to 2.0×10-6 mol/L. The detection limit for Zr(IV) was as low as 3.0×10-9 mol/L (S/N = 3) for 180 s accumulation. The proposed method was applied successfully to the determination of zirconium in ore samples without separation.

Keywords: Zirconium, Morin, Carbon Paste Electrode, Adsorption Voltammetry

? Wang, J.L., Liu, G.H. and Zhang, X.R. (2004), Solid-phase extraction of heavy metal ions in snow water on nanometer TiO2 hyphenated with inductively coupled plasma mass spectrometry. *Chinese Journal of Analytical Chemistry*, **32** (8), 1006-1010.

Full Text: [2004\Chi J Ana Che32, 1006.pdf](2004/Chi%20J%20Ana%20Che32,%201006.pdf)

Abstract: A method based on solid-phase extraction on nanometer TiO2 hyphenated with inductively coupled plasma mass spectrometry was established for the determination of trace heavy metal ions in the snow water. Three kinds of nanometer TiO2 in different sizes were synthesized by sol-gel route. The extraction efficiency of nanometer TiO2 decreases with the increase of size. The experimental parameters including pH and sample flow rate were optimized. The recover and the efficiency of the elution of various metal ions adsorbed on nanometer TiO2 have been investigated. This method was successfully applied to the preconcentration, separation and determination of trace heavy metal ions in snow water sample. The detection limit (3s) for Cu2+, Cd2+, Pb2+ and Mn2+ was 0.010, 0.011, 0.001 and 0.015 μg/L respectively. The method, with high sensitivity, simplicity and rapidity, can be applied to the analysis of surface water.

Keywords: Nanometer Titanium Oxide, Solid-Phase Extraction, Inductively Coupled Plasma Mass Spectrometry, Rare-Earth Elements, Atomic Emission-Spectrometry, Size Titanium-Dioxide, Carbon Nanotubes, ICP-AES, Preconcentration, Adsorption, Anatase

? Yu, W.T., Gu, L., Tang, M.H. and Fang, Y.Y. (2005), Novel method for spectrophotometric determination of indole in coal coking wastewater. *Chinese Journal of Analytical Chemistry*, **33** (5), 680-682.

Full Text: [2005\Chi J Ana Che33, 680.pdf](2005/Chi%20J%20Ana%20Che33,%20680.pdf)

Abstract: A novel spectrophotometric method for the determination of indole in coal coking wastewater has been proposed. In the sensitive and simple method, the sodium diphenylamine sulfonate was oxided to purple diphenylbenzidine sulfonic acid with the reaction of NaNO2 in HCI medium, then the unstable oxidation product was further reacted with NaNO2 to form a diazotized product, and that a red color was developed for the product on coupling to indole that was stable for at least 1 h. The absorption maximum was observed at 525 nm and the apparent molar absorptivity was 0.57×104 L . mol-1. cm-1. Beer’s law was obeyed over the range of 0.053 similar to 24 mg/L. Other materials in coal xoking wastewater were free of interference on the determination of indole, and the recoveries were 98.8% similar to 102%.

Keywords: Coal Coking Wastewater, Indole, Sodium Diphenylamine Sulfonate, Spectrophtometry

? Tian, X.J. and Song, J.F. (2006), Voltammetric behavior and determination of tanshinone II A at carbon paste electrode. *Chinese Journal of Analytical Chemistry*, **34** (9), 1283-1286.

Full Text: [2006\Chi J Ana Che34, 1283.pdf](2006/Chi%20J%20Ana%20Che34,%201283.pdf)

Abstract: The voltammetric behavior of tanshinone II A (TS) on carbon paste electrode (CPE) was studied. In 0.2 mol/L BR buffer (pH 2.4) -ethanol/water (40: 60, V/V) medium, the carbonyl group of TS under went a one-electron and one-proton redox reaction at CPE, which was a reversible process with adsorption character. The semiquinone radical of TS as reduction product existed stably on CPE, which might be that hydrophobic organic phase inhibited the disproportionation reaction of the radical of TS. The peak potentials of the reduction and oxidation were - 0.31 V and - 0.24 V (vs. SCE), respectively. The second-order derivative oxidation peak current showed a linear relationship with the concentration of TS in the range of 1.2×10-8 similar to 21×10-7 mol/L, and the detection limit was 4.1×10-9 mol/L. The voltammetric method proposed can be used to determine the total tanshinone in compound Danshen tablet.

Keywords: Tanshinone II A, Semiquinone Radical, Carbon Paste Electrode, Liquid-Chromatography, Cryptotanshinone, Plasma

? Wang, L.L., Yan, Y.S., Deng, Y.H., Li, C.X. and Xu, W.Z. (2009), Synthesis, characterization and adsorption behavior of Pb2+-imprinted polymer in aqueous solution. *Chinese Journal of Analytical Chemistry*, **37** (4), 537-542.

Full Text: [2009\Chi J Ana Che37, 537.pdf](2009/Chi%20J%20Ana%20Che37,%20537.pdf)

Abstract: Pb2+-imprinted polymer particles were prepared by surface molecular imprinting technique and sol-gel process with Pb2+ ion as the template, chitosan as the, functional monomer, silica gel as the carrier, and KH-560 as the cross-linking agent. Both the imprinted and non-imprinted polymer particles were characterized by FT-IR, UV-spectra, and scanning electron microscopy. The effect of adsorption acidity, sorbent dosage and resting time on adsorption rate was investigated by inductively coupled plasma atomic emission spectrometry.Selectivity for Pb2+ ions of the prepared polymer was also studied in mixed aqueous solution. Adsorption capacity of, pb(2+)-imprinted polymer was compared with that of non-imprinted Polymer. Finally. imprint and adsorption mechanism was also put forward. The optimum acidity for quantitative enrichment was around pH 4. 5 and the adsorption equilibrium could be. reached lit five hours. Pb2+-imprinted polymer exhibited high selectivity for Pb2+ ions, and its adsorption capacit\ was two tinies higher than that of non-Imprinted polymer.

Keywords: Lead(II)-Imprinted Polymer, Surface Molecular Imprinting Technique, Sol-Gel Process, Inductively Coupled Plasma Atomic Emission Spectrometry, Molecularly Imprinted Polymers, Solid-Phase Extraction, Performance Liquid-Chromatography, Chiral-Recognition, Antibodies, Triazines, Mechanism, Affinity, Samples

? Huang, W.H., Zhou, W., Xu, W.Z., Xu, P.P., Xu, X.J. and Yan, Y.S. (2011), Synthesis and evaluation of surface molecular imprinted potassium tetratitanate whisker for dibenzothiophene. *Chinese Journal of Analytical Chemistry*, **39** (4), 560-563.

Full Text: 2011\Chi J Ana Che39, 560.pdf

Abstract: A novel surface molecular imprinted material based on modification of potassium tetratitanate whisker has been successfully synthesized with dibenzothiophene(DBT) as template, 4-vinyl pyridine (4-VP) as functional monomer, potassium tetratitanate whisker (K(2)Ti(4)O(9)) as carrier. The synthetic sorbents were characterized by using the Fourier transform infrared spectroscopy, scanning electron microscopy and nitrogen adsorption. The adsorption conditions and properties of surface-imprinted/K(2)Ti(4)O(9)(MIP/K(2)Ti(4)O(9)) for selectivity of DBT were investigated. The experimental results showed that the optimum adsorption temperature was 318 K and adsorption time was 240 min. The equilibrium adsorption amount reached 23. 33 mg/g at an initial concentration of 500 mg/L; the adsorption process was described well with pseudo-second-order model, the chemisorption was dominant and the adsorption behavior was explained well with the Freundich isotherm equation, so it was a multi-molecular layer adsorption; the adsorption of DBT onto MIP/K(2)Ti(4)O(9) was a spontaneous, endothermic and entropy-driven process. Selective adsorption test indicated that the MIP/K(2)Ti(4)O(9) was a more effective sorbent than non-imprinted/K(2)Ti(4)O(9)(NIP/K(2)Ti(4)O(9)) toward DBT.

Keywords: Adsorption, Dibenzothiophene, Evaluation, Gas Chromatography, Model, Polymers, Potassium Tetratitanate Whisker, Pseudo-Second-Order, Surface-Imprinted

? Mao, Y.L., Xiao, X.C., Pan, J.M., Ou, H.X. and Yan, Y.S. (2011), Determination of nickel in water by flame atomic absorption spectrometry after separation/preconcentration with exopolymers. *Chinese Journal of Analytical Chemistry*, **39** (7), 1088-1092.

Full Text: 2011\Chi J Ana Che39, 1088.pdf

Abstract: A new exopolymers PF-2 was prepared for separation-preconcentration of trace nickel, and characterized using scanning electron microscope (SEM), energy dispersive X-ray spectrometry (EDX) and Fourier transform infrared spectrophotometry (FTIR). By means of the determination of flame atomic absorption spectrometry (FAAS), the adsorption behavior of exopolymers PF-2 for nickel ions was investigated. The results showed that at the optimum pH 5.0, the Langmuir isotherm fitted well with the experimental equilibrium data, and maximum monolayer adsorption capacity was 33.50 mg/g. The adsorption kinetics data fitted very well to pseudo second-order model. The adsorbed Ni(II) could be quantitatively eluted using 0.5 mol/L HCl. A linear response of nickel was obtained in the range of 0.05-2.0 mg/L with a detection limit of 48 mu g/L. Under optimum conditions, the relative standard deviation (RSD) was 2.6% (n = 9, c=0.08 mg/L). The proposed method has been applied to determine trace nickel in environmental samples with satisfactory results.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solution, Biosorption, Dyes, Equilibrium, Exopolymers, FAAS, Flame Atomic Adsorption Spectrometry, FTIR, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Ni(II), Nickel, pH, SEM, Separation-Preconcentration, Zn(II)

# Title: Chinese Journal of Applied Chemistry

Full Journal Title: [Chinese Journal of Applied Chemistry](http://202.98.16.42/yyhx/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1000-0518

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhang, X.J., Land, H.Y., Wei, Y.F. and Zhang, W.P. (2003), Synthesis and adsorption kinetics of the chelate compound of chitosan with ferrous ions. *Chinese Journal of Applied Chemistry*, **20** (8), 749-753.

Full Text: [2003\Chi J App Che20, 749.pdf](2003/Chi%20J%20App%20Che20,%20749.pdf)

Abstract: The isothermal sorption kinetics of chitosan(CTS) for ferrous ions has been investigated. The structure of the chelate compound was confirmed by IR spectra, UV-VIS spectra, elemental and thermal analysis. The results were satisfied with the Langmuir-single-molecule-layer adsorption mechanism and the Lagergren-one-order equation. The apparent adsorption activation energy is 20.23 kJPmol and the sorption rate constant of the Lagergren-one-order sorption is 0.25 h-1 at 293.15 K.

Keywords: Chitosan, Ferrous, Chelate, Adsorption Kinetics

? Liu, S.F., Hu, Y.C., Ma, S.M., Li, G.H., Fang, X.Q. and Zheng, K. (2006), Synthesis and adsorption properties of a novel polymer containing cyclic pseudo-cryptand ether as functional group for Fe3+. *Chinese Journal of Applied Chemistry*, **23** (7), 753-756.

Full Text: [2006\Chi J App Che23, 753.pdf](2006/Chi%20J%20App%20Che23,%20753.pdf)

Abstract: With 2-phenoxyethanol as initialmaterial, a novel pseudo-cryp tand ether polymerwith crosslinking phenolic chain and nitrogen atom at the end of bridge was synthesized by a combined method of first polymerization, then cyclization and functionalization. Static adsorp tionp roperties of the polymeric cryp tand ether formetallic ionswere tested. The results show that the polymer has a good p referential adsorp tion p roperty for Fe3+ and the adsorp tion capacity is 1122 mmol/g (start concentration of Fe3+ : 01053 mol/L, 25°C). Within the limits, the quantity of adsorp tion for Fe3+ increases alongwith the rising of Fe3+ concentration and the increase of adsorp tive time, the adsorp tion reaches equilibrium after three hour. The polymer has a good reprocess property and it can be fully reused. The adsorp tion capacities were over 1116 mmol/g after it was used more than four times.

Keywords: Polymeric Pseudo-Cryptand Ether, Synthesis, Adsorption

# Title: Chinese Journal of Cancer Research

Full Journal Title: Chinese Journal of Cancer Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Shen, W.D., Chen, H.L. and Liu, P.F. (2011), XRCC1 polymorphisms and pancreatic cancer: A meta-analysis. *Chinese Journal of Cancer Research*, **23** (3), 165-170.

Full Text: [2011\Chi J Can Res23, 165.pdf](2011/Chi%20J%20Can%20Res23,%20165.pdf)

Abstract: Objective: To assess the association between X-ray repair cross-complementating group 1 (XRCC1) polymorphisms and pancreatic cancer. Methods: We searched MEDLINE, Web of Science and HuGE Navigator at June 2010, and then quantitatively summarized associations of the XRCC1 polymorphisms with pancreatic cancer risk using meta-analysis. Results: Four studies with 1343 cases and 2302 controls were included. Our analysis found: at codon 194, the Trp allele did not decrease pancreatic cancer risk (Arg/Arg versus Trp/Trp: OR=0.97; 95% CI: 0.48-1.96; P=0.97; Arg/Arg versus Arg/Trp: OR=0.89; 95% CI: 0.70-1.13; P=0.55; Arg/Trp versus Trp/Trp: OR=1.06; 95% CI: 0.52-2.16; P=0.90); at codon 280, only a study showed a nonsignificant association between single nucleotide polymorphism with pancreatic cancer risk; at codon 399, the Gln allele also showed no significant effect on pancreatic cancer compared to Arg allele (Arg/Arg versus Gln/Gln: OR=0.94; 95% CI: 0.74-1.18; Arg/Arg versus Arg/Gln: OR=0.97; 95% CI: 0.83-1.13; Arg/Gln versus Gln/Gln: OR=0.97; 95% CI: 0.77-1.22). The shape of the funnel plot and the Egger’s test did not detect any publication bias. Conclusion: There is no evidence that XRCC1 polymorphisms (Arg194Trp, Arg280His, and Arg399Gln) are associated with pancreatic cancer risk.

Keywords: Adducts, Adenocarcinoma, Analysis, Arg399Gln, Association, Bias, Cancer, Damage, DNA-Repair Genes, Epidemiology, Frequency, Gene Polymorphism, Medline, Meta Analysis, Meta-Analysis, Methods, Molecular Epidemiology, Pancreatic Cancer, Polymorphism, Polymorphisms, Publication, Publication Bias, Risk, Science, Single Nucleotide, Smoking, Web of Science, X-Ray Repair Cross-Complementating Group 1, XRCC1

# Title: Chinese Journal of Chemistry

Full Journal Title: [Chinese Journal of Chemistry](http://www.vsppub.com/journals/jn-ChiJouChe.html); [Chinese Journal of Chemistry](http://www3.interscience.wiley.com/journal/109876584/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1001-604X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Guo, W., He, Y.Y. and Song, J.F. (2003), High selective determination of anionic surfactant using its parallel catalytic hydrogen wave. *Chinese Journal of Chemistry*, **21** (12), 1630-1635.

Full Text: [2003\Chi J Che21, 1630.pdf](2003/Chi%20J%20Che21,%201630.pdf)

Abstract: A faradaic response of anionic surfactants (AS), such as linear alkylbenzene sulfonate (LAS), dodecyl benzene sulfonate and dodecyl sulfate, was observed in weak acidic medium. The faradaic response of AS includes (1) a catalytic hydrogen wave of AS in HAc/NaAc buffer that was attributed to the reduction of proton associated with the sulfo-group of AS, and (2) a parallel catalytic hydrogen wave of AS in the presence of hydrogen peroxide, which was due to the catalysis of the catalytic hydrogen wave of AS by hydroxyl radical (OH)-O-. electrogenerated in the reduction of hydrogen peroxide. The parallel catalytic hydrogen wave is about 50 times as sensitive as the catalytic hydrogen wave. Based on the parallel catalytic hydrogen wave, a high selective method for the determination of AS was developed. In 0.1 mol/L HAc/NaAc (pH = 6.2±0.1)/1.0×10-3 mol/L H2O2 supporting electrolyte, the second-order derivative peak current of the parallel catalytic hydrogen wave located at - 1. 33 V (vs. SCE) was rectilinear to AS concentration in the range of 3.0×10-6-2.5×10-4 mol/L, without the interference of other surfactants. The proposed method was evaluated by quantitative analysis of AS in environmental wastewater.

Keywords: Anionic Surfactant, Linear Alkylbenzene Sulfonate, Hydrogen Peroxide, Parallel Catalytic Hydrogen Wave, Aqueous-Solutions, Active Substances, Spectrophotometric Determination, Serum-Albumin, Electrodes, Voltammetry, Adsorption, Extraction, Seawater

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Full Text: [2007\Chi J Che25, 1455.pdf](2007/Chi%20J%20Che25,%201455.pdf)

Abstract: Layered double hydroxide (LDH) with a Mg/Al molar ratio of 1 : 1 was synthesiied by using a co-precipitation method and its calcined product (CLDH) was obtained by calcination of the MgAl-LDH at 500°C. The sorption removal of Pb2+ from solution was investigated, finding that both LDH and CLDH show good sorption ability and they could be used as a new type of environmental sorbent for the removal of Pb2+ from water. The sorption kinetics and the sorption isotherms of Pb2+ on both LDH and CLDH can be described by the pseudo-second order kinetics and Freundlich isotherm, respectively, under the studied conditions. The sorption arnounts of Pb2+ on LDH and CLDH are independent of pH in a pH range of about 3-10. The presence of NaNO3 may inhibit the sorption of Pb2+ on LDH while hardly affect that on CLDH. The sorption mechanism of Pb2+ on LDH and CLDH may be attributed to the surface precipitation and the surface complex adsorption. The surface complex adsorption may be further distinguished to the chemical binding adsorption forming the inner-sphere surface complexes and the electrostatic binding adsorption forming the outer-sphere surface complexes. The sorption mechanism of Pb2+ on LDH may be attributed to the surface precipitation and the electrostatic binding adsorption, while that on CLDH may be attributed to the surface precipitation and the chemical binding adsorption.

Keywords: Adsorption, Affect, Anion, Aqueous-Solutions, Binding, Calcination, Calcined, Chemical, Co-Precipitation, Complex, Complexes, Coprecipitation, Electrostatic, Electrostatic Binding, Environmental, Freundlich, Freundlich Isotherm, Heavy Metal, Hydrotalcite-Like Compounds, Hydroxide, Interlayer, Ions, Isotherm, Isotherms, Kinetics, Layered Double Hydroxide, LDH, Lead, Mechanism, Method, Order, Pb(II), Pb2+, pH, Precipitation, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Range, Removal, Sorbent, Sorption, Sorption Isotherms, Sorption Kinetics, Sorption Mechanism, Surface, Surface Complex, Surface Complexes, Surface Precipitation, Systems, Water

? Qiu, D.P., Hou, W.G., Xu, J., Liu, J.Q. and Liu, S.J. (2009), Synthesis and characterization of imidacloprid/hydrotalcite-like compound nanohybrids. *Chinese Journal of Chemistry*, **27** (10), 1879-1885.

Full Text: [2009\Chi J Che27, 1879.pdf](2009/Chi%20J%20Che27,%201879.pdf)

Abstract: Hydrotalcite-like compounds (HTlc) were first modified by sodium dodecyl sulfate (SDS), then the intercalation of imidacloprid (IM) into modified HTlc was carried out in mixed solvent of toluene/ethanol by an evaporating solvent enhanced intercalation method, obtaining IM-SDS-HTlc nanohybrids. It was found that the nanohybrids could well control the release of imidacloprid, demonstrating that the nanohybrids are a potential pesticide controlled-release formulation. The release of imidacloprid from IM-SDS-HTlc nanohybrids is dependent on the pH and the presence of electrolyte in release medium. Acidic medium and the presence of electrolytes induce the higher release rate of imidacloprid. The release process of imidacloprid from IM-SDS-HTlc nanohybrids can be described by pseudo-second-order release kinetics.

Keywords: Adsorption, Characterization, Control, Controlled Release, Controlled-Release, Controlled-Release Formulation, Dodecyl-Sulfate, First, Formulation, Glyphosate, Hydrotalcite, Hydrotalcite-Like Compound, Imidacloprid, Intercalation, Kinetics, Layered Double Hydroxides, Microspheres, Modified, Nanohybrid, Nanohybrids, Pesticide, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Release, SDS, Slow-Release, Sodium, Sodium Dodecyl Sulfate, Sulfate, Surface Modification, Synthesis

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Full Text: [2009\Chi J Che27, 1981.pdf](2009/Chi%20J%20Che27,%201981.pdf)

Abstract: Mg-Fe layered double hydroxide (LDH) with a Mg/Fe molar ratio of 3:1 was synthesized by using a coprecipitation method and the sorption removal of Pb(II) by the LDH sample from Pb(NO3)2 solution was investigated. It was found that Mg-Fe LDH showed a good sorption ability for Pb(II) from Pb(NO3)2 solution, indicating that the use of LDH as a promising inorganic sorbent for the removal of heavy metal ions is possible. The sorption kinetics and the sorption isotherm of Pb(II) on the LDH sample obeyed the pseudo-second order kinetic model and Aranovich-Donohue equation, respectively. The sorption mechanism of Pb(II) on the LDH may be attributed to the surface-induced precipitation and the chemical binding adsorption, and the removal ability arising from the surface-induced precipitation is much higher than that from the chemical binding adsorption.

Keywords: Adsorption, Binding, Cations, Chemical, Compound, Coprecipitation, Double Hydroxide, Heavy Metal, Heavy Metal Ions, Hydrotalcite-Like Compounds, Hydroxide, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Layered Double Hydroxide, Lead, Mechanism, Metal, Metal Ions, Model, Pb(II), Physicochemical Properties, Precipitation, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Solution, Sorbent, Sorption, Sorption Isotherm, Sorption Kinetics, Sorption Mechanism, Surface Complexation, Surface Precipitation, Systems, Water

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Full Text: [2010\Chi J Che28, 349.pdf](2010/Chi%20J%20Che28,%20349.pdf)

Abstract: A batch system was applied to study the adsorption behavior of methylene blue (MB) and rhodamine B (RB) in single and binary component systems on natural zeolite. In the single component systems, the zeolite presents higher adsorption capacity for MB than RB with the maximal adsorption capacity of 7.95×10-5 and 1.26×10-5 mol/g at 55ºC for MB and RB, respectively. Kinetic studies indicated that the adsorption followed pseudo-second-order kinetics and could be described by a two-step diffusion process. For the single component systems, the adsorption isotherm could be fitted by the Langmuir model. In the binary component system, MB and RB exhibit competitive adsorption on the zeolite. The adsorption is approximately reduced to 50% and 60% of single component adsorption systems of MB and RB, respectively at an initial concentration of 6×10-6 mol center dot L-1 at 25ºC. In the binary component system, kinetic and adsorption isotherm studies demonstrate that the experimental data are following pseudo-second-order kinetics and Langmuir isotherm and kinetic data are fairly described by a two-step diffusion model. Effect of solution pH on adsorption of MB and RB in both single and binary component systems was studied and the results were described by electrostatic interactions.

Keywords: Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solution, Basic Dye Removal, Batch, Batch System, Behavior, Capacity, Clinoptilolite, Competitive, Competitive Adsorption, Concentration, Data, Diffusion, Diffusion Model, Equilibrium, Experimental, Fly-Ash, Isotherm, Kinetic, Kinetic Studies, Kinetics, L1, Langmuir, Langmuir Isotherm, Langmuir Model, Mar, MB, Mechanism, Methylene Blue, Model, Natural, Natural Zeolite, Parameters, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Reactive Dyes, Rhodamine B, Rhodamine-B, Solution, Sorption, Systems, Thermodynamic, Waste-Water, Wastewater Treatment, Zeolite

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Full Text: [2010\Chi J Che28, 548.pdf](2010/Chi%20J%20Che28,%20548.pdf)

Abstract: The surface-grafting ion-imprinting technology was applied to synthesis of a new Co(II)-imprinted polymer [Co(II)-IP], which could be used for selective removal of Co(II) from aqueous solutions. The prepared polymer was characterized by using the infrared spectra (IR), X-ray diffractometer (XRD), X-ray energy dispersion spectroscopy (EDS) and scanning electron microscopy (SEM). The maximum adsorption capacity values for the Co(II)-imprinted polymer and non-imprinted polymer (NIP) were 22 and 8 mg/g, respectively. The Freundlich equation fitted the adsorption isotherm data well. The applicability of two kinetic models including pseudo-first-order and pseudo-second-order models was estimated on the basis of comparative analysis of the corresponding rate parameters, equilibrium capacity, and correlation coefficients. Results suggested that chemical process could be the rate-limiting step in the adsorption process. And the adsorption of Co(II) on the Co(II)-imprinted polymer was endothermic. The relative selectivity coefficients of the Co(II)-imprinted polymer for Co(II)/Pb(II), Co(II)/Cu(II), Co(II)/Ni(II), Co(II)/Sr(II) and Co(II)/Cs(I) were respectively 11.5, 6.1, 13.8, 9.4, and 8.1 times greater than that of the non-imprinted polymer. Eventually, the desorption conditions of the adsorbed Co(II) from the Co(II)-imprinted polymer were also studied in batch experiments.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Analysis, Aqueous Solutions, Batch, Batch Experiments, Capacity, Chemical, Chitosan, Chitosan (CTS), Co(II), Cobalt, Correlation, Cu(II), Data, Desorption, Dispersion, EDS, Electron Microscopy, Endothermic, Energy, Equilibrium, Experiments, Extraction, Freundlich, Freundlich Equation, Gel, Ion-Imprinted, IR, Isotherm, Kinetic, Kinetic Models, Membranes, Models, Polymer, Preconcentration, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Recognition, Removal, Scanning Electron Microscopy, Selective, Selective Removal, Selectivity, SEM, Solutions, Sorption, Spectroscopy, Surface-Grafted, Synthesis, Technology, X-Ray, XRD

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Full Text: [2011\Che J Che29, 143.pdf](2011/Che%20J%20Che29,%20143.pdf)

Abstract: Highly ordered amino-functionalized hexagonal mesoporous silica (HMS-NH2) had been synthesized successfully by co-condensation. The resultant materials were characterized by means of XRD, TEM, FT-IR, N-2 ad-desorption and Si-29 NMR to confirm the ordered mesoporous structure and the functionalization of the amino groups. The sample was employed as a Pb2+ adsorbent in aqueous solutions at room temperature. Both Lagergren’s first order kinetic model and Lagergren’s second order kinetic model were used to describe the adsorption data. It was found that the pseudo second order model fitted the sorption kinetic data better than the pseudo first order model. According to the information analyzed from AAS, HMS-NH2 had a Pb2+ adsorption amount of over 90.7 mg.g-1, showing a promising application for the treatment of wastewater containing Pb2+ ions.

Keywords: Adsorption, Capacity, Co-Condensation, Co-Condensation, Functionalization, Kinetic Model, Mesoporous Materials, Route

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Full Text: [2010\Chi J Che28, 2483.pdf](2010/Chi%20J%20Che28,%202483.pdf)

Abstract: Based on sodium trititanate whisker as support particles, the surface ion-imprinted polymer (S-IIP) was synthesized for the selective adsorption of Co(II) ions from aqueous solution. Characterization of S-LIP was achieved by FTIR spectra and SEM micrographs. Kinetic properties were successfully investigated by the pseudo-first-order model and pseudo-second-order model, and a chemisorption process as the essential adsorption step was also proposed. Equilibrium data were fitted with the Langmuir, Dubinin-Radushkevich and Freundlich isotherm equations, and the maximum adsorption amount of monolayer saturation for S-HP was 33.75 mg/g at 298 K. Moreover, dimensionless separation factor R-L (R-L<1.0) indicated a highly favourable adsorption system between Co(II) ions and S-IIP. Selectivity experiments showed that selective adsorption of Co(II) ions for S-IIP was significantly higher than that of non-imprinted polymer (NIP).

Keywords: Adsorption, Aqueous-Solution, Carbon Nanotubes, Characterization, Co(II) Ions, Cobalt, Cross-Linked Chitosan, Equilibrium, Extraction, Freundlich, Freundlich Isotherm, FTIR, Kinetic, Kinetics, Langmuir, Liquid-Membrane, Metal-Ions, Selective Adsorption, Selectivity, Separation, Sorption, Surface Ion-Imprinted Polymer, System

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Full Text: [2011\Chi J Che29, 387.pdf](2011/Chi%20J%20Che29,%20387.pdf)

Abstract: A novel surface ion imprinted adsorbent [Co(II)-IIP] using polyethyleneimine (PEI) as function monomer and ordered mesoporous silica SBA-15 as support matrix was prepared for Co(II) analysis with high selectivity. The prepared polymer was characterized by Fourier transmission infrared spectrometry, scanning electron microscopy, X-ray diffraction and nitrogen adsorption-desorption isotherm. Bath experiments of Co(II) adsorption onto Co(II)-HP were performed under the optimum conditions. The experimental data were analyzed by pseudo-first-order and pseudo-second-order kinetic models. It was found that the pseudo-second-order model best correlated the kinetic data. The intraparticle diffusion and liquid film diffusion were applied to discuss the adsorption mechanism. The results showed that Co(II) adsorption onto LIP was controlled by the intraparticle diffusion mechanism, along with a considerable film diffusion contribution. Langmuir, Freundlich and Dubinin-Radushkevich adsorption models were applied to determine the isotherm parameters. Langmuir model fitted the experiment data well and the maximum calculated capacity of Co(II) reached 39.26 mg/g under room temperature. The thermodynamic data Were indicative of the spontaneousness of the endothermic sorption process of Co(II) onto Co(II)-IIP. Co(II)-LIP showed high affinity and selectivity for template ion compared with non imprinted polymer (NIP).

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Chromium, Co(II), Electron Microscopy, Equilibrium, Exchange, Freundlich, Impregnation, Industrial-Waste, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Mesoporous, Polyethyleneimine (PEI), Removal, SBA-15, Selective, Silica, Sorption, Surface Ion Imprinted, Thermodynamic, Thermodynamics, Waste-Water

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Full Text: [2011\Chi J Che29, 847.pdf](2011/Chi%20J%20Che29,%20847.pdf)

Abstract: Hydrotalcite-like compound (HTlc) with a Mg/Al molar ratio of 2: 1 was synthesized by using a coprecipitation method and the sorption removal of Cu(II) by the Mg-Al HTlc sample from CuSO4 solution was investigated. It was found that the Mg-Al HTlc showed a good sorption ability for Cu(II) from CuSO4 solution, indicating that the use of hydrotalcite-like compounds as promising inorganic sorbents for the removal of heavy metal ions from water is possible. The sorption kinetics and the sorption isotherm of Cu(II) on the HTlc obeyed the pseudo-second order kinetic model and Langmuir equation, respectively. The percent removal of Cu(II) by the HTlc was strongly dependent on the initial pH of bulk solution. It increased sharply with the increase of initial pH value in the range of 5-7, and was relatively small in the initial pH range of 4-5, while it reached about 100% after initial pH was higher than 7. The presence of AlCl3 might obviously lower the equilibrium sorption amount (q(e)) of Cu(II) on the HTlc. However, the presences of NaCl and MgCl2 might increase the q(e). The presences of ligands (citric acid and EDTA) in the studied concentration range might obviously decrease the *q*e of Cu(II) on the HTlc. The removal mechanism of Cu(II) cations by HTlc in the presence of 24 SO42- anions may be attributed to the surface-induced precipitation of Cu(II) hydroxides and the surface complex adsorption by the linking effect of 24 SO42- between the HTlc and Cu(II) cations, and the removal ability arising from the surface-induced precipitation is much higher than that from the linking effect of 24 SO42-.

Keywords: Adsorption, Adsorption, Behavior, Biosorption, Copper, Copper(II), Cu(II), EDTA, Equilibrium, Heavy-Metals, Hydrotalcite-Like Compounds, Ions, Isotherm, Kaolinite, Kinetic, Kinetic Model, Kinetics, Langmuir, Layered Double Hydroxides, Mechanism, pH, Poly(Acrylic Acid), Removal, Sorption

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Full Text: [C\Chi J Che Eng6, 68.pdf](C/Chi%20J%20Che%20Eng6,%2068.pdf)

Keywords: Biosorption, Cadmium, Biosorption, Heavy Metal Removal, Marine Algae

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Full Text: [1999\Chi J Che Eng7, 91.pdf](1999/Chi%20J%20Che%20Eng7,%2091.pdf)

Keywords: Adsorption, Adsorption Equilibrium, Benzene, Coal, Coke-Chemical Benzene, Source, Thiophene, Zeolite, ZSM-5 Molecular Sieve

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Full Text: [C\Chi J Che Eng8, 279.pdf](C/Chi%20J%20Che%20Eng8,%20279.pdf)

Abstract: The CO2 adsorption data may show more than one section in the Dubinin-Radushkevich-Kaganer(DRK) plot if samples had been over-activated. Each section in the plot represents a range of pore size. The whole DRK plot provided information on the pore size distribution(PSD) of a sample, which may be used to monitor the effect of activation conditions in activation processes.

Keywords: Pore Size Distribution, Activated Carbon, CO2 Adsorption, Activation, Carbon

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Full Text: [C\Chi J Che Eng9, 133.pdf](C/Chi%20J%20Che%20Eng9,%20133.pdf)

Abstract: Heavy metal pollution from industrial wastewater is a worldwide environmental issue. Biosorption of heavy metals by using biosorbents derived from various types of biomass has been shown to be effective for the uptake of heavy metal ions. In this study, biosorbents derived from the biomass of a group of marine macroalgae were used for the removal and recovery of heavy metal ions from aqueous solutions.: Results indicated that the biosorbents have high uptake capacities and affinities for a number of heavy metal ions. The uptake capacities of the biosorbents were in the range of 1.0 to 1.5mmol.g-1 for divalent heavy metal ions. The kinetics of the uptake process was fast and the process can be used in both batch and fixed-bed operations. It appears that the biosorption process by using biosorbents from marine macroalgae can be an efficient and cost effective technology for the treatment of heavy metal containing wastewater.

Keywords: Biosorption of Heavy Metal, Biosorbent, Marine Algae, Wastewater Treatment, Aqueous-Solutions, Biosorption, Biomass, Potatorum

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Full Text: [2002\Chi J Che Eng10, 102.pdf](2002/Chi%20J%20Che%20Eng10,%20102.pdf)

Abstract: The sorption behavior of acid dyes onto cetyltrimethylammonium bromide (CTAB)- modified silica as a function of pH in the aqueous medium was studied. Single- and multi-solute sorption equilibria of orange II(OR), phenol red (PR) and Eriochrome Black T (EBT) were studied at pH 3, unbuffered water pH and pH 11. Sorption behavior of EBT could not be conducted at pH 3 due to its aggregation in acidic medium, All the reaction conditions, experimental protocols and techniques remained the same throughout the sorption process. Sorption isotherms for single-solute system were fitted by the Langmuir model, while Langmuir competitive model (LCM) and the ideal adsorbed solution theory (IAST) coupled with Langmuir model (IAST/Langmuir) were used for the prediction of multisolute competitive sorption. Sorption affinities influenced by the factors like physical interactive forces between the molecules of CTA on silica and sorbate, structural limitations of the dyes based on their geometrical arrangement were investigated, Sorption affinity of OR was found to be higher than that of EBT and PR at all the pH values investigated. Magnitude of the sorption capacities was observed to be higher in acidic medium but lower in alkaline medium. Trends of the sorption affinities in multisolute system were similar to those in single-solute system but magnitude of the sorption capacities was significantly reduced due to the prevailing competition among the sorbates.

Keywords: Acid Dyes, Adsorption, Aggregation, Behavior, Clay, Competition, CTAB, Dyes, Dyestuffs, Equilibrium, Ideal, Isotherms, Limitations, Model, pH, pH Values, Phenol, Prediction, Reaction, Silica, Sorption, Techniques, Water

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Full Text: [2002\Chi J Che Eng10, 650.pdf](2002/Chi%20J%20Che%20Eng10,%20650.pdf)

Abstract: The adsorption properties of chitin adsorbent from mycelium of fermentation industries for the removal of heavy metal ions were studied. The result shows that the chitin adsorbent has high adsorption capacity for many heavy metal ions and Ni2+ in citric acid. The influence of pH was significant: When pH is higher than 4.0, the high adsorption capacity is obtained, otherwise H+ ion inhibits the adsorption of heavy metal ions. The comparison of the chitin adsorbent with some other commercial adsorbents was made, in which that the adsorption behavior of chitin adsorbent is close to that of commercial cation exchange adsorbents, and its cost is much lower than those commercial adsorbents.

Keywords: Adsorbents, Adsorption, Adsorption Capacity, Biosorption, Heavy Metal Ions, Mycelium, Mycelium Chitin, Ni2+

Zhang, J., Jiang, B., Li, X.G., Liu, R.X. and Sun, Y.L. (2005), Sorption kinetic analysis for the removal of copper(II) by using biofilm. *Chinese Journal of Chemical Engineering*, **13** (1), 135-139.

Full Text: [2005\Chi J Che Eng13, 135.pdf](2005/Chi%20J%20Che%20Eng13,%20135.pdf)

Abstract: The biosorption of copper(II) ions onto biofilm was studied in a batch system with respect to the temperature, initial pH value and biofilm sorbent mass. The biomass exhibited the highest copper(II) sorption capacity under the conditions of room temperature, initial pH value of 6.0 and the sorbent mass 8 g. The experimental data were analyzed using four sorption kinetic models, the pseudo-first order, the Ritchie second order, the modified second order and the Elovich equations to determine the best-fit equation for the sorption of metal ions onto biofilm. Comparing with the sum of squared-errors, the results show that both the Ritchie second order and modified second order equations can fit the experimental data very well.

Keywords: Biosorption, Copper(II), Biofilm, Kinetics, Heavy-Metals, Waste-Water, Ions

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Full Text: [2007\Chi J Che Eng15, 632.pdf](2007/Chi%20J%20Che%20Eng15,%20632.pdf)

Abstract: The adsorption of protein from model wine was investigated under different temperatures, pH values, contact times, and concentrations of ethanol, by certain bentonites. The results showed that ethanol molecules could broaden the protein molecules’ channel to the interlayer of bentonite, and the maximum protein adsorption amount occurred under an ethanol concentration of 12% (by volume) and a pH value of 3.56. The increased single point Brunauer-Emmitt-Teller (BET) surface area (S-BET) and adsorption pore volume (V-Ads) suggested a larger amount of active adsorption sites of the bentonite surface and a wider protein channel from the surface to the inner adsorption sites of bentonite, respectively. At the same time, higher Methylene blue test (MBT) and swelling index (Sw) indicated that it was easy for the entrance of water and the absorbance of protein. Higher temperature was found favorable to eliminate more proteins and it took about 20 to 40min to arrive at the maximum adsorption.

Keywords: Absorbance, Adsorption, Adsorption of Protein, Adsorption Sites, Aqueous-Solutions, Bentonite, Bentonites, BET, Concentration, Concentrations, Ethanol, Index, Interlayer, Ion, Methylene Blue, Methylene Blue Test, Model, Model Wine, Model Wine Solution, pH, pH Values, Pore, Pore Volume, Protein, Protein Adsorption, Proteins, Sites, Sorption, Surface, Surface Area, Swelling, Temperature, Temperatures, Test, Time, Value, Water, Wine

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Full Text: [2007\Chi J Che Eng15, 847.pdf](2007/Chi%20J%20Che%20Eng15,%20847.pdf)

Abstract: Magnetotactic bacteria (MTB) as biosorbents for the adsorption of Au(III) and Cu(II) ions from aqueous solution have been investigated. The optimum adsorption conditions for both metal ions were the initial pH scope of 1-5.5 for Au(III) and 2.0-4.5 for Cu(II), room temperature, biomass concentration of 10.0g.L-1 and sorption duration more than 10 min. When the initial metal concentration were within 500mg.L-1, the maximum biosorption capacity of 1.0g of MTB (dry mass basis) for Au(III) and Cu(II) were calculated as 505.2mg of Au(III) and 493.1mg of Cu(II) by Langmuir model in single system, Respectively. The isotherm equilibrium of Au(III) and Cu(II) ions in the Au-Cu binary system reflected a unique phenomenon that the adsorption of Au(III) was reinforced and that of Cu(II) prohibited, compared respectively with their performances in the single metal system. When the concentration of Au(III) and Cu(II) were below 80mg.L-1, the wastewater after MTB treating was below 1.0mg.L-1 which is in conformity with Environmental Performance Standards (EPS) of Canada. Besides, all the kinetic data were fitted well to the pseudo second-order kinetic model with a high correlation coefficient (R-2 > 0.999).

Keywords: Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Aqueous Solution, Au(III), Bacteria, Batch System, Biomass, Biosorption, China, Cu(II), Equilibrium, Immobilization, Industry, Isotherm, Kinetic, Kinetics, Langmuir, Magnetotactic Bacteria, Metal, Metal Ions, Metals, pH, Recovery, Selective Adsorption, Separation, Sorption, Strains, Temperature, Waste-Water, Wastewater, Zn(II)

? Tong, J.M., Wu, Z.S., Sun, X.F., Xu, X.L. and Li, C. (2008), Adsorption kinetics of *β*-carotene and chlorophyll onto acid-activated bentonite in model oil. *Chinese Journal of Chemical Engineering*, **16** (2), 270-276.

Full Text: [2008\Chi J Che Eng16, 270.pdf](2008/Chi%20J%20Che%20Eng16,%20270.pdf)

Abstract: The textural properties of acid-activated bentonite (AAB), which were prepared using four different concentrations of sulfuric acid, were analyzed by adsorption-desorption isotherm of nitrogen using an automated specific surface area and porosity analyzer. The total pore volume, specific surface area and average pore diameter of these four kinds of AAB show a regular changing trend, increasing first and then decreasing, the optimum of which can be achieved at a sulfuric acid concentration of 25% (sample A25). The kinetic analysis of the adsorption of beta-carotene and chlorophyll in model oil solutions, namely, xylene and edible oil solution, has been investigated by using AAB. Experimental results indicated that the adsorption data fit the pseudo-second-order model well. The whole adsorption process of the two pigments on AAB was divided basically into two parts: the initial adsorption of pigments was rapid in the first 10 min, followed by a slower adsorption process till equilibrium was attained at 60 min. In addition, the amount and rate of adsorption on A25 increase synchronously with the initial pigment concentration and temperature. The results showed that the adsorption kinetics behavior of AAB with respect to the pigments is not influence by the xylene and edible oil solution.

Keywords: Acid-Activated Bentonite, Adsorption, Adsorption Kinetics, Analysis, Behavior, Bentonite, Equilibrium, First, Isotherm, Kinetic, Kinetics, Mechanism, Model, Model Oil Solution, Montmorillonite Clay, Pigment, Porosity, Pseudo-Second-Order Model, Solution, Specific Surface, Surface Area, Temperature

? Wang, C.F., Li, M.S., Wang, L.J., Sun, X.Y. and Huang, J.J. (2009), Adsorption of dye from wastewater by zeolites synthesized from fly ash: Kinetic and equilibrium studies. *Chinese Journal of Chemical Engineering*, **17** (3), 513-521.

Full Text: [2009\Chi J Che Eng17, 513.pdf](2009/Chi%20J%20Che%20Eng17,%20513.pdf)

Abstract: The removal performance of a basic dye, Methylene blue (MB), in aqueous solution was investigated by adsorption process on single-phase and high-crystalline zeolite A (FA-ZA) and X (FA-ZX). Both adsorbents FA-ZA and FA-ZX were synthesized from fly ash prepared aluminosilicate gel followed by the hydrothermal treatment at 100°C with the control of Si/Al molar ratio, respectively. The properties of the synthetic zeolites and commercial grade zeolites, such as thermal stability, elemental composition, and cation exchange capacity, were investigated for comparison. Batch method was used to study the influential parameters, such as initial pH value of the solution, temperatures, and adsorbents dosage, on the adsorption process. The experimental data were well fitted by Ho’ pseudo-second-order model and liquid film diffusion model. The suitability of Langmuir and Freundlich isotherms to the equilibrium data was investigated in the solid-liquid system while the Langmuir model produces the best results. Thermodynamic data (Δ*N*, Δ*S*, and Δ*G*) corresponding to the MB uptake were evaluated from the Langmuir model. In all the adsorption experiments, the adsorption capacity followed the order as follows: FA-ZX > FA-ZA. In addition, attempts were also made to regenerate the adsorbents.

Keywords: Adsorbents, Adsorption, Adsorption Capacity, Aluminosilicate, Aqueous Solution, Aqueous-Solution, Basic Dye, Batch Method, Capacity, Cation, Cation Exchange, Cellulosic Waste, Coal Ash, Color Removal, Comparison, Composition, Control, Conversion, Data, Diffusion, Diffusion Model, Dye, Effluents, Equilibrium, Experimental, Experiments, Film Diffusion, Fly Ash, Freundlich, Gel, Heavy-Metals, Isotherms, Kinetic, Langmuir, Langmuir And Freundlich Isotherms, Langmuir Model, Liquid, MB, Methylene Blue, Model, N, Orange Peel, Performance, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Silica, Solution, Stability, Synthetic Zeolites, Thermal Stability, Thermodynamic, Thermodynamic Data, Treatment, Uptake, Value, Wastewater, Zeolite, Zeolites

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Full Text: [2009\Chi J Che Eng17, 942.pdf](2009/Chi%20J%20Che%20Eng17,%20942.pdf)

Abstract: The adsorption of methyl orange onto ultrafine coal powder (UCP) and modified ultrafine coal powder (MUCP) from aqueous solutions were studied, in which the influence of contact time, dosage, temperature, pH, and methyl orange concentration in the solution were investigated. The adsorption kinetics of methyl orange by UCP and MUCP can be described by the Lagergren first-order and pseudo second-order kinetic models, respectively. The adsorption isotherms of methyl orange onto MUCP at 303, 3 13 and 323 K follow the Freundlich and Langmuir isotherm equation. Values of Delta G(0) for methyl orange adsorption onto MUCP are -22.55, -23.10 and -23.79 kJ.mol-1 at 303, 313, and 323 K, respectively. The values of Delta H-0 and Delta S-0 are -3.74 kJ.mol-1 and 61.99 J.mol-1, respectively. The adsorption process is spontaneous and exothermic.

Keywords: Activated Carbons, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solutions, Aqueous-Solutions, Basic Dye, Cationic Dye, Coal, Concentration, Equilibrium, Exothermic, First Order, Fly-Ash, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Methyl Orange, Models, Modified, pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Removal, Second Order, Second-Order, Solution, Solutions, Sorption, Temperature, Ultrafine Coal Powder, Waste, Wastewater Treatment

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Full Text: [2010\Chi J Che Eng18, 223.pdf](2010/Chi%20J%20Che%20Eng18,%20223.pdf)

Abstract: A semi-empirical adsorption kinetic model was proposed with the time compensation method to describe the chemisorption of SO2 in flue gas by carbon adsorbents for flue gas purification. The change in adsorption capacity and adsorption rate with time at different water vapor concentrations and different SO2 concentrations was studied. The model was in good agreement with experimental data. The surface reaction was probably the rate controlling step in the early stage for SO2 adsorption by ZL50 activated carbon. The parameters m and n in the nth order adsorption kinetic model were related to the magnitude of the time compensation and adsorption driving force, respectively. The change of parameter n with water vapor concentrations and sulfur dioxide concentrations was studied and some physical implications were given. The sum of square errors was less than 1.0 and the average absolute percentage deviations ranged from 0.5 to 3.2. The kinetic model was compared with other models in the literature.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Kinetic, Adsorption Kinetic Model, Adsorption Rate, Capacity, Carbon, Chemisorption, Compensation, Cu(II), Data, Diffusion, Driving, Equilibrium, Errors, Experimental, Flue GAS Purification, Force, Kinetic, Kinetic Model, Lead(II), Literature, Model, Models, Physical, Purification, Removal, SO2, Solid, Solution Interfaces, Solute Adsorption, Sorption, Sulfur, Sulfur Dioxide, Surface, Surface Reaction, Theoretical Description, Time Compensation Method, Waste-Water, Water, Water Vapor, Zl50 Activated Carbon

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Full Text: [2011\Chi J Che Eng19, 76.pdf](2011/Chi%20J%20Che%20Eng19,%2076.pdf)

Abstract: A three phase fluidized bed reactor was used to investigate the combined effect of adsorption and oxidation for phenolic wastewater treatment. Aqueous solutions containing 10 mg.L-1 of phenol and ozone were continuously fed co-currently as upward flow into the reactor at constant flow rate of 2 and 1 L.min(-1), respectively. The phenolic treatment results in seven cases were compared: (a) O-3 only, (b) fresh granular activated carbon (GAC), (c) 1st reused GAC, (d) 2nd reused GAC, (e) fresh GAC enhanced with O-3, (f) 1st reused GAC enhanced with O-3, and (g) 2nd reused GAC enhanced with O-3. The phenolic wastewater was re-circulated through the reactor and its concentration was measured with respect to time. The experimental results revealed that the phenolic degradation using GAC enhanced with O-3 provided the best result. The effect of adsorption by activated carbon was stronger than the effect of oxidation by ozone. Fresh GAC could adsorb phenol better than reused GAC. All cases of adsorption on GAC followed the Langmuir isotherm and displayed pseudo second order adsorption kinetics. Finally, a differential equation for the fluidized bed reactor model was used to describe the phenol concentration with respect to time for GAC enhanced with O-3. The calculated results agree reasonably well with the experimental results.

Keywords: Activated Carbon, Adsorption, Azo-Dye, Biodegradation, Bioreactor, Biosorption, Catalytic Regeneration, Dye Adsorption, Equilibrium, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Oxidation, Ozonation, Ozone, Phenol, Wastewater

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Full Text: [2011\Chi J Che Eng19, 267.pdf](2011/Chi%20J%20Che%20Eng19,%20267.pdf)

Abstract: In this study, strontium adsorption from sulfuric acid solution by different Dowex 50W-X ion exchange resins was investigated. Among these resins, Dowex 50W-X8 resin showed the maximum sorption of strontium from the aqueous solutions. The effect of pH, contact time, mass of resin, temperature, and concentration of interfering ions on strontium adsorption were evaluated to determine the optimum conditions of strontium sorption process. The kinetic models of sorption were analyzed using pseudo-first and pseudo-second order models. The results indicated that the pseudo-second order kinetic model was more appropriate than the other one. Moreover, the data obtained in this study were fitted into several sorption isotherm models and it was found that the Langmuir sorption isotherm shows the best fitting to the experimental data.

Keywords: Adsorption, Aqueous-Solutions, Batch, Behavior, Dowex 50w, Ion Exchange, Ions, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Langmuir, pH, Removal, Resin, Resins, Sorption, Sorption Isotherm Model, Strontium Adsorption, Zeolite-A

? Lu, G.C., Hao, J., Liu, L., Ma, H.W., Fang, Q.F., Wu, L.M., Wei, M.Q. and Zhang, Y.H. (2011), The adsorption of phenol by lignite activated carbon. *Chinese Journal of Chemical Engineering*, **19** (3), 380-385.

Full Text: [2011\Chi J Che Eng19, 380.pdf](2011/Chi%20J%20Che%20Eng19,%20380.pdf)

Abstract: The feasibility and adsorption effect of lignite activated carbon for phenol removal from aqueous solutions were evaluated and investigated. A series of tests were performed to look into the influence of various experimental parameters such as contact time, initial phenol concentration, temperature, and pH value on the adsorption of phenol by lignite activated carbon. The experimental data were fitted well with the pseudo-second-order kinetic model. The adsorption is an endothermic process and conforms to Freundlich thermodynamic model. The results indicate that the lignite activated carbon is suitable to be used as an adsorbent material for adsorption of phenol from aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Carbon, Freundlich, Kinetic, Kinetic Model, Lignite, Lignite Activated Carbon, pH, Phenol, Removal, Temperature, Thermodynamic

? Cheng, X., Ye, J.X., Sun, D.Z. and Chen, A.Y. (2011), Influence of synthesis temperature on phosphate adsorption by Zn-Al layered double hydroxides in excess sludge liquor. *Chinese Journal of Chemical Engineering*, **19** (3), 391-396.

Full Text: [2011\Chi J Che Eng19, 391.pdf](2011/Chi%20J%20Che%20Eng19,%20391.pdf)

Abstract: A group of Zn-Al layered double hydroxides (LDHs) were synthesized at different temperatures from 25-90ºC in order to investigate the influence of synthesis temperature on characteristics of the LDHs and their phosphate adsorption behaviour. The results reveal that an increase in the synthesis temperature generally improves the specific surface area of the sample and the phosphate adsorption capacity. The significantly enhanced crystallinity of the Zn-Al-30, synthesized at 30ºC, leads to a remarkable decrease in the specific surface area and consequently a poor phosphate adsorption capacity. It is suggested that the surface adsorption plays an important role in the phosphate uptake by the Zn-Al LDHs. Zn-Al-70 presents a relatively higher crystallinity and a lower specific surface area, compared with Zn-Al-60 and Zn-Al-80, but the highest phosphate adsorption capacity, indicating that surface adsorption is only one of the pathways for phosphate removal. The phosphate adsorption by the Zn-Al follows a pseudo-second-order kinetic equation. The adsorption isotherms fit Langmuir models, and the maximum adsorption capacities of the Zn-Al-25, Zn-Al-50 and Zn-Al-70 are estimated to be 17.82, 21.01 and 27.10 mg.g-1 adsorbent, respectively.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Aqueous-Solution, Decomposition, Excess Sludge Liquor, Fluoride, Hydrotalcite-Like Compound, Ion-Exchange, Iron, Isotherms, Kinetic, Langmuir, Layered Double Hydroxides, Ldhs, Mg, Phosphate, Phosphate Adsorption, Removal, Sludge, Synthesis, Synthesis Temperature, Temperature, Uptake

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Full Text: [2011\Chi J Che Eng19, 938.pdf](2011/Chi%20J%20Che%20Eng19,%20938.pdf)

Abstract: Removal of nitrophenols (NPs) from aqueous solutions through the adsorption process by using cationic β-cyclodextrin (CCD) modified zeolite (CCDMZ) was investigated. The effects of particle size, contact time, solution pH values and sodium chloride content in the aqueous on adsorption capacity were evaluated through a series of batch experiments. The results showed that CCDMZ had a higher adsorption capacity for removing NPs at a size fraction of 0.45-0.9 mm while adsorption of NPs on CCDMZ reached equilibrium within 60 min. The adsorption process was apparently influenced by pH values and sodium chloride content in aqueous solution. To ascertain the mechanisms of sorption, the experimental data were modeled by using the pseudo-first and pseudo-second order kinetic equations, and the results indicated that the adsorption kinetics of NPs on CCDMZ well-matched with the pseudo-second order rate expression.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solutions, Degradation, Dyes, Equilibrium, Kinetic, Kinetics, Modification, Nitrophenols, Oxidation, P-Nitrophenol, pH, Phenols, Removal, Sorption, Zeolite

# Title: Chinese Journal of Chemical Physics

Full Journal Title: [Chinese Journal of Chemical Physics](http://www.iop.org/EJ/journal/1003-7713)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

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Language:

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Subject Categories:

: Impact Factor

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Full Text: [2007\Chi J Che Phy20, 449.pdf](2007/Chi%20J%20Che%20Phy20,%20449.pdf)

Abstract: There has been emerging needs for the quantitative polarization analysis for the Coherent Anti-stakes Raman Spectroscopy and Coherent Anti-stokes Hyper-raman Spectroscopy, as the experimental studies with coherent anti-stokes raman spectroscopy and coherent anti-stokes hyper-raman spectroscopy for the interface and membrane studies being growing. Recently we have demonstrated that orientational analysis of linear and nonlinear spectroscopy from the ordered molecular system, such as molecular interfaces and films, can be carried out with the formulation of the orientational function in simple functional forms. Applications of such formulation for the second order spectroscopy, namely, the Second Harmonic Generation and Sum Frequency Generation Vibrational Spectroscopy, have helped to understand spectral and orientational details of the molecular interfaces and films. In order to employ this formulation for the higher order coherent nonlinear spectroscopy, the detailed expressions of the experimental observables and the macroscopic susceptibility/microscopic polarizability tensors for the third and fourth-order nonlinear spectroscopy for the interface or film is presented with the rotational symmetry. General expressions for the typical third and fourth order spectroscopy, such as the Third Harmonic Generation, the degenerated coherent anti-stokes raman spectroscopy, the Fourth Harmonic Generation and the degenerated coherent anti-stokes hyper-raman spectroscopy, are presented for their future applications. The advantages and limitations of the third and fourth order spectroscopic techniques are also discussed.

Keywords: 2nd-Harmonic Generation, Analysis, Applications, CH Stretching Modes, Experimental, Experimental Observable, Film, Films, Formulation, Function, Functional, Interface, Interfaces, Limitations, Linear, Liquid Interface, Macroscopic Susceptibility, Microscopic Polarizability Tenser, Membrane, Methyl-Group, Nonlinear, Order, Ordered Molecular System, Parametric-Amplification, Polarization, Second Order, Spectroscopy, Stokes-Raman Scattering, Sum-Frequency Generation, Surface-Adsorption Layers, Techniques, Third and Fourth-Order Nonlinear Spectroscopy, Vibrational Spectroscopy, Water-Molecules

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Full Text: [2010\Chi J Che Phy23, 543.pdf](2010/Chi%20J%20Che%20Phy23,%20543.pdf)

Abstract: Four methods, including voltammetric measurement of double layer capacitance, surface oxides reduction, under potential deposition of Cu and carbon monoxide (CO) stripping have been applied to evaluate the real surface area of a polycrystalline Pd (pc-Pd) electrode. The results reveal that the second and third methods lead to consistent results with deviations below 5%. And from the determined double layer capacitance and CO stripping charge, it is deduced that the double layer capacity unit area is 23.1±0.4 mu F/cm2 and the saturated CO adlayer should be ca. 0.66 ML in order to ensure that the real surface area as determined is consistent with the other two techniques. The applicability as well as the attentions when applying these techniques for the determination of the real surface area of pc-Pd electrodes have been discussed.

Keywords: Aqueous-Solution, Capacity, Carbon, Carbon-Monoxide, Co, Co Stripping, Cu, Determination, Double Layer Capacitance, Electrochemical-Behavior, Infrared-Spectroscopy, Lead, Oxygen Adsorption, Oxygen Reduction, Palladium, Pd, Al2O3 Catalyst, Polycrystalline Pd Electrode, Real Surface Area, Reduction, Sulfate-Ions, Sulfuric-Acid-Solution, Surface Area, Ultrahigh-Vacuum, Under Potential Deposition, Underpotential Deposition

? Zhang, Z.J., Li, J., Sun, F.S., Ng, D.H.L., Kwong, F.L. and Liu, S.Q. (2011), Preparation and characterization of activated carbon fiber from paper. *Chinese Journal of Chemical Physics*, **24** (1), 103-108.

Full Text: [2011\Chi J Che Phy24, 103.pdf](2011/Chi%20J%20Che%20Phy24,%20103.pdf)

Abstract: Activated carbon fibers (ACFS) with surface area of 1388 m2/g prepared from paper by chemical activation with KOH has been utilized as the adsorbent for the removal of methylene blue from aqueous solution. The experimental data were analyzed by Langmuir and Freundlich models of adsorption. The effects of pH value on the adsorption capacity of ACFS were also investigated. The rates of adsorption were found to conform to the kinetic model of Pseudo-second-order equation with high values of the correlation coefficients (R>0.998). The Langmuir isotherm was found to fit the experimental data better than the Feundlich isotherm over the whole concentration range. Maximum adsorption capacity of 520 mg/g at equilibrium was achieved. It was found that pH played a major role in the adsorption process, higher pH value favored the adsorption of MB.

Keywords: Acid, Activated Carbon, Activated Carbon Fiber, Adsorbents, Adsorption, Aqueous-Solution, Biomass, Carbon, Characterization, Equilibrium, Freundlich, Impregnation, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Methylene Blue, Methylene-Blue Adsorption, Microstructure, Oil-Palm Stone, Paper, pH, Porosity, Pyrolysis, Waste

# Title: Chinese Journal of Disease Control & Prevention

Full Journal Title: [Chinese Journal of Disease Control & Prevention](http://e28.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=JBKZ&NaviLink=%e7%96%be%e7%97%85%e6%8e%a7%e5%88%b6%e6%9d%82%e5%bf%97)

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Journal Country/Territory:

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Subject Categories:

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Full Text: [2007\Chi J Dis Con Pre11, 72.pdf](2007/Chi%20J%20Dis%20Con%20Pre11,%2072.pdf)

Abstract: Objective To investigate the status and development trend of the research on mental disorders in China and abroad. Methods The method of subject-word retrieval was used to select the articles on mental disorders from PUBMED and CBMWeb. The bibliometrics analysis was performed. Results The number of the literatures about mental disorders in China and abroad increased year by year. The research structure of mental disorders in China was similar to that abroad. There were no significant differences in the numb...

Keywords: Mental Disorders, Bibliometrics, Subject Headings

# Title: Chinese Journal of Evidence-Based Medicine

Full Journal Title: [Chinese Journal of Evidence-Based Medicine](http://e45.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZZXZ&NaviLink=%e4%b8%ad%e5%9b%bd%e5%be%aa%e8%af%81%e5%8c%bb%e5%ad%a6%e6%9d%82%e5%bf%97)

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ISSN: 1672-2531

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Publisher Address:

Subject Categories:

: Impact Factor

Chen, Y.L., Ai, C.L., and Li, Y.P. (2007), Comparative studies on *Evidence-Based Medical Journals*. *Chinese Journal of Evidence-Based Medicine*, **7** (4), 289-295.

Full Text: [2007\Chi J Evi-Bas Med7, 289.pdf](2007/Chi%20J%20Evi-Bas%20Med7,%20289.pdf)

Abstract: Objective To compare and review worldwide journals titled”evidence-based”in order to provide an overview of these healthcare journals and suggestions for improving the quality of this type of journal in China and to introduce a quick way for healthcare professionals and patients to obtain high quality clinical evidence. Methods We searched PUBMED, EMBASE, Ulrich’s Periodicals Directory, Wanfang and some relevant websites to identify journals titled”evidence-based”. The last issues in 2006 of these kind of journ

Keywords: Evidence-Based Medicine, Periodical, Bibliometrics

# Title: Chinese Journal of Health Laboratory Technology

Full Journal Title: [Chinese Journal of Health Laboratory Technology](http://e37.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZWJZ&NaviLink=%e4%b8%ad%e5%9b%bd%e5%8d%ab%e7%94%9f%e6%a3%80%e9%aa%8c%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country/Territory:

Language:

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Subject Categories:

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Full Text: [2006\Chi J Hea Lab Tec16, 894.pdf](2006/Chi%20J%20Hea%20Lab%20Tec16,%20894.pdf)

Abstract: Objective:To statistically analyze the citations of papers in Chinese Journal of Health Laboratory Technology(CJHLT) published during 2003~2005.Methods:The bibliometric method was employed to determine the number of citations, citation rate, number of citations per paper, types of citations, language-based citation number, Price index and self-citation rate.Results:During 2003~2005, the average citation rate was 86.72% and number of citations per paper 4.36.The number of citations in Chinese was significant...

Keywords: Chinese Journal of Health Laboratory Technology, Citation Analysis

# Title: Chinese Journal of Hospital Administration

Full Journal Title: [Chinese Journal of Hospital Administration](http://e29.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZHYG&NaviLink=%e4%b8%ad%e5%8d%8e%e5%8c%bb%e9%99%a2%e7%ae%a1%e7%90%86%e6%9d%82%e5%bf%97)

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JCR Abbreviated Title:

ISSN: 1000-6672

Issues/Year:

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Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Zhang, L.H. (2006), Analysis of the major bibliometric indexes of the *Chinese Journal of Hospital Administration*. *Chinese Journal of Hospital Administration*, **22** (4), 282-284.

Full Text: [2006\Chi J Hos Adm22, 282.pdf](2006/Chi%20J%20Hos%20Adm22,%20282.pdf)

Abstract: Based on data provided by the China Scientific and Technical Papers and Citations Database, an analysis was made of some bibliometric indexes of the Chinese Journal of Hospital Administration over the 2001-2004 period, including total citation frequency, impact factor, citation index, and the proportion of papers based on fund-assisted projects. The result indicates that the journal has high impact factor and total citation frequency in periodicals covered by the China Scientific and Technical Papers and Ci...

Keywords: Citation Frequency, Impact Factor, Bibliometric Index

# Title: Chinese Journal of Inorganic Chemistry

Full Journal Title: Chinese Journal of Inorganic Chemistry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1001-4861

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yang, Z.P. and Si, S.H. (2005), Adsorption and photochemical reduction process of Cu(II) at the surface of nanocrystalline TiO2 studied by quartz crystal microbalance. *Chinese Journal of Inorganic Chemistry*, **21** (9), 1402-1406.

Full Text: [2005\Chi J Ino Che21, 1402.pdf](2005/Chi%20J%20Ino%20Che21,%201402.pdf)

Abstract: The adsorption and photochemical reduction process of Cu(II) at the surface of nanocrystalline TiO was investigated using in situ quartz crystal microbalance(QCM). It was found that the adsorption of Cu(II) onto active sites of nanocrystalline fit the pseudo-second-order reaction better than the pseudo-first-order reaction, and that the rate constant of the reaction was estimated to be about 0.09 g center dot mmol-1 center dot min-1. In addition, it was also found that the adsorption amount of Cu(II) at the surface of TiO2 was affected by pH concentration and coexisting anions, and the saturated amount of adsorbed Cu(II) was approximately 1.5 mmol center dot g-1 at pH 4. During UV illumination, the frequency of QCM decreased gradually, which meant the photoreduction deposition of Cu(II) from the solution, moreover, the rate of photodeposition of Cu(II) increased with increasing pH of solution, and the rate of photoreduction enhanced obviously when the organics were introduced.

Keywords: Copper(II), Titanium Dioxide, Adsorption, Photoreduction, Quartz Crystal Microbalance (QCM), Photocatalysis

? Wang, J.H., Zheng, S.R., Liu, F.L., Liu, J.L., Tang, L.A. and Xu, Z.Y. (2010), Removal of aqueous humic acid by magnetic chitosan microspheres. *Chinese Journal of Inorganic Chemistry*, **26** (10), 1761-1767.

Full Text: Chi J Ino Che26, 1761.pdf

Abstract: Magnetic chitosan microspheres were synthesized by hydrothermal method and its adsorption and desorption behavior for humic acid (HA) was also investigated. Characterized results showed that magnetic chitosan microspheres have the diameter of 200 similar to 300 nm, amino content of 1.29 mmol.g(-1), BET specified surface area of 36.00 m(2).g(-1), magnetization of 38.78 emu.g(-1), and the adsorbent was easy to separate at external magnetic field. Magnetic chitosan microspheres can greatly remove the aqueous HA, and adsorption isotherm of HA can be fitted by Freundlich equation. The pseudo-second-order kinetics can fit the adsorption data greatly. HA adsorption amount over adsorbent decreased with the increasing of solution pH, and increased with increasing of cation concentration. The effect of different cations was in the order of Ca2+>Mg2+>Na+>K+. HA saturated adsorbent can be regenerated in alkaline solution. Adsorption amount of HA after five successive adsorption-regeneration cycles was 79.8% of the initial one, which indicated that adsorbent can be recycled.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Isotherm, Aminated Polyacrylonitrile Fibers, Behavior, Bentonite, Bet, Cation, Chitosan, Coated Granules, Composite, Concentration, Data, Desorption, Field, Freundlich, Freundlich Equation, Humic Acid, Hydrothermal Method, Ions, Isotherm, Kinetics, Magnetic, Magnetic Chitosan Microsphere, Magnetic Field, Magnetic-Chitosan, Mechanisms, Microspheres, pH, Powdered Activated Carbon, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Regeneration, Removal, Solution, Substances, Surface, Surface Area

# Title: Chinese Journal of Integrative Medicine

Full Journal Title: [Chinese Journal of Integrative Medicine](http://www.springerlink.com/content/120447/?p=0ae988605a6049da9df6f43316c60187&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wu, G.C. (2007), Acupuncture anesthesia in China: Retrospect and prospect. *Chinese Journal of Integrative Medicine*, **13** (3), 163-165.

Full Text: [2007\Chi J Int Med13, 163.pdf](2007/Chi%20J%20Int%20Med13,%20163.pdf)

Keywords: Analgesia

? (2008), *Chinese Journal of Integrative Medicine* is included in Science Citation Index expanded journal list from 2008. *Chinese Journal of Integrative Medicine*, **14** (2), 110.

Full Text: Chi J Int Med14, 110.pdf

Keywords: Chinese, Citation, Jun, Science Citation Index

# Title: Chinese Journal of Medical Library and Information Science

Full Journal Title: [Chinese Journal of Medical Library and Information Science](http://e24.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=YXTS&NaviLink=%e4%b8%ad%e5%8d%8e%e5%8c%bb%e5%ad%a6%e5%9b%be%e4%b9%a6%e6%83%85%e6%8a%a5%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1617-3982

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Huang, R.M., Zhao, W.Z. and Lin, X.H. (2006), Scientific papers in China’s TCM colleges and universities from 1997 to 2005: A bibliometric analysis. *Chinese Journal of Medical Library and Information Science*, **15** (6), 74-76.

Full Text: [2006\Chi J Med Lib Inf Sci15, 74.pdf](2006/Chi%20J%20Med%20Lib%20Inf%20Sci15,%2074.pdf)

Abstract: The scientific papers in 23 colleges and universities of TCM in China from 1997 to 2005 are statistically analyzed based on the data on CBMdisc. The aim of this article is to reveal the current status and distribution of scientific papers in China’s TCM colleges and universities, the scientific research level and position in the same kind of colleges and universities in China so as to offer a valuable reference to managers and scientific personnel.

Keywords: TCM Papers, TCM Colleges and Universities, Bibliometrics

? Chen, J.Q., Du, Y.X., Zhang, Y., Liu J.Y., Wang, G.Q., Zhang X.M., Lei, C.B. and Yan, S.G. (2007), Area distribution of highly influential medical articles in China. *Chinese Journal of Medical Library and Information Science*, **16** (1), 63-67.

Full Text: [2007\Chi J Med Lib Inf Sci16, 63.pdf](2007/Chi%20J%20Med%20Lib%20Inf%20Sci16,%2063.pdf)

Abstract: A bibliometric analysis of 3548 highly influential medical articles with 30 citations searched on CMCI is conducted. The results show more articles scattered in the Southeast Area and Middle East Area of China than that in the West Area.

Keywords: Highly Influential Medical Articles, Bibliometric Analysis, Area Distribution, Medical Articles, China, CMCI, Citation Databases

? Su, X.M., Li, H.Y. and Wan, M. (2007), Papers released by Chinese Center for Disease Prevention & Control cited by SCI-E from 2003-2005: A bibliometric analysis. *Chinese Journal of Medical Library and Information Science*, **16** (1), 67-70.

Full Text: [2007\Chi J Med Lib Inf Sci16, 67.pdf](2007/Chi%20J%20Med%20Lib%20Inf%20Sci16,%2067.pdf)

Abstract: A bibliometric analysis of the papers released by Chinese Center for Disease Prevention & Control cited by SCIE from 2003 to 2005 is conducted in order to understand the status quo and level of scientific papers released by the Center. And some suggestions are put forward based on the analysis.

Keywords: Chinese Center for Disease Prevention & Control, SCI, Bibliometrics, Impact factors

? Wu, L.P. (2007), Medical papers of Xiamen municipality from 1995 to 2004: A bibliometric analysis. *Chinese Journal of Medical Library and Information Science*, **16** (1), 73-77.

Full Text: [2007\Chi J Med Lib Inf Sci16, 73.pdf](2007/Chi%20J%20Med%20Lib%20Inf%20Sci16,%2073.pdf)

Abstract: Bibliometrically analyzed are the medical papers of Xiamen Municipality from 1995 to 2004 on CBMdisc. The results show that the scientific and technological level of medical and health sciences in Xiaman has been raising gradually, and the scientific research of Xiamen University and the hospitals at Grade III is more powerful and plays a leading role in the medical and health development in Xiaman, but the cooperation and information awareness of the medical personnel needs to be improved.

Keywords: Bibliometrics, Medical papers, Xiamen

? Lu, Z.H., Hu, W., Qin, Y.M., Wang, N. and Wang, M. (2007), Literature on the drugs for breast cancer from 2001 to 2005: A bibliometric analysis. *Chinese Journal of Medical Library and Information Science*, **16** (2), 75-76.

Full Text: [2007\Chi J Med Lib Inf Sci16, 75.pdf](2007/Chi%20J%20Med%20Lib%20Inf%20Sci16,%2075.pdf)

Abstract: Based on the literature on drugs for breast cancer on MEDLINE (CD-ROM, 2001-2005), the major subject headings and correlative subject headings of the drugs for breast cancer are analyzed bibliometrically so as to explore the main types of the drugs for breast cancer in the foreign literature in the last five years and their development.

Keywords: Breast Neoplasms, Drug Therapy, Bibliometrics

? Li, F., Wang, F., Hou, Y.F. and Zhao, Y.H. (2007), Literature on medical records: A bibliometric analysis. *Chinese Journal of Medical Library and Information Science*, **16** (3), 70-72.

Full Text: [2007\Chi J Med Lib Inf Sci16, 70.pdf](2007/Chi%20J%20Med%20Lib%20Inf%20Sci16,%2070.pdf)

Abstract: An analysis of the literature on medical records from 2001 to 2005 on PUBMED is conducted with bibliometric methods. And the 6 indices including annual number, type, language and author of the articles and author units are calculated. The results show that the number of the articles has been generally increased year by year, and the authors are mainly from the advanced countries such as USA, Germany, and UK.

Keywords: Medical Record Literature, Bibliometrics

# Title: Chinese Journal of Medical Science Research Management

Full Journal Title: [Chinese Journal of Medical Science Research Management](Chinese%20Journal%20of%20Medical%20Science%20Research%20Management)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Li, X.R. (2001), Ranking analysis of publications from China hospitals in 2005. *Chinese Journal of Medical Science Research Management*, **20** (2), 107-111.

Full Text: [2007\Chi J Med Sci Res Man20, 107.pdf](2007/Chi%20J%20Med%20Sci%20Res%20Man20,%20107.pdf)

Abstract: Objectives To provide reference for the Research & Development depart merit of hospi- tals by analyzing the quantity of publications and their citation data of the top 20 hospitals in SCI and MED- LINE, and top 100 hospitals in domesti c publications during 2005. Methods The number of publications and their citati on counts of the first 20 hospitals in SCI and MEDLINE, and the top 100 hospital s in domes- tic publications in 2005 were analyzed with bibliometric methods. Results In 2005, the average increas...

Keywords: Hospital Management, Scientific Publications, Scientific Evaluation

# Title: Chinese Journal of Neuroimmunology and Neurology

Full Journal Title: [Chinese Journal of Neuroimmunology and Neurology](http://e45.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZSMB&NaviLink=%e4%b8%ad%e5%9b%bd%e7%a5%9e%e7%bb%8f%e5%85%8d%e7%96%ab%e5%ad%a6%e5%92%8c%e7%a5%9e%e7%bb%8f%e7%97%85%e5%ad%a6%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1006-2963

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Shi, Q.K. (2007), Analysis of citations and articles published in *Chinese Journal of Neuroimmunology and Neurology* from 2003 to 2005. *Chinese Journal of Neuroimmunology and Neurology*, **12** (2), 111-114.

Full Text: [2007\Chi J Neu Neu12, 111.pdf](2007/Chi%20J%20Neu%20Neu12,%20111.pdf)

Abstract: Objective To investigate the characteristics of citations and articles in Chinese Journal of Neuroimmunology and Neurology. Methods The data about citations and articles of Chinese Journal of Neuroimmunology and Neurology form 2003 to 2005 were collected and analyzed in terms of bibliometric parameters. Results There were 332 papers published in Chinese Journal of Neuroimmunology and Neurology during 3 years and papers with funed projects accounted for 34. 0%. The average citation rate was 91. 3%, and 8. 66 ...

Keywords: Neuroimmunology And Neurology, Bibliometrics, Citation Analysis

# Title: Chinese Journal of Nosocomiology

Full Journal Title: [Chinese Journal of Nosocomiology](http://e42.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZHYY&NaviLink=%e4%b8%ad%e5%8d%8e%e5%8c%bb%e9%99%a2%e6%84%9f%e6%9f%93%e5%ad%a6%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Du, Y. and Chen J.k. (2007), Chinese Journal of Nosocomiology:a citation analysis. Chinese Journal of Nosocomiology, 1**7** (3), 285-289.

Full Text: [2007\Chi J Nos17, 285.pdf](2007/Chi%20J%20Nos17,%20285.pdf)

Abstract: OBJECTIVE The bibliometric index of papers published in Chinese Journal of Nosocomiology in sequential 11 years was analyzed by the citation method in order to get comprehensive understanding of the articles in academic quality and level. METHODS The cited articles in the journal were analyzed and evaluated using quantitative approach on the basis of the data searched from Chinese Medical Citation Index(CMCI) database developed by Medical Library of Chinese PLA. RESULTS The total cites, immediacy index a...

Keywords: Medical Journals, Bibliometry, Citation Analysis, Chinese Journal 0f Nosocomiology

# Title: Chinese Journal of Nursing

Full Journal Title: [Chinese Journal of Nursing](http://e50.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZHHL&NaviLink=%e4%b8%ad%e5%8d%8e%e6%8a%a4%e7%90%86%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0254-1769

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ma, X.Q., Ding, L.S. and Ma, W.J. (2001), A bibliometric analysis of the correlative subject headings of health education studies. *Chinese Journal of Nursing*, **36** (6), 405-408.

Full Text: [2001\Chi J Nur36, 405.pdf](2001/Chi%20J%20Nur36,%20405.pdf)

Abstract: Bibliometrics can give various detailed information on medical studies, such as research contents, methods and trends in a specialty. In this study, the authors used a new medical bibliometric analysis method, correlative subject headings (COSH) analysis to analyse all relevant publications on the subject HEALTH and EDUCATION on their COSH in major MESH(MJME) fields of the document database from the MEDLINE CD-ROM (silver platter) 1990～1998. According to the computer statistical results of document retrieval, the authors presented and discuss the new trends and directions in health education studies. It provides theoretical grounds for the management and establishment of health education study and practice.

Keywords: Health Education Correlative Subject Headings Bibliometric

# Title: Chinese Journal of Oceanology and Limnology

Full Journal Title: [Chinese Journal of Oceanology and Limnology](http://www.springerlink.com/content/120408/?p=256e01756d854c2fb3e7901f1e4d4931&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0254-4059

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Deng, L.P., Zhu, X.B., Su, Y.Y., Su, H. and Wang, X.T. (2008), Biosorption and desorption of Cd2+ from wastewater by dehydrated shreds of *Cladophora fascicularis*. *Chinese Journal of Oceanology and Limnology*, **26** (1), 45-49.

Full Text: [2008\Chi J Oce Lim26, 45.pdf](2008/Chi%20J%20Oce%20Lim26,%2045.pdf)

Abstract: The adsorption and desorption of algae Cladophora fascicularis and their relation with initial Cd2+ concentration, initial pH, and co-existing ions were studied. Adsorption equilibrium and biosorption kinetics were established from batch experiments. The adsorption equilibrium was adequately described by the Langmuir isotherm, and biosorption kinetics was in pseudo-second order model. The experiment on co-existing ions showed that the biosorption capacity of biomass decreased with an increasing concentration of competing ions. Desorption experiments indicated that EDTA was efficient desorbent for recovery from Cd2+. With high capacities of metal biosorption and desorption, the biomass of Cladophora fascicularis is promising as a cost-effective biosorbent for the removal of Cd2+ from wastewater.

Keywords: Adsorption, Adsorption Equilibrium, Aqueous-Solutions, Biomass, Biosorbent, Biosorption, Biosorption Kinetics, Cadmium, Capacity, Cd2+, Cladophora Fascicularis, Desorbent, Desorption, EDTA, Equilibrium, Experiments, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Marine-Algae, Metal, Model, pH, Pseudo-Second Order, Recovery, Removal, Seaweed, Wastewater

# Title: Chinese Journal of Orthopaedic Trauma

Full Journal Title: [Chinese Journal of Orthopaedic Trauma](http://e45.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZCGK&NaviLink=%e4%b8%ad%e5%8d%8e%e5%88%9b%e4%bc%a4%e9%aa%a8%e7%a7%91%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1671-7600

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Li, G.Y.,Zhang, N.and J.,D. (2007), An analysis of articles published from 1999 to 2006 in Chinese Journal of Orthopaedic Trauma. *Chinese Journal of Orthopaedic Trauma*, **9** (1), 74-76.

Full Text: [2007\Chi J Ort Tra9, 74.pdf](2007/Chi%20J%20Ort%20Tra9,%2074.pdf)

Abstract: Objective To analyze papers published in Chinese Journal of Orthopaedic Trauma (CJOT)so as to evaluate its current academic status. Methods A bibliometric survey was done to analyze the quantity, types, foundation support, intervals between receiving and publication of all the articles published from 1999 to 2006 in CJOT. Results From 1999 to 2006, 1807 articles were published, with 225. 9 ones every year. 14. 61% of the total papers got foundation support, with the support rates for each year being 0. 12 (1999), ...

Keywords: Periodical Research, Analysis Of Published Articles, Bibiometrics, Evaluation

# Title: Chinese Journal of Physics

Full Journal Title: Chinese Journal of Physics

ISO Abbreviated Title: Chin. J. Phys.

JCR Abbreviated Title: Chinese J Phys

ISSN: 0577-9073

Issues/Year: 6

Journal Country/Territory: Taiwan

Language: English

Publisher: Physical Soc Republic China

Publisher Address: Chinese Journal Physics PO Box 23-30, Taipei 10764, Taiwan

Subject Categories:

Physics: Impact Factor 0.238, 66/68 (2006)

Tsay, J.S., Shyu, F.C., Fu, T.I. and Shern, C.S. (1994), Adsorption and absorption of hydrogen on a Pt (110) surface. *Chinese Journal of Physics*, **32** (2), 195-204.

Full Text: [1994\Chi J Phy32, 195.pdf](1994/Chi%20J%20Phy32,%20195.pdf)

Abstract: Hydrogen is adsorbed on a Pt (110)-(1×2) surface at T = 170 K. Two peaks, the β1 state and the β2 state are found in temperature desorption spectroscopy (TDS). These two peaks correspond to the different adsorption sites of the substrate surface. The β1-state desorption is second-order kinetics while the β2-state desorption is first-order kinetics. The puzzle of the β2 state in the first-order desorption is discussed. The absorption of hydrogen in bulk is studied by the positive hydrogen ion impinging beneath the surface at room temperature with a kinetic energy of 1.8 keV. From the Arrhenius plot, we obtained the activation energy of desorption Ed = 24.3 kcal/mole and the pre-exponential factor *v*1 = 4.6×109/s. The best condition for cleaning the residual carbon on the Pt (110) surface by means of an oxidation reaction was tested.

# Title: Chinese Journal of Polymer Science

Full Journal Title: [Chinese Journal of Polymer Science](http://www.worldscinet.com/cjps/cjps.shtml)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0256-7679

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yan, J.L. (2006), Study on the adsorption of phenol by chitosan from aqueous solution. *Chinese Journal of Polymer Science*, **24** (5), 497-502.

Full Text: [2006\Chi J Pol Sci24, 497.pdf](2006/Chi%20J%20Pol%20Sci24,%20497.pdf)

Abstract: The effects of pH, initial concentration and temperature on the adsorption of phenol by chitosan are investigated in this paper. The isothermal data was applied to Langmuir linear and the Freundlich linear isotherm equation, and the thermodynamic parameters (ΔH, ΔG, ΔS) were calculated according to the values of binding Langmuir constant, KL. Results indicated that the adsorption between chitosan and phenol was significantly physical in nature, the negative H constant at lower temperature confirmed that more phenol was adsorbed by chitosan at lower temperature. The kinetics of the sorption process of phenol on chitosan was investigated using the pseudo-first order and pseudo-second order kinetics, and results showed that the second order equation model provided the best correlation with the experimental results.

? Meng, G.H., Li, A.M., Yang, W.B., Liu, F.Q. and Zhang, Q.X. (2006), Effect of hypercrosslinked resins surface chemistry on the adsorption of phenol from aqueous solution. *Chinese Journal of Polymer Science*, **24** (6), 585-591.

Full Text: [2006\Chi J Pol Sci24, 585.pdf](2006/Chi%20J%20Pol%20Sci24,%20585.pdf)

Abstract: Two hypercrosslinked resins with similar physical characters but different surface chemistry were synthesized and used to remove phenol from aqueous solutions. The FTIR spectra, elemental analysis and the Boehm titration were used to characterize the chemical properties of the resins. The adsorption experiments were carried out using the bottle-point technique, and the effects of the surface chemistry on the adsorption were discussed. The adsorption data fit well with the Freundlich model, indicating the heterogeneity of the resins surface. It could be seen from the experimental results that the adsorption capacity increased with the increase in the total surface concentration of oxygen-containing groups. The pH dependence and the effects of ionic strength were also discussed. The kinetic adsorption data fit well with the pseudo-second order model, and the results showed that the surface oxygen-containing groups have little effect on the adsorption rate.

Keywords: Hypercrosslinked Resin, Phenol, Surface Chemistry, Adsorption Isotherm, Kinetic Study, Activated Carbons, Adsorbents, Removal

? Qiu, Y.P., Ling, F., Cheng, H.Y., Shi, H.H., Huang, M.S. and He, L. (2007), Equilibrium and kinetic adsorption of a reactive black KNB dye on polydivinylbenzene and styrene-divinylbenzene copolymer resins. *Chinese Journal of Polymer Science*, **25** (2), 163-170.

Full Text: [2007\Chi J Pol Sci25, 163.pdf](2007/Chi%20J%20Pol%20Sci25,%20163.pdf)

Abstract: In this study, two polymeric resins with different pore sizes were synthesized to study comparative adsorption of reactive black KNB dye. Styrene-divinylbenzene copolymer resin NG-8 has an average pore size of 3.82 nm, about half of that of polydivinylbenzene resin NG-7 (6.90 nm). NG-8 also has a surface acidity about 4 times that of NG-7, resulting in a much more negative surface of the former resin as compared to the latter at pH 6.05. Equilibrium adsorption of KNB was significantly influenced by the surface functionality of the resins, as evidenced by the observations that NG-8 adsorbed constantly less KNB than NG-7 and that the presence of CaCl2 enhanced the adsorption by both resins. The intra- particle diffusion appears to be the primary rate-limiting process. While the pores of both resins are accessible to KNB, the slower adsorption by NG-8 than by NG-7 suggests that the smaller pores of NG-8 further retard the intra- particle diffusion of KNB.

Keywords: Acidity, Activated Carbons, Adsorbents, Adsorption, Aqueous-Solution, Comparative Adsorption, Copolymer, Diffusion, Dye, Equilibrium, Intra Particle Diffusion, Ions, Isotherms, Kinetic, Kinetic Adsorption, Kinetics, Particle, Particle Diffusion, pH, Phenol, Polymer, Polymeric, Polymeric Resins, Pore, Pore Size, Pores, Primary, Process, Rate Limiting, Rate-Limiting Process, Reactive Black, Reactive Black Knb Dye, Removal, Resin, Resins, Size, Sorption, Surface, Surface Acidity, Surface Functionality, Surface-Chemistry

? Sun, Y., Li, A.M., Fei, Z.H., Zhang, Q.X. and Wang, S.H. (2007), Adsorption of tannin acid onto an aminated macroporous resin from aqueous solutions. *Chinese Journal of Polymer Science*, **25** (6), 621-627.

Full Text: [2007\Chi J Pol Sci25, 621.pdf](2007/Chi%20J%20Pol%20Sci25,%20621.pdf)

Abstract: A macroporous polymeric adsorbent NG-8 was synthesized with divinylbenzene using conventional suspension polymerization technique. Its aminated product NG-9 was prepared by introducing tertiary amino groups into NG-8 for removal of tannin acid from aqueous solutions. NG-9 could be used directly without a wetting process and had higher adsorption capacity than NG- 8, which might be attributed to the enhanced adsorbent-adsorbate interaction due to the tertiary amino groups on the polymeric matrix. The Langmuir equation was successfully employed to describe the adsorption process. The adsorption enthalpy change further validated the uptake of tannin acid on NG-9 to be an enhanced physical adsorption because of the Lewis acid-base interaction. In addition, adsorption kinetic studies testified that the tertiary amino groups on the polymer matrix could decrease the adsorption rate maybe for the hindrance of the tertiary amino groups and water clusters built up.

Keywords: Macroporous Resin, Tannin Acid, Adsorption, Thermodynamics, Kinetics, Polymeric Adsorbent, Phenolic-Compounds, XAD-4

? Huang, K.L., Ding, P., Liu, S.Q., Li, G.Y. and Liu, Y.F. (2008), Preparation and characterization of novel chitosan derivatives: Adsorption equilibrium of iron(III) ion. *Chinese Journal of Polymer Science*, **26** (1), 1-11.

Full Text: [2008\Chi J Pol Sci26, 1.pdf](2008/Chi%20J%20Pol%20Sci26,%201.pdf)

Abstract: The adsorption of Fe(III) ions from aqueous solution by chitosan alpha-ketoglutaric acid (KCTS) and hydroxamated chitosan alpha-ketoglutaric acid (HKCTS) was studied in a batch adsorption system. Experiments were carried out as function of pH, temperature, agitation rate and concentration of Fe(III) ions. The Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms and isotherm constants were determined. The Langmuir model agrees very well with experimental data. The pseudo-first-order and second-order kinetic models were used to describe the kinetic data and the rate constants were evaluated. The dynamical data fit well with the second-order kinetic model. The pseudo second-order kinetic model was indicated with the activation energy of 19.61 and 7.98 kJ/mol for KCTS and HKCTS, respectively. It is suggested that the overall rate of Fe(III) adsorption is likely to be controlled by the chemical process. Results also showed that novel chitosan derivatives (KCTS and HKCTS) were favorable adsorbents.

Keywords: Activation, Activation Energy, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solution, Atomic-Absorption-Spectrometry, Batch Adsorption, Beads, Characterization, Chitosan, Chitosan Derivatives, Cross-Linked Chitosan, Equilibrium, Experimental, Fe(III), Fe(III) Ion, Freundlich, Function, Humic-Acid, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Langmuir Model, Mechanisms, Model, Models, pH, Preconcentration, Pseudo Second-Order, Separation, Solution, Sorption, Temperature

# Title: Chinese Journal of Process Engineering

Full Journal Title: [Chinese Journal of Process Engineering](http://engine.cqvip.com/QK/94710A/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1009-606X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tang, Y.K., Tong, Z.F., Wei, G.T., Li, Z.M. and Liang, D.W. (2006), Removal of phosphate from aqueous solution with modified bentonitec. *Chinese Journal of Process Engineering*, **6** (2), 197-200.

Full Text: [2006\Chi J Pro Eng6, 197.pdf](2006/Chi%20J%20Pro%20Eng6,%20197.pdf)

Abstract: Bentonite combined with sawdust and other metallic compounds was used to remove phosphate from aqueous solutions in this study. The adsorption characteristics of phosphate on the modified bentonite were investigated, including the effects of temperature, adsorbent dosage, initial concentration of phosphate and pH on removal of phosphate by conducting a series of batch adsorption experiments. The results showed that 98% of phosphate removal rate was obtained since sawdust and bentonite used in this investigation were abundantly and locally available. It is concluded that modified bentonite is a relatively efficient, low cost and easily available adsorbent for the removal of phosphate from aqueous solutions.

Keywords: Adsorption, Phosphate, Sawdust, Bentonite

# Title: Chinese Journal of Rare Metals

Full Journal Title: [Chinese Journal of Rare Metals](http://e36.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZXJS&NaviLink=%e7%a8%80%e6%9c%89%e9%87%91%e5%b1%9e)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0258-7076

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? He, C.G., Wang, W., Liu, P., Liao, X.P. and zhao, S.L. (2006), Adsorption property of Nd3+ by immobilized myrtan tannins. *Chinese Journal of Rare Metals*, **30** (4), 559-563.

Full Text: [2006\Chi J Rar Met30, 559.pdf](2006/Chi%20J%20Rar%20Met30,%20559.pdf)

Abstract : The immobilized myrtan tannins (IMT) based on collagen fiber was prepared through aldehyde cross linking reaction. The adsorption property to Nd3+ from rare earth was studied. Experiments show that the adsorption capacity of the novel adsorbent to Nd3+ is related to pH value and temperature of solution. When temperature is 293～323 K, the adsorption capacity of the novel adsorbents to Nd3+ increases while the adsorption temperature becomes high. When the adsorption temperature over 323 K, the adsorption capacity decreases greatly. In the adsorption pH value range of 3. 5～5.5, the adsorption capacity rises with the increase of pit. The adsorption kinetics data are well fitted by pseudo-second-order rate model, and the equilirium adsorption capacities calculated by pseudo-second-order rate model are nearly as same as the data actually determined with error less than 4 %. The adsorption property study presents an new method for recovery and determining the trace Nd3+ and separating the single rare earth element and receivering the rare metal from the waste water.

Keywords: Immobilized Myrtan Tannins, Adsorption, Nd3+

# Title: Chinese Journal of Reactive Polymers

Full Journal Title: [Chinese Journal of Reactive Polymers](http://www.ilib.cn/P-fyxgfz.html)

ISO Abbreviated Title:

JCR Abbreviated Title(20 character):

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Li, X.A. and Guo, H.F. (2006), Liquid-phase adsorption kinetics of isomaltotriose on Ca2+ exchange resin. *Chinese Journal of Reactive Polymers*, **15** (2), 121-127.

Full Text: [2006\Chi J Rea Pol15, 121.pdf](2006/Chi%20J%20Rea%20Pol15,%20121.pdf)

Abstract: The adsorption of isomaltotriose from aqueous solution on Ca2+ resin was investigated. The adsorption isotherm and the rate curve were determined. The pseudo-first-order model, pseudo-second-order model and the intraparticle diffusion model were used to predict the rate constants of adsorption. The activation energy of adsorption has been also evaluated using the pseudo-second-order rate constants. The results showed that the adsorption of isomaltotriose onto Ca2+ resin is an exothermically activated process. The adsorption isotherm can be described by Langmuir equation. The pseudo-second-order model can fit well to the adsorption rate curve of isomaltotriose onto Ca2+ resin. It suggests that the adsorption of isomoltotriose onto Ca2+ resin involve chemical adsorption.

# Title: Chinese Journal of Ultrasound in Medicine

Full Journal Title: [Chinese Journal of Ultrasound in Medicine](http://e41.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZGCY&NaviLink=%e4%b8%ad%e5%9b%bd%e8%b6%85%e5%a3%b0%e5%8c%bb%e5%ad%a6%e6%9d%82%e5%bf%97)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1002-0101

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fan, C.M. (2007), Bibliometric analysis of *Chinese Journal of Ultrasound in Medicine*. *Chinese Journal of Ultrasound in Medicine*, **23** (1), 1-2.

Full Text: [2007\Chi J Ult Med23, 1.pdf](2007/Chi%20J%20Ult%20Med23,%201.pdf)

Abstract: Objective To evaluate the quality of the publications and effects of Chinese Journal of Ultrasound in Medicine(CJUM). Methods Based on the database of Chinese Science & Technology Journal Citation Reports 2002-2005, the six indicators, including impact factor (IF), total cited numbers, immediate index, ratio of cited numbers by other journals to total cited numbers, number of citing journals and cited half-life, were evaluated and compared with other Chinese periodicals in the field of ultrasound medicine. Results F...

Keywords: Bibliometrics, Chinese Journal of Ultrasound in Medicine.

# Title: Chinese Journal of Zoology

Full Journal Title: Chinese Journal of Zoology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Jiang, W. (1997), Twenty important zoological science journals covered by the Science Citation Index. *Chinese Journal of Zoology*, **32** (4), 43-46.

Keywords: Citation, Journals, Science, Science Citation Index, Science Journals

# Title: Chinese Medical Equipment Journal

Full Journal Title: [Chinese Medical Equipment Journal](http://c.wanfangdata.com.cn/periodical-ylwszb.aspx)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zheng, Y.L., Liu, Y.Q., Liu, G.Z., Ma, B.J. and Huang T. (2006), Reinforcement on construction and management of software and hardware in laboratory for better utilization of large-scale instruments. *Chinese Medical Equipment Journal*, **27** (7), 43-44.

Full Text: [2006\Chi Med Equ J27, 43.pdf](2006/Chi%20Med%20Equ%20J27,%2043.pdf)

Abstract: Besides good teaching and researching personnel and research basis, such factors as large- scale instruments and good lab software and hardware construction are very important for colleges and universities to cultivate advanced person with ability as well as take high- level scientific achievements.

Keyword: Laboratory, Large- Scale Instrument, Software Construction

# Title: Chinese Medical Journal

Full Journal Title: [Chinese Medical Journal](http://hk.wanfangdata.com.cn/wf/%7Ekjqk/zhcmj/index.html); [Chinese Medical Journal](http://e42.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=ZHSS&NaviLink=Chinese%20Medical%20Journal)

ISO Abbreviated Title: Chin. Med. J.

JCR Abbreviated Title(20 character): Chinese Med J-Peking

ISSN: 0366-6999

Issues/Year: 12

Journal Country/Territory: Peoples R China

Language: English

Publisher: Chinese Medical Association

Publisher Address: 42 Dongsi Xidajie, Beijing 100710, Peoples R China

Subject Categories:

Medicine, General & Internal: Impact Factor

? Lu, H.M. and Takeda, H. (1992), Biokinetics of tritium incorporation into the tissues of rats during continuous ingestion of tritiated water or tritium-labeled food. *Chinese Medical Journal*, **105** (7), 594-597.

Abstract: Wistar strain male rats were continuously given tritiated water or tritiated wheat as drinking water or food for 70 days. During the ingestion, the tritium incorporation into rat tissues was examined in both wet and dry samples of liver, kidney, testis and blood. The concentration of organically bound tritium (OBT) in dry tissues of rats exposed to tritiated water (HTO) and 3H-food (tritiated wheat) attained an equilibrium within 2-3 weeks after the exposure. The concentration of OBT in dry tissues of rats exposed to HTO also reached an equilibrium within 3-4 weeks after the exposure. However, rats exposed to 3H-food, except for the liver, such an equilibrium state was not reached in other tissues and the OBT concentrations increased gradually throughout the exposure. The relative concentrations of total 3H and OBT at the end of the chronic ingestion of 3H food (70 day), expressed in percentages of the total activity were 1 and 9 times higher than those in rats exposed to HTO, respectively. In both groups, OBT as well as total 3H was almost uniformly distributed, Among the tissues examined.

? Ma, E.L. and Jiang, Z.M. (1993), Ion-exchange chromatography in simultaneous determination of serum copper and zinc levels in patients with cancer of digestive-tract. *Chinese Medical Journal*, **106** (2), 118-121.

? Yang, K.H., Guo, Y.S. and Xing, Z.L. (1998), Bibliometric analysis on asthma literature. *Chinese Medical Journal*, **111** (3), 227-228.

Full Text: [1998\Chi Med J111, 227.pdf](1998/Chi%20Med%20J111,%20227.pdf)

Abstract: Objective To provide scientific information for comprehending the progress of asthma research, speculating asthma research trends and selecting the reserach topics and promoting thorough asthma research by studying the speciality distribution of asthma papers. Data and Methods MEDLINE search was conducted to retrieve the papers published between the years 1983-1996 under the main headings of asthma. Nationalities, languages, journals, authors and headings frequency of 24 276 papers were analysed with bibliometrics. Results 24 276 papers on asthma research between the years 1983-1996 were found in MEDLINE. They came from 74 nations and regions, in 27 languages and 451 journals. 91. 36% came from America and 14 other nations, while 59 other nations made up less than 9%. Six nations publishing papers more than others were America 8778 (36.4%), England 4143 (17. 07%), Denmark 1465 (6.03%), Japan 1288 (5. 31%), Germany 1079 (4.44%) and Switzerland 1075 (4.43%). 74.21% were in English and 26other languages were only 25.8%. The source journals of papers showed the distribution of the Bradford’s law. Less than 1% journals carried more than 20% of all papers. 5 journals that carried more papers than others were Am J Respir Crit Cam Med 1212 (5%), J Allergy Clin Immunol 1124 (4. 63%), Chest 960 (3.96%), Eur Respir J 825 (3.40%), and Ann Allergy Asthma Immunol 800 (3.30%). There were 15 authors who each presented more than 30 papers in first position, among whom, Barnes PJ (English) produced 70 papers, Tanizaki Y (Japanese) 53 papers, Mole JL (Canadian) 48 papers, Sears MR (New Zealander) 47 papers, and Holgate ST (English) 43 papers. The variety of subject heading frequency reflected the hot topics and the developing direction of the research. Heading frequency on asthma research focused on therapeutics 27. 20% (including drug therapy 20.07%, comprehensive therapy 7. 01%, diet therapy 0.09%, and radiotherapy 0.03%); physiopathology 18. 10%; immunology 8.03%; diagnosis 7.88%and etiology 7.82% . It is worth noticing that little has been done before on epidemiology, economics, microbiology and virology of asthma, but literature on these aspects has increased obviously in recent years. Conclusion Asthma literature mainly came from America and 5 other nations. English was the major language. The source journals of the papers showed the distribution of the Bradford’s law. Am J Respir Crit Care Med and 4 other journals were core journals of asthma research. Barnes PJ and 14 other authors were the most active and the most important researchers in this field. Treatment, physiopathology, immunology, diagnosis and etiology were the emphasis and hot topics on asthma research. Great attention has been paid to the research on epidemiology, economics, microbiology and virology of asthma year after year.

Keywords: Analysis, Asthma, Bibliometric Analysis, Literature

? Wu, H., Xu, M.J., Zou, D.J., Han, Q.J. and Hu, X. (2010), Intensive glycemic control and macrovascular events in type 2 diabetes mellitus: A meta-analysis of randomized controlled trials. *Chinese Medical Journal*, **123** (20), 2908-2913.

Full Text: [2010\Chi Med J123, 2908.pdf](2010/Chi%20Med%20J123,%202908.pdf)

Abstract: Background There is no agreement as to whether intensive glucose control in type 2 diabetes can reduce the incidence of macrovascular events in these patients. We performed a meta-analysis comparing intensive glucose control or conventional glucose control in randomized controlled trials. Methods Databases including MEDLINE, EMBASE, and Cochrane controlled trials register, the Cochrane Library, and Science Citation Index were searched to find relevant trials. Outcome measures were the incidence of major macrovascular events. Results Six trials involving 28 065 patients were included. Analysis suggested that there was an obviously decreased incidence of major macrovascular events in patients having intensive glucose treatment vs. controls (RR 0.92; 95% CI 0.87, 0.98; P=0.005). However, intensive glycemia control strategies in type 2 diabetes showed no significant impact on the incidence of death from any cause compared with conventional glycemia control strategies, intensive 14.7%, controls 12.0% (RR 0.95; 95% CI 0.80, 1.12; P=0.55), as well as on the incidence of cardiovascular death, intensive 3.7%, controls 3.6% (RR 1.10, 95% CL 0.79, 1.53; P=0.57). Conclusions Control of glycemia to normal (or near normal levels) in type 2 diabetes appears to be effective in reducing the incidence of major macrovascular events, but there were no significant differences of either the mortality from any cause or from cardiovascular death between the two glycemia-control strategies. Chin Med J 2010;123(20):2908-2913.

Keywords: Cardiovascular-Disease, Citation, Complications, Control, Databases, Death, Diabetes Mellitus, Glucose Control, Intervention, Medline, Meta-Analysis, Pioglitazone, Quality, Randomized Controlled Trial, Risk, Science Citation Index, Treatment, Type 2 Diabetes, Type 2 Diabetes Mellitus, Veterans

? Liao, X.M. and Chen, P.Y. (2011), Citation analysis of meta-analysis articles on posttraumatic stress disorder. *Chinese Medical Journal*, **124** (7), 1088-1093.

Full Text: [2011\Chi Med J124, 1088.pdf](2011/Chi%20Med%20J124,%201088.pdf)

Abstract: Background In the past two decades enormously scientific researches on posttraumatic stress disorder (PTSD) have been undertaken and many related meta-analyses have been published. Citation analysis was used to get comprehensive perspectives of meta-analysis articles (MA articles) on PTSD for the purpose of facilitating the researchers, physicians and policy-makers to understand the PTSD. Methods MA articles on PTSD in any languages from January 1980 to March 2009 were included if they presented meta-analytical methods and received at least one citation recorded in the Web of Science (WoS). Whereas studies, in which any effect sizes of PTSD were not distinguished from other psychological disorders, were excluded. Citations to and by identified MA articles were documented basing on records in WoS. Citation analysis was used to examine distribution patterns of characteristics and citation impact of MA articles on PTSD. Canonical analysis was used to explore the relationship between the characteristics of MA articles and citation impact. Results Thirty-four MA articles published during 1998 and 2008 were identified and revealed multiple study topics on PTSD: 10 (29.4%) were about epidemiology, 13 (38.2%) about treatment or intervention, 6 (17.6%) about pathophysiology or neurophysiology or neuroendocrine, 3 (8.8%) about childhood and 2 (5.9%) about psychosocial adversity. Two articles cited most frequently with 456 and 145 counts were published in Journal of Consulting and Clinical Psychology by Brewin (2000) and Psychological Bulletin by Ozer (2003), respectively. Mean cited count was 7.48 +/- 10.56 and mean age (year 2009 minus article publication year) was (4.24 +/- 2.91) years. They had been cited approximately by 67 disciplines and by authors from 42 countries or territories. Characteristics of meta-analysis highly correlated with citation impact and reflected by canonical correlation of 0.899 (P<0.000 01). Conclusions The age of MA articles predicted their citation impact. Citation analysis would serve to capture the global perspectives and topics of MA articles on PTSD. Chin Med J 2011;124(7):1088-1093.

Keywords: Authors, Bibliometric Analysis, Citation, Citation Analysis, Controlled Clinical-Trials, Effect-Sizes, Epidemiology, Hippocampal Volume, Intervention, Journals, Meta-Analysis, Pharmacotherapy, Posttraumatic Stress Disorder, Psychology, PTSD, Publication, Publications, Survivors, Trauma-Exposed Adults, Web of Science

? Liu, X.Y., Wan, X.H. and Li, Z.W. (2011), Ten-year survey on oncology publications from China and other top-ranking countries. *Chinese Medical Journal*, **124** (20), 3314-3319.

Full Text: [2011\Chi Med J124, 3314.pdf](2011/Chi%20Med%20J124,%203314.pdf)

Abstract: Background Cancer is a global disease that knows no borders. Over the past decade, oncology research had developed rapidly worldwide. The aim of this study was to evaluate the publication characteristics in oncology journals from China and other top-ranking countries. Methods The present study was designed to study publication characteristics in oncology journals from China and other top-ranking countries, the United States (USA), Japan, Germany, the United Kingdom (UK) and France, from 2001 to 2010. We also examined the research output from the three different regions of China: the mainland of China, Hong Kong and Taiwan. Results Articles published in 163 journals related to oncology were retrieved from the PubMed database. The number of articles showed significantly positive trends for the six countries. The percentage of articles in the world output showed a significantly positive increase in contributions from China, especially the mainland of China. China contributed 4.5% of the total 163 journals, and 2.5% of the journals with the top 10% impact factor (IF) scores. USA contributed 31.4% of the total world output, 40.5% of the top 10% IF score journals and ranked the first. Conclusions This analysis described the research output from each country and region of China, and revealed the positive trend in China during 2001 and 2010. Also, by contrast with other top-ranking countries, these results imply that China falls behind the others in conducting high-quality oncology research. Chin Med J 2011;124(20):3314-3319.

Keywords: 2 Systems, Analysis, Articles, Cancer, China, Disease, Falls, France, Germany, Health-Care, Hong Kong, Hong-Kong, Impact, Impact Factor, Japan, Journal Citation Reports, Journal Impact Factor, Journals, Methods, Oncology, Projections, Publication, Publications, Pubmed, Research, Research Output, Science Citation Index Expanded, Survey, Taiwan, Trend, Trends, UK, United Kingdom, USA

# Title: Chinese Physics Letters

Full Journal Title: Chinese Physics Letters

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Ahmad, W. (2009), Co-Adsorption of CO in NO-CO Reaction on a Metal Catalytic Surface Studied by Computer Simulation. *Chinese Physics Letters*, **26** (3), 036401.

Full Text: [2009\Chi Phy Let26, 036401.pdf](2009/Chi%20Phy%20Let26,%20036401.pdf)

Abstract: The effect of co-adsorption of CO molecules in the NO-CO reaction on a metal catalytic surface like Pt(001) is studied by applying the Langmuir-Hinshelwood mechanism using the Monte Carlo simulations. The system is investigated by two approaches of NO adsorption; dissociatively at two empty surface sites and molecularly at a single vacant site. The elementary steps are the same as those in the conventional Ziff-Gulari-Barshad model. With the additional reaction step of co-adsorption, the sustained production of CO2 is obtained, which has never been seen on a square lattice without introducing additional parameters. The most interesting result is the elimination of continuous second order phase transition, i.e. the production of CO2 starts as soon as the partial pressure of CO departs from zero, which is in accordance with the experimental observations. The effect of co-adsorption probability on the phase diagrams has also been studied.

Keywords: Models, Monte-Carlo-Simulation, Repulsion, Square, Transitions

# Title: Chinese Science Bulletin

Full Journal Title: [Chinese Science Bulletin](http://www.scienceinchina.com/csb_en.htm); [Chinese Science Bulletin](http://www.springerlink.com/(tu2awtnfz5hzrir1aggrmwfh)/app/home/journal.asp?referrer=parent&backto=subject,9,30;)

ISO Abbreviated Title: Chin. Sci. Bull.

JCR Abbreviated Title: Chinese Sci Bull

ISSN: 1001-6538

Issues/Year: 24

Journal Country/Territory: Peoples R China

Language: English

Publisher: Science Press

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

Subject Categories:

Multidisciplinary Sciences: Impact Factor 0.593, 18/46 (2003); Impact Factor 1.087, 18/59 (2010)

? Zhou, D.H., Xu, F.L., Dong, Y.Y. and Li, X.Y. (1996), Some problems relating to characterizing specific adsorption of heavy-metal ions on surface of oxide: Effect of accompanying anions. *Chinese Science Bulletin*, **41** (17), 1483-1487.

Full Text: [1996\Chi Sci Bul41, 1483.pdf](1996/Chi%20Sci%20Bul41,%201483.pdf)

? Ran, Y., Lin, Z., Wang, X.L., Min, Y.S., Sheng, G.Y. and Fu, J.M. (2000), Sorption and desorption of 1,4-dichlorobenzene on peat. *Chinese Science Bulletin*, **45** (Suppl), 47-52.

Full Text: [2000\Chi Sci Bul45, 47.pdf](2000/Chi%20Sci%20Bul45,%2047.pdf)

Abstract: Sorption and desorption of 1,4-dichlorobenzene (DCB) on peat (>92% organic matter) display large-scale hysteresis and nonlinearity. The magnitude of desorption hysteresis decreases in the order: untreated Pahokee peat (P)> acid treated peat (FP)> humin (TP). The desorption percentages are lower than 28% of the sorbed 1, 4-DCB after desorbing for 6 days. The sorption and desorption isotherms are well fitted to Freundlich equation, whose parameter 1/n ranges from 0.055 to 0.527. Moreover, the parameter 1/n of the desorption isotherm is significantly lower than that of the sorption isotherm, but the parameter logK increases on contrary to 1/n. The desorption isotherms are very well fitted to Langmuir equation, whose Q(m) decreases in the order: TP>FP>P. The apparent partition coefficients (K-p) increase with increasing sorption time or decreasing aqueous equilibrium concentration of DCB. And K-p of P is significantly higher than that of FP or TP.

Keywords: 1,4-Dichlorobenze, Sorption, Desorption, Natural Organic Matter, Isothermal Equation, Distributed Reactivity Model, Sediments, Soils, Pollutants

? Meng, Q.Y., Chu, S.G. and Xu, X.B. (2001), Sorption phenomena of PCBs in environment. *Chinese Science Bulletin*, **46** (2), 89-97.

Full Text: [2001\Chi Sci Bul46, 89.pdf](2001/Chi%20Sci%20Bul46,%2089.pdf)

Abstract: The relationship between the properties of PCBs and the behavior of soil and sediment is reviewed. The sorption phenomena of PCBs in the environment are described with different models. The research progress on the sorption mechanisms is also discussed.

Keywords: PCBs, Sorption, Environmental Transport, Distributed Reactivity Model, Polychlorinated Biphenyl Congeners, Surfactant-Enhanced Solubilization, Hydrophobic Organic-Compounds, Water Partition-Coefficients, Nonionic Surfactant, Natural Sediments, Suspended-Solids, Desorption-Kinetics, Sorbent Zones

Ingwersen, P., Larsen, B., Rousseau, R. and Russell, J. (2001), The publication-citation matrix and its derived quantities. *Chinese Science Bulletin*, **46** (6), 524-528.

Full Text: [2001\Chi Sci Bul46, 524.pdf](C:/Users/YSHo/AppData/Roaming/Microsoft/Word/2001/Chi Sci Bul46, 524.pdf)

Abstract: We give an overview of the main data of a publication-citation matrix. We show how impact factors are defined, and, in particular, point out the difference between the synchronous and the diachronous impact factor. The advantages and disadvantages of using both as tools in research evaluation are discussed.

Keywords: Research Evaluation, Publication-Citation Matrix, Diachronous Impact Factor, Synchronous Impact Factor, Science, Impact

? Lin, Z.Y., Zhou, C.H., Wu, J.M., Cheng, H., Liu, B.L., Ni, Z.M., Zhou, J.Z. and Fu, J.K. (2002), Adsorption and reduction of palladium (Pd2+) by Bacillus licheniformis R08. *Chinese Science Bulletin*, **47** (15), 1262-1266.

Full Text: [2002\Chi Sci Bul47, 1262.pdf](2002/Chi%20Sci%20Bul47,%201262.pdf)

Abstract: Preliminary study on the mechanism of Pd2+ biosorption by resting cells of Bacillus licheniformis R08 biomass has been carried out by means of chemical kinetics and AAS, TEM, XRD and FTIR methods. The results showed that at 30degreesC and PH 3.5, when dry R08 biomass powder (800 mg/L) was mixed with Pd2+ (100 mg/L) for 45 min, the rate constant k of biosorption of Pd2+ attained a maximum of 5.97×10-2 min-1 and the half life period of the reaction reached 12 min. The part of Pd2+ adsorbed by R08 biomass was reduced to elemental, cell-bound Pd-0 at the same condition. The cell wall of R08 biomass was the primary location for accumulating Pd2+, and aldoses, i. e. hydrolysate of a part of polysaccharides on the peptidoglycan layer in the acidic medium, serving as the electron donor, in situ reduced the Pd2+ to Pd-0.

Keywords: Bacillus Licheniformis, Biosorption, Palladium, Non-Enzymatically Mediated Bioreduction, FTIR, Biomass

? Wang, S.G., Li, Y.H., Gong, X.Y., Zhao, H.Z., Luan, Z.K., Xu, C.L. and Wu, D.H. (2003), Surface characteristics of modified carbon nanotubes and its application in lead adsorption from aqueous solution. *Chinese Science Bulletin*, **48** (5), 441-443.

Full Text: [2003\Chi Sci Bul48, 441.pdf](2003/Chi%20Sci%20Bul48,%20441.pdf)

Abstract: Carbon nanotubes (CNT) were modified by nitric acid oxidation. Infrared spectroscopy (IR) demonstrated that hydroxyl (-OH) and carbonyl (-C=O) functional groups were introduced to the surface of modified CNT. Micrometrics ASAP 2000 measurement showed that the surface area of modified CNT was slightly increased. Furthermore, the Pb2+ adsorption behavior on the surface of modified CNT has been investigated. The results indicate that the modified CNT has an exceptional adsorption capability for Pb2+ removal. The adsorption isotherms are well described by the Langmuir equation under test temperatures and the kinetics level is three.

Keywords: Carbon Nanotubes, Oxidized Modification, Lead Removal

? Jin, B.H., Liang, L.M., Rousseau, R. and Egghe, L. (2007), The R- and AR-indices: Complementing the h-index. *Chinese Science Bulletin*, **52** (6), 855-863.

Full Text: [2007\Chi Sci Bul52, 855.pdf](2007/Chi%20Sci%20Bul52,%20855.pdf)

Abstract: Based on the foundation laid by the h-index we introduce and study the R- and AR-indices. These new indices eliminate some of the disadvantages of the h-index, especially when they are used in combination with the h-index. The R-index measures the h-core’s citation intensity, while AR goes one step further and takes the age of publications into account. This allows for an index that can actually increase and decrease over time. We propose the pair (h, AR) as a meaningful indicator for research evaluation. We further prove a relation characterizing the h-index in the power law model.

Keywords: A-Index, Age, Ar-Index, Citation, Evaluation, g Index, h Index, h-Index, Hirsch-Index, Indicator, Law, Model, Performance Evaluation, Power Law, Publications, R-Index, Ranking, Research, Research Evaluation, Scientists

? Yao, L., Ye, Z.F., Wang, Z.Y. and Ni, J.R. (2008), Characteristics of Pb2+ biosorption with aerobic granular biomass. *Chinese Science Bulletin*, **53** (6), 948-953.

Full Text: [2008\Chi Sci Bul53, 948.pdf](2008/Chi%20Sci%20Bul53,%20948.pdf)

Abstract: Experimental studies were conducted on the feasibility of aerobic granular biomass as a novel type of biosorbent for Pb2+ removal. The results show that the initial pH, Pb2+ concentration (C0) and biomass concentration (X0) affected the biosorption process significantly. Both the Freundlich and Langmuir isotherm models describe the biosorption process accurately, with correlation coefficients of 0.932 and 0.959 respectively. The Pb2+ biosorption kinetics is interpreted as having two stages, with the second stage described reasonably well by a Lagergren pseudo-second order model. Moreover, the surface change of granular biomass after the Pb2+ biosorption process appears to be caused by ion exchange and metal chelation according to the analysis results of Environmental Scanning Electron Microscopy (ESEM) and Energy Dispersive X-ray Spectroscopy (EDX).

Keywords: Activated-Sludge, Aerobic Granular Biomass, Analysis, Aqueous-Solutions, Biomass, Biosorbent, Biosorption, Biosorption Characteristics, Biosorption Kinetics, Chelation, Copper(II), EDX, Equilibrium, ESEM, Freundlich, Heavy-Metals, Ion Exchange, Ion-Exchange, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lead(II), Metal, Model, Models, Pb(II), Pb2+, pH, Pseudo-Second Order, Removal, Sequencing Batch Reactor

? Kostoff, R.N., Barth, R.B. and Lau, C.G.Y. (2008), Quality vs. quantity of publications in nanotechnology field from the People’s Republic of China. *Chinese Science Bulletin*, **53** (8), 1272-1280.

Full Text: [2008\Chi Sci Bul53, 1272.pdf](2008/Chi%20Sci%20Bul53,%201272.pdf)

Abstract: This study evaluates trends in quality of nanotechnology and nanoscience papers produced by authors from the People’s Republic of China (PRC). The metric used to gauge quality is ratio of highly cited nanotechnology papers to total nanotechnology papers produced in sequential time frames. The USA is both the most prolific nanotechnology publishing country and most represented country on highly cited nanotechnology papers (both in absolute numbers of highly cited papers and highly cited papers relative to total publications) over the 1998-2003 time frame, based on the SCI/SSCI databases. Some of the smaller hi-tech countries have relatively high ratios (similar to 2) of highly cited papers to total publications (e.g. Denmark, Netherlands, Switzerland). Countries that have exhibited rapid growth in SCI/SSCI nanotechnology paper production in recent years (e.g. PRC, South Korea) had ratios an order of magnitude less than that of the USA for 1998, but by 2003 had increased to about 20% that of the USA (similar to 2.5). PRC and South Korea have climbed in the publications rankings from 6th and 9th in 1998, respectively, to 2nd and 6th in 2005, respectively. PRC’s ratio monotonically increased from 0.16 to 0.45 over the 1998-2003 period, and South Korea’s ratio increased from 0.11 to about 0.6 over that same period, indicating their papers are getting more and more citations proportionately. Thus, under rapid growth conditions, PRC and South Korea have been able to increase their share of participation in highly cited papers. As of 2003, PRC and South Korea have ratios comparable to nations like Japan, France, Italy, and Australia but not yet approaching those of the highly cited countries. None of the top ten publications producing institutions are from the USA, while all of the top ten highly cited publications producers are from the USA. Over the 1998-2003 time period, the top six total publications producing institutions (globally) remained the same, with Chinese Academy of Sciences (which consists of many research institutes) wresting the lead from Russian Academy of Sciences in 1999, and thereafter increasing the gap. Over this same time period, the USA institutions constituted about 90% of the top ten most cited papers list. For Chinese institutions specifically in the period 1998-2003, the nanotechnology publication leading Chinese Academy of Sciences has maintained an average of about 30% of nanotechnology publications over that time frame. The second tier (in terms of quantity) for the last few years has consisted of Tsinghua University, Nanjing University, University of Science and Technology of China, Peking University, Jilin University, Zhejiang University, Shandong University, and Fudan University. Hong Kong institutions have, on average, been strong in ratio, especially City University Hong Kong, and Hong Kong University of Science and Technology, indicating significant citations.

Keywords: Australia, China, Chinese, Citations, Country, Databases, Denmark, Field, France, Growth, Hong Kong, Institutions, Italy, Japan, Korea, Lead, Nanoscience, Nanotechnology, Nanotechnology Publication, Nations, Papers, Participation, People’s Republic of China, Publication, Publications, Publishing, Quality, Quality of, Rankings, Research, Switzerland, Trends, USA

? Feng, Z.Z., Kobayashi, K., Wang, X.K. and Feng, Z.W. (2009), A meta-analysis of responses of wheat yield formation to elevated ozone concentration. *Chinese Science Bulletin*, **54** (2), 249-255.

Full Text: [2009\Chi Sci Bul54, 249.pdf](2009/Chi%20Sci%20Bul54,%20249.pdf)

Abstract: The meta-analysis method was applied to quantitatively investigate effects of the elevated ozone concentration ([O(3)]) on chlorophyll concentration, gas exchange and yield components of wheat. There were 39 effective references through Web of Science (ISI, USA) and Chinese journal full-text database (CNKI, China). The results of meta-analysis indicated that elevated [O(3)] decreased grain yield, grain weight, grain number per ear, ear number per plant and harvest index by 26%, 18%, 11%, 5% and 11%, respectively, relative to ambient air. The decrease in leaf physiological characters was much greater than that in yield when wheat was expose to elevated [O(3)], while light-saturated photosynthetic rate (Asat), stomatal conductance (Gs) and chlorophyll content (Chl) decreased by 40%, 31%, and 46%, respectively. The responses to elevated [O(3)] between spring wheat and winter wheat were similar. Most of the variables showed a linear decrease trend with an increase of [O(3)]. The most significant decrease for Asat, Gs and Chl was found in grain filling stage. Elevated [CO(2)] could significantly ameliorated or offset the detrimental effects caused by elevated [O(3)].

Keywords: Meta-Analysis, Elevated [CO2], Wheat, Ozone, Gas Exchange, Yield, Triticum-Aestivum l., Ambient Ozone, Stomatal Conductance, Air-Pollution, Spring Wheat, Photosynthesis, CO2, Impact, Growth, Crops

# Title: Cirugía Española

Full Journal Title: Cirugía Española

ISO Abbreviated Title:

JCR Abbreviated Title: Cir Esp

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Manterola, C., Busquets, J., Pascual, M. and Grande, L. (2006), What is the methodological quality of articles on therapeutic procedures published in *Cirugía Española*? *Cirugía Española*, **79** (2), 95-100.

Abstract: INTRODUCTION: The aim of this study was to determine the methodological quality of articles on therapeutic procedures published in Cirugia Espanola and to study its association with the publication year, center, and subject-matter. MATERIAL AND METHOD: A bibliometric study that included all articles on therapeutic procedures published in Cirugia Espanola between 2001 and 2004 was performed. All kinds of clinical designs were considered, excluding editorials, review articles, letters to editor, and experimental studies. The variables analyzed were: year of publication, center, design, and methodological quality. Methodological quality was determined by a valid and reliable scale. Descriptive statistics (calculation of means, standard deviation and medians) and analytical statistics (Pearson’s chi2, nonparametric, ANOVA and Bonferroni tests) were used. RESULTS: A total of 244 articles were studied (197 case series [81%], 28 cohort studies [12%], 17 clinical trials [7%], 1 cross sectional study and 1 case-control study [0.8%]). The studies were performed mainly in Catalonia and Murcia (22% and 16%, respectively). The most frequent subject areas were soft tissue and hepatobiliopancreatic surgery (23% and 19%, respectively). The mean and median of the methodological quality score calculated for the entire series was 10.2±3.9 points and 9.5 points, respectively. Methodological quality significantly increased by publication year (p < 0.001). An association between methodological quality and subject area was observed but no association was detected with the center performing the study. CONCLUSIONS: The methodological quality of articles on therapeutic procedures published in Cirugia Espanola between 2001 and 2004 is low. However, a statistically significant trend toward improvement was observed.

Keywords: Anova, Association, Bibliometric, Bibliometric Study, Calculation, Case-Control, Case-Control Study, Clinical, Clinical Trials, Cohort, Design, Experimental, Improvement, Procedures, Publication, Quality, Quality of, Review, Scale, Standard, Statistics, Surgery, Therapeutic, Trend

# Title: Chirurg

Full Journal Title: Chirurg

ISO Abbreviated Title: Chirurg

JCR Abbreviated Title: Chirurg

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Haller, U., Hepp, H. and Reinold, E. (1999), Does the “impact factor” kill the German language? *Chirurg*, **70** (2), S39-S41.

Full Text: 1999\Chirurg70, S39.pdf

? Hasse, W. and Fischer, R.J. (2010), Citation characteristics of German authors in “*Der Chirurg*” - Hegemony of the impact factor. *Chirurg*, **81** (4), 361-364.

Full Text: [2010\Chirurg81, 361.pdf](2010/Chirurg81,%20361.pdf)

Abstract: Characteristics of citation and language in publications of German authors from the journal aEuroDer Chirurg” (vol 78, 2007) were analysed. Out of a total of 3,342 citations, 756 (22.62%) were from German authors with 248 (32.8) self-citations. The hegemony of the impact factor in science, research and education is critically discussed. The imbalance between the number of surgeons in the US and United Kingdom (66,032) and surgeons in the German speaking countries in Europe (25,300) is compared with respect to the counting methods used to create the impact factor of a journal. The creation of an independent impact factor in Europe and the development of an EU-based citation data bank which allows unselected access to national language scientific literature are strongly needed.

Keywords: Citation, Citations, European Citations Databank, Impact Factor, Journals, Language, Medicine, Publications, Research, Science, Self-Citation, Self-Citations, US

# Title: CHISA 2004 - 16th International Congress of Chemical and Process Engineering

Full Journal Title: CHISA 2004 - 16th International Congress of Chemical and Process Engineering

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Benaïssa, H. and Elouchdi, M.A. (2004), Effect of co-ions on cadmium sorption kinetics from aqueous solutions by dried sunflower leaves. *CHISA 2004 - 16th International Congress of Chemical and Process Engineering*, 8963-8970.

Abstract: The effect of ions presence such as: Na+, K+, Ca2+, Cl-, SO42- and CO 32-, at various initial concentrations, on the kinetics of cadmium sorption by dried sunflower leaves was studied at 25°C in batch conditions. The presence of these ions in solution was found to inhibit the uptake of cadmium by dried sunflower leaves at different degrees. Na + and K+ ions have no significant effect. For Ca 2+, SO42- and CO32- ions, the effects ranged from an inhibition of cadmium by Ca2+ and CO 32- to a weak inhibition by SO42-. Cl-1 ion was found to enhance slightly cadmium uptake level. The results also showed that the kinetics of sorption were described by a pseudo-second order rate model.

Keywords: Cadmium, Dried sunflower leaves, Ions effect, Kinetics, Sorption

? Benaïssa, H. and Attar, M.A. (2004), Screening of new sorbent materials for acid dyes removal from aqueous solutions. *CHISA 2004 - 16th International Congress of Chemical and Process Engineering*, 8973-8979.

Abstract: Three low-cost materials as agricultural by-product wastes: almond rinds, eucalyptus barks and orange peels were tested for the removal of acid dyes from aqueous solutions in batch conditions. As results obtained, kinetics of dyes sorption was time of contact and initial dyes concentration dependent and were described by a pseudo-second order rate model. Langmuir model gave a good fit to the experimental data. A high dyes adsorption was observed by these materials. For Nylosane Blue, the orange peels were the most effective with a maximum sorption capacity about 65.88 mg/g followed by almond rinds (62.03 mg/g) and eucalyptus barks (59.56 mg/g). For Erionyl Yellow, the orange peels were the most effective with a maximum sorption capacity about 64.14 mg/g followed by eucalyptus barks (52.85 mg/g) and almond rinds (50.71 mg/g). For Erionyl Red, the orange peels were the most effective with a maximum sorption capacity about 40.71 mg/g followed by eucalyptus barks (38.04 mg/g) and almond rinds (29.61 mg/g). For Nylomine Red, the almond rinds were the most effective with a maximum sorption capacity about 67.16 mg/g followed by orange peels (62.03 mg/g) and encalyptus barks (58.34 mg/g).

# Title: Chitin

Pergamon Press, Oxford.

? Muzzarelli, R.A.A. (1977), *Chitin*, Pergamon Press, Oxford.

# Title: Chromatographia

Full Journal Title: [Chromatographia](http://www.springerlink.com/content/110810/?p=3cacfdb78b7f42ab8471d695011d7225&pi=0)

ISO Abbreviated Title: Chromatographia

JCR Abbreviated Title: Chromatographia

ISSN: 0009-5893

Issues/Year: 12

Journal Country/Territory: Germany

Language: English

Publisher: Vieweg

Publisher Address: Abraham-Lincoln-Strabe 46, Postfach 15 47, D-65005 Wiesbaden, Germany

Subject Categories:

Biochemical Research Methods: Impact Factor 1.619, / (2000)

Chemistry, Analytical: Impact Factor 1.619, / (2000)

? Deininger, G., Asshauer, J. and Halasz, I. (1975), Simple measurement of sorption isosteres by gas-chromatography within linear range of isotherm. *Chromatographia*, **8** (3), 143-154.

? Gros, N. and Gorenc, B. (1994), Ion-chromatographic determination of alkali and alkaline-earth metals in mineral waters. *Chromatographia*, **39** (7-8), 448-452.

Abstract: The rapid, simultaneous, isocratic, suppressed ion chromatographic determination of alkali, alkaline earth metals and ammonium in highly mineralized waters has been examined using the novel cation exchange IonPac CS12 column. General ability for the determination of lithium, sodium, ammonium, potassium, magnesium, calcium and strontium in concentrations from a few µg to several mg per liter was studied. The relative standard deviations of retention times of all seven cations were below 0.7% and the relative standard deviations of the measurements of peak areas and peak heights were mostly below 5%. Six natural mineral waters of different types were selected for evaluation of the method. It was not possible to determine lithium in the one run usually partially coelutes with sodium quantitative determination. Strontium was undetectable because of the necessary dilutions. All the relationships between peak areas and concentrations or peak height and concentrations were linear and there was also no evidence of the effect of different matrices on the slope of regression lines.

Keywords: Ion Chromatography, Mineral Waters, Alkali Metals, Alkaline Earth Metals, Ammonium, Cations, Column, Anions, Acid

? Chu, J., Hu, R., Miwa, T. and Takeuchi, T. (1995), Indirect photometric detection of inorganic anions by microcolumn liquid-chromatography using anthraquinone-disulfonate as visualization agent. *Chromatographia*, **40** (7-8), 379-381.

Abstract: Disodium salts of several anthraquinone-disulfonic acids, which possess large molar absorptivity, were employed as the visualization agent for microcolumn ion chromatography with indirect photometric detection. Detection limits of inorganic anions were improved, e.g., concentration detection limits of chloride, nitrate and sulfate were 0.98-1.6 µmol L-1 at S/N = 3, corresponding to mass detection limits of 18-32 fmol. The present system was applied to the determination of inorganic anions in tap water.

Keywords: Column Liquid Chromatography, Indirect Photometric Detection, Anthraquinone-Disulfonate Ion, Inorganic Anions, Ion Chromatography, Performance, Columns

? Jahanshahi, M., Panahi, H.A., Hajizadeh, S. and Moniri, E. (2008), Boronate-containing copolymer grafted on Eupergit C as matrix for affinity chromatography: Isotherms and kinetics study. *Chromatographia*, **68** (1-2), 41-47.

Full Text: [2008\Chromatographia68, 41.pdf](2008/Chromatographia68,%2041.pdf)

Abstract: Eupergit C, an acrylic polymer support containing oxirane groups, for pseudo affinity adsorption of bioproducts was modified and functionalized by 1,2-ethanedithiol followed by graft copolymerization of 3-acrylamidophenylboronic acid and N,N-dimethylacrylamide. The resin was characterized by elemental analysis and IR spectroscopy and was subjected to biochemical evaluation through batch binding and column chromatography of mucin. Based on equilibrium adsorption data the Langmuir and Freundlich constants were determined 0.04 and 0.84 at pH 8 and 0.19 and 4.53 at pH 8.5, respectively. Subsequently adsorption data were modeled using the pseudo-first-order and pseudo-second-order kinetics equation. It was shown that the pseudo-second-order kinetic equation could best describe adsorption. The generic application of such copolymer grafted for the adsorption and separation of bioproducts is discussed.

Keywords: Acids, Adsorption, Affinity Chromatography, Analysis, Bioseparation, Chromatography, Column, Column Chromatography, Constants, Copolymerization, Design, Disruption, Equilibrium, Eupergit C, Evaluation, Fluidized-Bed Adsorption, Freundlich, Graft, Graft Copolymerization, Grafted, IR, Isotherms, Kinetic, Kinetics, Langmuir, Membrane, Mucin, Pervaporation, pH, Polymer, Polymer Grafting, Protein, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Resin, Rheological Behavior, Separation, Spectroscopy

? Jahanshahi, M. and Ebrahimpour, M. (2009), Expanded bed chromatography as a tool for nanoparticulate separation: kinetic study and adsorption of protein nanoparticles. *Chromatographia*, **70** (11-12), 1553-1560.

Full Text: [2009\Chromatographia70, 1553.pdf](2009/Chromatographia70,%201553.pdf)

Abstract: Expanded bed adsorption was investigated together with its suitability for the practical recovery of nanoparticulate mimics of products such as plasmid DNA and viruses as putative gene therapy vectors. The study assessed the binding of protein nanoparticles fabricated from bovine serum albumin (BSA) with average size of 80 nm as a model system and viral size/charge mimic to the streamline DEAE adsorbent in the expanded bed column chromatography. The adsorption kinetics and adsorption mechanism for the BSA nanoparticles on the adsorbent were studied. In batch adsorption studies, the factors nanoparticle concentration, contact time and adsorbent amount, affecting adsorption isotherms were investigated. Subsequently the data were regressed against the Lagergren equation, which represents a first-order kinetics equation and also against a pseudo-second-order kinetics equation. The results demonstrated that the adsorption process followed a Langmuir isotherm equation. The kinetics of the adsorption process followed a pseudo-second-order kinetics model with a rate constant value of 0.025 g mg-1 min-1. The dynamic binding capacity of the BSA nanoparticles on an expanded bed was calculated. The recovery of the nanoparticles was more than 85%.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Adsorption Mechanism, Albumin, Aqueous-Solutions, Batch, Batch Adsorption, Binding, Bovine, Bovine Serum Albumin, Bovine Serum-Albumin, BSA, Capacity, Chromatography, Chromium, Column, Column Chromatography, Column Liquid Chromatography, Concentration, Contact Time, Data, DNA, Drug-Delivery, Dynamic, Expanded Bed Adsorption, First Order, First-Order Kinetics, Gene, Hydrodynamic Behavior, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Kinetics Equation, Kinetics Model, Lagergren Equation, Langmuir, Langmuir Isotherm, Mechanism, Model, Nanobioparticles, Nanoparticle, Nanoparticles, Particles, Protein, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second Order Kinetics Equation, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Purification, Rate Constant, Recovery, Separation, Serum, Size, Therapy, Value, Viral

# Title: Chronic Diseases in Canada

Full Journal Title: [Chronic Diseases in Canada](http://www.phac-aspc.gc.ca/publicat/cdic-mcc/pastiss-numant-eng.php)

ISO Abbreviated Title: Chronic. Dis. Can.

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wigle, D.T. (1998), Safe drinking water: A public health challenge. *Chronic Diseases in Canada*, **19** (3), 103-107.

Abstract: Disinfection of drinking water through processes including filtration and chlorination was one of the major achievements of public health, beginning in the late 1800s and the early 1900s. Chloroform and other chlorination disinfection by-products (CBPs) in drinking water were first reported in 1974. Chloroform and several other CBPs are known to cause cancer in experimental animals, and there is growing epidemiologic evidence of a causal role for CBPs in human cancer, particularly for bladder cancer. It has been estimated that 14 16% of bladder cancers in Ontario may be attributable to drinking water containing relatively high levels of CBPs; the US Environmental Protection Agency has estimated the attributable risk to be 2 17%. These estimates are based on the assumption that the associations observed between bladder cancer and CBP exposure reflect a cause-effect relation. An expert working group (see Workshop Report in this issue) concluded that it was possible (60% of the group) to probable (40% of the group) that CBPs pose a significant cancer risk, particularly of bladder cancer. The group concluded that the risk of bladder and possibly other types of cancer is a moderately important public health problem. There is an urgent need to resolve this and to consider actions based on the body of evidence which, at a minimum, suggests that lowering of CBP levels would prevent a significant fraction of bladder cancers. In fact, given the widespread and prolonged exposure to CBPs and the epidemiologic evidence of associations with several cancer sites, future research may establish CBPs as the most important environmental carcinogens in terms of the number of attributable cancers per year.

# Title: Chung Hua Min Kuo Wei Sheng Wu Chi Mien I Hsueh Tsa Chih

? Chao, W.L., Ding, R.J. and Chen, R.S. (1987), Survival of pathogenic bacteria in environmental microcosms. *Chung Hua Min Kuo Wei Sheng Wu Chi Mien I Hsueh Tsa Chih*, **20** (4), 339-348.

Abstract: The survival times of Salmonella enteritidis, *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Vibrio cholerae* in natural soil and river water samples were monitored by using various differential media., S. aureus and *V. cholerae* failed to survive in samples of soil, groundwater, and river water with various degrees of eutrophication. The population of the introduced, S. enteritidis remained fairly constant in all three samples of soils tested. In water samples, numbers of, S. enteritidis and P. aeruginosa showed an initial rapid decline followed by a much lower rate of decrease. The results indicated that some allochthonous microorganisms, because of their insensitivity to various biotic and abiotic stresses, might persist for a long time in the environment and become a serious threat to public health.

# Title: Ciba Foundation Symposia

Full Journal Title: Ciba Foundation Symposia

ISO Abbreviated Title: Ciba. F. Symp.

JCR Abbreviated Title: Ciba F Symp

ISSN: 0300-5208

Issues/Year: 1

Journal Country/Territory: England

Language: English

Publisher: John Wiley & Sons Ltd

Publisher Address: Baffins Lane Chichester, W Sussex PO19 1UD, England

Subject Categories:

Medicine, General & Internal: Impact Factor

? Harries, J.T. (1976), The problem of bacterial diarrhoea. *Ciba Foundation Symposia*, **42,3-**25.

Abstract: The reported incidence of “pathogenic” bacteria, as judged by serotype, in the stools of children with acute diarrhoea has varied from 4 to 33% over the last twenty years. Techniques such as tissue culture provide a means for detecting enterotoxin-producing strains of bacteria, strains which often do not possess “pathogenic” serotypes. “Pathogenicity” requires redefinition, and the aetiological importance of bacteria in diarrhoea is probably considerably greater than previous reports have indicated. Colonization of the bowel by a pathogen will result in structural and/or mucosal abnormalities, and will depend on a series of complex interactions between the external environment, the pathogen, and the host and its resident bacterial flora. Enteropathogenic bacteria may be broadly classified as (i) invasive (e.g. Shigella, Salmonella and some *Escherichia coli*) which predominantly affect the distal bowel, or (II) non-invasive (e.g. *Vibrio cholerae* and E. coli) which affect the proximal bowel. *V. cholerae* and E. coli elaborate heat-labile enterotoxins which activate adenylate cyclase and induce small intestinal secretion; the secretory effects of heat-stable E. coli and heat-labile Shigella dysenteriae enterotoxins are not accompanied by cyclase activation. The two major complications of acute diarrhoea are (i) hypernatraemic dehydration with its attendant neurological, renal and vascular lesions, and (II) protracted diarrhoea which may lead to severe malnutrition. Deconjugation of bile salts and colonization of the small bowel with toxigenic strains of E. coli may be important in the pathophysiology of the protracted diarrhoea syndrome. The control of bacterial diarrhoea requires a corrdinated political, educational, social, public health and scientific attack. Bacterial diarrhoea is a major health problem throughout the world, and carries an appreciable morbidity and mortality. This is particularly the case during infancy, and in those developing parts of the world where malnutrition is common. This paper is concerned mainly with acute bacterial diarrhoea, and reviews the problem as a whole.

? Martyn, C.N. (1992), The epidemiology of Alzheimer’s disease in relation to aluminium. *Ciba Foundation Symposia*, **169**, 69-79; discussion 79-86.

Abstract: The combination of an ageing population, an exponential increase in the incidence of dementing illness with age, and the high demands that demented patients place on health care resources makes Alzheimer’s disease a major public health issue. So far, epidemiologists have made better progress in quantifying the frequency of the disease than in identifying strong risk factors, but evidence is accumulating to implicate environmental exposure to aluminium in the aetiology. The finding of a geographical correlation between death rates from dementia and water aluminium concentrations in Norway has since been replicated in several other surveys. Although ecological studies of this type should be interpreted cautiously, the association between Alzheimer’s disease and aluminium in drinking water may prove to be an example of a potentially important biological effect of aluminium.

# Title: Ciencia da Informacao Ciencia da Informacao

Full Journal Title: Ciencia da Informacao Ciencia da Informacao

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? guiar Poblacin, D. and Pires Noronha, D. (2002), “White” and “grey” literature produced in information science by doctors/lectures from the Brazilian graduate programs. *Ciencia da Informacao Ciencia da Informacao*, **31**, (2), 98-106.

Abstract: A scientometric study of the doctor/lecturer scientific production of information science graduate programs in Brazil was undertaken with the purpose of finding the doctors’ profiles and the trends of “white” and grey” literature produced by them. The data were obtained directly from doctors using the Delfos Conference technique. It was found that 66 doctors were developing their studies in 22 research fields; 54.5% of them graduated in information science. 1108 documents were produced between 1990 to 1999, 59.8% being “white” literature, with articles published in scientific journals predominating. Among the “grey” literature, congress communications were more frequent. Individual works are more common. Doctors’ scientific production, linked to research fields, has influenced the establishment of research groups.

Keywords: Brazil, Communications, Data, Developing, Doctors, Graduate, Information, Information Science, Journals, Literature, Profiles, Purpose, Research, Science, Scientific Journals, Scientific Production, Scientometric, Trends

# Title: Ciencia & Saude Coletiva

Full Journal Title: Ciência & Saúde Coletiva

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Edwards, T.M. and Myers, J.P. (2008), Environmental exposures and gene regulation in disease etiology (Reprinted from Environmental Health Perpectives, vol 115, pg 1264-1270, 2007). *Ciência & Saúde Coletiva*, **13** (1), 269-281.

Full Text: [2008\Cie Sau Col13, 269.pdf](2008/Cie%20Sau%20Col13,%20269.pdf)

Abstract: 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. 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. Pharmaceuticals, pesticides, air pollutants, industrial chemicals, heavy metals, hormones, nutrition, and behavior can change gene expression through a broad array of gene regulatory mechanisms. 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. The reviewed studies indicate that genetic predisposition for disease is best predicted in the context of environmental exposures. And 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, Airway Epithelial-Cells, Alpha-Synuclein, Alzheimer, Assessment, Cancer, Chemicals, Costs, Diabetes, Diesel Exhaust Particles, Disease, DNA Methylation, Drug Resistance, Endocrine Disruption, Environment, Environmental, Environmental Health, Environmental Health Research, Etiology, Gene Expression, Gene Regulation, Genetic, Health, Heavy Metals, Human, IGF-II Genes, Induced, Lead, Medical, Nutrition, Obesity, Parkinsons-Disease, Pollutants, Primordial Germ-Cells, Prostate-Cancer, Publications, Research, Risk, Risk Assessment, Science, Smooth-Muscle-Cells, Web of Science

? Engel-Cox, J., Van Houten, B., Phelps, J. and Rose, S. (2009), Conceptual model of comprehensive research metrics for improved human health and environment. *Ciência & Saúde Coletiva*, **14** (2), 519-531.

Full Text: [2009\Cie Sau Col14, 519.pdf](2009/Cie%20Sau%20Col14,%20519.pdf)

Abstract: Performance measurement predominantly consisted of near-term outputs measured through bibliometrics, but the recent focus is on accountability for investment based on long-term outcomes. Our objective 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. 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, focusing on the environmental health research portfolio of the National Institute of Environmental Health Sciences (NIEHS) Division of Extramural Research and Training and delineates pathways for contributions by five types of institutional partners in the research process. 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: Accountability, And Sustainability, Bibliometrics, Children, Community, Conceptual Model Development, Contribution, Developed, Economics, Economy, Environment, Environmental, Environmental Health, Environmental Health Research, Environmental Quality, Epidemiologic Evidence, Evaluation, Health, Health Research, Human, Human Health, Institutional, Investment, Lead, Life, Logic, Long Term, Long-Term, Long-Term Outcomes, Measure, Measurement, Metrics, Metrics Development, Model, Mortality, Objective, Outcome, Outcomes, Particulate Air-Pollution, Pathways, Performance, Performance Measurement, Portfolio, Process, Quality, Quality of, Quality of Life, Research, Research Impact Evaluation, Social, Social Welfare, Sustainability, Welfare

? Karn, B., Kuiken, T. and Otto, M. (2011), Nanotechnology and *in situ* remediation: A review of the benefits and potential risks. *Ciência & Saúde Coletiva*, **16** (1), 165-178.

Full Text: [2011\Cie Sau Col16, 165.pdf](2011/Cie%20Sau%20Col16,%20165.pdf)

Abstract: 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 also discuss nanoscale zero-valent iron in detail. 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. 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. 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.

Keywords: C-60, Costs, Ecotoxicology, Engineered Nanoparticles, Environment, Environmental, Environmental Implications, Environmental Technology, Field, Hazardous Wastes, Information, Iron, Nanoremediation, Nanoscale Iron Particles, Nanotechnology, Overview, Pollutants, Practice, Remediation, Research, Review, Safety, Science, Suspensions, Toxicity, Transport, Treatment, Waste Sites, Water, Web of Science, Zero-Valent Iron, Zero-Valent Iron, Zerovalent Iron

? Costa, E.A.M. and Costa, E.A. (2011), The reprocessing of medical products: From regulatory polices to operational practices. *Ciência & Saúde Coletiva*, **16** (12), 4787-4794.

Full Text: [2011\Cie Sau Col16, 4787.pdf](2011/Cie%20Sau%20Col16,%204787.pdf)

Abstract: The number of technological resources used in health care interventions is growing and continually expanding with the introduction of new products and articles. Problems associated with the reutilization of medical products, both reusable and of single use, affect policies and related technical-operational, economic, political, ethical, legal, and environmental matters. This study aims to contextualize the regulatory systems of medical products, and analyze the subsequent operational implications for Brazilian hospital practices. The article consists of a bibliographic review, carried out without time and language restriction, utilizing the Web of Science, Bireme, Scielo and Lilacs databases, with the support of specific descriptors. This study uses the contextualization of regulatory plans for medical products across the world and in Brazil and the existing condition of standardization of the reprocessing of these products as the assessment sources with which to analyze the operational implications for these practices in Brazilian hospitals.

Keywords: Assessment, Bibliographic, Brazil, Care, Databases, Devices, Environmental, FDA Regulation, Health Care, Hospital, Hospitals, Interventions, Medical, Medical Devices, Operational Pratices, Policies, Questions, Regulation, Reprocessing, Review, Sanitary Surveillance, Science, Web of Science

# Title: CIN-Computers Informatics Nursing

Full Journal Title: [CIN-Computers Informatics Nursing](http://ovidsp.uk.ovid.com/spa/ovidweb.cgi?&S=IELLPDFDAEHFDOLHFNFLPBGHKEEKAA00&TOC=S.sh.15.17%7c5%7c60&WebLinkReturn=Full+Text%3dL%7cS.sh.15.16%7c0%7c00024665-200903000-00005)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Anderson, C.A., Keenan, G. and Jones, J. (2009), Using bibliometrics to support your selection of a nursing terminology set. *CIN-Computers Informatics Nursing*, **27** (2), 82-90.

Full Text: [2009\CIN-Com Inf Nur27, 82.pdf](2009/CIN-Com%20Inf%20Nur27,%2082.pdf)

Abstract: Nurses are being pressured to integrate standardized nursing terminology into the electronic health record to enable the representation and evaluation of nursing practice. Five terminology sets are recognized by the American Nurses Association that contain terms to represent nursing diagnoses, outcomes, and intervention: CCC, ICNP, NANDA/NOC/NIC, Omaha System, and PNDS. Key criteria for choosing the most suitable include demonstrated use and testing under real-time clinical conditions, scope of terms, cost, and the administrative infrastructure to sustain and evolve the terminology. Likelihood of survival is also critical and was evaluated here by examining the diffusion pattern of each terminology set through bibliometric analysis. Each of the five sets had a unique diffusion pattern, with NANDA/NOC/NIC demonstrating the most extensive penetration and author network in the CINAHL literature examined from 1982 to 2006.

Keywords: American, Analysis, Author, Bibliometric, Bibliometric Analysis, Bibliometrics, Citations, Clinical, Cost, Criteria, Diffusion, Diffusion of Innovations, Epistemic Origins, Evaluation, Health, Impact Factor, Infrastructure, Intervention, Literature, Mapping Knowledge Domains, Network, Networks, Nursing, Outcomes, Pattern, Penetration, PNAS, Practice, Real Time, Record, Representation, Scope, Standardized Terminology, Survival, Terminology, Testing, US

# Title: CIM Bulletin

(CIM Bulletin), (Can. Mining Met. Bul.; Can. Min. Met.; Can. Min. Metall. Bull.; Can. Min. and Metallurg. Bull.; Can. Min. and Met. Bul.; CMMBA)

Full Journal Title: CIM Bulletin (Canadian Mining and Metallurgical Bulletin)

ISO Abbreviated Title: CIM Bull.

JCR Abbreviated Title: CIM Bull

ISSN: 0317-0926

Issues/Year: 12

Journal Country/Territory: Canada

Language: English

Publisher: Canadian Inst Mining Metallurgy Petroleum

Publisher Address: 101 6th Ave SW, Ste 320, Calgary, Alberta Tzp 3P4, Canada

Subject Categories:

Metallurgy & Metallurgical Engineering: Impact Factor 0.070, / (2000)

Mining & Mineral Processing: Impact Factor 0.070, / (2000)

Wolfe, W.J. (1971), Biogeochemical prospecting in glaciated terrain of the Canadian precambrian shield. *CIM Bulletin*, **64**, 72-80.

Tinh, V.Q., Leblanc, R., Janssens, J.M. and Ruel, M. (1971), Peat moss: A natural adsorbing agent for the treatment of polluted water. *CIM Bulletin*, **64**, 99-104.

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Abstract: A systematic survey of the appropriate literature in terms of phase equilibria and possible reactions involving deposits in Municipal Solid Waste (MSW) incinerators are analyzed particularly with respect to the theoretical first melting points of typical ashes and the possible presence of a liquid phase at the temperature of ash-metal interface. Conclusions are drawn on the basis of the possible presence or absence of various metal chlorides and sulphates in such situations, and their effects on the problems of fouling and metal corrosion. From preliminary results, it would appear that ZnCl2 is unlikely to be present in any molten phase which causes corrosion because it evaporates rapidly from such liquids. It would also appear that PbCl2 and, by inference, ZnCl2, will sulphate at relatively low temperatures if the flue gas contains SO2 and O2.

Keywords: Metallurgy, Corrosion

# Title: Circulation

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Cardiac & Cardiovascular Systems Hematology Peripheral Vascular Disease: Impact Factor

? Mitchell, S.C., Korones, S.B. and Berendes, H.W. (1971), Congenital heart disease in 56,109 births incidence and natural history. *Circulation*, **43** (3), 323-332.

Full Text: [1960-80\Circulation43, 323.pdf](1960-80/Circulation43,%20323.pdf)

? Kelly, R.P., Ting, C.T., Yang, T.M., Liu, C.P., Maughan, W.L., Chang, M.S. and Kass, D.A. (1992), Effective arterial elastance as index of arterial vascular load in humans. *Circulation*, **86** (2), 513-521.

Full Text: [1992\Circulation86, 513.pdf](1992/Circulation86,%20513.pdf)

Abstract: Background. This study tested whether the simple ratio of ventricular end-systolic pressure to stroke volume, known as the effective arterial elastance (E(a)), provides a valid measure of arterial load in humans with normal and aged hypertensive vasculatures.

Methods and Results. Ventricular pressure-volume and invasive aortic pressure and flow were simultaneously determined in 10 subjects (four young normotensive and six older hypertensive). Measurements were obtained at rest, during mechanically reduced preload, and after pharmacological interventions. Two measures of arterial load were compared: One was derived from aortic input impedance and arterial compliance data using an algebraic expression based on a three-element Windkessel model of the arterial system [E(a)(Z)], and the other was more simply measured as the ratio of ventricular end-systolic pressure to stroke volume [E(a)(PV)]. Although derived from completely different data sources and despite the simplifying assumptions of E(a)(PV), both E(a)(Z) and E(a)(PV) were virtually identical over a broad range of altered conditions: E(a)(PV) = 0.97 . E(a)(Z) +0.17; n=33, r2=0.98, SEE=0.09, p<0.0001. Whereas E(a)(PV) also correlated with mean arterial resistance, it exceeded resistance by as much as 25% in older hypertensive subjects (because of reduced compliance and wave reflections), which better indexed the arterial load effects on the ventricle. Simple methods to estimate E(a) (PV) from routine arterial pressures were tested and validated.

Conclusions. E(a)(PV) provides a convenient, useful method to assess arterial load and its impact on the human ventricle. These results highlight effects of increased pulsatile load caused by aging or hypertension on the pressure-volume loop and indicate that this load and its effects on cardiac performance are often underestimated by mean arterial resistance but are better accounted for by E(a).

Keywords:,Hypertension, Ventricle, Afterload, Pressure Volume Relations, Aortic Input Impedance, Pressure-Volume Relationships, Isolated Systolic Hypertension, Ventricular Load, Heart-Failure, Contractility, Catheter, Therapy, Urban

? Kloner, R.A., Leor, J., Chen, H., Giangreco, C.A., Poole, W.K. and Perritt, R.L. (1996), A population based analysis of the effect of the Northridge earthquake on cardiac events among 19,617 deaths in Los Angeles County, California. *Circulation*, **94** (8 SS), 4156.

Full Text: Circulation94, 4156.pdf

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Full Text: [1998\Circulation97, 1186.pdf](1998/Circulation97,%201186.pdf)

Abstract: Background - Acupuncture is reported to reduce myocardial ischemia, arrhythmias, and hypertension, To investigate the physiological mechanisms underlying these observations, a model of reflex-induced, reversible myocardial ischemia was developed to test the effects of median nerve stimulation as a surrogate for electroacupuncture.

Methods and Results - Chloralose-anesthetized cats were instrumented to measure arterial blood pressure, left ventricular pressure, left ventricular dP/dt, heart rate, left anterior descending (LAD) coronary blood velocity, and regional wall motion, The LAD artery either was partially occluded or a small diagonal branch was ligated. Subsequently, transient reflex activation of the cardiovascular system was evoked by application of bradykinin (typically 1 mu g/mL) to the gallbladder, which significantly increased myocardial oxygen demand (double product), left ventricular dP/dt, and coronary blood velocity and caused ischemia-induced regional dysfunction, evidenced by significant (P < .05) reduction in normalized wall thickening (10.7 +/- 4.2% versus -23.6 +/- 2.9%; control versus ischemia; n = 7). However, when median nerves were stimulated with low frequency (5 Hz) to mimic electroacupuncture, bradykinin-induced change in normalized wall thickening was significantly improved (-23.6 +/- 2.9% versus 9.8 +/- 4.9%; ischemia versus median nerve stimulation, P < .05) and remained augmented greater than or equal to 1 hour. Results were similar in partial and complete occlusion groups, Significant improvement in wall thickening was associated with unchanged increment of coronary blood velocity and significantly diminished increments of double product and diastolic blood pressure.

Conclusions - These results suggest that stimulation of the median nerve to mimic electroacupuncture diminishes regional myocardial ischemia triggered by a sympathetically mediated increase in cardiac oxygen demand. The mechanism of this effect Is related to reduction In cardiac oxygen demand, secondary to a diminished pressor response. These data provide the first documentation of the physiological mechanisms underlying the possible beneficial effect of electroacupuncture in the context of restricted coronary blood flow and augmented myocardial oxygen demand.

Keywords: Bradykinin, Ischemia, Coronary Heart Disease, Angina, Ultrasonics, Hypertensive Rats, Angina-Pectoris, Coronary, Acupuncture, Circulation, Depression, Bradykinin, Exercise, Humans, Stress

? Sorensen, K.E., Dorup, I., Hermann, A.P. and Mosekilde, L. (1998), Combined hormone replacement therapy does not protect women against the age-related decline in endothelium-dependent vasomotor function. *Circulation*, **97** (13), 1234-1238.

Full Text: [1998\Circulation97, 1234.pdf](1998/Circulation97,%201234.pdf)

Abstract: Background-Improvement in endothelial function may be an important mechanism by which estrogen replacement therapy protects postmenopausal women against coronary artery disease. However, combined hormone replacement therapy is more frequently used owing to the risk of uterine cancer with estrogen-only therapy. Concurrent progesterone treatment may attenuate the beneficial effects of estrogens not only on the lipid profile but also on the endothelium.

Methods and Results-We studied endothelial vasomotor function in 100 healthy postmenopausal women aged 53.3±2.9 years randomized to either combined hormone replacement therapy (n=46) or no substitution (n=54) 2.9±0.5 years earlier. In addition, 30 healthy premenopausal women aged 30.3±4.2 years were studied. With external ultrasound, brachial artery diameter was measured at rest, during reactive hyperemia (with increased flow causing endothelium-dependent dilation), and after sublingual nitroglycerin (causing endothelium-independent dilation). Compared with premenopausal women, flow-mediated dilation was significantly reduced in both postmenopausal groups. In the postmenopausal women, total cholesterol was lower in the treated women (5.66±0.83 versus 6.13±0.92 mmol/L; P=.025), whereas HDL cholesterol was similar (1.91±0.53 versus 1.85±0.46 mmol/L; P=NS). Dilation to flow and to nitroglycerin was similar in the two postmenopausal groups (flow: 2.5±2.9% versus 2.2±2.2%, P=NS; nitrate: 18.7±5.9% versus 17.2±6.2%, P=NS).

Conclusion-Long-term combined oral hormone replacement therapy is without beneficial effects on endothelial vasomotor function in healthy postmenopausal women. This supports the view that progesterone may attenuate the beneficial effects of unopposed estrogen replacement.

Keywords: Women Hormones, Endothelium, Ultrasonics, Cholesterol, Atherosclerotic Coronary-Arteries, Ischemic-Heart-Disease, Postmenopausal Women, Estrogen Replacement, Cardiovascular-Disease, Cigarette-Smoking, Cynomolgus Monkeys, Nitric-Oxide, Responses, Risk

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Full Text: [1999\Circulation99, 2055.pdf](1999/Circulation99,%202055.pdf)

Abstract: Background-Over the past decade, calcium channel blockers (CCBs) and ACE inhibitors have been used increasingly in the treatment of hypertension. In contrast, beta-blocker and diuretic use has decreased. It has been suggested that pharmaceutical marketing has influenced these prescribing patterns. No objective analysis of advertising for antihypertensive therapies exists, however. Methods and Results-We reviewed the January, April, July, and October issues of the New England Journal of Medicine from 1985 to 1996 (210 issues). The intensity of drug promotion was measured as the proportion of advertising pages used to promote a given medication. Statistical analyses used the chi(2) test for trend. Advertising for CCBs increased from 4.6% of advertising pages in 1985 to 26.9% in 1996, while advertising for beta-blockers (12.4% in 1985 to 0% in 1996) and diuretics (4.2% to 0%) decreased (all P<0.0001). A nonsignificant increase was observed in advertising for ACE inhibitors (3.5% to 4.3%, P=0.17). Although the total number of drug advertising pages per issue decreased from 60 pages in 1985 to 42 pages in 1996 (P<0.001), the number of pages devoted to calcium channel blocker advertisements nearly quadrupled. Conclusions-Increasing promotion of CCBs has mirrored trends in physician prescribing. An association between advertising and prescribing patterns could explain why CCBs have supplanted better-substantiated therapies for hypertension.

Keywords: Advertising, Analyses, Analysis, Association, Calcium, Drug, England, Hypertension, Marketing, Physician, Prescribing, Promotion, Treatment, Trend, Trends

Notes: highly cited

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Full Text: [2003\Circulation107, 38.pdf](2003/Circulation107,%2038.pdf)

Abstract: Background-The TAXUS NIRx stent (Boston Scientific Corp) provides local delivery of paclitaxel via a slow-release polymer coating. The TAXUS I trial was the first in-human experience evaluating safety, and feasibility of the TAXUS NIRx stent system compared with bare NIR stents (control) (Boston Scientific Corp) for treatment of coronary lesions.

Methods and Results-The TAXUS I trial was a prospective, double-blind, three-center study randomizing 61 patients with de novo or restenotic lesions (less than or equal to12 mm) to receive a TAXUS (n=31) versus control (n=30) stent (diameter 3.0 or 3.5 mm). Demographics, lesion characteristics, clinical outcomes were comparable between the group. The 30-day major adverse cardiac event (MACE) rate was 0% in both groups (P=NS). No stent thromboses were reported at 1, 6, 9, or 12 months. At 12 months, the MACE rate was 3% (1 event) in the TAXUS group and 10%- (4 events in 3 patients) in the control group (P=NS). Six-month angiographic restenosis rates were 0% for TAXUS versus 10% for control (P=NS) patients. There were significant improvements in minimal lumen diameter (2.60+/-0.49 versus 2.19+/-0.65 mm), diameter stenosis (13.56+/-11.77 versus 27.23+/-16.69), and late lumen loss (0.36+/-0.48 versus 0.71+/-0.48 mm) in the TAXUS group (all P<0.01). No evidence of edge restenosis was seen in either group. Intravascular ultrasound analysis showed significant improvements in normalized neointimal hyperplasia in the TAXUS (14.8 mm(3)) group compared with the control group (21.6 mm(3)) (P<0.05).

Conclusions-In this feasibility trial, the TAXUS slow-release stent was well tolerated and showed promise for treatment of coronary lesions, with significant reductions in angiographic and intravascular ultrasound measures of restenosis.

Keywords: Stents, Drugs, Restenosis, Coronary Disease, Revascularization, In-Vivo, Delivery, Proliferation, Implantation, Inhibition, Arrest

? Conen, D., Torres, J. and Ridker, P.M. (2008), Differential citation rates of major cardiovascular clinical trials according to source of funding: A survey from 2000 to 2005. *Circulation*, **118** (13), 1321-1327.

Full Text: [2008\Circulation118, 1321.pdf](2008/Circulation118,%201321.pdf)

Abstract: Background - Prior work indicates that therapeutic trials funded by for-profit organizations are more likely to report positive findings than trials funded by not-for-profit organizations. What impact, if any, funding source has on subsequent dissemination of trial data is uncertain. To address this issue, we used the number of citations per publication per year to assess differences in trial dissemination according to funding source. Methods and Results - We assessed 303 consecutive superiority trials of cardiovascular medicine published between January 1, 2000, and July 30, 2005, in the Journal of the American Medical Association, The Lancet, and the New England Journal of Medicine. The primary outcome measure was the number of citations per publication per year up to December 31, 2006. Overall, the median number of citations per publication per year was 46 for trials funded exclusively by for-profit organizations, 37 for trials jointly funded, and 29 for trials funded by not-for-profit organizations (P = 0.0007). Higher citation rates for trials funded by for-profit organizations were consistently observed in analyses stratified by journal and various trial design features and were most striking when the new intervention was favored over the standard of care; in this subgroup, the median number of citations per publication per year was 52 for trials funded by for-profit organizations compared with 25 for trials funded by not-for-profit organizations (P = 0.0006). In marked contrast, in analyses limited to trials in which the new intervention was significantly worse than the standard of care, an inverse pattern was observed with fewer citations per publication per year for trials funded by for-profit organizations compared with not-for-profit organizations (33 versus 41; P = 0.048). Higher citation rates were observed for industry-funded trials than for federally funded trials even when the trials dealt with similar issues and were published back-to-back in the same journal. Conclusions - Dissemination of clinical trial results is important for clinical practice but appears to be biased in favor of for-profit entities. Consideration should be given to more extensive promotion of clinical trial results that are funded by not-for-profit organizations.

Keywords: Access, Articles, Bibliometrics, Cardiovascular Diseases, Chronic Heart-Failure, Citation, Citations, Clinical Trials, Financial Support, Impact, Journals, Organizations,Nonprofit, Publication, Radiation Therapy, Randomized Controlled Trials as Topic, Registration, Restenosis

? Young, G., Albisetti, M., Bonduel, M., Brandao, L., Chan, A., Friedrichs, F., Goldenberg, N.A., Grabowski, E., Heller, C., Journeycake, J., Kenet, G., Krumpel, A., Kurnik, K., Lubetsky, A., Male, C., Manco-Johnson, M., Mathew, P., Monagle, P., van Ommen, H., Simioni, P., Svirin, P., Tormene, D. and Nowak-Gottl, U. (2008), Impact of inherited thrombophilia on venous thromboembolism in children: A systematic review and meta-analysis of observational studies. *Circulation*, **118** (13), 1373-1382.

Full Text: [2008\Circulation118, 1373.pdf](2008/Circulation118,%201373.pdf)

Abstract: Background - The aim of the present study was to estimate the impact of inherited thrombophilia (IT) on the risk of venous thromboembolism (VTE) onset and recurrence in children by a meta-analysis of published observational studies. Methods and Results - A systematic search of electronic databases (MEDLINE, EMBASE, OVID, Web of Science, The Cochrane Library) for studies published from 1970 to 2007 was conducted using key words in combination as both MeSH terms and text words. Citations were independently screened by 2 authors, and those meeting the inclusion criteria defined a priori were retained. Data on year of publication, study design, country of origin, number of patients/controls, ethnicity, VTE type, and frequency of recurrence were abstracted. Heterogeneity across studies was evaluated, and summary odds ratios and 95% CIs were calculated with both fixed-effects and random-effects models. Thirty-five of 50 studies met inclusion criteria. No significant heterogeneity was discerned across studies. Although > 70% of patients had at least 1 clinical risk factor for VTE, a statistically significant association with VTE onset was demonstrated for each IT trait evaluated (and for combined IT traits), with summary odds ratios ranging from 2.63 (95% CI, 1.61 to 4.29) for the factor II variant to 9.44 (95% CI, 3.34 to 26.66) for antithrombin deficiency. Furthermore, a significant association with recurrent VTE was found for all IT traits except the factor V variant and elevated lipoprotein(a). Conclusions - The present meta-analysis indicates that detection of IT is clinically meaningful in children with, or at risk for, VTE and underscores the importance of pediatric thrombophilia screening programs.

Keywords: Activated Protein-C, Acute Lymphoblastic-Leukemia, Arterial Ischemic-Stroke, Authors, Cerebral Sinovenous Thrombosis, Children, Citations, Cochrane, Databases, EMBASE, Ethnicity, Factor-V-Leiden, Frequency, G-A Mutation, Gene G20210a Mutation, Impact, Meta-Analysis, Methods, Observational Studies, Pediatric, Pediatrics, Portal-Vein Thrombosis, Prothrombotic Risk-Factors, Publication, Recurrence, Review, Risk, Science, Screening, Single-Center, Systematic, Systematic Review, Thrombophilia, Thrombosis, Web of Science

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Full Text: [2009\Circulation119, F55.pdf](2009/Circulation119,%20F55.pdf)

Keywords: Atrial-Fibrillation, Gtpase

? Kenet, G., Lutkhoff, L.K., Albisetti, M., Bernard, T., Bonduel, M., Brandao, L., Chabrier, S., Chan, A., deVeber, G., Fiedler, B., Fullerton, H.J., Goldenberg, N.A., Grabowski, E., Gunther, G., Heller, C., Holzhauer, S., Iorio, A., Journeycake, J., Junker, R., Kirkham, F.J., Kurnik, K., Lynch, J.K., Male, C., Manco-Johnson, M., Mesters, R., Monagle, P., van Ommen, C.H., Raffini, L., Rostasy, K., Simioni, P., Strater, R.D., Young, G. and Nowak-Gottl, U. (2010), Impact of thrombophilia on risk of arterial ischemic stroke or cerebral sinovenous thrombosis in neonates and children a systematic review and meta-analysis of observational studies. *Circulation*, **121** (16), 1838-U92.

Full Text: [2010\Circulation121, 1838.pdf](2010/Circulation121,%201838.pdf)

Abstract: Background-The aim of this study was to estimate the impact of thrombophilia on risk of first childhood stroke through a meta-analysis of published observational studies. Methods and Results-A systematic search of electronic databases (MEDLINE via PUBMED, EMBASE, OVID, Web of Science, The Cochrane Library) for studies published from 1970 to 2009 was conducted. Data on year of publication, study design, country of origin, number of patients/control subjects, ethnicity, stroke type (arterial ischemic stroke [AIS], cerebral venous sinus thrombosis [CSVT]) were abstracted. Publication bias indicator and heterogeneity across studies were evaluated, and summary odds ratios (ORs) and 95% confidence intervals (CIs) were calculated with fixed-effects or random-effects models. Twenty-two of 185 references met inclusion criteria. Thus, 1764 patients (arterial ischemic stroke [AIS], 1526; cerebral sinus venous thrombosis [CSVT], 238) and 2799 control subjects (neonate to 18 years of age) were enrolled. No significant heterogeneity was discerned across studies, and no publication bias was detected. A statistically significant association with first stroke was demonstrated for each thrombophilia trait evaluated, with no difference found between AIS and CSVT. Summary ORs (fixed-effects model) were as follows: antithrombin deficiency, 7.06 (95% CI, 2.44 to 22.42); protein C deficiency, 8.76 (95% CI, 4.53 to 16.96); protein S deficiency, 3.20 (95% CI, 1.22 to 8.40), factor V G1691A, 3.26 (95% CI, 2.59 to 4.10); factor II G20210A, 2.43 (95% CI, 1.67 to 3.51); MTHFR C677T (AIS), 1.58 (95% CI, 1.20 to 2.08); antiphospholipid antibodies (AIS), 6.95 (95% CI, 3.67 to 13.14); elevated lipoprotein(a), 6.27 (95% CI, 4.52 to 8.69), and combined thrombophilias, 11.86 (95% CI, 5.93 to 23.73). In the 6 exclusively perinatal AIS studies, summary ORs were as follows: factor V, 3.56 (95% CI, 2.29 to 5.53); and factor II, 2.02 (95% CI, 1.02 to 3.99). Conclusions-The present meta-analysis indicates that thrombophilias serve as risk factors for incident stroke. However, the impact of thrombophilias on outcome and recurrence risk needs to be further investigated. (Circulation. 2010; 121: 1838-1847).

Keywords: Antiphospholipid Antibodies, Bias, Cerebrovascular Disorders, Childhood Stroke, Cochrane, Confidence Intervals, Control, Databases, EMBASE, Ethnicity, Factor-V-Leiden, Gene G20210a Mutation, Homocysteine Metabolism, Impact, Meta-Analysis, Methods, Methylenetetrahydrofolate Reductase, Model, Mthfr, Observational Studies, Outcome, Pediatric Stroke, Pediatrics, Perinatal, Protein-C, Prothrombin 20210 G, Publication, Publication Bias, PUBMED, Recurrence, Review, Risk, Risk Factors, Science, Stroke, Systematic, Systematic Review, Thrombophilia, Thrombosis, Venous Sinus Thrombosis, Venous Thrombosis, Web of Science

# Title: Circulation-Cardiovascular Quality and Outcomes

Full Journal Title:

ISO Abbreviated Title:

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ISSN:

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Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

? Sasson, C., Rogers, M.A.M., Dahl, J. and Kellermann, A.L. (2010), Predictors of survival from out-of-hospital cardiac arrest a systematic review and meta-analysis. *Circulation-Cardiovascular Quality and Outcomes*, **3** (1), 63-U111.

Abstract: Background-Prior studies have identified key predictors of out-of-hospital cardiac arrest (OHCA), but differences exist in the magnitude of these findings. In this meta-analysis, we evaluated the strength of associations between OHCA and key factors (event witnessed by a bystander or emergency medical services [EMS], provision of bystander cardiopulmonary resuscitation [CPR], initial cardiac rhythm, or the return of spontaneous circulation). We also examined trends in OHCA survival over time. Methods and Results-An electronic search of PUBMED, EMBASE, Web of Science, CINAHL, Cochrane DSR, DARE, ACP Journal Club, and CCTR was conducted (January 1, 1950 to August 21, 2008) for studies reporting OHCA of presumed cardiac etiology in adults. Data were extracted from 79 studies involving 142 740 patients. The pooled survival rate to hospital admission was 23.8% (95% CI, 21.1 to 26.6) and to hospital discharge was 7.6% (95% CI, 6.7 to 8.4). Stratified by baseline rates, survival to hospital discharge was more likely among those: witnessed by a bystander (6.4% to 13.5%), witnessed by EMS (4.9% to 18.2%), who received bystander CPR (3.9% to 16.1%), were found in ventricular fibrillation/ventricular tachycardia (14.8% to 23.0%), or achieved return of spontaneous circulation (15.5% to 33.6%). Although 53% (95% CI, 45.0% to 59.9%) of events were witnessed by a bystander, only 32% (95% CI, 26.7% to 37.8%) received bystander CPR. The number needed to treat to save 1 life ranged from 16 to 23 for EMS-witnessed arrests, 17 to 71 for bystander-witnessed, and 24 to 36 for those receiving bystander CPR, depending on baseline survival rates. The aggregate survival rate of OHCA (7.6%) has not significantly changed in almost 3 decades. Conclusions-Overall survival from OHCA has been stable for almost 30 years, as have the strong associations between key predictors and survival. Because most OHCA events are witnessed, efforts to improve survival should focus on prompt delivery of interventions of known effectiveness by those who witness the event. (Circ Cardiovasc Qual Outcomes. 2010; 3: 63-81.).

Keywords: Adults, Advanced Life-Support, American-Heart-Association, Automated External Defibrillators, Cardiac Arrest, Cardiopulmonary-Resuscitation, Cochrane, Death, Sudden, Effectiveness, EMBASE, Emergency Medical Services, Emergency Medical-Services, EMS, Etiology, European-Resuscitation-Council, Health-Care Professionals, Heart Arrest, Hospital, Hospital Admission, International Liaison Committee, Interventions, Journal, Medical, Meta-Analysis, Methods, Outcomes, PUBMED, Review, Rhythm, Science, Survival, Systematic, Systematic Review, Trends, Utstein Style, Ventricular-Fibrillation, Web of Science

# Title: Circulation Research

Full Journal Title: [Circulation Research](http://circres.ahajournals.org/)

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Subject Categories:

: Impact Factor

Marbán, E., Bolli, R., Breitwieser, G., Busse, R., Dietz, H., Endoh, M., Finkel, T., Kass, D., Lowenstein, C., Rabinovitch, M. and Tomaselli, G. (2000), Circulation research editors’ yearly report: 1999–2000. *Circulation Research*, **87** (4), 261-263.

Full Text: [C\Cir Res87, 261.pdf](C/Cir%20Res87,%20261.pdf)

Marbán, E., Bolli, R., Breitwieser, G., Busse, R., Dietz, H., Endoh, M., Finkel, T., Kass, D., Lowenstein, C., Rabinovitch, M. and Tomaselli, G. (2002), Circulation research editors’ yearly report: 2001. *Circulation Research*, **90** (2), 115-117.

Full Text: [C\Cir Res90, 115.pdf](C/Cir%20Res90,%20115.pdf)

Marbán, E., Bolli, R., Breitwieser, G., Busse, R., Dietz, H., Endoh, M., Finkel, T., Kass, D., Lowenstein, C., Rabinovitch, M., Tomaselli, G. and Keehan, K.H. (2003), *Circulation Research* Editors’ Yearly Report: 2002. *Circulation Research*, **92** (2), 121-123.

Full Text: [C\Cir Res92, 121.pdf](C/Cir%20Res92,%20121.pdf)

Vatner, S.F. (2003), A three-decade dialectic with Circulation Research. *Circulation Research*, **92** (9), 939-940.

Full Text: [C\Cir Res92, 939.pdf](C/Cir%20Res92,%20939.pdf)

Keywords: Scientific Publishing, Cardiovascular Research, Impact Factor, Molecular Biology, Vascular Biology

# Title: Cirugía Española

Full Journal Title: Cirugia Espanola

ISO Abbreviated Title:

JCR Abbreviated Title: Cir Esp

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Manterola, C., Busquets, J., Pascual, M. and Grande, L. (2006), What is the methodological quality of articles on therapeutic procedures published in *Cirugía Española*? *Cirugía Española*, **79** (2), 95-100.

Abstract: INTRODUCTION: The aim of this study was to determine the methodological quality of articles on therapeutic procedures published in Cirugia Espanola and to study its association with the publication year, center, and subject-matter. MATERIAL AND METHOD: A bibliometric study that included all articles on therapeutic procedures published in Cirugia Espanola between 2001 and 2004 was performed. All kinds of clinical designs were considered, excluding editorials, review articles, letters to editor, and experimental studies. The variables analyzed were: year of publication, center, design, and methodological quality. Methodological quality was determined by a valid and reliable scale. Descriptive statistics (calculation of means, standard deviation and medians) and analytical statistics (Pearson’s chi2, nonparametric, ANOVA and Bonferroni tests) were used. RESULTS: A total of 244 articles were studied (197 case series [81%], 28 cohort studies [12%], 17 clinical trials [7%], 1 cross sectional study and 1 case-control study [0.8%]). The studies were performed mainly in Catalonia and Murcia (22% and 16%, respectively). The most frequent subject areas were soft tissue and hepatobiliopancreatic surgery (23% and 19%, respectively). The mean and median of the methodological quality score calculated for the entire series was 10.2±3.9 points and 9.5 points, respectively. Methodological quality significantly increased by publication year (p < 0.001). An association between methodological quality and subject area was observed but no association was detected with the center performing the study. CONCLUSIONS: The methodological quality of articles on therapeutic procedures published in Cirugia Espanola between 2001 and 2004 is low. However, a statistically significant trend toward improvement was observed.

Keywords: Anova, Association, Bibliometric, Bibliometric Study, Calculation, Case-Control, Case-Control Study, Clinical, Clinical Trials, Cohort, Design, Experimental, Improvement, Procedures, Publication, Quality, Quality of, Review, Scale, Standard, Statistics, Surgery, Therapeutic, Trend

? Gisbert, J.P. and Panes, J. (2009), The Hirsch’s h-index: A new tool for measuring scientific production. *Cirugía Española*, **86** (4), 193-195

Keywords: Bibliometric Indicators, h Index, h-Index, Scientific Production

# Title: Cirugia Pediatr

Full Journal Title: Cirugia Pediatr

ISO Abbreviated Title:

JCR Abbreviated Title: Cir Pediatr

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

? Gonzalez de Dios, J. and Martinez Lorente, A. (1998), Model of bibliometric analysis of publications on pediatric surgery: 1984-1996. *Cirugia* *Pediatr*, **11** (4), 139-146

Abstract: BACKGROUND: There is no detailed information on the scientific production in Pediatric Surgery (PS) in Spain, and we studied this problem by means of a model of bibliometric analysis. MATERIALS AND METHODS: Retrospective study of all the articles published in the main pediatric Spanish journal (Anales Espanoles de Pediadria) over a 13-year period (1984-1996). Quantitative and qualitative bibliometric indicators of the articles over PS were performed, and we studied also the main differences found between the period before (1984-87) and after (1988-96) the foundation of the journal Cirugia Pediatrica. RESULTS: PS is the subject matter in 7.6% (n = 227) of all the articles published in this pediatric journal. The main type of articles in PS were Clinical Notes (56.9%) and Originals (31.7%). The autonomous regions of Madrid, Cataluna, Valencia, Andalucia and Pais Vasco have the 70.4% of the total productivity in PS, and we also emphasize the relative productivity of others autonomous regions (mainly Extremadura). The essential authorship of the scientific activity in PS falls on hospitals, with no authorship on University and Health Care Centers. The two different bibliometric indicators in PS in relation to the other pediatric subspecialties are: the low statistical accessibility and the excessive use of English references, with a very low insularity index. After the foundation the journal Cirugia Pediaatrica, a reduction in the number of articles over PS (mainly Originals) published in Anales Espanoles de Pediatria is noted. CONCLUSIONS: PS have a significant quantitative importance in pediatric journals, with two negative differences in relation to the other pediatric subspecialties: low statistical accessibility and low insularity index. We think is important to increase the citation of Spanish publications and, specifically, articles at the journal Cirugia Pediatrica.

# Title: Cities

Full Journal Title: [Cities](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5909&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=78f20bf0e8051a2f2aa7040b7be7767d)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Naude, W.A. and Krugell, W.F. (2003), Are South Africa’s cities too small? *Cities*, **20** (3), 175-180.

Full Text: [C\Cities20, 175.pdf](C/Cities20,%20175.pdf)

Abstract: Are South African cities to small? Given the history of South Africa’s spatial development, one might expect that South African cities might be under-sized, and not over-sized as in many other developing countries. It is found that the rank-size distribution explains the sizes of South Africa’s cities but that Zipf’s Law does not hold for the country’s cities. The so-called q-coefficient was found to be equal to -0.75 for the 123 places with population in excess of 100 000. It was also found that urbanisation in South Africa over the past decade seems to have taken the form of the parallel (slow, 1.04%) growth of five large cities. Finally, calculating the “*H*-measure” for 19 metropolitan areas in South Africa yields an inverse *H*-measure of 11.3. This suggests a reasonable degree of dispersal, which would only be consistent with optimal city size if transport costs were low and manufacturing not in need of scale economies; two conditions unlikely to apply to South Africa. Finally, the primacy ratio for South Africa’s largest urban agglomeration was found to be 38%. This suggests that the size of the Johannesburg-East Rand urban agglomeration (the primate city) may be relatively too large, whereas more efficient growth may come from larger harbour cities.

Keywords: Spatial Development, Transportation, Scale Economies, Developing Nations

# Title: Civil Engineering and Environmental Systems

Full Journal Title: [Civil Engineering and Environmental Systems](http://taylorandfrancis.metapress.com/(plfoti45kri2qszajdjlqamn)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:101448,1;&absoluteposition=2#A2)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1028-6608

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Chevalier, L.R. (2006), Use of optimization to develop a correlation model for predicting residual NAPL saturation. *Civil Engineering and Environmental Systems*, **23** (2), 65-72.

Full Text: [2006\Civ Eng Env Sys23, 65.pdf](2006/Civ%20Eng%20Env%20Sys23,%2065.pdf)

Abstract: Predicting the residual saturation of a trapped non-aqueous phase liquid (NAPL) contaminant is critical to estimate the region of contamination, the design of remediation strategies, and risk assessment. Models were developed to predict residual NAPL saturation utilizing optimization and non-linear functions, consequently allowing for a broader mathematical approach to model development. The input parameters evaluated represent soil and fluid properties; the uniformity coefficient (C-u), the coefficient of gradation, the capillary number (Nc), the bond number (Nc), and the total trapping number (Nt). Overall, the model that performed the best was based on a second-order equation with the independent variables C-u and Nt(1) using the sum of the squares of the errors. The non-linear error function based on a derivative of Marquardt’s percent standard deviation performed the best for three other cases.

Keywords: Groundwater, Regression Analysis, Optimization, Napl, Multiphase Flow, Soil Contamination, Isotherm, Forces, Soils

# Title: Classical Review

Full Journal Title: Classical Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tyrrell, W.B. (2009), A meaning for (Sic) not cited in Lsj. *Classical Philology*, **104** (1), 82-84.

# Title: Classical Review

Full Journal Title: Classical Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ohrman, M. (2009), The game with own texts. Repetition and self citation during Ovid. *Classical Review*, **59** (1), 298-299

Keywords: ‘Epistulae-ex-Ponto’ 3.1, Citation, Self-Citation

# Title: Clay Minerals

Full Journal Title: [Clay Minerals](http://www.ingentaconnect.com/content/minsoc/cm;jsessionid=dm5r9fqntlnpg.victoria)

ISO Abbreviated Title: Clay Min.

JCR Abbreviated Title: Clay Miner

ISSN: 0009-8558

Issues/Year: 4

Journal Country/Territory: England

Language: Multi-Language

Publisher: Mineralogical Society

Publisher Address: 41 Queens Gate, London, England SW7 5HR

Subject Categories:

Mineralogy: Impact Factor

? Perez-Rodriguez, J.L., Madrid, L. and Sanchez-Soto, P.J. (1988), Effects of dry grinding on pyrophyllite. *Clay Minerals*, **23** (??), 399-410.

Full Text: Cla Min23, 399

? Breen, C. and Rock, B. (1994), The competitive adsorption of Methylene-blue on to montmorillonite from binary-solution with thioflavin-T, proflavine and acridine yellow - steady-state and dynamic studies. *Clay Minerals*, **29** (2), 179-189.

Full Text: Cla Min29, 179

Abstract: Methylene blue (MB) has been used as a probe molecule to examine how the uptake dynamics and the equilibria between this dye and the surface of Na+- and H+- montmorillonite were affected by the presence of a second dye. To prevent spectral interference, the yellow dyes thioflavin T, TFT, proflavine, PFH, and acridine yellow, ACY, were chosen to compete with MB for the exchange sites. The MB was initially adsorbed as trimer (MB+)3 and then redistributed via collisions between clay particles until equilibrium was reached. At equilibrium in the clay, MB systems, the protonated species (MBH2+) predominated at low loadings (1-5% CEC), whereas at higher loadings the trimer (MB+)3 was the major species. The presence of the second, competing dye slowed the approach to equilibrium, significantly reduced the amount of MBH2+ formed and provided evidence for the monomeric MB+, dimeric (MB+)2, and trimeric (MB+)3 forms of MB. Moreover, the presence of PFH and ACY, which are structurally similar to MB, resulted in more dimeric character in the aggregated form of MB compared to the aggregate formed in the presence of the structurally dissimilar TFT.

Keywords: Cation-Exchange, Clay, Clay-Minerals, Crystal Violet, Dye, Dyes, Laponite, Metachromasy, Montmorillonite, Particles, Sorption, Surface

? Breen, C. and Loughlin, H. (1994), The competitive adsorption of Methylene-Blue on to Na- montmorillonite from binary-solution with N- alkylytrimethylammonium surfactants. *Clay Minerals*, **29** (5), 775-783.

Full Text: Cla Min29, 775

Abstract: The affect of competing surfactant molecules, n- decyltrimethylammonium bromide (C10TAB) and n- hexadecyltrimethylammonium bromide (C16TAB), on the adsorption equilibrium between Methylene blue (MB) and Na+-montmorillonite has been studied using visible spectrophotometry. The MB competed effectively with both these surfactants and also tetramethylammonium ions, which were used as a model for the surfactant head group. At loadings up to 50% of the CEC of the clay, all of the MB was associated with the clay or clay, surfactant system. Evidence for the presence of monomer, MB+, dimer, (MB+)2, trimer, (MB+)3, and protonated monomer, MBH2+, was obtained in each case, with the trimeric form dominanting at loading >5% of the CEC. The spectra of adsorbe MB reflected the difference in chain length between C10TAB and C16TAB and indicated that a significant amount of monomeric, MB+, was solubilized in the C16TAB surfactant clusters on the clay surface. Pre-adsorbed MB was not displaced by added C16TAB surfactant.

Keywords: Adsorption, Bilayers, Chloride, Clay, Fluorescence, Laponite Clay Suspensions, Metachromasy, Methylene Blue, Minerals, Na-, Particles, Probe, Silica, Sorption, Spectrophotometry, Surfactants

? Garfinkel Shweky, D. and Yariv, S. (1997), Metachromasy in clay-dye systems: The adsorption of acridine orange by Na-saponite. *Clay Minerals*, **32** (4), 653-663.

Full Text: Cla Min32, 653

Abstract: The adsorption of the cationic dye acridine orange (AO) by Na-saponite and the colloidal properties of the aqueous suspension were investigated by visible spectroscopy and XRD. The organic cation is adsorbed by the mechanism of cation exchange. When small amounts of the dye are adsorbed, the system contains small tactoids and is peptized. At this stage the dye penetrates into the interlayer space and most of it undergoes metachromasy due to interactions between the aromatic entity and the oxygen plane of the clay. When greater amounts of AO are adsorbed, the clay platelets flocculate to form book-house flocs which, with excess AO, are transformed into card-house flocs. At this stage metachromasy results from the aggregation of the dye in the interparticle space of the flocs, in addition to the pi interactions with the oxygen plane. In excess AO, the clay is gradually peptized. At this stage the dispersed clay platelets form small tactoids with monomeric AO in the interlayer space and at the same time adsorb dimeric and polymeric AO cationic species at the solid-liquid interface.

? An, J.H. and Dultz, S. (2007), Polycation adsorption on montmorillonite: pH and *T* as decisive factors for the kinetics and mode of chitosan adsorption. *Clay Minerals*, **42** (3), 329-339.

Full Text: [2007\Cla Min42, 329.pdf](2007/Cla%20Min42,%20329.pdf)

Abstract: Adsorption of the polycation chitosan on montmorillonite was studied at different pH values from 4.5 to 6.5 and at temperatures of 25, 50 and 75°C. The amount of chitosan adsorbed increased with temperature, indicating that temperature is a decisive factor. At pH 5.0 and 25°C the amount adsorbed was 1.18 mol(c) kg-1, whereas it was 1.5 times higher (1.79 mol(c) kg-1) at 75°C. The uptake of chitosan increased significantly at higher pH. This can be attributed to the decrease in the degree of protonation. Surface charge and X-ray diffraction measurements indicate that most of the chitosan is adsorbed in the interlayer, where mono- and bilayer structures are formed. The kinetics of chitosan adsorption also depend on temperature and pH. At >= 50°C, the adsorption mechanism of chitosan on montmorillonite is closest to the intraparticle diffusion model, whereas at lower temperature (25°C) the adsorption process is closer to the pseudo-second order model. The pH of the solution affects the protonation degree of chitosan and the mode of adsorption on montmorillonite, but not the adsorption rate. For chitosan-montmorillonite prepared at pH 5.0 and 75°C, the effective anion exchange capacity (AEC) was found to be 80% (0.36 mol, kg-1) of the calculated value. The relatively large AEC and the location of most of the anion exchange sites in the interlayer make chitosan-montmorillonite an interesting prospect as an adsorbent for water-purification procedures.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Kinetics, Adsorption Mechanism, Adsorption Process, Adsorption Rate, Aggregation, and pH, Anion, Anion Exchange, Anion Exchange Capacity, Anion-Exchange, Bentonites, Capacity, Charge, Chitosan, Clay, Diffusion, Diffusion Model, Effective, Exchange Capacity, Interlayer, Intraparticle, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetics, Location, Measurements, Mechanism, Metal-Ions, Model, Montmorillonite, Order, Organo-Clay Mineral, pH, pH Values, Polycation, Process, Protonation, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rate, Removal, Sites, Sorption, Tannic-Acid, Temperature, Temperatures, Uptake, Value, Water, Water Purification, X-Ray, X-Ray Diffraction, X-Ray Diffraction Measurements

# Title: Clays and Clay Minerals

Full Journal Title: [Clays and Clay Minerals](http://select.ingentaconnect.com/cms/00098604/contp1-1.htm); [Clays and Clay Minerals](http://www.clays.org/journal/archive/TOC/main.htm)

ISO Abbreviated Title: Clay. Clay Min.

JCR Abbreviated Title: Clay Clay Miner

ISSN: 0009-8604

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Clay Minerals Society

Publisher Address: PO Box 4416, Boulder, CO 80306

Subject Categories:

Geosciences, Interdisciplinary Mineralogy: Impact Factor 1.244, / (2000)

Agriculture, Soil Science: Impact Factor 1.244, 6/29 (2000)

Water Resources: Impact Factor 1.244, 5/47 (2000)

? Bassett, W.A. (1961), The geology of vermiculite occurrences. *Clays and Clay Minerals*, **18** (4), 61-69.

Full Text: [1960-80\Cla Cla Min18, 61.pdf](1960-80/Cla%20Cla%20Min18,%2061.pdf)

Abstract: Vermiculite occurrences can be divided into two major categories, those having macroscopic and those having microscopic or clay vermiculite. This paper is concerned with the former. The macroscopic type of vermiculite deposits can be subdivided into four categories based on the host rock: (1) ultramafic and mafic; (2) gneiss and schist; (3) carbonate rocks; and (4) granitic rocks. Field and laboratory evidence strongly suggests that most and possibly all macroscopic-type vermiculite deposits formed by the action of supergene solutions on biotite and phlogopite. Vermiculite in mixed-layer association with biotite, phlogopite, and chlorite is likewise believed to be of supergene origin.

Notes: Highly cited

? Hang, P.T. and Brindley, G.W. (1970), Methylene blue absorption by clay minerals. Determination of surface areas and cation exchange capacities (clay-organic studies XVIII). *Clays and Clay Minerals*, **18** (4), 203-212.

Full Text: [1960-80\Cla Cla Min18, 203.pdf](1960-80/Cla%20Cla%20Min18,%20203.pdf)

Abstract: Under appropriate conditions, both surface areas and cation exchange capacities of clay minerals can be measured by absorption of Methylene blue from aqueous solutions. The method has been applied to two kaolinites, one illite, and one montmorillonite, all initially saturated with Na+ ions. For Na-montmorillonite, the total area, internal plus external, is measured. For Ca-montmorillonite, entry of Methylene blue molecules appears to be restricted by the much smaller expansion of the Ca- clay in water. X-ray diffraction data clarify the absorption behavior in Na- and Ca-montmorillonite, and in particular it is shown that two orientations of the Methylene blue molecules are involved.

? Mattigod, S.V., Gibali, A.S. and Page, A.L. (1979), Effect of ionic strength and ion pair formation on the adsorption of nickel by kaolinite. *Clays and Clay Minerals*, **6** (??), 411-416.

Full Text: Cla Cla Min6, 411

? Narine, D.R. and Guy, R.D. (1981), Interactions of some large organic cations with bentonite in dilute aqueous systems. *Clays and Clay Minerals*, **29** (3), 205-212.

Full Text: 1981\Cla Cla Min29, 205.pdf

? Mortland, M.M., Shaobai, S. and Boyd, S.A. (1986), Clay-organic complexes as adsorbents for phenol and chlorophenols. *Clays and Clay Minerals*, **34** (5), 581-585.

Full Text: [1986\Cla Cla Min34, 581.pdf](1986/Cla%20Cla%20Min34,%20581.pdf)

Abstract: Several clay-organic complexes were synthesized by placing quaternary ammonium cations on smectite by cation exchange. they were then examined for their ability to adsorb phenol and several of its chlorinated congeners. The organic cations used were: hexadecylpyridinium (HDPY+), hexadecyltrimethyl ammonium (HDTMA+), trimethylphenyl ammonium (TMPA+), and tetramethylammonium (TMA+). The complexes containing long-chain alkyl (hexadecyl) groups were the most hydrophobic and adsorbed the phenols from water in proportion to their hydrophobicities, which increase with chlorine addition (phenol < chlorophenol < dichloropohenol < trichlorophenol). With n-hexane as the solvent, different adsorption was found which depended on the type and degree of solvent interactions with the compound and the clay-organic complex. Thus, the amount of adsorption of these phenols on clay-organic complexes was dependent on the relative energies of adsorbent-adsorbate and adsorbate-solvent interactions.

Keywords: Adsorption, Chlorophenols, Hydrophobicity, Organo Clays, Phenol, Smectite

? Zielke, R.C. and Pinnavaia, T.J. (1988), Modified clays for the adsorption of environmental toxicants: Binding of chlorophenols to pillared, delaminated, and hydroxy-interlayered smectites. *Clays and Clay Minerals*, **36** (5), 403-408

Full Text: [1988\Cla Cla Min36, 403.pdf](1988/Cla%20Cla%20Min36,%20403.pdf)

Abstract: Due to their unique polarity, pore-size distribution, and high surface areas, pillared and delaminated clays are potentially useful materials for the adsorption of environmenlal toxicants. To determine their properties for adsorption of chlorinated phenols, alumina-pillared montmorillonite (APM), chromia-pillared montmorillonite (CPM), and alumina-delaminated Laponite (ADL) were reacted with aqueous pentachlorophenol (PCP) solutions in batch equilibrium experiments. An hydroxy-A1 Laponite (HAL) in which the Na+ exchange ions were replaced by ions of the type Al13O4(OH)(24+x)(H2O)(12-x)(7-x)+ was included in the study. With ADL as the adsorbent, the extent of PCP adsorption increased with decreasing pH, and then became constant at pH ≤ pKa. Thus, the neutral phenol was preferred over the phenolate form. Binding of neutral PCP at pH 4.7 to all adsorbents never reached saturation values, and the loadings achieved were limited by the water solubility of the adsorbate. Among the pillared and delaminated clays investigated, ADL exhibited the largest capacity for physical adsorption of PCP at pH 4.7. Differences in the PCP binding capacities for APM, CPM, and ADL suggested that adsorption was dependent on the pore structure and surface composition of the modified clay adsorbent, not on surface area alone. HAL exhibited quantitative uptake of PCP at the 8 #mole/g level, indicating that a chemisorptions mechanism may operate for PCP binding to this adsorbent. Adsorption of 3-chlorophenol, 3,5-dichlorophenol, and 3,4,5-trichlorophenol by ADL at pH 7.4 increased as the degree of hydrophobicity and chlorination of the phenol increased; hence, the binding capacity was not limited by the molecular size of the adsorbate. In contrast to the adsorption properties observed for pillared, delaminated, and hydroxy-interlayered clays, Na+-montmori Uonite and Na+-Laponite did not adsorb PCP from aqueous solution.

Keywords: Adsorption, Chlorophenol, Delaminated smectite, Hydroxy-A1, Laponite, Pillared smectite, Smectite, Toxicants

? Michot, L.J. and Pinnavaia, T.J. (1991), Adsorption of chlorinated phenols from aqueous-solution by surfactant-modified pillared clays. *Clays and Clay Minerals*, **39** (6), 634-641.

Full Text: [1991\Cla Cla Min39, 634.pdf](1991/Cla%20Cla%20Min39,%20634.pdf)

Abstract: New pillared clay-based adsorbents have been prepared by incorporating a nonionic surfactant of general formula C12-14H25-29O(CH2CH2O)5H (commercial name, Tergitol 15S-5), during the synthesis of the aluminum hydroxide pillaring reagent. Different loadings of surfactant have been examined. The presence of the surfactant enhanced the adsorption capacity of the clay toward 3-monochlorophenol from aqueous solution. On the basis of adsorption results for a series of clays with increasing surfactant loadings, the best adsorbent was obtained at a surfactant loading of 255 mg/g of clay. At this loading, the surfactant occupies the micropores, as well as the mesopores and the external surfaces of the pillared clay. Analysis of the adsorption isotherms for 3-monochlorophenol, 3,5-dichlorophenol,3,4,5-trichlorophenol and pentachlorophenol at different pH shows that the most energetic adsorption sites are the surfactant-occupied micropores between pillars. Additional binding of chlorinated phenols occurs at surfactant sites on external surfaces and mesopores. Upon calcination at 500-degrees-C, the clay is converted to a conventional alumina-pillared clay with a basal spacing near 16 angstrom. This calcined product can be reused as an adsorbent for chlorinated phenols by readsorbing fresh surfactant. The recycled adsorbent exhibits performance properties comparable to the original adsorbent. These results demonstrate the feasibility of utilizing a surfactant-modified pillared clay as a recyclable adsorbent and combustion catalyst for environment pollutants.

Keywords: Adsorption, Adsorption Isotherms, Alumina-Pillared Clay, Aluminum, Capacity, Catalyst, Chlorinated Phenols, Chlorophenols, Clay, Combustion, Complexes, Environment, Immobilized Enzymes, Industrial Wastewaters, Inorgano-Organo-Clays, Interface, Isotherms, Loading, Pentachlorophenol, Performance, pH, Pollutants, Priority Pollutants, Properties, Removal, Sites, Surfaces, Surfactant, Surfactant Loading, Synthesis, Tergitol

? Fitch, A., Du, J., Gan, H.M. and Stucki, J.W. (1995), Effect of clay charge on swelling: A clay-modified electrode study. *Clays and Clay Minerals*, **43** (5), 607-614.

Full Text: [1995\Cla Cla Min43, 607.pdf](1995/Cla%20Cla%20Min43,%20607.pdf)

Abstract: The uniformity of clay films affects the transport of an anionic electroactive probe through the film. When cations other than Na+ are present in the initial swelling of the him (such as native K+ and Ca2+), or when the native clay is highly charged, internal dislocations of the film, caused by variable stacking domains, enhance the diffusive transport of Fe(CN)63- across the film. This effect is investigated using clay-modified electrodes in which the clays are of variable exchange forms (Na+, Ca2+, or K+) and variable charge. The charge on the clay is determined both by the native form of the clay and by reduction of structural Fe3+. The results suggest that swelling of clays increases in a linear fashion with CEC, at least for minimally charged clays.

Keywords: Charged Clays, Diffusive Transport, Iron Reduction, Iron Oxidation-State, Octahedral-Iron, Nontronite, Reduction, Reoxidation, Smectite

? Kukkadapu, R.K. and Boyd, S.A. (1995), Tetramethylphosphonium- and tetramethylammonium-smectite as adsorbents of aromatic and chlorinated hydrocarbons: Effect of water on adsorption efficiency. *Clays and Clay Minerals*, **43** (3), 318-323.

Full Text: [1995\Cla Cla Min43, 318.pdf](1995/Cla%20Cla%20Min43,%20318.pdf)

Abstract: Tetramethylphosphonium-smectite (TMP-clay) and tetramethylammonium-smectite (TMA-clay), were prepared and characterized as adsorbents for a series of aromatic and chlorinated hydrocarbons. The sorption of benzene, alkylbenzenes, and carbon tetrachloride as vapors and as solutes from water was studied to evaluate the effect of water on adsorption efficiency. Adsorption of organic vapors depended on the N-2 BET surface area. TMA-clay was a slightly better adsorbent than TMP-clay, due to its somewhat higher surface area. The Langumir isotherms obtained indicated that adsorption occurred predominantly in the interlayer micropores, apparently on mineral surfaces between onium ions. Adsorption efficiency bf both organo-clays decreased, compared to vapor sorptions, in presence of water. Lower sorption was apparently due to shrinkage of the interlayer pore or cavity sizes by hydration of interlayer TMA and TMP cations. Although sorption efficiencies of both organo-clays was reduced in presence of bulk water, the extent of reduction was much less for TMP-clay. Thus, TMP-clay was a better adsorbent than TMA-clay in presence of water, despite its lower surface area, in direct contrast to vapor sorption. The Langumir isotherms indicated interlayer sorption of benzene, alkylbenzenes and carbon tetrachloride from water by TMP-clay. The absence of langumir isotherms for toluene, ethylbenzene and p-xylene uptake from water by TMA-clay indicated that these bulkier solutes were not adsorbed in the interlayers. These results indicate that hydration of TMA cations causes shrinkage of the interlayer pores to dimensions that exclude these solutes. The lower degree of hydration of TMP cations enables TMP-clay to maintain interlayer pores large enough to accommodate the bulkier alkylbenzenes.

Keywords: Adsorbent, Adsorption Efficiency, Langumir Isotherms, Monolayer Volumes, Organo-Clays, Shrinkage of Pores, Sorption From Water, Surface Area, TMA- and TMP-Clays, Vapor Sorptions

Singh, J., Huang, P.M., Hammer, U.T. and Liaw, W.K. (1996), Influence of citric acid and glycine on the adsorption of mercury(II) by kaolinite under various pH conditions. *Clays and Clay Minerals*, **44** (1), 41-48.

Full Text: [1996\Cla Cla Min44, 41.pdf](1996/Cla%20Cla%20Min44,%2041.pdf)

Abstract: This investigation was carried out to study the effect of different concentrations of citric acid and glycine, which are common in freshwaters, on the kinetics of the adsorption of Hg by kaolinite under various pH conditions. The data indicate that Hg adsorption by kaolinite at different concentrations of citric acid and glycine obeyed multiple first order kinetics. In the absence of the organic acids, the rate constants of the initial fast process were 46 to 75 times faster than those of the slow adsorption process in the pH range of 4.00 to 8.00. Citric acid had a significant retarding effect on both the fast and slow adsorption process at pHs of 6.0 and 8.0. It had a significant promoting effect on the fast and slow adsorption process at pH 4.00. Glycine had a pronounced enhancing effect on the rate of Hg adsorption by kaolinite during the fast process. The rise in pH of the system further increased the effect of glycine on Hg adsorption. The magnitude of the retarding/promoting effect upon the rate of Hg adsorption was evidently dependent upon the pH, structure and functionality of organic acids and molar ratio of the organic acid/Hg. The data obtained suggest that low-molecular-weight organic acids merit close attention in studying the kinetics and mechanisms of the binding of Hg by sediment particulates and the subsequent food chain contamination.

Keywords: Adsorption, Kaolinite, Kinetics, Mercury, Organic Acids, pH, Pzc, Speciation, Water

? Shariatmadari, H., Mermut, A.R. and Benke, M.B. (1999), Sorption of selected cationic and neutral organic molecules on palygorskite and sepiolite. *Clays and Clay Minerals*, **47** (1), 44-53.

Full Text: [1999\Cla Cla Min47, 44.pdf](1999/Cla%20Cla%20Min47,%2044.pdf)

Abstract: Palygorskite and sepiolite show a high sorption capacity for organic molecules. Adsorption of 2 organic cations, Methylene blue (MB) and crystal violet (CV), by palygorskite and sepiolite were examined. The maximum sorption of MB and CV far exceeded the cation exchange capacity (CEC) of these minerals. This shows that, besides the contribution of free negative sorption sites (P-), the sites satisfied with sorption of single cations (PXi(0)) and neutral sorption sites (N) on clay surfaces may contribute to the sorption of organic cations. The number of neutral sites was determined by examining the sorption of 2 neutral organic molecules, triton-X 100 (TX100) and 15 crown ether 5 (15C5), and by application of the Langmuir isotherm. To determine the contribution of different sites, an adsorption model that applies the Gouy-Chapman equation and takes into account the formation of different clay-organic complexes in a closed system was employed. Application of this model to sorption data provided the calculation of binding coefficients for neutral sites, as well as the surface potential of the minerals at different sorbate concentrations. At sorption maxima, for both palygorskite and sepiolite, the contribution of neutral sites for sorption of organic cations was the highest, followed by the PXi(0) sites in case of CV sorption, while in sorption of MB the contribution of P- sites was the second highest. The Fourier transform infrared (FTIR) patterns of clay-organic cation complexes compared with pure clays confirm that the sorption of organic cations is by silanol groups located at the edge of fibrous crystals, which account for neutral sorption sites.

Keywords: 15 Crown Ether 5, Adsorption, Binding, Clay-Minerals, Crystal Violet, Crystal Violet, Exchange Capacities, Methylene Blue, Methylene-Blue, Model, Montmorillonite, Palygorskite, Phospholipid-Vesicles, Sepiolite, Sorption Modeling, Surface, Triton-X 100

? Pai, C.W., Wang, M.K., Wang, W.M. and Houng, K.H. (1999), Smectites in iron-rich calcareous soil and black soils of Taiwan. *Clays and Clay Minerals*, **47** (4), 389-398.

Full Text: [1999\Cla Cla Min47, 389.pdf](1999/Cla%20Cla%20Min47,%20389.pdf)

Abstract: The iron-rich calcareous soil (Typic Rhodustalf) from the Penghu island group represents a volcanic area. The black soils (Typic Haplustert, Vertic Endoaquoll, Typic Hapludolls) are typical of eastern Taiwan. Four A horizons and a pedon from the iron-rich calcareous soil and four pedons from the black soils were studied to analyze soil properties and clay compositions. The objective was to compare the properties of smectites developed from different parent materials. The materials were studied by using conventional X-ray diffraction (XRD) of K- and Mg-saturated clays and involved the alkylammonium (C = 12) method and the Greene-Kelly test. The mean-layer charge of smectites (0.48-0.52 cmol(c)/O-10(OH)(2)) in the iron-rich calcareous soil was found to be higher than the black soils (0.43-0.48 cmol(c)/O-10(OH)(2)). A smectite of higher charge developed from the basalts. This smectite is enriched in Fe and Mg, and lacks Si, thereby forming beidellite and/or nontronite. In contrast, under high precipitation, elevated temperature, base saturation (e.g., Na, K, Ca, Mg), and about equal wet and dry cycles per year in the black soil environments, smectites developed from the complicated geologic site of eastern Taiwan. These smectites transformed to smectite-kaolinite mixed-layer clay and thus, resulted in lower-charge smectites. The K fixation capacity of the iron-rich calcareous soil was higher than the black soils.

Keywords: Black Soils, Iron-Rich Calcareous Soil, Mollisols, Smectite, Vermiculite, Vertisols, Charge Characteristics, Clay-Minerals, Layer Charge, Heterogeneity, Sediments, Red

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Full Text: [1999\Cla Cla Min47, 567.pdf](1999/Cla%20Cla%20Min47,%20567.pdf)

Abstract: The ability of Na-activated bentonite to remove Ni2+ and Co2+ from aqueous solutions at room temperature (22±1°C) was studied under various experimental conditions. The parameters studied were solid-to-liquid ratios and initial cation concentrations. Experiments involved the behavior of bentonite vs. Ni and Co separately and where Ni and Co were present in solution at different concentrations and ratios. Bentonite retained substantial amounts of both metals readily, but it showed a higher affinity for Ni. Over-exchange appears when initial metal concentration exceeds the concentration corresponding to the cation exchange capacity (CEC) of bentonite. The presence of both metals in solution may be either synergistic or antagonistic sorption, depending on the initial ion concentrations.

Keywords: Soil Clay Fractions, Minerals, Sorption, Montmorillonite, Adsorption, Exchange, Cations, Cadmium, Zinc, Cd, Adsorption, Bentonite, Cation Exchange, Clays, Cobalt Removal, Heavy Metals, Nickel Removal, Wastewater

? Matthes, W, Madsen, F.T. and Kahr, G. (1999), Sorption of heavy-metal cations by Al and Zr-hydroxy-intercalated and pillared Bentonite. *Clays and Clay Minerals*, **47** (5), 617-629.

Full Text: [1999\Cla Cla Min47, 617.pdf](1999/Cla%20Cla%20Min47,%20617.pdf)

Abstract: The sorption of Cd, Cu, Pb, and Zn ions by Na-rich bentonite, Al and Zr-pillared Na-rich bentonite (Al-MX80, Zr-MX80), the uncalcined hydroxy-intercalated precursors (HAI, HZr-MX80), and commercial Al-pillared bentonite EXM 534 was investigated. Experiments were conducted in ultrapure water and artificial leachate with varying pH. The experiments were performed over periods to 30 wk. Sorption characteristics were described with one and two-site Langmuir isotherms. The non-exchangeable quantities of heavy metals were determined by fusion of the sorbents after ion exchange with ammonium acetate. The sorption of Cd, Cu, Pb, and Zn by bentonite was dominated by cation exchange. In artificial leachate, the sorption was reduced due to competition with alkali and alkaline-earth cations. The sorption of Cu, Zn, and Pb at pH 4.9 and Cd at pH 6.9 by Al and Zr-hydroxy-intercalated and pillared MX80 was governed also by cation exchange. In contrast, the sorbed quantities of Zn at pH 6.9 exceeded the cation exchange capacity (CEC) of HAl, HZr, Al, Zr-MX80, and EXM 534 and were partially nonexchangeable. The increase of the sorption of Zn with pH and its independence of the ionic strength of the solution at neutral pH suggest a complexation of Zn ions to surface hydroxyl groups of the intercalated Al and Zr-polyhydroxo cations and pillars. This complexation is the dominating sorption mechanism. Removal of dissolved Zn from solution with time is attributed to surface precipitation. Al-hydroxy and pillared bentonites are considered potential sorbents of Zn ions from neutral pH aqueous solutions, such as waste waters and leachates.

Keywords: Electron-Spin Resonance, Cross-Linked Smectites, Interlayer Clays, Organic-Ligands, Montmorillonite, Adsorption, Aluminum, Water, Calcium, Catalysts, Heavy Metals, Intercalation, Montmorillonite, Pillared Clay, Sorption

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Full Text: [2000\Cla Cla Min48, 563.pdf](2000/Cla%20Cla%20Min48,%20563.pdf)

Abstract: This paper examines the ion-exchange properties of synthetic zeolite Na-P-c,, which was produced from perlite-waste fines and has a SiO2:Al2O3 ratio of 4.45:1 and a cation-exchange capacity (CEC) of 3.95 meg g-1. Although equilibrium is attained rapidly for all three metals, exchange is incomplete, with A(c)(max) (maximum equilibrium fraction of the metal in the zeolite) being 0.95 for Pb, 0.76 for Zn, and 0.27 for Ni. In both Na --> 1, 2Pb and Na --> 1, 2Zn exchange, the normalized selectivity coefficient is virtually constant for (N)A(c) (normalized equilibrium fraction of the metal in the zeolite) values of less than or equal to0.6, suggesting a pronounced homogeneity of the available exchange sites. The Gibbs standard free energy, DeltaG(degrees), of the Na --> 1, 2Pb exchange calculated from the normalized selectivity coefficient is -3.11 kJ eq-1 and, for the Na --> 1, 2Zn exchange, it is 2.75 kJ eq-1. Examination of the solid exchange products with X-ray diffraction (XRD) revealed a possible decrease in crystallinity of zeolite Pb-P-c as suggested by the significant broadening and disappearance of diffraction lines. This decrease is associated with a reduction of pore opening, as indicated from Fourier-transform infrared analysis (FTIR), which in turn results in a decrease of the amount of zeolitic water. Thermogravimetric-differential thermogravimetric (TG-DTG) analysis showed that water loss occurs in three steps, the relative significance of which depends on the type of exchangeable cation and subsequently on the type of complex formed with the cation and, or the zeolite channels. Zeolite Na-Pc might be utilized in environmental applications, such as the treatment of acid-mine drainage and electroplating effluents.

Keywords: Heavy Metals, Ion Exchange, Pb2+, Perlite, Perlite, Selectivity, Selectivity Coefficient, Zeolite, Zeolite P-C, Zeolitization, Zn2+

? Matthes, W. and Kahr, G. (2000), Sorption of organic compounds by Al and Zr-hydroxy-intercalated and pillared bentonite. *Clays and Clay Minerals*, **48** (6), 593-602.

Full Text: [2000\Cla Cla Min48, 593.pdf](2000/Cla%20Cla%20Min48,%20593.pdf)

Abstract: Owing to their large and chemically active surface, hydroxy-intercalated and pillared clays can be potent sorbents for organic compounds. The sorption behavior of Al and Zr-hydroxy-intercalated bentonite (HAl-, HZr-MX80), Al and Zr-pillared bentonite (Al-MX80, Zr-MX80), and a commercial Al-pillared bentonite (EXM 534) for 3-chloroaniline (3-CA), atrazine (AT), and 3-chlorophenol (3-CP) was investigated. The results were compared with the sorption behavior of the untreated Na-rich bentonite (MX80) and granulated activated carbon (GAC). Also the influence of the salinity of the sorbate and the age of the sorbents was studied.

Al and Zr-hydroxy-intercalated and pillared bentonites sorbed higher amounts of 3-CA, AT, and 3-CP than the untreated bentonite. The quantities sorbed related to the electron-donating properties of the sorbate and the acidity of the sorbents. Sorbed quantities increased from the hydroxy-intercalated to the pillared species, and from the Al to the Zr forms. The organic bases, 3-CA and AT, were sorbed in higher quantities than the organic acid 3-CP. For AT, the sorbents exhibited a high affinity. Aging of the samples and a high ionic strength of the sorbate reduced the sorption of 3-CA, whereas the sorption of AT was not affected greatly. The sorption capacity of GAC for organic bases was generally higher than that of the hydroxy-intercalated and pillared bentonites.

The data suggest that at initial concentrations at a ppm level, 3-CA and AT can be entirely removed from aqueous solutions by Al and Zr-hydroxy-intercalated and pillared bentonites. These materials, especially Zr-pillared bentonites, represent potent alternative sorbents for atrazine, chloroanilines, and probably a wide range of other organic bases.

Keywords: Activated Carbon, Al-Pillared Montmorillonite, Atrazine, 3-Chloroaniline, 3-Chlorophenol, Sorption, Zr-Pillared Montmorillonite, Powdered Activated Carbon, Mineral Surfaces, Clay Catalysts, Atrazine, Adsorption, Montmorillonite, Smectites, Phenols, Transformation, Suspensions

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Full Text: [2002\Clay Cla Min50, 127.pdf](2002/Clay%20Cla%20Min50,%20127.pdf)

Abstract: Clinoptilolite-rich materials from widespread pyroclastic and epiclastic deposits of northern Sardinia were investigated to assess their cation exchange properties and to find the most reliable experimental method to determine their cation exchange capacity (CEC). The CECs were evaluated using a cross exchange method (CEM) and a batch exchange method (BEM). The CEM resulted in values 30-35% lower than the theoretical or expected CEC calculated from the chemical analyses of the clinoptilolite-rich materials. The BEM resulted in CECs 6-12% lower than the expected CECs. Various parameters, such as the grain-size of powders (<64 μm and 125-250 μm) and replacement cation (Na+, K+, Li+, Cs+, NH4+, Ca2+, Mg2+, Sr2+) were evaluated in order to optimize the cation exchange process, i.e. enhance complete exchange. The particle size did not affect the exchange process appreciably. The type of replacement cation had a substantial effect on the experimental CEC determined by the BEM. The NH4+ and Cs+ replacement solutions resulted in the best experimental CECs ranging between 75% and 94% of the theoretical CEC with NH4+ as the replacement cation and 79% and 88% of the theoretical CEC with Cs+ as the replacement cation. The exchange efficiency was also measured as a function of ammonium concentration in the replacement solution (0.50, 1.00, 2.00 and 3.00 M). Experimental CECs ranged between 94% (0.5 M NH4Cl solution) and 99% (1 M NH4Cl solution) of the theoretical CEC for one epiclastic rock sample and between 79% (3 M NH4Cl solution) and 87% (2 M NH4Cl solution) of the theoretical CEC for one pyroclastic rock sample.

Keywords: Batch Exchange Method (BEM), Cation Exchange Capacity (CEC), Chabazite, Clinoptilolite, Cross Exchange Method (CEM), Equilibria, Greece, Ion-Exchange, Italy, Mordenite, Natural Zeolites, Sardinia, Tuffs

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Full Text: [2003\Clay Cla Min51, 172.pdf](2003/Clay%20Cla%20Min51,%20172.pdf)

Abstract: The adsorption behavior of quaternary ammonium cationic surfactants with different hydrocarbon chain lengths, i.e. HDTMA (hexadecyltrimethylammonium), TDTMA (tetradecyltrimethylammonium) and DDTMA (dodecyltrimethyl ammonium), onto clinoptilolite has been investigated. The adsorption isotherms of these surfactants are correlated with the zeta potential curves of clinoptilolite. Accordingly, the applicability of the hemimicelle hypothesis to the adsorption of cationic surfactants at the clinoptilolite, water interface considering in the electrical double layer (EDL) of clinoptilolite is discussed. Even though the adsorption occurs in the EDL of clinoptilolite, the adsorption of HDTMA, TDTMA and DDTMA onto clinoptilolite is not conveniently described by the hemimicelle hypothesis. The absence of all expected marked increase in the zeta potential curves at the hemimicelle concentration is ascribed to the large external cation exchange capacity of clinoptilolite. The hydrocarbon chain length of surfactant molecules is found to have a significant effect on the ion exchange as well as hydrophobic interaction mechanisms. The effectiveness of both ion exchange and hydrophobic interactions increases with increasing chain length, and so the greatest surfactant adsorption onto clinoptilolite was obtained by HDTMA.

Keywords: Adsorption, Cationic Surfactant, Chromate, Clays, Clinoptilolite, Contaminants, Double Layer, Hydrophobic Interaction, Ion Exchange, Kinetics, Mechanism, Modified Zeolite, Natural Clinoptilolite, Organic Cations, Sorption, Water, Zeta Potential

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Full Text: [2003\Clay Cla Min51, 327.pdf](2003/Clay%20Cla%20Min51,%20327.pdf)

Abstract: The mechanism of decolorization of crude maize and sunflower oils was studied by means of adsorption of beta-carotene by a low-grade bentonite, containing mixed-layered illite-smectite. Decolorization depends on temperature and the time required for equilibrium decreases with increasing temperature. The study of the kinetics of adsorption showed that decolorization of maize oil is a first-order process which occurs in two steps: a first fast step with higher activation energy (25.6 kJ mol-1), indicating the influence of a chemical interaction between the pigment and the clay surface, followed by a second slow step with low activation energy (12.3 kJ mol-1), characteristic of physical adsorption on the previously adsorbed molecules. Decolorization of sunflower oil is also a first-order process, described by a single mechanism with intermediate activation energy (19.0 kJ mol-1). Adsorption isotherms of decolorization of maize oil follow the Freundlich equation, indicating the existence of heterogeneous adsorption sites on the solid’s surface. Heterogeneity is attributed both to different active centers on the smectite surface (Bronsted and Lewis centers) and to the different phases present in bentonite, such as illitic layers and clinoptilolite, which also have active centers on their surfaces.

Keywords: Acid-Activated Bentonite, Activation Energy, Active Centers, Adsorption Kinetics, Beta-Carotene, Decolorization, Freundlich Isotherm, Reaction Order, Vegetable Oils, Crude Palm Oil, Clay-Minerals, Montmorillonite

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Full Text: [2006\Cla Cla Min54, 689.pdf](2006/Cla%20Cla%20Min54,%20689.pdf)

Abstract: A series of organoclays with monolayers, bilayers, pseudotrilayers, paraffin monolayers and paraffin bilayers were prepared from montmorillonite by ion exchange with hexadecyltrimethylammonium bromide (HDTMAB). The HDTMAB concentrations used for preparing the organoclays were 0.5, 0.7, 1.0, 1.5, 2.0 and 2.5 times the montmorillonite cation exchange capacity (CEC). The microstructural parameters, including the BET-N-2 surface area, pore volume, pore size, and surfactant loading and distribution, were determined by X-ray diffraction, N-2 adsorption-desorption and high-resolution thermogravimetric analysis (HRTG). The BET-N-2 surface area decreased from 55 to 1 m2/g and the pore volume decreased from 0.11 to 0.01 cm3/g as surfactant loading was increased from Na-Mt to 2.5CEC-Mt. The average pore diameter increased from 6.8 to 16.3 nm as surfactant loading was increased. After modifying montmorillonite with HDTMAB, two basic organoclay models were proposed on the basis of HRTG results: (1) the surfactant mainly occupied the clay interlayer space (0.5CEC-Mt, 0.7CEC-Mt, 1.0CEC-Mt); and (2) both the clay interlayer space and external surface (1.5CEC-Mt, 2.0CEC-Mt, 2.5CEC-Mt) were modified by surfactant. In model 1, the sorption mechanism of p-nitrophenol to the organoclay at a relatively low concentration involved both surface adsorption and partitioning, whereas, in model 2 it mainly involved only partitioning. This study demonstrates that the distribution of adsorbed surfactant and the arrangement of adsorbed HDTMA(+) within the clay interlayer space control the efficiency and mechanism of sorption by the organoclay rather than BET-N-2 surface area, pore volume, and pore diameter.

Keywords: Adsorption, Adsorption-Desorption, Analysis, Bentonites, Bet-N-2 Surface Area, Capacity, Cation Exchange Capacity, Cations, Clay, Clay-Minerals, Concentration, Control, Distribution, Efficiency, HDTMA(+), Interlayer, Ion, Ion Exchange, Loading, Mechanism, Model, Models, Montmorillonite, Nanocomposites, Organic Contaminants, Organoclay, Organoclays, P-Nitrophenol, Paraffin, Parameters, Partitioning, Pore Size, Pore Volume, Sorption, Sorption Efficiency, Sorption Mechanism, Surface Area, Surfactant, Surfactant Loading, Thermogravimetric, Thermogravimetric Analysis, Water, X-Ray Diffraction

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Full Text: [2007\Cla Cla Min55, 71.pdf](2007/Cla%20Cla%20Min55,%2071.pdf)

Abstract: The citrate-induced desorption kinetics of pre-adsorbed Se from montmorillonite (Mt) and its complexes with hydroxyaluminum (HyA-Mt) and hydroxyaluminosilicate (HAS-Mt) were studied. The mole fraction of pre-adsorbed Se released in 24 It from different clays followed the trends of Mt >> HAS-Mt > HyA-Mt with a significant increase with elevated citrate concentration in the desorbing solution. In contrast, the amount of Se adsorbed per unit mass of different clays followed a clear-cut opposite trend of HyA-Mt > HAS-Mt >> Mt. The Se desorption kinetics in different systems indicated multiple rate characteristics; where an initial fast reaction (0.25-2 h) was followed by a slow reaction (2-16 h). Of the six different kinetic models tested (zero-, first-, and second-order; power function, Elovich, and parabolic diffusion), the second-order rate equation showed the overall best fit to the fast and slow desorption kinetic data from the clays. Based on second-order rate constants, the rates of the mole fraction of Se desorption by citrate from different clay systems at 298 K followed the order Mt > HAS-Mt >> HyA-Mt. For both fast and slow reaction, the rates of desorption increased proportionally with the level of citrate. Replicate experiments conducted across a range of temperature (288-318 K) yielded Arrhenius parameters that followed the order HyA-Mt > HAS-Mt >> Mt. Considering that a lower mole fraction of Se desorption after a particular reaction period, slower desorption kinetics, and a greater activation energy of desorption are the indices of increased adsorption bond strength, the results clearly indicate that HyA- and HAS-interlayering and coatings on Mt not only augmented its Se adsorption affinity and capacity, but also increased the adsorption bond strength. Silication in HyA not only reduced the Se adsorption capacity, but also weakened the adsorption bond strength. This establishes a significant role of HyA/HAS-interlayering and coating on Mt in influencing the rate of citrate-induced release of Se. Reduction in surface-positive potential following citrate adsorption on the clay surface, a direct ligand exchange between Se and citrate, and structural dissolution are possible mechanisms responsible for citrate-induced Se desorption in the present study.

Keywords: 298 K, 298-K, Activation Energy, Adsorption, Adsorption Capacity, Alluvial Soils, Aluminum Hydroxides, Capacity, Citrate, Clay, Clear-Cut, Coating, Coatings, Complexation, Complexes, Concentration, Desorption, Diffusion, Dissolution, Electric Charge, Energy, Gas-Chromatography, Hydroxy-Aluminosilicate Ions, Hydroxyaluminosilicate, Hydroxyaluminum, Iron-Oxides, Kinetic, Kinetic Models, Kinetics, Mechanisms, Models, Montmorillonite, Organic-Acids, Parameters, Phosphate, Power Function, Range, Rate Equation, Reaction, Role, Selenite, Surface, Temperature, Trend, Trends

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Full Text: Cla Cla Min57, 555.pdf

Abstract: Synthetic dyes in industrial effluents pose a significant risk to human health and the environment, so much effort has been expended to degrade them using various methods, including the use of clay minerals as catalysts. The purpose of this Study was to advance understanding of the mechanisms for clay-catalyzed degradation of crystal violet (CV) and other triarylmethine dyes using three different vermiculite clays (Llano, Texas, VTx-1; Ojen, OV; and Russian, RV), a montmorillonite (SWy-1), and a Spanish sepiolite (SEP). While OV, RV, SWy-1, and SEP showed almost no activity with respect to dye degradation, VTx-1 caused complete removal of the dye from Solution Lip to the equivalent of 200% of the cation exchange capacity of the clay. While large amounts of dye were removed from the solution, no change in basal spacing was observed by X-ray diffraction. The kinetics of removal of CV from Solution began after a lag period of > 10 days in a process that call be described by pseudo-second order kinetics. By comparison, adsorption of CV onto SWy-1 and SEP was immediate, without any lag period. Sonication treatment of the VTx-1 vermiculite suspension caused the CV removal process to begin immediately. Fourier-transform infrared measurements of adsorption of CV on clays revealed that for the OV and RV vermiculites, SEP sepiolite, and SWy-1 montmorillonite the spectra were similar to the original dye; the spectra of the VTx-1-dye differed considerably, however, exhibiting vibrations of methylene groups (-CH2-) which were not present in the CV molecule. The significant changes in the IR spectrum indicated that CV underwent degradation oil the surface of the VTx-1 vermiculite. Carbon-content analysis led to the Conclusion that degradation products remained bound to the clay. Similar effects were observed for two other triarylmethine dyes (malachite green and methyl green) added to VTx-1. indicated that it may therefore, be considered suitable as a sorbent to remove and decompose such dyes From industrial effluents. pretreatment by sonication would remove the need for long incubation times.

Keywords: Adsorption, Adsorption, Advance, Analysis, Arnolds Base, Capacity, Cation, Cation Exchange, Changes, Clay, Clay Minerals, Clay-Minerals, Clays, Comparison, Crystal Violet, Degradation, Doped TiO2, Dye, Dyes, Effluents, Environment, FTIR, Health, Human, Human Health, IR, Kinetics, Layered Silicates, Llano Vermiculite, Malachite Green, Mechanisms, Methods, Methyl Green, Minerals, Model-Calculations, Monovalent Organic Cations, Montmorillonite, Photocatalytic Degradation, Porous Materials, Pretreatment, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Pseudosecond Order Kinetics, Purpose, Removal, Risk, Sepiolite, Solution, Sonication, Sorbent, Surface, Suspension, Texas, Treatment, Understanding, Vermiculite, X-Ray, X-Ray Diffraction

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Full Text: Cla Cla Min57, 695.pdf

Abstract: An important application of clay is as a solid adsorbent for industrial dyes. The aim of the present work was to carry out an experimental-theoretical study of the adsorption of dye mixtures, namely malachite green (MG) and Congo red (CR), by bentonite. Adsorption studies were conducted after evaluation of the impact of several parameters, including pH, adsorbate dose, and contact time, on the removal of MG and CR. The pH of the dye solution is strongly affected by the chemistry of both the dye molecules and of the adsorbent in an aqueous solution. Where both dye molecules exist in solution, the optimum pH was found to be 8.2 in order to achieve the maximum adsorption of both MG and CR. Preliminary studies showed that 60 min of contact time is sufficient to reach adsorption equilibrium. The adsorption studies were carried Out using 1.0 g samples of bentonite. The amount of dye adsorbed was found by application of classical least squares to the synthetic dye Mixtures. Data from equilibrium adsorption on bentonite were analyzed by Freundlich, Langmuir, Redlich-Peterson, and Temkin isotherm equations using regression analysis for non-linear forms of those equations. For binary-mixture analysis, isotherm parameters were determined from single-component adsorption Studies and the theoretical amount of dye adsorbed was calculated using an extended Langmuir isotherm. Non-linear error analysis showed that the Temkin and Redlich-Peterson isotherms gave the best fits to the equilibrium data for adsorptive removal of MG and CR by bentonite.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Equilibrium, Adsorption-Isotherm, Analysis, Application, Aqueous Solution, Batch Adsorber, Bentonite, Chemistry, Clay, Cls, Component Systems, Congo Red, Cr, Data, Diffusion, Dye, Dyes, Equilibrium, Error, Error Analysis, Evaluation, Extended Langmuir, Forms, Freundlich, Impact, Isotherm, Isotherm Equations, Isotherm Parameters, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Malachite Green, Mg, Non-Linear, pH, Prediction, Redlich-Peterson, Regression, Regression Analysis, Removal, Single, Solution, Sorption, Temkin Isotherm, Waste-Water, Work

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Full Text: [2011\Cla Cla Min59, 34.pdf](2011/Cla%20Cla%20Min59,%2034.pdf)

Abstract: Ruthenium compounds are highly toxic and carcinogenic. In the present study, clinoptilolite was used in the removal of Ru species from aqueous solutions. Clinoptilolite is a good choice of sorbents because it is naturally abundant and therefore cheap. After the process where Ru was removed from the aqueous solution, the clinoptilolite was characterized by X-ray diffraction, X-ray fluorescence, thermogravimetric analysis, and Fourier-transform infrared spectroscopy techniques. The influence of pH, contact time, and temperature on the adsorption of Ru was investigated and the optimum conditions were found to be 2 h of contact time and pH = 2. Pseudo first-order, pseudo second-order, Elovich, and intra-particle diffusion models were used to analyze the adsorption-rate data. The pseudo second-order model was found to be the best kinetics model in terms of matching the experimental results obtained. Adsorption isotherms were constructed to assess the maximum adsorption capacity of clinoptilolite. The Langmuir model fitted the data reasonably well in terms of regression coefficients. Adsorption studies were also performed at different temperatures to calculate the thermodynamic parameters. The numerical value of AG decreased with increasing temperature, indicating that adsorption is favored at higher temperatures. The positive values of ΔH-0 corresponded to the endothermic nature of the adsorption processes. The proposed method of removal is applicable at an industrial scale.

Keywords: Adsorption, Adsorption, Adsorption Isotherms, Aqueous Solution, Clinoptilolite, Fission-Products, Ions, Iron, Isotherms, Kinetics, Langmuir, Natural Zeolites, pH, Removal, Ruthenium, Sorption, Thermodynamic, Thermodynamic Parameters, Waste

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Full Text: [2011\Cla Cla Min59, 240.pdf](2011/Cla%20Cla%20Min59,%20240.pdf)

Abstract: Toxic dyes must be removed from waste water coming from the textile and paint industries. Adsorption is one possible method of removing dyes under ‘soft’ conditions, without the generation of secondary hazardous materials. The present study used the carbonate-containing layered double hydroxides (LDH), Mg-Al and Mg-Zn-Al (with a M2+/M3+ ratio of 3), as adsorbents to remove two industrial colorants, Astrazon Remazol Brilliant Blue and Direct Red, present in low concentrations in aqueous solutions. The physicochemical properties of adsorbents at the surfaces of LDH, as well as the properties of the solutions containing the dyes control how the colorants are removed. Both fresh and calcined LDH were effective in the removal experiments, with effectiveness ranging from 50 to 100%. Analysis of kinetic data demonstrated that the adsorption process fitted the pseudo-second-order model better than the pseudo-first order model, information which is useful for system design in the treatment of wastes from the textile industry. Parameters such as pH of solutions and concentration of dye in solution influenced mainly the initial adsorption rate.

Keywords: Acid-Base Properties, Adsorption, Adsorption, Aqueous-Solution, Catalysts, Colorant, Dyes, Hydrotalcite, Hydrotalcite-Like Compounds, Layered Double Hydroxides, Layered Double Hydroxides, Mg, Nontoxic Hybrid Pigments, pH, Reactive Dye, Remediation, Sorption, Textile Industry, Wastes

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Full Text: 2011\Cla Cla Min59, 277.pdf

Abstract: Toxic metal contamination of waste waters can be mitigated by metal adsorption to clay and zeolitic minerals, but in developing countries such environmental remediation can be cost prohibitive if these minerals are not readily available. Because of its abundance, low cost, and excellent selectivity for several toxic metal ions, clinoptilolite from the Zlatokop deposit in Serbia was investigated for its ability to remove copper ions from aqueous solutions and serve as an effective local resource for this purpose. The sorption capacity of the clinoptilolite at 298 K varied from 8.3 mg Cu g-1 (for C0 = 100 mg Cu dm-3) to 16.8 mg Cu g-1 (for C0 = 400 mg Cu dm-3). The sorption data were best described by the Freundlich isotherm and the sorption kinetics followed the pseudo-second-order model. Intra-particle diffusion of Cu2+ was present but it is not the rate-limiting step. The sorption of Cu2+ on the clinoptilolite occurred spontaneously, the free energy change decreasing with temperature. The sorption was endothermic and was accompanied by an increase in entropy. Dehydration of the Cu-loaded clinoptilolite at 540°C led to the formation of nanocrystallinc Cu(I) oxide particles with an average size of similar to 2 nm, suggesting possible novel applications for the Cu-loaded clinoptilolite.

Keywords: Adsorption, Biosorption, Clinoptilolite, Copper Removal, Equilibrium, Heavy-Metal Ions, Intraparticle, Isotherm, Kinetics, Kinetics, Models, Nano-Cuprite, Natural Zeolite, Nickel(II) Ions, Removal, Sorption, Systems, Thermodynamics

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Full Text: [2011\Cla Cla Min59, 438.pdf](2011/Cla%20Cla%20Min59,%20438.pdf)

Abstract: Among the many techniques used to remove toxic dyes from the environment, layered double hydroxides (LDH) are considered to be especially environmentally friendly, but, this quality may be altered by variations in the octahedral Mg/Al molar ratios in the LDH structure. The aim of the present study was to synthesize environmentally sound LDH for use as an economically viable sorbent for the adsorption of reactive brilliant orange X-GN. Layered double hydroxides with Mg/Al molar ratios of 2:1 and 4:1 were prepared by co-precipitation. The materials obtained were characterized by powder X-ray diffraction (XRD), Fourier-transform infrared (FTIR) spectroscopy, X-ray fluorescence spectroscopy (XRF), and surface-area analysis. Batch experiments were carried out to investigate the effects of contact time, pH, adsorbent dosage, and initial dye concentration on the adsorption behavior of the reactive brilliant orange X-GN by Mg-Al LDH. The results showed that the optimum pH value for dye adsorption was 3.0, at which the adsorption capacities of the reactive brilliant orange X-GN by the 2:1 LDH and the 4:1 LDH at 298 K were 79.370 mg/g and 83.343 mg/g, respectively. Further analysis of the dye-adsorption kinetics show that they fit the pseudo second-order model well. The adsorption equilibrium data showed that the Langmuir model provided better correlation of the equilibrium data than the Freundlich model. This result indicates that LDH provide specific homogeneous sites where monolayer dye adsorption occurs. The results of XRD and FTIR analyses of LDH before and after the dye adsorption demonstrated that the adsorption mechanisms were ion exchange and coulombic attraction.

Keywords: Adsorbent, Adsorption, Batch, Carbon, Concentration, Coprecipitation, Dye Adsorption, Dyes, Equilibrium, Freundlich, FTIR, Intercalation, Ion Exchange, Ion-Exchange, Ions, Kinetics, Langmuir, Layered Double Hydroxides, pH, Reactive Brilliant Orange X-Gn, Removal, Selenium, Sludge, Solutions, Sorption, Temperature, Waste-Water, X-Ray Diffraction

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? Holtge, S. and Kreuzig, R. (2007), Laboratory testing of sulfamethoxazole and its metabolite acetyl-sulfamethoxazole in soil. *Clean-Soil Air Water*, **35** (1), 104-110.

Full Text: [2007\Cle-Soi Air Wat35, 104.pdf](2007/Cle-Soi%20Air%20Wat35,%20104.pdf)

Abstract: The fate of C-14-labeled sulfamethoxazole and ace tyl-sulfamethoxazole in soil has been investigated with special respect to possible entry routes of human and veterinary pharmaceuticals into soil environments. Therefore, the stability of the test substances was monitored first in sewage sludge and bovine manure. Within the incubation period of 72 d, 1% at maximum of the initially applied radiotracers was released as C-14-carbon dioxide while 22 75% was transferred to non-extractable residues that were operationally defined by the ethyl acetate extraction. Test-sludge and test-manure samples with defined aged residues were prepared and, supplementary to standard solutions, applied to silty-clay soil samples. After standard and test-sludge application, soil/water distribution coefficients of Kd < 5 L kg-1 were determined revealing both test substances as potential leachers. In contrast, the sorption of sulfamethoxazole increased after test-manure application (K-d > 10 L kg-1). In the long-term degradability tests, the metabolic fate of both test substances was characterized by the continuous decrease of extractable residues, resulting in disappearance times of DT90 <= 33 d, and the increase of non-extractable residues. Mineralization reached 11% at maximum. Thereby, the dynamics of these processes differed whether the test substances were applied via standard, test-sludge or test-manure application. This fact emphasized the relevance of entry route specific matrix effects on the fate of both test substances in soil.

Keywords: Acetyl-Sulfamethoxazole, Bovine Manure, Clay Soil, Degradation, Environment, Fate, Metabolic Fate, Pharmaceuticals, Sewage Sludge, Sewage-Treatment Plants, Soil, Sorption, Sorption Behavior, Sulfamethoxazole, Sulfonamides, Test-Plot, Veterinary Antibiotics, Waste-Water

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Full Text: [2007\Cle-Soi Air Wat35, 143.pdf](2007/Cle-Soi%20Air%20Wat35,%20143.pdf)

Abstract: Batch biosorption experiments were carried out for the removal of Congo red from aqueous solution using native and pretreated mycelial pellets/biomass of Trametes versicolor. The effect of process parameters such as contact time, dye concentration, and pH on the extent of Congo red biosorption has been investigated. Higher dye concentrations resulted in lower biosorption. Increases in biomass dosage led to increases in the levels of biosorption. Biosorption kinetics and equilibrium data are essential basic requirements to develop an effective and accurate design model for the removal of the dye. A kinetic study showed that the biosorption of the dye on fungal biomass was a gradual process. Pseudo-first-order, pseudo-second-order, and Bangham’s model were used to fit the experimental data. The results of the kinetic studies showed that the second-order kinetic model fitted well for the present experimental data. Equilibrium isotherms were analyzed by Langmuir, Freundlich, Dubnin-Radushkevich, and Temkin isotherms. The biosorption equilibrium data obeyed the Langmuir and Temkin isotherms well. Acidic pH was favorable for the biosorption of the dye. Studies on the pH effect and desorption show that chemisorption seems to play a major role in the biosorption process. Among the native and pretreated biomass studied, autoclaved biomass showed a better biosorption capacity.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Aqueous-Solution, Biomass, Biosorption, Biosorption, Capacity, Chemisorption, Concentration, Concentrations, Congo Red, Corynebacterium-Glutamicum, Decolorization, Design, Desorption, Dosage, Dye, Equilibrium, Freundlich, Fungal Biomass, Fungus, Isothermal, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetic Study, Kinetics, Langmuir, Levels, Microorganisms, Model, Modified, Mycelial Biomass, Parameters, pH, Pretreatment, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Requirements, Role, Sorption, Trametes Versicolor, Waste-Water, Water

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Full Text: [2007\Cle-Soi Air Wat35, 172.pdf](2007/Cle-Soi%20Air%20Wat35,%20172.pdf)

Abstract: The fate of the OP nerve agent isopropyl methylphosphonofluoridate (sarin) on granular activated and metal-impregnated activated carbons that are used in gas-mask filters was investigated by means of P-31 magic-angle-spinning (MAS) NMR spectroscopy. The results show that most of the adsorbed sarin on extensively dried carbons decomposes with a half-life of 5-12 days. A MAS-NMR signal of the degradation product isopropyl methylphosphonic acid (IMPA) appears in the spectra of sarin on non-impregnated carbons. The IMPA signal is not visible in the spectra from metal-impregnated carbons, probably due to strong binding of the acid molecule to paramagnetic Cr3+ and Cu2+ ions. Exposure of BPL and ASC carbons to air of 53% relative humidity shortens the degradation time by approximately an order of magnitude. Wetting shortens the half-life of sarin on BPL carbon to approximately 2 hours.

Keywords: Activated Carbon, Adsorption, Adsorption, Angle-Spinning NMR, Decomposition, Degradation, Impregnated Carbon, Impregnated Carbons, Nerve Agents, NMR, Sulfur Mustard, Toxicity

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Full Text: [2007\Cle-Soi Air Wat35, 193.pdf](2007/Cle-Soi%20Air%20Wat35,%20193.pdf)

Abstract: The bioremediation of soil contaminated with the herbicide 2,4-dichlorophenoxy acetic acid has been studied applying the bacterium Ralstonia eutropha. The effects of temperature, pH, and moisture content of soils on the rate of degradation of this herbicide have been investigated. The Taguchi experimental design method was applied to determine the relative impacts of the pertinent system variables. According to this approach, four series of experiments were performed under various operating conditions. In all four series the herbicide was degraded efficiently, however, the highest rate was observed at a temperature of 35°C, pH 6, and at 80% moisture content of the soil. A kinetic model for the biodegradation of the herbicide was developed for this particular conditions based on the Monod type growth equation and autocatalytic behavior of the decomposition reaction. A close correlation has been observed between the experimental data and those predicted from the model. The degree of agreement was between 85-95%.

Keywords: Bacteria, Biodegradation, Bioremediation, Columns, Degradation, Herbicides, Kinetics, Microorganisms, Modeling, Remediation, Soil, Soils, Sorption

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Full Text: [2007\Cle-Soi Air Wat35, 362.pdf](2007/Cle-Soi%20Air%20Wat35,%20362.pdf)

Abstract: The removal of Cu, Zn, and Cd from a sandy soil was investigated using iron filings as an adsorbent, and subsequently recovering the iron filings by magnetic separation. The best treatment was obtained by using 5% iron filings and 3 h contact time between iron filings and the soil. The metal removal efficiency from soil extracts was evaluated, using MetPIATE (TM), a toxicity test that is specific for heavy metals, and the 48 h Ceriodaphnia dubia acute toxicity test. The toxicity removal was generally higher than 95% for Cu after a single treatment. With regard to Zn-spiked soil, the toxicity removal was 96.1%, 70.0%, and 49.6% after single treatment at the input concentration of 200 mg/kg, 400 mg/kg, and 800 mg Zn2+/kg soil, respectively. After two or three successive treatments, more than 90% of the toxicity was removed for 400 mg/kg and 800 mg/kg Zn-spiked soils. In the case of Cd-spiked soil, a single treatment removed 51.1% of the toxicity from 200 mg/kg Cd-spiked soil extracts while more than 90% of the toxicity was removed after two or three treatments. Chemical analysis and a mass balance study were also carried out to investigate the Cu distribution in the soil fractions. The results indicate that, before treatment, a large portion of Cu was immobilized in the soil matrix. Following magnetic separation, Cu was removed from both the soil matrix and extracts and was indeed adsorbed and concentrated on the iron filings. The retrieval of Cu by iron filings was further examined by energy dispersive X-ray spectroscopy (EDS).

Keywords: Adsorption, Bioavailability, Heavy Metal, Heavy Metals, Immobilization, In-Situ Remediation, Iron, Iron Filings, Lead, Magnetic Separation, Metal Removal, Phytoremediation, Smelter-Contaminated Soil, Soil, Soils, Synthetic Zeolites, Toxicity, Toxicity Removal, Treatment

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Full Text: [2007\Cle-Soi Air Wat35, 495.pdf](2007/Cle-Soi%20Air%20Wat35,%20495.pdf)

Abstract: As a consequence of human pharmaceuticals being found in surface, ground and drinking water, there is growing interest in their fate and behavior in soil environments. Therefore, laboratory tests on the degradation of the C-14-labeled model substances ibuprofen and diazepam were performed in two different soils. Based on the results of the laboratory-batch experiments, metabolic fate models have been devised using model discriminating techniques based on likelihood tests for nested models. Although, the data for ibuprofen fit well into the frame of linear compartment theory, the diazepam data show pronounced nonlinearities. The kinetic behavior of both pharmaceuticals in soil is characterized by the participation of microbial processes in the formation of non-extractable residues and by low degradation rates out of the non-extractable fractions. An accumulation of those non-extractable residues may occur in soils under simulated multiple contaminations.

Keywords: Biodegradation, Degradation, Drugs, Human Pharmaceuticals, Kinetic Models, Metabolic Fate, Modeling, Nonlinear Kinetics, Soil, Soils, Sorption, Waste-Water, Water

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Full Text: [2007\Cle-Soi Air Wat35, 488.pdf](2007/Cle-Soi%20Air%20Wat35,%20488.pdf)

Abstract: The fate of flubendazole and fenbendazole in manure and manured soils was investigated under laboratory and field conditions. In pig manure, both C-14-labeled benzimidazoles disappeared slowly. After a 102 day incubation period, extractable fractions contained 72% flubendazole or 80% fenbendazole of the radioactivity initially applied. The latter was accompanied by 4% of the corresponding metabolite fenbendazole-sulfoxide. Non-extractable residues amounted to 24 and 13%, respectively. On this basis, test manures with 7 day aged benzimidazole residues were prepared. Mobility tendencies differed for clay and sand soils as well as for standard and test-manure application. Regarding K-oc > 1100 L/kg, however, criteria for potential leachers were not fulfilled. The metabolic fate of flubendazole was predominated by the occurrence of the parent compound while fenbendazole was accompanied by fenbendazole-sulfoxide. In clay soil samples after standard application, DT50 values were 174 and 54 days, respectively. Mineralization and formation of non-extractable residues were of minor relevance. For fenbendazole, these processes were intensified after test-manure application. Due to enhanced formation of fenbendazole-sulfoxide, fenbendazolesulfone, and non-extractable residues, DT50 thus dropped to 9 days. Similar mobility and degradability tendencies were also found under field conditions. In the sand soil, however, the metabolic dynamics decelerated due to its lower microbial activity.

Keywords: Benzimidazoles, Clay Soil, Degradation, Degradation, Liquid Manure, Metabolic Fate, Mobility, Pig Manure, Residues, Runoff, Soil, Soils, Sorption, Sulfonamide, Tandem Mass-Spectrometry, Test-Plot, Transport, Veterinary Antibiotics

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Full Text: [2007\Cle-Soi Air Wat35, 601.pdf](2007/Cle-Soi%20Air%20Wat35,%20601.pdf)

Abstract: The batch removal of Cu(II) ions from aqueous solution using low-cost adsorbents such as walnut (WNS) (Juglans regia), hazelnut (HNS) (Corylus avellana), and almond (AS) (Prunus dulcis) shell under different experimental conditions was investigated in this study. The main parameters influencing Cu(II) ion sorption on WNS, HNS, and AS were: initial metal ion concentration, amount of adsorbent, contact time, and the pH value of the solution. The influences of initial Cu(II) ion concentration (0.005-0.05 mmol/mL), pH (2 - 9), contact time (10 - 240 min), and adsorbent amount (0.1 - 1.0 g) have been reported. WNS presented the highest adsorption capacities for the cu(h) ion. each of wns, hns, and as as sorbents for the removal of Cu(II) ions showed that the sorption process was pH dependent. the greatest increase in the rate of adsorption of metal ion on the shells was observed for ph changes from 5.5 - 7.0. For WNS, HNS, and AS, the optimum pH value was 6 and the equilibrium time was 120 min. The metal ion sorption obeyed both the Langmuir and Freundlich isotherms. The sorption process conformed to the Langmuir isotherm with maximum Cu(II) ion sorption capacities of 6.74, 6.65, and 3.62 mg/g for WNS, HNS, and AS, respectively. The experimental results demonstrated that chelation and ion exchange is one of the major adsorption mechanisms for binding metal ions to the sorbents. The percentage removal Cu(II) ion was maximum at 10-3 mol/L solution concentration and initial pH of 6.0 (80.3, 75.6, and 75.0% by WNS, HNS, and AS, respectively).

Keywords: Adsorption, Batch Mode, Walnut Shell, Hazlenut Shell, Almond Shell, Copper, Low Cost Adsorbent, Heavy-Metal Ions, Sawdust Adsorption, Activated Carbon, By-Products, Biosorption, Sorption, Equilibrium, Adsorbents, Residues, Biomass

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Full Text: [2007\Cle-Soi Air Wat35, 607.pdf](2007/Cle-Soi%20Air%20Wat35,%20607.pdf)

Abstract: A method for the determination of Fe(III), Pb(II), and Ni(II) by flame atomic absorption spectrometry (FAAS) after preconcentrating on a column containing *Aspergillus niger* loaded on silica gel 60 (Biosorbent) is described. The effect of experimental parameters such as pH, flow rate of sample solution, and volume of sample solution were investigated on the recovery of the analytes. The effect of interfering ions on the recovery of the analytes has also been investigated. Recoveries of Fe(III), Pb(II), and Ni(II) were (98±2), (98±3), (99±2)% at the 95% confidence level, respectively. For the analytes, 50-fold preconcentration was obtained. The analytical detection limits for Fe(III), Pb(II), and Ni(II) were 1.7, 5.2, and 1.6 ng/mL, respectively. The proposed method was applied to the determination of trace metals in various water and vegetable samples. The analytes have been determined with relative error lower than 7%.

Keywords: Amberlite XAD-4, *Aspergillus niger*, Atomic Absorption Spectrometry, Atomic-Absorption-Spectrometry, Biosorbent, Biosorption, Biosorption, Chromium(III), Cobalt(II), Copper(II), Determination, Extraction, FAAS, Nickel, Preconcentration, Saccharomyces-Carlsbergensis, Separation, Preconcentration, Silica-Gel-60, Trace Metal, Water, Water Analysis

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Full Text: [2007\Cle-Soi Air Wat35, 612.pdf](2007/Cle-Soi%20Air%20Wat35,%20612.pdf)

Abstract: Calix[n]arenes having different internal cavities sizes were synthesized. The ability of these sorbents to extract carcinogenic direct azo dyes from water by a solid-liquid extraction process was studied and compared to results obtained with the unsubstituted calix[n]arene. The carboxylic acid derivative of calix[6,8]arene showed the highest affinity towards the azo dyes. The sorption capacity of dyes on the calix[n]arenes was dependent on the presence of sulfonate groups on the anionic dyes. The optimum pH value for dye sorption was observed at pH 3.5 to 8.5 for all calixarene derivatives. The proposed sorption mechanism involves several kinds of interactions: electrostatic repulsion between carboxylic acid groups of calix[n]arenes and sulfonate groups of azo dyes, hydrogen bonding and formation of an inclusion complex through host-guest interactions.

Keywords: Activated Carbon, Adsorption, Beta-Cyclodextrin, Calix(N)Arenes, Calixarene, Calixarenes, Carcinogens, Congo-Red, Direct Azo Dye, Reactive Dyes, Removal, Solid-Liquid Phase, Solid-Phase Extraction, Sorbents, Sorption, Sorption, Waste-Water, Water

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Full Text: [2008\Cle-Soi Air Wat36, 45.pdf](2008/Cle-Soi%20Air%20Wat36,%2045.pdf)

Abstract: The nutrient rich fractions in wastewater originating from human urine and can be recovered as solids for more efficient recycling, facilitated handling and storage for reuse in agriculture. Freezing and thawing can be used to concentrate the urine nutrients. Phosphorus (P) and nitrogen (N) can be precipitated as struvite [(Mg,Ca)(K,NH4)(PO4) center dot 6H(2)O] by adding MgO and additional nitrogen can be recovered by using zeolites. The zeolite in this study was pretreated in two ways: (i) washed and (II) washed and thermally treated. The P recovery was high (> 97%) and the N recovery was ca. 50 to 60%. There was no significant difference in the nitrogen recovery among the different pretreated zeolites or between the pretreated and the untreated zeolite. Freezing had a positive effect on the nutrient concentration. The acute toxicity of the supernatants was tested on Daphnia magna to evaluate the possibilities of discharging the remaining supernatants to a recipient. The supernatants from the frozen treatments and from the unfrozen and washed zeolites were much less toxic than those of the original urine. The minerals acted as slow-release fertilizers in climate chamber tests on spring wheat.

Keywords: Adsorption, Ammonia Emissions, Behavior, Common Wheat, Crystallization, Freezing-Thawing, Nitrogen, Phosphate, Removal, Salinity, Source-Separated Urine, Struvite, Toxicity, Urine, Wastewater, Zeolite, Zeolite

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Full Text: [2008\Cle-Soi Air Wat36, 180.pdf](2008/Cle-Soi%20Air%20Wat36,%20180.pdf)

Abstract: In this study, a new strain of microorganism Shewanella putrefaciens was used for biofiltration of a pyridine laden air stream in a corn-cob packed biotrickling filter. In the biotrickling filter tested with S. putrefaciens, the maximum removal of pyridine is determined to be 100% at less than the average inlet concentration of 0.653 g m(-3) and more than 93% at a higher average inlet concentration of 1.748 g m-(3) (phase VIII) with an empty bed residence time (EBRT) of 106 s. However, when the biotrickling filter was operated at a low EBRT of 53 s and almost the same average inlet concentration of 1.752 g m(-3) (phase VII), the removal level attained was not greater than 85%. The maximum elimination capacity (EC) of the biotrickling filter was 102.34 g m(-3) h(-1) at an inlet pyridine load of 119.62 g m(-3) h(-1) with an EBRT of 53 s in phase VII. The maximum deviation of the EC. from the 100% conversion line varied from 0.257 to 10.166% when going from phase I to VIII. Kinetic analysis showed that the maximum removal rate, r(max), and saturation constant, K-s, values for pyridine were calculated as 0.24 g m(-3) h(-1) and 6.44 g m(-3), respectively, with a correlation coefficient, R-2, of 0.9939 and a standard deviation of error of 23.94%. The information contained herein indicates that the corn-cob packed biotrickling filter inoculated by S. putrefaciens should provide excellent performance in the removal of gaseous pyridine.

Keywords: Adsorption, Agricultural Waste Materials, Air-Pollution Control, Aqueous-Solution, Bacteria, Biodegradation, Biotrickling Filter, Degradation, Derivatives, Environment, Immobilized Pimelobacter sp, Kinetic, Kinetics, Pyridine, Removal, Shewanella Putrefaciens

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Full Text: [2008\Cle-Soi Air Wat36, 201.pdf](2008/Cle-Soi%20Air%20Wat36,%20201.pdf)

Abstract: Critics charge that agricultural managers routinely overdose their fields with chemical N and P to levels that exceed the soil’s capacity to adsorb these materials, creating a situation that promotes hypoxia in Iowa lakes. Soil colloidal particles, capable of forming complexes with inorganic and organic N and P, control the equilibrium concentration of dissolved nutrients in lake waters. However, it should be realized that adsorbed nutrients also exhibit strong influences on the potential of sediments to undergo dispersion, a condition that may directly impact nutrient bioavailability. Thus, direct links may exist between adsorbed nutrient compositions and flocculation/dispersion properties of lake colloidal material. This paper presents work involving four Iowa lakes undertaken to determine relationships between ion composition and the dispersion potential of sediments. Surface waters and lake-bottom grab samples were collected at three separate collection times from August to October. Samples were characterized for dissolved and adsorbed cations. Dispersion potential of each water sample was characterized by relating the total suspended solids concentration to the absorbance at 560 rim. It was found that sediment dispersion was easily predictable by a simple yet significant linear correlation with the concentration ratio of Na (CRNa = [Na]/[Ca](-1/2)) in solution. This correlation was further improved by including Na concentration, CRK, electrical conductivity, temperature, and solution P concentrations into the model. Nonlinear inter-dependences were found between TSS and cation exchange capacity (CEC), and adsorbed Na, K, P, and heavy metals. Our analysis suggests that solution/solid phase constituents influenced the dispersion behavior of sediments through subtle manipulations of the excess surface charge.

Keywords: Adsorption, Atrazine, Bioavailibility, Colloidal Dispersion, Equilibrium, Eutrophication, Heavy Metals, Ion Exchange, Nitrogen, Nonlinear, Smectite, Soil, Water

? Wasewar, K.L., Atif, M., Prasad, B. and Mishra, I.M. (2008), Adsorption of zinc using tea factory waste: Kinetics, equilibrium and thermodynamics. *Clean-Soil Air Water*, **36** (3), 320-329.

Full Text: [2008\Cle-Soi Air Wat36, 320.pdf](2008/Cle-Soi%20Air%20Wat36,%20320.pdf)

Abstract: In India, the annual production of tea is ca. 857,000 tonnes, which is 27.4% of the total world production. The amount of tea factory waste (TFW) produced per annum after processing is ca. 190,400 tonnes. TFW can be used as a low cost adsorbent for the removal of toxic metals from the aqueous phase. An investigation was carried out to study the feasibility of the use of TFW as an adsorbent for the removal of the heavy metal, zinc. Equilibrium, kinetic and thermodynamic studies were reported. The straight line plot of Iog (q(c) - q) versus time for the adsorption of zinc shows the validity of the Lagergren equation. The various steps involved in adsorbate transport from the solution to the surface of the adsorbent particles were dealt with by using a Weber-Morris plot, q, versus t(0.5) for the TFW. The rate controlling parameters, kid, and k(id.2), were determined and it was found that the macro-pore diffusion rate was much larger than micro-pore diffusion rate. A batch sorption model, which assumes the pseudo-second-order mechanism, was used to predict the rate constant of sorption, the equilibrium sorption capacity and the initial sorption rate with the effect of initial zinc(II) ion concentration. Equilibrium data obtained from the experiments were analyzed with various isotherms, i.e., Freundlich, Langmuir, Redlich-Peterson and Tempkin. The adsorption equilibrium was reached in 30 min and the adsorption data fitted well to all models. The maximum adsorption capacity of TFW for zinc(II) ions was determined to be 14.2 mg/g. The capacity of adsorption on Zn(II) increased with increasing temperatures and pH. The maximum uptake level of zinc was observed at pH of 4.2. The various thermodynamic parameters, i.e., ΔG°, ΔH° and ΔS°, were estimated. The thermodynamics of the zinc ion/TFW system indicated a spontaneous, endothermic and random nature of the process. The results showed that the TFW, which has low economical value, is a suitable adsorbent for the removal of zinc(II) ions from aqueous solutions.

Keywords: Adsorbent, Adsorption, Adsorption Equilibrium, Aqueous Solutions, Aqueous-Solutions, Basic Dye, Biosorbent, Capacity, Chromium(VI), Copper(II) Ions, Cost, Diffusion, Equilibrium, Error Analysis, Experiments, Fixed-Bed, Freundlich, Heavy Metal, India, Investigation, Isotherms, Kinetic, Kinetics, Langmuir, Mechanism, Metal, Metals, Model, Models, Parameters, Particles, pH, Removal, Solution, Sorption, Tea Factory Waste (TFW), Thermodynamic Parameters, Thermodynamics, Transport, Validity, Zinc

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Full Text: [2008\Cle-Soi Air Wat36, 292.pdf](2008/Cle-Soi%20Air%20Wat36,%20292.pdf)

Abstract: In this work, 8-hydroxyquinoline is used as the active sites in cross-linked chitosan beads with epichlorchydrin (CT-8HQ). The CT-8HQ material was shaped in bead form and used for heavy metal removal from aqueous solution. The study was carried out at pH 5.0 with both batch and column methods and the maximum adsorption capacity of metal ions by the CT-8HQ was attained in 4 h in the batch experiment. The adsorption capacity order was: Cu2+ > Ni2+ > Zn2+ for both mono- and multi-component systems with batch conditions. From breakthrough curves with column conditions, the adsorption capacity followed the order Cu2+ > Zn2+ > Ni2+ for both monoand multi-component systems. The CT-8HQ beads maintained good metal adsorption capacity for all five cycles with absorbent restoration achieved with the use of 1.0 mol L HCl solution, with 90% regeneration.

Keywords: 8-Hydroxyquinoline, 8-Hydroxyquinoline, Adsorption, Breakthrough Curve, Chelating Resins, Chitosan Beads, Chitosan Derivatives, Column, Copper, Effluent Wastewater, Heavy-Metals, Immobilized 8-Quinolinol, Lead(II), Mannich Reaction, Metal Adsorption, Metal Ions, Metal Removal, Nickel, Removal, Zinc, Zn(II)

? Vijayaraghavan, K. (2008), Biosorption of nickel from synthetic and electroplating industrial solutions using a green marine *Algae Ulva* reticulata. *Clean-Soil Air Water*, **36** (3), 299-305.

Full Text: [2008\Cle-Soi Air Wat36, 299.pdf](2008/Cle-Soi%20Air%20Wat36,%20299.pdf)

Abstract: The present work investigated the biosorption of nickel from synthetic and electroplating industrial effluents using a green marine algae Ulva reticulato. Preliminary batch results imply that pH 4.5 was optimum for nickel uptake and the isotherm experiments conducted at this pH condition indicated that U. reticulata can biosorb 62.3 mg g-1 nickel ions from synthetic solutions, according to the Langmuir model. Desorption was effective and practical using 0.1 M CaCl2, (pH 2.5, HCl) and the biomass was regenerated and reused for three cycles. Continuous biosorption experiments were performed in an upflow packed column (2 cm LD and 35 cm height). Among the two electroplating effluents used, effluent-1 is characterized by excess co-ions and high nickel ion content. This influenced the column nickel uptake with U. reticulata exhibiting 52.1 mg g-1 in the case of effluent-1 compared to 56.5 mg g-1 in the case of synthetic solution. On the other hand U. reticulata performed well in effluent-2 with uptakes of 53.3 and 54.3 mg g-1 for effluent-2 and synthetic solution, 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 simulate breakthrough curves with high correlation coefficients.

Keywords: Biosorption, Wastewater Treatment, Environmental Biotechnology, Nickel, Ulva Reticulate, Heavy-Metals, Aqueous-Solutions, Removal, Biosorbent, Recovery, Chromium, Biomass, Ions, Lead, Equilibrium

? Taqvi, S.I.H., Hasany, S.M. and Bhanger, M.I. (2008), Sorptive potential of beach sand to remove Ni(II) ions: An equilibrium isotherm study. *Clean-Soil Air Water*, **36** (4), 366-372.

Full Text: [2008\Cle-Soi Air Wat36, 366.pdf](2008/Cle-Soi%20Air%20Wat36,%20366.pdf)

Abstract: The potential to remove Ni(II) ions from aqueous solutions using sea beach sand, a carbonate-quartz mineral, was thoroughly investigated. The effects of relevant parameters such as solution pH, adsorbent dose, metal ions concentration, and temperature on Ni(II) sorption onto beach sand were examined. The sorption data followed the Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherms. The adsorption was endothermic in nature at ambient temperature and the computation of the parameters, Delta H, Delta S and Delta G indicated the interactions between sorbate and sorbent to be thermodynamically favorable. Equilibrium was achieved very quickly within 30 min of shaking. A pseudo-first order Lagergren equation was used to test the adsorption kinetics. Other kinetic models, e.g., the Morris-Weber and Reichenberg equations, were used to calculate the rate constant of intraparticle diffusion and the fate of the diffusion process, respectively. The influence of some of the common cations and anions were also a subject of this study.

Keywords: Adsorption, Aqueous-Solutions, Beach Sand, Cr(III), Equilibrium, Gases, Haro River Sand, Isotherms, Kinetic Models, Kinetics, Langmuir, Metal Ions, Natural Bentonite, Ni(II) Ions, Sorbent, Sorption, Sorption Isotherms, Thermodynamics, Zeolite

? Bedoui, A., Sin, K. and Bensalah, N. (2008), Treatment of refractory organics contained in actual agro-industrial wastewaters by UV/H2O2. *Clean-Soil Air Water*, **36** (4), 373-379.

Full Text: [2008\Cle-Soi Air Wat36, 373.pdf](2008/Cle-Soi%20Air%20Wat36,%20373.pdf)

Abstract: In this work, the treatment of actual agro-industrial wastewaters (IWW) by a UV/H2O2 process has been investigated. The aqueous wastes were received from industrial olive oil mills and then treated by laboratory scale physicochemical methods, i.e., coagulation using ferrous and aluminum sulfate, decantation, filtration and adsorption on activated carbon. These wastes are brown colored effluents and have a residual chemical oxygen demand (COD) in the range of 1800 to 3500 mgO2 L-1, which cannot be further eliminated with physicochemical processes. The UV/H2O2 treatments were carried out under monochromatic irradiation at 254 nm using a thermostated reactor equipped with a mercury vapor lamp located in an axial position. The effects of initial H2O2 concentration, initial COD, pH and temperature have been studied in order to determine the optimum conditions for maximum color and COD removals. The experimental results reveal the suitability of the UV/H2O2 process for both removal of high levels of COD and effectively decolorizing the solution. In particular, 95% of color removal and 90% of COD removal were obtained under conditions of pH = 5 and 32°C using 2.75 g H2O2 g-1 COD L-1 during 6 h of UV-irradiation. The treatment is unaffected by pH over the range 2 to 9. In addition, the COD removal is improved by increasing the temperature, whereas the color removal has not been affected by this parameter. The results show that the hydroxyl radicals generated from the catalytic decomposition of H2O2 by UV-irradiation of the solution could be successfully used to mineralize the organics contained in IWW. The mineralization of the organics seems to occur in three main sequential steps: the first is the rapid decomposition of tannins leading to aromatic compounds, which are confirmed by the decolorization of the IWW; the second step corresponds to the oxidation of aromatics leading to aliphatic intermediates, which occurs by the cleavage of an aromatic ring, and is established by the removal of aromatics, and the final step is the slow oxidation of the aliphatic intermediates, which is measured by the COD removal.

Keywords: Activated Carbon, Adsorption, Advanced Oxidation Processes, COD Removal, Color, Combination, Components, Degradation, Fentons Reagent, H2O2, UV, Hydroxyl Radicals, Mill Waste-Water, Olive, Olive Oil, Ozonation, Treatment, UV, H2O2 Process, Wastewater Treatment

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Full Text: [2008\Cle-Soi Air Wat36, 387.pdf](2008/Cle-Soi%20Air%20Wat36,%20387.pdf)

Abstract: The effect of varying parameters such as dye concentration, adsorbent dose, pH and temperature on the adsorption capacity of Pleurotus ostreatus is investigated. The commonly available white rot fungus Pleurotus ostreatus is investigated as a viable biomaterial for the biological treatment of synthetic basic methylene blue effluents. The results obtained from the batch experiments reveal the ability of the fungus to remove methylene blue. The performance is dependent on the dye concentration, pH, and fungal biomass. The equilibrium and kinetics of adsorption are investigated and the Langmuir equation is used to fit the equilibrium isotherm. The adsorption isotherm of methylene blue follows only the Langmuir model with a correlation coefficient of ca. 0.96-0.99. The maximum adsorption capacity is ca. 70 mg of dye per g of dry fungus at pH 11, 70 mg L-1 dye, and 0.1 g L-1 fungus concentration, respectively. This study demonstrates that the fungus could be used as an effective biosorbent for the treatment of dye-containing wastewater streams.

Keywords: Activated Carbon, Adsorption, Adsorption, Biosorption, Copper, Dyes, Equilibrium, Heavy-Metals, Kinetics, Langmuir, Mechanism, Methylene Blue, Pleurotus Ostreatus (Jacq.) P.Kumm., Removal, Sorption, Treatment, Wastewater

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Full Text: [2008\Cle-Soi Air Wat36, 798.pdf](2008/Cle-Soi%20Air%20Wat36,%20798.pdf)

Abstract: Activated carbons prepared from sunflower seed hull have been used as adsorbents for the removal of acid blue 15 (AB-15) from aqueous solution. Batch adsorption techniques were performed to evaluate the influences of various experimental parameters, e.g., temperature, adsorbent dosage, pH, initial dye concentration and contact time on the adsorption process. The optimum conditions for AB-15 removal were found to be pH = 3, adsorbent dosage = 3 g/L and equilibrium time = 4 h at 30°C. The adsorption of AB-15 onto the adsorbent was found to increase with increasing dosage. It was found from experimental results that the Langmuir isotherm fits the data better than the Freundlich and Terrikin isotherms. The maximum adsorption capacity, Q(m) (at 30°C) was calculated for SF1, SF2, and SF3 as 75, 125 and 110 mg g-1 of adsorbent, respectively. It was found that the adsorption follows pseudo-second order kinetics. The thermodynamic parameters such as ΔG°, ΔH°, and ΔS° were also evaluated. The activated carbons prepared were characterized by FT-IR, SEM and BET analysis.

Keywords: Acid Blue 15, Acid Dyes, Activated Carbon, Adsorbents, Adsorption, Aqueous-Solution, Equilibrium, Hull, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Methylene-Blue, Pseudo-Second Order, Rice-Husk, Sawdust, Sorption, Sunflower Seed Hull, Waste

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Full Text: [2008\Cle-Soi Air Wat36, 879.pdf](2008/Cle-Soi%20Air%20Wat36,%20879.pdf)

Abstract: Bokbunja (wild raspberry) seed waste from the Bokbunja wine industry is a serious environmental problem due to the increasing popularity of Bokbunja wines in recent years. In the present study, Bokbunja seeds were carbonized and used as an adsorbent for the removal of Procion Red MX-5B. A batch of carbon was further treated with n-hexane to remove excess seed oil and used separately as an adsorbent for comparison. There was a slight variation in the adsorption capacities of n-hexane untreated (HUTC) and n-hexane treated carbon (HTC). The adsorption capacities predicted by the Langmuir isotherm were 29.37 and 30.65 mg/g for HUTC and HTC, respectively. The adsorption was found to be dependant on initial pH, contact time and initial dye concentration. The dye removal rates were higher at pH 2, while equilibrium time was achieved at 120 min. Kinetic studies showed a pseudo-first-order rate of adsorption. The results show that Bokbunja carbon could be used as a potential adsorbent for dye removal from wastewaters.

Keywords: Activated Carbon, Adsorption, Adsorption Performance, Bokbunja Seeds, Carbon, Congo Red, Dyes, Equilibrium, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Metal-Ions, Methylene-Blue, Mycelial Biomass, Phase, Procion Red MX-5B, Removal, Sorption, Wastewater, Wine, Wine Industry Waste, Wood-Rotting Fungus

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Full Text: [2008\Cle-Soi Air Wat36, 900.pdf](2008/Cle-Soi%20Air%20Wat36,%20900.pdf)

Abstract: The biodegradable synthetic polymer poly(E-caprolactone) was investigated as a substrate for denitrification. This substrate may also act as an adsorbent for two pesticides, i.e., atrazine and simazine, from water. The equilibrium was studied at 25, 35 and 45°C. The results were correlated using the Langmuir and Freundlich adsorption models. The total capacities of the adsorbent were defined from experimental data for atrazine (10.98 mg g-1) and simazine (27.54 mg g-1). The effect of temperature on the model constants and the thermodynamics of adsorption were investigated. The evaluation of the development of adsorption was achieved by assuming a pseudo-second order chemical reaction.

Keywords: 2,4-D, 2,4-Dichlorophenoxy Acetic-Acid, Activated Carbon, Adsorption, Atrazine, Equilibrium, Equilibrium, Herbicide, Kinetics, Langmuir, Nanofiltration, Pesticides, Poly(Epsilon-Caprolactone), Pseudo-Second Order, Removal, Simazine, Sorption, Thermodynamics, Water

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Full Text: [2008\Cle-Soi Air Wat36, 937.pdf](2008/Cle-Soi%20Air%20Wat36,%20937.pdf)

Abstract: A significant number of biosorption studies on the removal of heavy metal from aqueous solutions have been conducted worldwide. Nearly all of them have been directed towards optimizing biosorption parameters to obtain the highest removal efficiency while the rest of them are concerned with the biosorption mechanism. Combinations of FTIR, SEM-EDX, TEM as well as classical methods such as titrations are extremely useful in determining the main processes on the surfaces of biosorbents. Diverse functional groups represented by carboxyl, hydroxyl, sulfate and amino groups play significant roles in the biosorption process. Solution pH normally has a large impact on biosorption performance. In brief, ion exchange and complexation can be pointed out as the most prevalent mechanisms for the biosorption of most heavy metals.

Keywords: Biosorption, Heavy Metals, Biosorbent, Mechanism, Industrial Waste-Water, Pretreated Aspergillus-Niger, Tea Factory Waste, Algae Cladophora-Fascicularis, Dried Activated-Sludge, Golden Shower Biomass, Dead Fungal Biomass, Green Coconut Shell, Aqueous-Solutions, Hexavalent Chromium

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Full Text: [2009\Cle-Soi Air Wat37, 45.pdf](2009/Cle-Soi%20Air%20Wat37,%2045.pdf)

Abstract: The present study describes an electrocoagulation process for the removal of iron from drinking water using magnesium as the anode and galvanized iron as the cathode. Experiments were carried out as a function of pH, temperature and current density. The adsorption capacity was evaluated using both the Langmuir and the Freundlich isotherm models. The results show that the maximum removal efficiency of 98.4% was achieved at a current density of 0.06 A dm(-2), at a pH of 6.0. The adsorption of iron was better explained by fitting the Langmuir adsorption isotherm, which suggests a monolayer coverage of adsorbed molecules. The adsorption process followed a second-order kinetics model. Temperature studies showed that adsorption was endothermic and spontaneous in nature.

Keywords: Adsorption, Adsorption Kinetics, Clean Technology, Electrocoagulation, Electrodes, Equilibrium, Filter, Fluoride, Groundwater, India, Industrial Solid-Waste, Iron Removal, Isotherms, Kinetics, Langmuir, Manganese, Phosphate, Removal, Water

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Full Text: [2009\Cle-Soi Air Wat37, 60.pdf](2009/Cle-Soi%20Air%20Wat37,%2060.pdf)

Abstract: Coconut coir pith, a lignocellulosic polymer, is an unwanted by-product of the coir fiber industry. The pith was used as a biosorbent for the removal of Molybdenum(VI) after modification with a cationic surfactant, hexadecyltrimethylammonium bromide. The optimum pH for maximum adsorption of Mo(VI) was found to be 3.0. Langmuir, Freundlich and Dubinin Radushkevich isotherms were used to model the adsorption equilibrium data and the system was seen to follow all three isotherms. The Langmuir adsorption capacity of the biosorbent was found to be 57.5 mg g(-1). Kinetic studies showed that the adsorption generally obeyed a second-order kinetic model. Desorption studies showed that the recovery of Mo(VI) from the spent adsorbent was feasible. The effect of foreign anions on the adsorption of Mo(VI) was also examined.

Keywords: Adsorption, Agricultural Solid-Waste, Anion Sorption, Biosorbent, Biosorption, Carbon, Desorption, Dye, Equilibrium, Gel, Ions, Isotherms, Kinetic, Kinetics, Langmuir, Lignocellulosic Polymer, Molybdate, Molybdenum(VI), Recovery, Removal, Water

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Full Text: [2009\Cle-Soi Air Wat37, 80.pdf](2009/Cle-Soi%20Air%20Wat37,%2080.pdf)

Abstract: The adsorption of Cu(II) ions from aqueous solutions by soda lignin as an absorbent using a batch adsorption system is presented in this paper. The soda lignin used in this study was extracted from black liquor derived from oil palm empty fruit bunches (EFB) using 20% v/v sulfuric acid. The effects of varying experimental parameters such as pH value, adsorbent dosage, different concentrations of Cu(II) ions, and agitation period were investigated. The results revealed that the optimum adsorption of Cu(II) onto soda lignin was recorded at a pH of 5.0 at an adsorbent dosage of 0.5 g soda lignin and an agitation period of 40 min. The adsorption capacities and rates of Cu(II) ions onto soda lignin was evaluated. The Langmuir and Freundlich adsorption models were applied to calculate the isotherm constants. It was found that the adsorption isothermal data could be well interpreted by the Freundlich model. The kinetic experimental data properly correlated with the pseudo-second-order kinetic model, which implies that chemical sorption is the rate-limiting step.

Keywords: Activated Carbon, Adsorption, Adsorption Behavior, Agricultural Waste, Aqueous-Solution, Biosorption, Copper(II) Biosorption, Copper(II), Cu(II), Empty Fruit Bunches, Isotherms, Kinetic, Langmuir, Linked Chitosan Beads, Palm Oil, Removal, Sawdust, Single, Soda Lignin, Sorption, Water

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Full Text: [2009\Cle-Soi Air Wat37, 115.pdf](2009/Cle-Soi%20Air%20Wat37,%20115.pdf)

Abstract: The diffusion and adsorption of two common volatile organic compounds, i.e., methanol and benzene, in different zeolite pellets were studied experimentally by using the single pellet moment technique. The experiments were conducted in a one-sided single pellet adsorption cell at different temperatures in the range between 303 and 343 K. The results showed that both volatile organic tracers were adsorbed reversibly onto all zeolite samples. The overall adsorption equilibrium constants of both volatile organic compounds decreased with increasing temperature. The adsorption of the tracers onto the zeolite samples were found to increase in the order of NaY > clinoptilolite > 4A. In the range between 303 and 343 K, the adsorption constants of benzene range from 10.51 to 5.52 for zeolite 4A, from 11.90 to 6.37 for clinoptilolite and from 20.32 to 9.82 for NaY. The adsorption constants of methanol range from 19.05 to 8.26 for zeolite 4A, from 38.40 to 9.12 for clinoptilolite and from 74.21 to 14.70 for NaY at temperatures between 303 and 333 K. The effective diffusivities for benzene varied from 2.20×10-6 to 13.01×10-6 m2/s, whereas for methanol, they varied from 9.80 . 10 h to 15.60×10-6 m2/s at the temperatures studied.

Keywords: Adsorption, Adsorption Equilibrium Constant, Convective Coefficients, Dynamic-Analysis, Effective Diffusivities, Effective Diffusivity, Equilibria, Equilibrium, Hydrocarbons, Intraparticle Diffusion, Mixtures, Single Pellet Moment Technique, Soil, Sorption, Volatile Organic Compounds, Y-Zeolites, Zeolite, Zeolites

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Full Text: [2009\Cle-Soi Air Wat37, 249.pdf](2009/Cle-Soi%20Air%20Wat37,%20249.pdf)

Abstract: Living lichens are known to accumulate metals across their surface. in this study, the biosorption of cadmium ions (Cd2+) by the lichen Ramalina fraxinea was investigated in aqueous solution in a batch system with respect to pH, contact time, temperature, initial cadmium ion concentration and size of biomass. The adsorption data appear to fit both the Langmuir and Freundlich adsorption models. The maximum adsorption capacity of the lichen R. fraxinea was found to be 7.00 mg/g at pH 6. The kinetic data were analyzed using the pseudo-first-order and pseudo-second-order equations. Kinetic parameters such as rate constants, equilibrium adsorption capacities and correlation coefficients for each kinetic model were calculated and discussed. The adsorption process of cadmium ions onto the R. fraxinea biomass fitted well the pseudo-second-order kinetic model. It appears that R. fraxinea adsorbs cadmium ions moderately compared to some biosorbents.

Keywords: Biosorption, Cadmium, Equilibrium, Fungal, Heavy-Metal Biosorption, Industrial Solutions, Isotherms, Kinetics, Lead, Lichen, Marine-Algae, Nickel, Pseudo Second Order, Removal, Sorption, Waste

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Full Text: [2009\Cle-Soi Air Wat37, 314.pdf](2009/Cle-Soi%20Air%20Wat37,%20314.pdf)

Abstract: This study presents a procedure for preconcentration of Cr(III), Cd(II) and Mn(II) from water and biological samples using Penicillium digitatum immobilized on pumice stone. Optimum conditions such as pH, flow rate were evaluated. The recoveries of Cr(III), Cd(II) and Mn(II) under optimum conditions were found to be 98±2%, 100±2%, and 97±2%, respectively, at a 95% confidence level. Detection limits were 2.0, 1.6 and 1.5 ng/mL for Cr(III), Cd(II) and Mn(II), respectively. The proposed procedure was successfully applied for the determination of chromium, cadmium and manganese in dam water, spring water and fish (Carp) samples. The accuracy was evaluated through the analysis of the certified standard reference fish tissue samples (IAEA-407) and spiked fish and water samples.

Keywords: Aspergillus-Niger, Atomic-Absorption-Spectrometry, Biosorption, Cadmium, Chromium, Copper(II), Determination, Environmental-Samples, Fish Sample, Lead, Online Preconcentration, Penicillium Digitatum, Preconcentration, Pumice Stone, Separation, Solid-Phase Extraction, Sorption, Trace Metals, Water, Zinc(II)

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Full Text: [2009\Cle-Soi Air Wat37, 319.pdf](2009/Cle-Soi%20Air%20Wat37,%20319.pdf)

Abstract: In the present study, response surface methodology (RSM) was employed to investigate the effects of different operating conditions on the removal of hexavalent chromium (Cr(VI)) onto mixed cultures of Pseudomonas aeruginosa and Bacillus subtilis (MCO-PAABS) using biosorption processes. Box-Behnken design (BBD) wits used for optimization of the biosorption process and to evaluate the effects and interactions of the process variables, i.e., biomass concentration, pH, temperature and contact time on the removal of Cr(VI). A synthetic aqueous solution with a Cr(VI) concentration of 10 mg/L, was used in the experimental study its a fixed input variable. The optimum conditions for maximum uptake (1.44 mg/g) of Cr(VI) onto the biosorbent were established as 0.5 g/L biosorbent dosage, pH 2 for the aqueous Solution, 32°C temperature and 23 min contact time.

Keywords: Agricultural Waste, Aqueous-Solutions, Aspergillus-Niger, Bacillus Subtilis, Bacteria, Biosorption, Box-Behnken Design, Box-Behnken Design, Cr(VI), Cr(VI) Biosorption, Fungal Biomass, Heavy-Metal Biosorption, Hexavalent Chromium, Low-Cost Adsorbents, Mixed Cultures, Pseudomonas Aeruginosa, Response Surface Methodology, Rhizopus-Arrhizus

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Full Text: [2009\Cle-Soi Air Wat37, 349.pdf](2009/Cle-Soi%20Air%20Wat37,%20349.pdf)

Abstract: A dynamic method called stepwise frontal analysis (SFA) was Used to derive equilibrium sorption data of copper and aniline on a carboxylated diaminoethane sporopollenin (CDAE-S) solid phase. The derived data wits modeled on the basis of some common adsorption isotherms, and the importance of Scatchard plot analysis in isotherm modeling was emphasized. In light of the applied isotherm models, the role of aminocarboxylic acid functionalities in the sorption of each chemical species was discussed in terms of specific and nonspecific binding.

Keywords: Acid, Adsorption, Adsorption, Behavior, Breakthrough Curve, Copper, Diaminoethane Sporopollenin, Equilibrium, Isotherms, Methylene-Blue, Model, Modeling, Orange, Phase, Removal, Scatchard, Scatchard Plot, Sorption

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Full Text: [2009\Cle-Soi Air Wat37, 392.pdf](2009/Cle-Soi%20Air%20Wat37,%20392.pdf)

Abstract: Hydroxypropyl cellulose has been crosslinked by epichlorohydrin (EPI) and ammonia in sodium hydroxide aqueous Solution. A temperature induced phase separation (TIPS) process was applied to synthesize a microporous crosslinked HPC hydrogel and was confirmed by SEM studies. The cationic HPC hydrogel showed an excellent ability to adsorb anionic dye AO7, and the maximum adsorption capacity at room temperature was found to be 2478 (g/kg) at pH 3.96. Both Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms, and the Langmuir model agreed well with the experimental data (R2 > 0.99). Kinetics of the adsorption were tested and the data agreed well with the pseudo-second-order kinetic model. The strong electrostatic interaction between the quaternary ammonium and dye anions could be the main driving force adsorption. The effects of pH and temperature oil the adsorption of the dye have also been investigated and discussed.

Keywords: Acid Orange-7, Adsorbents, Adsorption, Adsorption, Aqueous-Solutions, Azo Dyes, Beta-Cyclodextrin, Cellulose, Dyes, Hydrogels, Linked Chitosan Beads, Metal-Ions, Microporous Resins, Reactive Dyes, Sorption

? Vijayakumar, G., Dharmendirakumar, M., Renganathan, S., Sivanesan, S., Baskar, G. and Elango, K.P. (2009), Removal of Congo red from aqueous solutions by perlite. *Clean-Soil Air Water*, **37** (4-5), 355-364.

Full Text: [2009\Cle-Soi Air Wat37, 355.pdf](2009/Cle-Soi%20Air%20Wat37,%20355.pdf)

Abstract: The removal of Congo red dye from an aqueous solution using perlite, a volcanic siliceous rock, as a low cost adsorbent was studied. Adsorption experiments were carried out as batch stitches at different adsorbent close, pH, temperature and initial dye concentration. The dye adsorption equilibrium was rapidly attained after 40 min of contact time. The adsorbent was characterized by Fourier Transform Infrared spectroscopy (FTIR), X-ray Diffraction (XRD) and Scanning Electron Microscopy (SEM). Langmuir and Freundlich isotherms were studied for the adsorption data over a concentration ran-e of 20 to 100 mg/L The thermodynamic parameters such as entropy of adsorption (ΔS°), enthalpy of adsorption (ΔH°) and Gibbs free energy of adsorption (ΔG°) were obtained and analyzed. Kinetic stitches showed that the adsorption process obeyed the pseudo first order kinetic model. The dimension less separation factors (RI) showed that perlite could be used to remove Congo red from an aqueous solution.

Keywords: Activated Carbons, Adsorbent, Adsorption Characteristics, Adsorption Isotherm, Congo Red, Dye, Dyes, Dyestuffs, Equilibrium, Kinetics, Kinetics, Mechanism, Methylene-Blue, Minerals, Perlite, Sorption

? Wasewar, K.L., Prasad, B. and Gulipalli, S. (2009), Adsorption of selenium using bagasse fly ash. *Clean-Soil Air Water*, **37** (7), 534-543.

Full Text: [2009\Cle-Soi Air Wat37, 534.pdf](2009/Cle-Soi%20Air%20Wat37,%20534.pdf)

Abstract: The present work involves the study of Se(IV) adsorption onto bagasse fly ash. The adsorbents were coated with a ferric chloride solution for the effective removal of selenium. The physico-chemical characterization of the adsorbent was carried out using standard methods, e.g., proximate analysis, scanning electron microscopy, Fourier transform infrared spectroscopy, thermo-gravimetric analysis and differential thermal analysis. Batch experiments were carried out to determine the effect of various parameters such as adsorbent dose, initial pH, contact time, and temperature on the adsorption process. Results obtained from these studies were analyzed using various kinetic models and isotherms. Se(IV) adsorption onto adsorbent was high at low pH values, and decreased with an increase in initial pH. A temperature study showed that the uptake of Se(IV) was greatest at 293 K, within the temperature range studied. The parameters of pseudo first order, pseudo second order, and Weber-Morris intra-particle kinetic models were determined. Equilibrium isotherms were analyzed using Langmuir, Freundlich, and Temkin isotherms. Error analyses were also carried out using hybrid fractional error function and Marquardt’s percent standard deviation.

Keywords: Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Analyses, Analysis, Bagasse, Bagasse Fly Ash, Bagasse Fly Ash (BFA), Characterization, Chloride, Coated, Electron Microscopy, Equilibrium, Equilibrium Isotherms, Error, Error Analysis, Experiments, Ferric Chloride, First, First Order, Fly Ash, Freundlich, Function, Hybrid, Infrared Spectroscopy, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Methods, Models, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Scanning Electron Microscopy, Se(IV), Second Order, Second-Order, Selenium, Solution, Spectroscopy, Standard, Temperature, Thermal Analysis, Thermal Degradation, Uptake, Work

? Chowdhury, A.K., Sarkar, A.D. and Bandyopadhyay, A. (2009), Rice husk ash as a low cost adsorbent for the removal of Methylene blue and Congo red in aqueous phases. *Clean-Soil Air Water*, **37** (7), 581-591.

Full Text: [2009\Cle-Soi Air Wat37, 581.pdf](2009/Cle-Soi%20Air%20Wat37,%20581.pdf)

Abstract: Adsorption is of significant importance for effluent treatment, especially for the treatment of colored effluent generated from the dyeing and bleaching industries. Low cost adsorbents have gained attention over the decades as a means of achieving very high removal efficiencies to meet effluent discharge standards. The present article reports on batch investigations for color removal from aqueous solutions of Methylene Blue (MB) and Congo Red (CR) using Rice Husk Ash (RHA) as an alternative low cost adsorbent. The performance analysis was carried out as a function of various operating parameters, such as initial concentration of dye, adsorbent dose, contact time, shaker speed, interruption of shaking and ionic concentration. Performance studies revealed that a very high percentage removal of color was achievable for both dyes. The maximum percentage removal of MB was 99.939%, while 98.835% removal was observed for CR. These percentage removals were better than existing systems. Detailed data analysis indicated that adsorption of MB followed the Temkin isotherm, while CR followed the Freundlich isotherm. These isotherms were feasible within the framework of experimentation. Batch kinetic data, on the other hand, indicated that pseudo second order kinetics governed adsorption in both cases. Sensitivity analysis further indicated that the effects of initial dye concentration, shaker speed, pH and ionic strength had no noticeable effect on the percentage dye removal at equilibrium. Batch desorption studies revealed that 50% acetone solution was optimum for CR, while desorption of MB varied directly with acetone concentration.

Keywords: Acetone, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Alternative, Analysis, Aqueous Solutions, Batch, Biosorption, Chi-Square Test, Color Removal, Concentration, Congo Red, Cost, Cr, Data, Data Analysis, Desorption, Desorption Studies, Discharge, Dye, Dye Removal, Dyes, Equilibrium, Equilibrium Isotherm, Error Analysis, Fly-Ash, Framework, Freundlich, Freundlich Isotherm, Function, Investigations, Ionic Strength, Isotherm, Isotherms, Kinetic, Kinetics, Low Cost, Low Cost Adsorbent, Low Cost Adsorbents, MB, Methylene Blue, Performance, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Removal, Rice Husk Ash, Second Order, Second Order Kinetics, Second-Order, Solution, Solutions, Sorption, Standards, Strength, Systems, Temkin Isotherm, Treatment

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Full Text: [2009\Cle-Soi Air Wat37, 642.pdf](2009/Cle-Soi%20Air%20Wat37,%20642.pdf)

Abstract: Xanthoceras sorbifolia seed coat (XSSC), a bioenergy forest waste, was used for the adsorption of Methylene blue (MB) from aqueous solutions. The effects of adsorbent dosage, pH, adsorbate concentration and contact time on MB biosorption were studied. The equilibrium adsorption data was analyzed by Langmuir and Freundlich isotherm models. The results indicated that the Langmuir model provided the best correlation with the experimental data. The adsorption capacity of XSSC for MB was determined with the Langmuir model and was found to be 178.6 mg/g at 298 K. The adsorption kinetic data was modeled using the pseudo-first order, pseudo-second order, and intraparticle diffusion kinetic equations. It was seen that the pseudo-second order equation could describe the adsorption kinetics, and intraparticle diffusion was not the sole rate controlling factor. Thermodynamic parameters were also evaluated. Standard Gibbs free energy was spontaneous for all interactions, and the biosorption process exhibited exothermic standard enthalpy values. The results indicated that XSSC is an attractive alternative for removing cationic dyes from wastewater.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetic, Adsorption Kinetics, Adsorption-Kinetics, Alternative, Aqueous Solutions, Basic Dye, Bioenergy, Biosorption, Capacity, Cationic Dye, Cationic Dyes, Cedar Sawdust, Concentration, Correlation, Crushed Brick, Data, Diffusion, Dye, Dyes, Energy, Enthalpy, Equilibrium, Exothermic, Experimental, Forest, Freundlich, Freundlich Isotherm, Gibbs Free Energy, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Equations, Kinetics, Langmuir, Langmuir Model, Leaf Powder, MB, Methylene Blue, Model, Models, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Seed Coat, Solutions, Sorption, Standard, Thermodynamic, Thermodynamic Parameters, Tree Fern, Waste, Wastewater, Water, Xanthoceras Sorbifolia

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Full Text: [2009\Cle-Soi Air Wat37, 663.pdf](2009/Cle-Soi%20Air%20Wat37,%20663.pdf)

Abstract: The adsorption of nickel and copper in a bicomponent system using the nonliving biomass of the marine brown alga Laminaria japonica was investigated in batch systems as a function of initial solution pH, contact time and temperature. The adsorption of nickel and copper was strongly pH dependent. Kinetic studies pointed to a rapid uptake with an equilibrium time of about 30 min. The kinetic curves were successfully fitted by linear regression to pseudo first and pseudo-second-order equations. The equilibrium data was analyzed using several models, including the extended Langmuir equation, modified extended Langmuir model and combined extended Langmuir-Freundlich model. The results suggested that the competitive adsorption of nickel and copper at all temperatures was best represented by the combined extended Langmuir-Freundlich isotherm. The isotherms indicated competitive uptake, with copper being preferentially adsorbed followed by nickel with an increase in the amount of solute in solution. Thermodynamic analysis revealed that the simultaneous adsorption of nickel and copper ions could be considered to be a spontaneous, endothermic process, with increased randomness.

Keywords: Adsorption, Analysis, Batch, Biomass, Biosorption, Brown Alga, Cd(II), Competitive, Competitive Adsorption, Copper, Cu(II), Data, Endothermic, Equilibrium, First, Function, Ions, Isotherm, Isotherms, Kinetic, Kinetic Studies, Kinetics, Kinetics, Langmuir, Langmuir Equation, Langmuir Model, Langmuir-Freundlich, Langmuir-Freundlich Isotherm, Linear Regression, Mechanisms, Model, Models, Modified, Ni(II), Nickel, pH, pH-Dependent, Pseudo Second Order, Pseudo-Second-Order, Randomness, Regression, Removal, Sludge, Solution, Sorption, Systems, Temperature, Thermodynamic, Uptake

? Hanafiah, M.A.K.M. and Ngah, W.S.W. (2009), Preparation, characterization and adsorption mechanism of Cu(II) onto protonated rubber leaf powder. *Clean-Soil Air Water*, **37** (9), 696-703.

Full Text: [2009\Cle-Soi Air Wat37, 696.pdf](2009/Cle-Soi%20Air%20Wat37,%20696.pdf)

Abstract: The adsorption of Cu(II) onto HCl treated rubber leaf powder (HHBL) was investigated in batch and column studies. The adsorbent was characterized by spectroscopic and quantitative analyses in order to understand the mechanism of copper adsorption. HHBL is mesoporous in nature as indicated by Bruneuer, Emmett and Teller (BET) analysis, and has various kinds of functional groups such as Si-OH, ROH, RCOOH, RCOO-, RNH2, C-O-C and aromatic rings as detected by Fourier transform infrared (FTIR) spectroscopy. Copper adsorption was confirmed by scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDS). The equilibrium process was described well by the Langmuir isotherm model, and a maximum adsorption capacity of 8.39 mg/g was recorded for the smallest adsorbent size (<180 mu m). The two main adsorption mechanisms involved were ion exchange and complexation. The fixed bed column study demonstrated satisfactory applicability of HHBL in removing Cu(II) from aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Mechanisms, Analyses, Analysis, Aqueous Solutions, Aqueous-Solution, Batch, Batch And Column Studies, BET, Biosorption Mechanism, Capacity, Characterization, Column, Column Studies, Column Study, Complexation, Copper, Copper, Copper Adsorption, Cu(II), EDS, Electron Microscopy, Energy, Equilibrium, Fixed Bed, FTIR, Functional Groups, Heavy-Metal Ions, Ion Exchange, Ion-Exchange, Isotherm, Isotherm Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanism, Mechanisms, Mesoporous, Model, Removal, Rice Husk, Rubber Leaf Powder, Scanning Electron Microscopy, SEM, Size, Solutions, Sorption, Spectroscopy, Waste Materials, X-Ray

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Full Text: [2009\Cle-Soi Air Wat37, 704.pdf](2009/Cle-Soi%20Air%20Wat37,%20704.pdf)

Abstract: The use of rice husk as a low cost adsorbent for the removal of copper from wastewater has been explored in a laboratory scale experiment. The rice husk used for the study was treated with alkali to increase the sorption properties. The influence of metal ion concentration, weight of biosorbent, stirring rates, temperature and pH were also evaluated, and the results are fitted using adsorption isotherm models. From the experimental results it was observed that almost 90-98% of the copper could be removed using treated rice husk. The Langmuir adsorption isotherm, Freundlich isotherm and Tempkin isotherm models were used to describe the distribution of copper between the liquid and solid phases in batch studies, and it was observed that the Langmuir isotherm better represented the adsorption phenomenon. The experimental 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: Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solutions, Biosorbent, Biosorption, Biosorption, Chitosan, Chromium, Copper, Cr(III), Fruit Shell, Heavy-Metals, Kinetics, Langmuir, Langmuir Isotherm, Low Cost Adsorbent, Removal, Sorption, Thermodynamic Parameters, Waste-Water, Wastewater, Weight

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Full Text: [2009\Cle-Soi Air Wat37, 712.pdf](2009/Cle-Soi%20Air%20Wat37,%20712.pdf)

Abstract: The removal of heavy metals such as Ni(II), Zn(II), Al(III), and Sb(III) from aqueous metal solutions was investigated using novel, cost effective, seaweed derived sorbents. Studies with a laboratory scale fixed-bed sorption column, using a seaweed waste material (referred to as waste Ascophyllum product (WAP)) from the processing of Ascophyllum nodosum as biosorbent, demonstrated high removal efficiencies (RE) for a variety of heavy metals including Ni(II), Zn(II) and Al(III), with 90, 90 and 74% RE achieved from initial 10 mg/L metal solutions, respectively. The presence of Sb(III) in multi component metal solutions suppressed the removal of Ni(II), Zn(II) and AI(III), reducing the RE to 28, 17 and 24%, respectively. The use of Polysiphonia lanosa as a biosorbent showed a 67% RE for Sb(III), both alone and in combination with other metals. Potentiometric and conductometric titrations, X-ray photoelectron and mid-infrared spectroscopic analysis demonstrated that carboxyl, alcohol, sulfonate and ether groups were heavily involved in Sb(III) binding by P. lanosa. Only carboxyl and sulfonate groups were involved in Sb(III) binding by WAP. Furthermore, a greater amount of weak acidic groups (mainly carboxylic functions) were involved in Sb(III) binding by P. lanosa compared to WAP which involved a greater concentration of strong acidic groups (mainly sulfonates).

Keywords: Adsorption, Antagonism, Antimony, Binary, Biomass, Biosorption, Biosorption, Cadmium, Copper, Green, Heavy Metals, Ion-Exchange, Lead, Nickel, Seaweed, Sorption, Spectroscopy

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Full Text: [2009\Cle-Soi Air Wat37, 776.pdf](2009/Cle-Soi%20Air%20Wat37,%20776.pdf)

Abstract: In this study, the biosorption of Cd(II), Ni(II) and Pb(II) on *Aspergillus niger* in a batch system was investigated, and optimal condition determined by means of central composite design (CCD) under response surface methodology (RSM). Biomass inactivated by heat and pretreated by alkali solution was used in the determination of optimal conditions. The effect of initial solution pH, biomass dose and initial ion concentration on the removal efficiency of metal ions by A. niger was optimized using a design of experiment (DOE) method. Experimental results indicated that the optimal conditions for biosorption were 5.22 g/L, 89.93 mg/L and 6.01 for biomass dose, initial ion concentration and solution pH, respectively. Enhancement of metal biosorption capacity of the dried biomass by pretreatment with sodium hydroxide was observed. Maximal removal efficiencies for Cd(II), Ni(III) and Pb(II) ions of 98, 80 and 99% were achieved, respectively. The biosorption capacity of A. niger biomass obtained for Cd(II), Ni(II) and Pb(II) ions was 2.2, 1.6 and 4.7 mg/g, respectively. According to these observations the fungal biomass of A. niger is a suitable biosorbent for the removal of heavy metals from aqueous solutions. Multiple response optimization was applied to the experimental data to discover the optimal conditions for a set of responses, simultaneously, by using a desirability function.

Keywords: *Aspergillus niger*, Biomass, Biosorption, Cadmium Biosorption, Cone Biomass, Fungal Biomass, Heavy Metal, Heavy Metals, Heavy-Metals, Immobilized Activated-Sludge, Industrial-Waste-Water, Lead Biosorption, Metal Ions, Packed-Bed, Pretreatment, Removal, Response Surface Methodology, Streptomyces-Rimosus Biomass

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Full Text: [2009\Cle-Soi Air Wat37, 787.pdf](2009/Cle-Soi%20Air%20Wat37,%20787.pdf)

Abstract: In the present work, biosorption of Cr(VI) by Nymphaea rubra was investigated in batch studies. Batch experiments were conducted to study the effect of initial sorbent dosage, solution pH and initial Cr(VI) concentration. The results showed that the equilibrium uptake capacity was increased with decrease in biomass dosage. The Cr(VI) removal was influenced by the initial chromium compound concentration. Langmuir and Freundlich adsorption isotherm models were used to represent the equilibrium data. The Freundlich isotherm model was fitted very well with the equilibrium data when compared to Langmuir isotherm model. The sorption results were analyzed for pseudo-first order and pseudo-second order kinetic model. It was observed that the kinetic data fitted very well with the pseudo-second order rate equation when compared to the pseudo-first order rate equation. Fourier transform infrared spectrum showed the presence of different functional groups in the biomass. The surface morphology of the sorbent was exemplified by SEM analysis. Aquatic weeds seem to be a promising biosorbent for the removal of chromium ions from water environment. This paper reports the research findings of a laboratory-based study on the removal of Cr(VI) from the synthetic solution using the dried stem of N. rubra as a biosorbent.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Isotherm Models, Analysis, Aqueous-Solutions, Batch, Batch Studies, Biomass, Biosorbent, Biosorption, Biosorption, Capacity, Chromium, Chromium Ions, Concentration, Cr(VI), Cr(VI) Removal, Data, Environment, Equilibrium, Equilibrium Uptake Capacity, Experiments, Freundlich, Freundlich Adsorption Isotherm, Freundlich Isotherm, Freundlich Isotherm Model, Functional Groups, Hexavalent Chromium, Ions, Isotherm, Isotherm Model, Isotherm Models, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanism, Model, Models, Morphology, N, Nymphaea Rubra, pH, 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, Removal, Research, SEM, Solution, Sorbent, Sorption, Surface, Uptake, Water, Water Environment, Work

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Full Text: [2009\Cle-Soi Air Wat37, 793.pdf](2009/Cle-Soi%20Air%20Wat37,%20793.pdf)

Abstract: Batch adsorption experiments were carried out using nonliving biomass of Porphyra yezoensis Ueda (red alga) for the removal of Congo red from aqueous solutions at 25ºC. The effects of process parameters such as contact time, adsorbent concentration and ionic strength were investigated. The raw biomass and Congo red loaded biomass were characterized by Fourier transform infrared spectroscopy (FTIR). The pseudo first order, pseudo second order and intraparticle diffusion models were tested. The results showed that adsorption of Congo red followed pseudo second order kinetics very well. Langmuir and Freundlich equations were applied to the data related to the adsorption isotherms, and the observed maximum adsorption capacities (*q*m) were 71.46 mg/g at 25ºC. Adsorbent concentration and ionic strength had a marked effect on Congo red adsorption.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Adsorption Isotherms, Aqueous Solutions, Batch Adsorption, Biomass, Biosorption, Biosorption, Carbon, Concentration, Congo Red, Contact Time, Data, Degradation, Diffusion, Dye, Equilibrium, Experiments, First, First Order, Freundlich, FTIR, Infrared Spectroscopy, Intraparticle Diffusion, Ionic Strength, Isotherms, Kinetics, Langmuir, Marine Alga, Methylene-Blue, Models, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second-Order, Removal, Second Order, Second Order Kinetics, Second-Order, Solutions, Spectroscopy, Strength, Waste-Water, Yellow

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Full Text: [2009\Cle-Soi Air Wat37, 818.pdf](2009/Cle-Soi%20Air%20Wat37,%20818.pdf)

Abstract: Variations in phosphorus (P) speciation were compared for two types of pilot scale wetlands: a blast furnace slag-based constructed wetland (SCW), and a gravel-based constructed wetland (GCW). Synthetic secondary effluent was used as the influent of the wetlands, which contained 1.1 mg/L P with more than 95% present as soluble reactive P (SRP). However, dissolved organic phosphorus (DOP) and particulate phosphorus (PP) emerged in the water along both wetlands. The levels of these three P species varied between the two wetlands. The GCW was more efficient than SCW at removing SRP, but showed a different trend. SRP decreased continually in the SCW, while it increased at the end of the GCW due to biological release. DOP was constant in SCW and GCW, and the mean value was 0.023 and 0.020 mg/L, respectively. The mean values of PP in the GCW ranged between 0.093 and 0.216 mg/L; much higher than the 0.05 +/- 0.01 mg/L measured in the SCW. Sequential extractions showed that iron bound PP (Fe-PP), aluminum bound PP (Al-PP), organic PP (Org-PP) and occluded PP (Oc-PP) were the major components of PP at most locations of the GCW. Fe-PP decreased from 0.53 to 0.14 mg/L in the upper layer, with DO steady at about 0.15 mg/L at the bottom. Oc-PP increased at each layer. Al-PP and Org-PP were steady in the first 140 cm of the GCW, but decreased sharply at the end. Considering the variation of SRP, DOP and PP fractionations, it can be seen that PP exchanged intensively with SRP in the GCW, and might act as an intermediate in the P removal process. Part of the SRP was first transformed into PP, and then absorbed by substrates or deposited in the wetlands. P removal was mainly via Ca precipitation in the SCW, but involved multiple mechanisms in the GCW, such as precipitation, adsorption and biological interactions. The multiple P removal mechanisms might be the reason for the low proportion of SRP, and the better P removal efficiency observed in the GCW.

Keywords: Adsorption, Iron, Lightweight Expanded Shale, Organic Phosphorus, Particulate Phosphorus, Phosphorus Speciation, Removal, Retention Capacity, Scale, Secondary Effluent, Sediment, Soil-Phosphorus, Station Aloha, Steel Slag, Treatment System, Trend, Waste-Water, Wetland, Wetlands

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Full Text: [2009\Cle-Soi Air Wat37, 872.pdf](2009/Cle-Soi%20Air%20Wat37,%20872.pdf)

Abstract: The present work involves the study of Se(IV) adsorption onto granular activated carbon (GAC) and powdered activated carbon (PAC). The adsorbents are coated with ferric chloride solution for the effective removal of selenium. The physico-chemical characterization of the adsorbents is carried out using standard methods, e.g., proximate analysis, scanning electron microscopy (SEM), fourier transform infrared spectroscopy (FTIR), thermo-gravimetric (TGA) and differential thermal analysis (DTA), etc. The FTIR spectra of the GAC and PAC indicate the presence of various types of functional groups, e.g., free and hydrogen bonded OH groups, silanol groups (Si-OH), alkenes, and CO group stretching from aldehydes and ketones on the surface of adsorbents. Batch experiments are carried out to determine the effect of various factors such as adsorbent dose (w), initial pH, contact time (t), and temperature (7) on the adsorption process. The optimum GAC and PAC dosage is found to be 10 g/L and 8 g/L, respectively, for Se(M removal with C-0 = 100 mg/L. The percent removal of Se(IV) increases with increasing adsorbent concentration, while removal per unit weight of adsorbent increases with decreasing adsorbent concentration. Se(M adsorption onto both the GAC and PAC adsorbents is high at low pH values, and decreases with increased initial pH. The results obtained are analyzed by various kinetic models. The parameters of pseudo-first order, pseudo-second order kinetics, and Weber-Morris intra particle kinetics are determined. It is seen that the sorption kinetics of Se(IV) onto GAC and PAC can be best represented by the pseudo-second order kinetic model.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Analysis, Batch Study, Carbon, Characterization, Chloride, Co, Coated, Concentration, Contact Time, Electron Microscopy, Experiments, Ferric Chloride, FTIR, FTIR Spectra, Functional Groups, GAC, Granular Activated Carbon, Granular Activated Carbon (GAC), Hydrogen, Infrared Spectroscopy, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Methods, Model, Models, Nov, PAC, pH, Powdered Activated Carbon, Powdered Activated Carbon (PAC), 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, Removal, Scanning Electron Microscopy, Se(IV), Selenium, SEM, Solution, Sorption, Sorption Kinetics, Spectroscopy, Standard, Surface, T, Temperature, TGA, Thermal Analysis, Thermal Degradation, Work

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Full Text: [2009\Cle-Soi Air Wat37, 901.pdf](2009/Cle-Soi%20Air%20Wat37,%20901.pdf)

Abstract: Nymphaea rubra stein was used as a low cost and easily available biosorbent for the removal of Reactive Red 2 dye from an aqueous solution. Initially, the effects of biosorbent dosage (0.2-1.0 g L-1), pH (1-6), and dye concentration (30-110 mg L-1) on dye removal were studied. Batch experiments were carried out for biosorption kinetics and isotherm studies. The results showed that dye uptake capacity was found to increase with a decrease in biosorbent dosage. Equilibrium uptake capacity was found to be greatest at a pH value of 2.0, when compared to all other pH values studied. The equilibrium biosorption isotherms were analyzed by the Freundlich and Langmuir models. The equilibrium data was found to fit very well with the Freundlich isotherm model when compared to the Langmuir isotherm model. The kinetic data was analyzed using pseudo-first order and pseudo-second order kinetic models. From the results, it was observed that the kinetic data was found to fit the pseudo-second order kinetic model very well. The surface morphology of the stein of the N. rubra biosorbent was exemplified by scanning electron microscopy. Fourier transform infrared analysis was employed to confirm the existence of an amine group in the stem of N. rubra.

Keywords: Adsorption, Analysis, Aqueous Solution, Biomass, Biosorbent, Biosorption, Biosorption, Biosorption Isotherms, Biosorption Kinetics, Capacity, Concentration, Congo Red, Cost, Data, Decolorization, Dye, Dye Removal, Dyes, Electron Microscopy, Equilibrium, Equilibrium Uptake Capacity, Experiments, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, L1, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, Model, Models, Morphology, N, NOV, Nymphaea Rubra, Organic Pollutants, pH, Ph Value, 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, Reactive Dye, Removal, *Rhizopus-arrhizus*, Scanning Electron Microscopy, Solution, Sorption, Surface, Textile Dyes, Uptake, Value, Water

? Parab, H., Sudersanan, M., Shenoy, N., Pathare, T. and Vaze, B. (2009), Use of agro-industrial wastes for removal of basic dyes from aqueous solutions. *Clean-Soil Air Water*, **37** (12), 963-969.

Full Text: [2009\Cle-Soi Air Wat37, 963.pdf](2009/Cle-Soi%20Air%20Wat37,%20963.pdf)

Abstract: The biosorption potential of three different agro-industrial waste materials of lignocellulosic origin, i.e., coir pith (CP), sawdust (SD) and sugarcane fiber (SF), is investigated in the case of basic dyes, i.e., crystal violet (CV) and rhodamine B (RB). The uptake of dyes from aqueous solutions is found to be rapid when using these candidate biosorbents. The application of various kinetic models reveals good correlation of a pseudo-second order kinetics model with the experimental data. Equilibrium adsorption data have been analyzed using nonlinearized forms of the Langmuir, Freundlich and Redlich-Peterson isotherms, to determine the best fit equation for the adsorption process. Experimental results show that all of the adsorbents are effective for the removal of dyes from aqueous solutions and their adsorption capacities are comparable with other reported adsorbents. Since the agricultural solid waste materials used in the present investigation are freely and abundantly available, the adsorption process is expected to be economically viable for wastewater treatment.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Capacities, Agricultural, Agricultural Solid Waste, Application, Aqueous Solutions, Basic Dyes, Biosorbents, Biosorption, Cationic Dyes, Coir Pith, Coir Pith, Color Removal, Correlation, Crystal Violet, Crystal Violet Dye, Data, Dyes, Equilibrium, Experimental, Forms, Freundlich, Industrial Solid-Waste, Investigation, Isotherms, Kinetic, Kinetic Models, Kinetics, Kinetics Model, Langmuir, Methylene-Blue, Model, Models, Origin, Pith, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Redlich-Peterson, Removal, Removal of Dyes, Rhodamine B, Rhodamine-B, Sawdust, Solid Waste, Solutions, Sugarcane, Sugarcane Fiber, Surfactant-Modified-Alumina, Textile Dyes, Treatment, Uptake, Waste, Waste Materials, Wastewater, Wastewater Treatment

? Vasudevan, S., Lakshmi, J. and Vanathi, R. (2010), Electrochemical coagulation for chromium removal: Process optimization, kinetics, isotherms and sludge characterization. *Clean-Soil Air Water*, **38** (1), 9-16.

Full Text: [2010\Cle-Soi Air Wat38, 9.pdf](2010/Cle-Soi%20Air%20Wat38,%209.pdf)

Abstract: This study presents an electrochemical coagulation process for the removal of chromium from water using magnesium as the anode and galvanized iron as the cathode. The effects of pH, current density, concentration, temperature, adsorption kinetics and adsorption isotherms on chromium removal were investigated. The results showed that an optimum removal efficiency of 98.6% was achieved at a current density of 0.2 A/dm2 and a pH of 7.0. The adsorption kinetics showed that the first order rate expression fitted the adsorption kinetics. The equilibrium isotherm was measured experimentally. Results were analyzed by Langmuir, Freundlich, Dubinin-Redushkevich and Frumkin isotherms using linearized correlation coefficients. The characteristic parameters for each isotherm were determined. The Langmuir adsorption isotherm was found to fit the equilibrium data best for chromium adsorption. Temperature Studies showed that adsorption was endothermic and spontaneous in nature.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Adsorption-Kinetics, Aqueous-Solutions, Chromium, Cr(VI), Electrochemical Removal Process, Electrocoagulation, Equilibrium, Isotherms, Kinetics, Langmuir, Phosphate, Removal, Thermodynamics, Waste-Water, Water

? Wang, X.S., Li, F.Y., He, W. and Miao, H.H. (2010), Hg(II) Removal from Aqueous Solutions by *Bacillus subtilis* Biomass. *Clean-Soil Air Water*, **38** (1), 44-48.

Full Text: [2010\Cle-Soi Air Wat38, 44.pdf](2010/Cle-Soi%20Air%20Wat38,%2044.pdf)

Abstract: The biosorption of Hg(II) from aqueous solutions using Bacillus subtilis biomass was investigated in this study. The adsorbent was characterized by FTIR. Various factors including solution pH, initial concentration of Hg(II), contact time, reaction temperature and ionic strength were taken into account and promising results were obtained. An initial solution pH of 5.0 was most favorable for Hg(II) removal. The kinetic data was also analyzed using pseudo first order and pseudo second order equations. The results suggested that Hg(II) bioadsorption was best represented by the pseudo second order equation. Freundlich, Langmuir and Langmuir-Freundlich isotherms for the present systems were analyzed. The most satisfactory interpretation for the equilibrium data at different temperatures was given by the Langmuir-Freundlich isotherm. The effect of ionic strength on bioadsorption was significant. Bacillus subtilis biomass could serve as low cost adsorbent to remove Hg(II) from aqueous solutions, especially at lower concentrations of Hg(II) (<20 mg Hg/L).

Keywords: Adsorbent, Aqueous Solutions, Bacillus, Bacillus Subtilis Biomass, Batch Bioadsorption, Biomass, Biosorbents, Biosorption, Cadmium, Concentration, Cost, Data, Equilibrium, First, First Order, Freundlich, FTIR, Fungal Biomass, Hg(II), Ionic Strength, Isotherm, Isotherms, Kinetic, Langmuir, Langmuir-Freundlich, Langmuir-Freundlich Isotherm, Lead, Low Cost, Low Cost Adsorbent, Mercury, Metal-Ions, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Reaction, Removal, Second Order, Second-Order, Separation, Si, Solution, Solutions, Strength, Systems, Temperature, Time

? Farooq, U., Khan, M.A., Athar, M., Sakina, M. and Ahmad, M. (2010), Environmentally benign urea-modifed *Triticum aestivum* biomass for lead(II) elimination from aqueous solutions. *Clean-Soil Air Water*, **38** (1), 49-56.

Full Text: [2010\Cle-Soi Air Wat38, 49.pdf](2010/Cle-Soi%20Air%20Wat38,%2049.pdf)

Abstract: Lead is among the three most toxic heavy metal ions (mercury, lead and cadmium). A number of methods are in use for the treatment of lead contaminated waters. The materials used for these are too expensive to be economical for lower concentrations of lead. Raw biological materials have been investigated as alternates. They can be chemically modified or pretreated in an attempt to increase their metal capturing capacities. A new material has been prepared from widely available wheat straw (WS) and urea using microwave radiation and its biosorptive behavior for lead ions has been Studied. Modified wheat straw (MWS) was subjected to aqueous lead ions to optimize parameters like pH, contact time, MWS dose and temperature. A known amount of MWS was put in contact with certain concentrations of Pb (II) ions at specified temperatures and pH for certain periods of time. Time of contact, pH, dose and temperature were optimized. The sorption of lead by MWS followed the Langmuir model with a maximum sorption capacity (q(max)) of 31.85 mg/g and pseudo second-order kinetics under a specified set of conditions. The changes in the values of free energy (ΔGº) and enthalpy (ΔHº) indicated the spontaneous, feasible and endothermic nature of sorption process. MWS has been found to be better biosorbent for lead ions than simple wheat straw and certain other biosorbents. WS and urea are easily available, cost effective, and the modification process is simple. So, MWS appears to be a cost effective material for Pb (II) sorption.

Keywords: Adsorption, Behavior, Biological, Biomass, Biosorbent, Biosorbents, Biosorption, Cadmium, Capacity, Cd(II), Changes, Cost, Cost-Effective, Endothermic, Energy, Enthalpy, Heavy Metal, Heavy Metal Ions, Heavy-Metals, Ions, Kinetics, Langmuir, Langmuir Model, Lead, Mercury, Metal, Metal Ions, Methods, Microwave, Model, Modification, Modified, Modified Wheat Straw, Pb, Pb(II), pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-Second-Order, Radiation, Removal, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Si, Sorption, Sorption Capacity, Sorption Process, Straw, Temperature, Time, Toxic, Treatment, Triticum Aestivum, Urea, Waste-Water, Waters

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Full Text: [2010\Cle-Soi Air Wat38, 77.pdf](2010/Cle-Soi%20Air%20Wat38,%2077.pdf)

Abstract: Monoaromatic hydrocarbons including benzene, toluene, ethylbenzene and xylene isomers (BTEX) are a very important category of water pollutants. These volatile compounds are very hazardous because of their fast migration in soil and water bodies and their acute and chronic toxicities when inhaled or ingested, especially benzene which is a known carcinogenic molecule. In this study, a natural zeolite (i.e., clinoptilolite-rich tuffs) was modified by two cationic surfactants (i.e., hexadecyltrimethyl ammonium chloride (HDTMA-Cl), and N-cetylpyridinium bromide (CPB)). The prepared adsorbents were then characterized, and their adsorptive capabilities for BTEX examined at different experimental conditions. The results of adsorption tests at 24 h revealed that the adsorption capacity of the modified zeolites improved by increasing the surfactant loading (i.e., less than the critical micelle concentration (CMC), to higher than the CMC), which caused an increase in sorption capacity from 60 to 70% for HDTMA-modified samples, and from 47 to 99% for CPB-modified zeolite. Adsorption kinetic tests showed the optimum contact time was 48 h with an average BTEX removal of 90 and 93% for HDTMA-modified and CPB-modified zeolite, respectively. Results showed that by increasing of pH from 3 to 11, the sorption capacity of the adsorbent decreased markedly from 97 to 75%. Analyzing the influence of temperature showed that the adsorption efficiency of adsorbents for benzene reduced from 93% at 20 degrees C to 10% at 4 degrees C. However, the influence of temperature on other compounds was not remarkable. Overall, CPB-modified zeolite exhibited higher selectivity toward BTEX compounds at optimum experimental conditions. Although commercial powder activated carbon (PAC) showed a higher capacity for all BTEX compounds and faster adsorption kinetics, the adsorption capacity of the CPB-modified zeolite at optimized conditions was competitive with PAC results.

Keywords: Activated Carbon, Adsorption, Adsorption, Benzene, BTEX, Carbon, Cationic Surfactants, Chromate, Clinoptilolite, Isotherm, Kinetics, Powder Activated Carbon, Removal, Soil, Sorbents, Sorption, Surfactant-Modified Zeolite, Toluene, Wastewaters, Water, Zeolite

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Full Text: [2010\Cle-Soi Air Wat38, 153.pdf](2010/Cle-Soi%20Air%20Wat38,%20153.pdf)

Abstract: Biosorption using activated Sludge biomass (ASB) as a potentially sustainable technology for the treatment of wastewater containing different metal ions (Cd(II), Pb(II) and Zn(II)) was investigated. ASB metal uptake clearly competed with protons consumed by microbial biomass compared with control tests with non-activated sludge biomass. Biosorption tests confirmed maximum exchange between metal ions and protons at pH 2.0 - 4.5. It was revealed by the study that the amount of metal ions released from the biomass increased with biomass sludge concentration. The result showed that maximum absorption of metal ions was observed for Cd(II) at pH 3.5, Pb(II) at pH 4.0, and pH 4.5 for Zn(II) ions. The maximum absorption capacities of ASB for Cd(II), Pb(II) and Zn(II) were determined to be 59.3, 68.5 and 86.5%, respectively. The biosorption of heavy metals was directly proportional to ASB stabilization corresponding to a reduction in heavy metals in the order of Cd < Pb < Zn. The order of increase of biosorption of metal ions in ASB was Zn(II) < Pb(II) < Cd(II), and this was opposite to that of non active sludge. The results indicate that ASB is a sustainable tools for the bioremediation of Cd(II), Pb(II) and Zn(II) ions from industrial sludge and wastewater treatment plants.

Keywords: Activated Sludge Biomass, Aqueous-Solution, Biomass, Bioremediation, Biosorption, Cadmium, Fungal Biomass, Heavy Metals, Heavy Metals Removal, Heavy-Metals, Ions, Lead, Metal Ions, Phanerochaete-Chrysosporium, Removal, Systems, Technology, Treatment, Waste-Water, Wastewater, Wastewater Treatment, Zinc

? Çelekli, A., Yavuzatmaca, M. and Bozkurt, H. (2010), Modeling the removal of reactive red 120 on pistachio husk. *Clean-Soil Air Water*, **38** (2), 173-180.

Full Text: [2010\Cle-Soi Air Wat38, 173.pdf](2010/Cle-Soi%20Air%20Wat38,%20173.pdf)

Abstract: In this study, the adsorption of reactive red 120 (RR 120) on pistachio husk, and the modeling of the adsorption was investigated. Characterization of the pistachio husk was confirmed by Fourier transform infrared spectroscopy. The pH(zpc) of pistachio husk was found to be pH 8.5. Increasing the initial pH value decreased (p < 0.01) the amount of dye adsorbed. However, increasing the initial dye concentration from 50 to 900 mg/L, at pH I increased (p < 0.01) the equilibrium dye uptake from 20.83 to 182.10 mg/g. Results indicated that this adsorbent had great potential for the removal of RR 120 dye. The logistic model was found to be the most suitable of the kinetic and equilibrium models tested to describe the adsorption of the dye. The parameters determined from the logistic model were well correlated with the initial dye concentration, and were seen to increase with the increasing initial dye concentration, but this was not observed from pseudo-second order kinetics.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous-Solution, Ash, Biosorption, Characterization, Concentration, Dye, Equilibrium, Equilibrium Models, Heavy-Metals, Infrared Spectroscopy, Kinetic, Kinetics, Logistic, Methylene-Blue, Model, Modeling, Models, Parameters, pH, pH Value, pHzpc, Pistachio Husk, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Spectroscopy, Uptake, Value

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Full Text: [2010\Cle-Soi Air Wat38, 202.pdf](2010/Cle-Soi%20Air%20Wat38,%20202.pdf)

Abstract: Batch sorption experiments were carried out for the adsorption of the basic dye Rhodamine B from aqueous solution using baryte as the adsorbent. The effect of adsorbent dosage, temperature, initial dye concentration and pH were studied. Adsorption data were modeled using first and second order kinetic equations and the intra particle diffusion model. Kinetic studies showed that the adsorption process followed second order rate kinetics with an average rate constant of 0.05458 g mg-1min-1. Dye adsorption equilibrium was attained rapidly after 30 min of contact time. The equilibrium data was fitted to the Langmuir, Freundlich and Tempkin isotherms over a dye concentration range of 50-250 mg/L. The adsorption thermodynamic parameters showed that adsorption was an exothermic, spontaneous and less ordered arrangement process. The adsorbent, baryte, was characterized by Fourier transform infrared spectroscopy and scanning electron microscopy. The results showed that baryte has good potential for the removal of Rhodamine B from dilute aqueous solution.

Keywords: Adsorbent, Adsorption, Aspergillus-Niger, Baryte, Basic-Dyes, Biosorption, Dye, Equilibrium, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Minerals, Perlite, Red, Removal, Rhodamine B, Sorption, Textile Dye Effluent, Waste-Water

? Vasudevan, S., Epron, F., Lakshmi, J., Ravichandran, S., Mohan, S. and Sozhan, G. (2010), Removal of NO3- from drinking water by electrocoagulation an alternate approach. *Clean-Soil Air Water*, **38** (3), 225-229.

Full Text: [2010\Cle-Soi Air Wat38, 225.pdf](2010/Cle-Soi%20Air%20Wat38,%20225.pdf)

Abstract: The present study provides an electrocoagulation method, for the removal of NO3- from drinking water using magnesium as the anode and cathode. The experiments are carried out as a function of pH, temperature, and current density. The results show that the maximum removal efficiency of 95.8% was achieved at a current density of 0.25 A/dm2, at a pH of 7.0. The adsorption of NO3- preferably fitting the Langmuir adsorption isotherm suggests monolayer coverage of the adsorbed molecules. The adsorption process follows a second-order kinetics model. Thermodynamic studies show that the adsorption was exothermic and spontaneous in nature.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solution, Clean Technology, Efficient Electrochemical Reduction, Electrocoagulation, Electrodes, Industrial Solid-Waste, Ion-Exchange, Isotherms, Kinetics, Langmuir, Nitrate, Nitrogen, NO3- Removal, Phosphate, Removal, Water

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Full Text: [2010\Cle-Soi Air Wat38, 248.pdf](2010/Cle-Soi%20Air%20Wat38,%20248.pdf)

Abstract: The adsorption of Ni(II) from aqueous solutions using base treated cogon grass or Imperata cylindrica (NHIC) was performed under batch and column modes. Batch experiments were conducted to determine the factors affecting adsorption such as pH, adsorbent dosage, initial nickel concentration, contact time and temperature. The fixed-bed column experiment was performed to determine the practical applicability of NHIC and to obtain the breakthrough curve. Adsorption was fast as equilibrium was achieved within 60 min, and was best described by the pseudo second order model. According to the Langmuir model, a maximum adsorption capacity of 6.96 mg/g was observed at pH 5 and at a temperature of 313 K. Thermodynamic parameters such as ΔG°, ΔH° and ΔS° were calculated, and indicated that adsorption was a spontaneous and endothermic process. The mechanistic pathway of Ni(II) uptake was examined by Fourier transform infrared (FTIR) spectroscopy, scanning electron microscopy (SEM) and energy dispersive X-ray (EDX) spectroscopy. The Thomas and Yoon-Nelson models were used to analyze the fixed-bed column data.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption, Adsorption Capacity, Aqueous Solutions, Aqueous-Solution, Batch, Biomass, Biosorption, Breakthrough, Breakthrough Curve, Capacity, Carbon Nanotubes, Column, Column Experiment, Column Modes, Concentration, Data, EDX, Electron Microscopy, Endothermic, Energy, Equilibrium, Equilibrium Isotherm, Experiment, Experiments, Fixed Bed, Fixed-Bed, FTIR, Heavy-Metal Ions, Imperata Cylindrica, Isotherm, Isothermal, Kinetic, Langmuir, Langmuir Model, Mar, Model, Models, Ni(II), Nickel, Nickel, pH, Pseudo Second Order, Pseudo-Second-Order, Removal, Sawdust, Scanning Electron Microscopy, Second Order, Second-Order, SEM, Solutions, Spectroscopy, Temperature, Thermodynamic, Thermodynamic Parameters, Time, Uptake, Waste-Water, X-Ray

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Full Text: [2010\Cle-Soi Air Wat38, 257.pdf](2010/Cle-Soi%20Air%20Wat38,%20257.pdf)

Abstract: A seaweed-waste material resulting from the processing of Ascophyllum nodosum was previously shown to be very efficient at removing Zn(II), Ni(II) and Al(III) both in single and multi-metal waste streams. In this study, the regeneration of the biosorbent using an acid wash resulted in the release of high metal concentrations during multiple desorption cycles. Maximum desorption efficiencies (DE) of 183, 122 and 91% were achieved for Zn(II), Ni(II) and Al(III), respectively, for subsequent metal loading cycles, significantly exceeding the desorption rates observed for conventional sorbents. The regeneration of the sorbent was accomplished with very little loss in metal removal efficiency (RE) for both single and multi-metal systems. Values of 92, 96 and 94% RE were achieved for Zn(II), Ni(II) and Al(111), respectively, for the 5(th) sorption cycle in single metal aqueous solutions. A slight decrease was observed for the same metals in multi-metal systems with maximum REs of 85, 82 and 82% for Zn(II), Ni(II) and Al(III), respectively. This study showed that the novel sorbent derived from a seaweed industrial waste would be suitable for multiple metal sorption cycles without any significant loss in RE.

Keywords: Adsorption, Algal Biomass, Aqueous-Solutions, Biosorbent, Biosorption, Biosorption, Cadmium, Desorption, Heavy Metals, Heavy-Metals, Ions, Marine-Algae, Metal Removal, Recovery, Regeneration, Seaweed-Waste Material, Sorbent, Sorption, Zinc

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Full Text: [2010\Cle-Soi Air Wat38, 321.pdf](2010/Cle-Soi%20Air%20Wat38,%20321.pdf)

Abstract: A novel, simple method based on magnetic separation was developed for analytical purposes. In this method, N-methyl-D-glucamine (NMDG) modified magnetic micro-particles that were synthesized by using the sol-gel method were used for the selective extraction and preconcentration of boron from aqueous solutions. This method combines the simplicity and selectivity of solvent extraction with the easy separation of magnetic microparticles from a solution with a magnet without any preliminary filtration step. The structure of the prepared gamma-Fe2O3-SiO2-NMDG (magnetic sorbent) composites were characterized by using X-ray diffraction (XRD), Transmission Electron Microscopy (TEM), and Fourier Transform Infrared Spectroscopy (FTIR). The influence of different parameters on the sorbent capacity, such as the sorption/desorption of boron, magnetic sorbent dosage, pH, equilibrium time, type, and amount of stripping solution, were evaluated by using the magnetic sorbent. Any equilibrium pH greater than 6 can be used for sorption. Desorption from the sorbent was carried out by using 1.0 M HCl. The sorption and desorption efficiency of the gamma-Fe2O3-SiO2-NMDG was found as 92.5±0.5% and 99.8±6%, respectively.

Keywords: Adsorption, Amino-Silane, Boron, Composites, Contaminants, Desorption, Equilibrium, Immobilization, Maghemite, Magnetic, Magnetic Separation, N-Methylglucamine, Nanoparticles, Nanoparticles, Particles, Preconcentration, Removal, Separation, Sol-Gel, Solvent-Extraction, Sorbent, Sorption, Water

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Full Text: [2010\Cle-Soi Air Wat38, 361.pdf](2010/Cle-Soi%20Air%20Wat38,%20361.pdf)

Abstract: Adsorptive removal of EDTA (ethylenediaminetetraacetic acid) from aqueous solution was studied using steam pyrolyzed activated carbon. Rubber wood sawdust, obtained from a local timber facility at Kodangavila, Trivandrum, Kerala, India was used as the precursor for the production of the activated carbon. Batch adsorption experiments were employed to monitor and optimize the removal process. The experimental parameters, i.e., solution pH, agitation time, initial EDTA concentration and adsorbent dosage, affecting the adsorption of EDTA onto sawdust activated carbon (SDAC) were optimized. The inner core mechanism for the interaction between EDTA and SDAC, which resulted in the adsorption process, was also discussed. The change in amount of EDTA adsorbed onto SDAC and CAC (commercial activated carbon) was compared over a wide range of pH (2.0-8.0). The maximum removal of EDTA took place in the pH range of 4.0-6.0 for SDAC and 5.0-5.5 for CAC, which demonstrates the effectiveness of the former adsorbent. Kinetic as well as equilibrium studies were performed to determine the rate constant and adsorption capacity, respectively. The adsorption kinetic data was fitted with pseudo-first-order kinetics and the equilibrium data was shown to follow the Langmuir isotherm model. These observations explain the formation of a monolayer of EDTA on the surface of SDAC as confirmed by the slow approach to equilibrium after 4 h of contact time. The adsorption capacity of SDAC for the removal of EDTA was 0.526 mmol/g and is seen to be greater than that of CAC and other reported adsorbents (0.193-0.439 mmol/g). Finally, it is clear that the production of steam pyrolyzed activated carbon in the presence of K2CO3 greatly enhanced EDTA removal and resulted in a product with possible commercial value for wastewater treatment strategies.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Kinetic, Adsorption Mechanisms, Agitation, Approach, Aqueous Solution, Bagasse Pith, Batch Adsorption, Capacity, Carbon, Chelating Agent, Complexes, Concentration, Data, Degradation, Dissolution, EDTA, Effectiveness, Equilibrium, Equilibrium Studies, Experimental, Experiments, Goethite, India, Interaction, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Local, Mechanism, Metal-Ions, Model, Modeling, Monolayer, pH, Pseudo First Order, Pseudo-First-Order, Pseudo-First-Order Kinetics, Rate Constant, Removal, Sawdust, Solution, Speciation, Steam Pyrolysis, Surface, Treatment, Value, Waste-Water, Wastewater, Wastewater Treatment, Wood

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Full Text: [2010\Cle-Soi Air Wat38, 370.pdf](2010/Cle-Soi%20Air%20Wat38,%20370.pdf)

Abstract: This study was undertaken to determine the cadmium removal efficiency of Lemna minor when it was used for treatment of wastewater having different characteristics, i.e., pH, temperature and cadmium concentration. Plants were cultivated in different pH solutions (4.5-8.0) and temperatures (15-35°C) in the presence of cadmium (0.1-10.0 mg/L) for 168 h. The amount of biomass obtained in the study period, the concentrations of cadmium in the tissues and in the media and net uptake of cadmium by Lemna have been determined for each condition. The percentages of cadmium uptake (PMU) and bioconcentration factors (BCF) were also calculated. The highest accumulation was obtained for the highest cadmium concentration of 10.0 mg Cd/L as 11.668 mg Cd/g at pH 6.0, and as 38.650 mg Cd/g at 35 C and pH 5.0. The cadmium accumulation gradually increased with initial concentration of the medium, but the opposite trend was observed for the PMU. However, the maximum PMU was obtained as 52.2% in the solution with the lowest concentration of 0.1 mg Cd/L. A mathematical model was used to describe the cadmium uptake and the equation obtained was seen to fit the experimental data very well.

Keywords: Bioaccumulation, Biosorption, Cadmium, Duckweed, Duckweed, Growth, Heavy-Metals, Ions, Lemna Minor, Phytoremediation, Plants, Removal, Treatment, Trend, Wastewater, Water

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Full Text: [2010\Cle-Soi Air Wat38, 378.pdf](2010/Cle-Soi%20Air%20Wat38,%20378.pdf)

Abstract: A macroporous, hydrophobically modified poly(acrylic acid-acrylamide) hydrogel was prepared. The fourier transform infrared (FTIR) spectrum and field emission scanning electron microscopy (FE-SEM) results showed that the hydrogel had a macroporous structure. The dynamic swelling and removal of cationic dyes, crystal violet (CV) and basic magenta (BM), by this macroporous hydrophobically modified poly(acrylic acid-acrylamide) hydrogel were studied. The adsorption capacity and kinetic and isotherm studies of the cationic dyes into the hydrogels have been evaluated. It was found that the macroporous hydrophobically modified hydrogel (M) exhibited improved swelling and adsorption capacity compared with the non-macroporous hydrophobically modified hydrogel (NM). The adsorption process agreed very well with the Langmuir model and the adsorption of the cationic dyes depended on the pH of the solution via a mechanism combining swelling, electrostatic, and hydrophobic interactions. Moreover, adsorption kinetic studies showed that the adsorption followed a pseudo-second-order kinetic model, indicating that chemical adsorption was the rate-limiting step.

Keywords: Acid, Adsorption, Adsorption Capacity, Adsorption Kinetic, Capacity, Cationic Dye, Cationic Dyes, Chemical, Crystal Violet, Delivery, Dye, Dyes, Dynamic, Electron Microscopy, Emission, Field, FTIR, Hydrogel, Hydrogels, Isotherm, Kinetic, Kinetic Model, Kinetic Modeling, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Macroporous, Macroporous Hydrogel, Mechanism, Model, Modified, NM, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rate Limiting Step, Rate-Limiting Step, Reactive Dye, Removal, Scanning Electron Microscopy, Solution, Structure, Swelling

? Ngah, W.S.W., Ariff, N.F.M., Hashim, A. and Hanafiah, M.A.K.M. (2010), Malachite green adsorption onto chitosan coated bentonite beads: Isotherms, kinetics and mechanism. *Clean-Soil Air Water*, **38** (4), 394-400.

Full Text: [2010\Cle-Soi Air Wat38, 394.pdf](2010/Cle-Soi%20Air%20Wat38,%20394.pdf)

Abstract: The removal of Malachite green (MG) from aqueous solutions by cross-linked chitosan coated bentonite (CCB) beads was investigated and the CCB beads were characterized by Fourier Transform Infrared (FTIR) spectroscopy, scanning electron microscopy (SEM) coupled with energy dispersive spectroscopy (EDS) and X-ray diffraction (XRD) analysis. Solubility and swelling tests were performed in order to determine the stability of the CCB beads in acidic solution, basic solution and distilled water. The amount of MG adsorbed was shown to be influenced by the initial pH of the solution, contact time and the initial MG concentration. A kinetic study indicated that a pseudo-second-order model agreed well with the experimental data. From the Langmuir isotherm model, the maximum adsorption capacity of MG was found to be 435.0 mg g-1. Desorption tests were carried out at different concentrations of EDTA, H2SO4 and NaOH. However, all desorbing solutions showed zero recovery of MG at all concentrations.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Analysis, Aqueous Solutions, Aqueous-Solutions, Beads, Bentonite, Capacity, Chitosan, Chitosan Coated Bentonite, Coated, Concentration, Cross-Linked, Cross-Linked Chitosan, Crosslinked Chitosan, Data, Desorption, Divalent Metal-Ions, Dye, EDS, EDTA, Electron Microscopy, Energy, Equilibrium Isotherm, Experimental, FTIR, Industry Waste, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Study, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Malachite Green, Mechanism, Methylene-Blue, Mg, Model, NaOH, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Recovery, Removal, Scanning Electron Microscopy, SEM, Solution, Solutions, Sorption, Spectroscopy, Stability, Swelling, Waste-Water, Water, X-Ray, X-Ray Diffraction, XRD

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Full Text: [2010\Cle-Soi Air Wat38, 409.pdf](2010/Cle-Soi%20Air%20Wat38,%20409.pdf)

Abstract: This work investigates electrolytic treatment and activated carbon adsorption for the removal of melanoidins, the recalcitrant: coloring component in fermentation industry wastewaters. A 10% solution of synthetic melanoidins was electrolytically reduced and simultaneously oxidized in an electrolytic cell, thereby altering its reactivity. Adsorption studies using granular activated carbon were conducted using both control and electrolyzed streams. The filterability, surface tension and capillary suction time of the samples were also determined. The reduced melanoidins stream exhibited both a high chemical oxygen demand (COD) removal of 79% and a high color removal of 77% upon activated carbon adsorption. In comparison with the oxidized fraction, the reduced samples displayed enhanced filtration flux as well as decreased capillary suction time, thus indicating better filterability. Furthermore, a decline in surface tension was also observed confirming the decreased hydrophobicity of the reduced melanoidins.

Keywords: Activated Carbon, Activated Carbons, Adsorption, Alcohol Distillery, Color, Color Removal, Decolorization, Degradation Products, Distillery Waste-Water, Effluent, Electrolysis, Electrolytic Oxidation, Electrolytic Reduction, Fungus Phanerochaete-Chrysosporium, Humic Acids, Melanoidins, Removal, Spentwash, Treatment

? Li, B.H., Qian, Y.A., Bi, E.P., Chen, H.H. and Schmidt, T.C. (2010), Sorption behavior of phthalic acid esters on reference soils evaluated by soil column chromatography. *Clean-Soil Air Water*, **38** (5-6), 425-429.

Full Text: [2010\Cle-Soi Air Wat38, 425.pdf](2010/Cle-Soi%20Air%20Wat38,%20425.pdf)

Abstract: Soils are commonly exposed to phthalic acid esters (PAEs) due to their wide usage in a large variety of fields. Several PAEs have been categorized as priority pollutants due to their environmental impact. Therefore, characterizing the sorption behavior of PAEs on soils is very important. Soil column chromatography was utilized to study sorption of dimethyl phthalate (DMP) and diethyl phthalate (DEP) on European and Chinese reference soils. The influence of different environmental conditions such as ionic strength, temperature and pH on the sorption process was investigated. Results show the organic carbon (OC) content in soil plays a main role in the sorption of DMP and DEP. Ionic strength and cation type influenced sorption of DMP and DEP on the two soils, however, in a different manner suggesting that OC in these two soils might be differently affected by the presence of ions. The sorption of DMP and DEP was also found to depend on the investigated pH range of mobile phase with significant relative changes of sorption coefficients in both soils. The influence of temperature on sorption to both soils was small and derived sorption enthalpies indicated that van der Waal’s forces dominate the sorption of DMP and DEP, which leads us to propose that additional specific interactions such as hydrogen bonding only play a negligible role.

Keywords: Activated Carbon, Adsorption, Coefficients, Desorption, Diethyl Phthalate, Dimethyl Phthalate, Organic-Compounds, Partition, Pollutants, Process Identification, Soil, Soil Column Chromatography, Soils, Sorption, Water

? Saha, P., Chowdhury, S., Gupta, S., Kumar, I. and Kumar, R. (2010), Assessment on the removal of malachite green using tamarind fruit shell as biosorbent. *Clean-Soil Air Water*, **38** (5-6), 437-445.

Full Text: [2010\Cle-Soi Air Wat38, 437.pdf](2010/Cle-Soi%20Air%20Wat38,%20437.pdf)

Abstract: Tamarind fruit shell was used as a low cost biosorbent for the removal of malachite green from aqueous solution. The various factors affecting adsorption such as agitation, pH, initial dye concentration, contact time, and temperature were investigated. It was observed that the dye adsorption capacity was strongly dependent on solution pH as well as temperature. The equilibrium data were described by the Langmuir, Freundlich, and Temkin isotherm models. The Langmuir isotherm model showed good fit to the equilibrium adsorption data and the maximum adsorption capacity obtained was 1.951 mg/g at 303K. The kinetics of adsorption followed the pseudo-second-order model and the rate constant decreased with increase in temperature indicating exothermic nature of adsorption. The Arrhenius equation was used to obtain the activation energy (E-a) for the adsorption system. The activation energy was estimated to be 63.56 kJ/mol. Thermodynamic parameters such as Gibbs free energy (ΔG(0)), enthalpy (ΔH-0), and entropy (ΔS-0) were also investigated. Results suggested that adsorption of malachite green onto tamarind fruit shell was a spontaneous and exothermic process. Present investigation suggests that tamarind fruit shell may be utilized as a low cost adsorbent for removal of malachite green from aqueous solution.

Keywords: Activation, Activation Energy, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, Agitation, Aqueous Solution, Aqueous-Solution, Biosorbent, Biosorption, Biosorption, Capacity, Concentration, Cost, Data, Dye, Dye Adsorption, Dye Removal, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Freundlich, Gibbs Free Energy, Investigation, Isotherm, Isotherm Model, Isotherm Models, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, Low Cost Adsorbent, Malachite Green, Methylene-Blue, Model, Models, Peanut Hull, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Constant, Removal, Rice Husk, Solution, Tamarind Fruit Shell, Temkin Isotherm, Temperature, Thermodynamic, Thermodynamic Parameters, Waste

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Full Text: [2010\Cle-Soi Air Wat38, 492.pdf](2010/Cle-Soi%20Air%20Wat38,%20492.pdf)

Abstract: Response surface methodology (RSM) employing the Box-Behnken design was used to optimize the biosorption of chromium (Cr6+) by Mucor racemosus in submerged culture. The initial Cr6+ concentration (20-100 mg/L), pH (3.0-7.0), biomass dosage (5.0-9.0 mg), and time of sorption (2.0-6.0 h) were chosen as the process variables for the optimization. Two response values were chosen, i.e., sorption capacity (mg/g) and sorption percentage are optimized. A four-factor-three-level Box-Behnken design was used to evaluate the effects of these parameters on the sorption percentage. A second-order quadratic model suggested the optimum conditions (initial Cr6+ concentration 100 mg/L, pH of 5.0, biomass dosage of 5.0 mg, and time of sorption 4 h) resulted in the improvement of sorption of Cr6+ from 12.47 to 49.98% as well as the improvement of the sorption capacity from 0.1036 to 0.5 mg/g. Analysis of variance (ANOVA) for the above-mentioned response variables yielded a high coefficient of determination (R-2) value of 0.9985 and 0.9025 for the sorption capacity and sorption percentage, respectively. The desirability plot and overlay plot suggested the significance of the designed model. This is the first report on Cr6+ sorption by M. racemosus using statistical experimental design employing RSM.

Keywords: Biomass, Biosorption, Box-Behnken Design, Chromium (Cr6+), Chromium(VI), Circinelloides, Cr(VI), Methodology, Mucor Racemosus, Optimization, Petroleum-Contaminated Soils, Potential Bioremediator, Removal, Response Surface Methodology, Sorption, YR-1 Strain

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Full Text: [2010\Cle-Soi Air Wat38, 500.pdf](2010/Cle-Soi%20Air%20Wat38,%20500.pdf)

Abstract: Staphylococcus aureus has not been used to remove Cr(VI) ions from aqueous solutions. In the present study, biosorption experiments for Cr(VI) were investigated using S. aureus biomass isolated from activated sludge, Lianyungang Dapu sewage treatment plant, China. The effects of solution pH, contact time reaction temperature and ionic strength on Cr(VI) uptake were studied. The biomass was characterized by energy dispersive X-ray spectroscopy and Fourier transform infrared spectrometer. The applicability of the Langmuir and Freundlich models was tested. The correlation coefficients (R) of both models were higher than 0.9. The maximum adsorption capacity was found to be 27.36 mg/g for Cr(VI) at 20ºC. The adsorption process was quick and found to follow the pseudo-second-order equation. The optimum adsorption was achieved at pH 2. The adsorption was strongly dependent on NaCl concentrations as well as on reaction temperature. The S. aureus biomass could serve as adsorbent to remove Cr(VI) from industrial effluents.

Keywords: Activated Sludge, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Aqueous Solutions, Bacteria, Biomass, Biosorption, Capacity, China, Chromium(VI) Biosorption, Correlation, Cr(VI), Effluents, Energy, Equilibrium, Experiments, Freundlich, Ionic Strength, Ions, Langmuir, Models, NaCl, pH, Plant, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Separation, Sewage, Sludge, Solution, Solutions, Sorption, Spectroscopy, Staphylococcus Aureus, Staphylococcus Aureus Biomass, Strength, Temperature, Treatment, Uptake, Water, X-Ray

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Full Text: [2010\Cle-Soi Air Wat38, 516.pdf](2010/Cle-Soi%20Air%20Wat38,%20516.pdf)

Abstract: This work examined the relative distribution of nonylphenol (NP), a known endocrine disrupting compound, between the water phase and biosolids (sludge) under aseptic conditions, as well as the conditions under which NP could be released from the biosolids back into the water phase. The experimental work involved adsorption and desorption studies on activated sludge biomass with the water phase being both pure water and treated municipal wastewater (secondary effluent). NP adsorption on biomass was very fast: about 90% of NP was removed from the water phase in 1 h, while in 5 h the equivalent degree of removal was around 99%. There was no significant difference in adsorptive behavior of active and inactive biomass. Adsorption of NP under equilibrium showed that NP accumulates in the biosolids reaching levels up to two orders of magnitude higher than the equilibrium water phase concentration. This was due to the hydrophobic nature of both NP and the biosolids. The adsorption isotherm was modeled by means of the Freundlich model. Desorption of NP from biosolids was possible to a significant extent at pH 12 and above. This may have an implication on lime stabilized sludge, where under high pH conditions, NP may leach out from dewatered sludge.

Keywords: Activated Sludge, Adsorption, Alkylphenols, Behavior, Biomass, Biosolids, Bisphenol-A, Desorption, Equilibrium, Ethoxylate Surfactants, Fate, Liquid-Chromatography, Mass-Spectrometry, Nonylphenol, Removal, Sewage-Treatment Plants, Waste-Water, Wastewater, Water

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Full Text: [2010\Cle-Soi Air Wat38, 521.pdf](2010/Cle-Soi%20Air%20Wat38,%20521.pdf)

Abstract: Activated carbon materials were prepared from the Brazilian pine-fruit shell (Araucaria angustifolia) by chemically activated carbon (CAC) and chemically and physically activated carbon (CPAC), and tested as adsorbents for the removal of brilliant green (BG) dye from aqueous effluents. The mixed activation process leads to increases in the specific surface area, average porous volume, and average porous diameter of the adsorbent CPAC when compared to CAC. The effects of shaking time, adsorbent dosage and pH on the adsorption capacity were studied. BG uptake was favorable at pH values ranging from 2.0 to 10.0 for both CAC and CPAC. The contact time required to obtain the equilibrium using CAC and CPAC as adsorbents was 4 h at 298 K, respectively. The fractionary-order kinetic model provided the best fit to experimental data compared with other models. Equilibrium data were better fit to the Sips and Redlich-Peterson isotherm models using CAC and CPAC as adsorbents. The enthalpy and entropy of adsorption of BG were obtained from adsorption experiments ranging from 298 to 323 K.

Keywords: Activated Carbon, Adsorption, Adsorption-Kinetics, Araucaria-Angustifolia Wastes, Basic Dye, Batch Conditions, Brilliant Green, Dye, Equilibrium, Mandarin Peels, Methylene-Blue, Nonlinear Isotherms, Pecan Nutshell, Pine-Fruit Shell, Removal, Sorption Capacity, Statistical Design

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Full Text: [2010\Cle-Soi Air Wat38, 614.pdf](2010/Cle-Soi%20Air%20Wat38,%20614.pdf)

Abstract: Limestone defluoridation by fixed bed reactor has been studied with water pre-acidified with edible organic acids, viz, acetic acid (AA) and citric acid (CA). The study has been carried out by varying acid concentration, contact time (t), number of repeated use of the same limestone bed (n), and chip size of the crushed limestone using fixed fluoride concentration of 10 mg/L in distilled water and groundwater amended to that concentration of fluoride. The presence of both the acids considerably improved the fluoride removal and the removal increased with increase in the acid concentration. Fluoride removal to less than 0.5 and 1.0 mg/L from initial 5 and 10 mg/L, respectively, have been achieved by the method on treatment with single reactor. The mechanism of fluoride removal in the process thought to be the increase in Ca2+ activity by dissolution of limestone, which precipitates as CaF2. XPS analysis reveals that adsorption also contribute to the fluoride removal along with precipitation. The final pH of water remained within acceptable range for drinking water. Initial concentration of fluoride, effects the removal ability of the limestone particles only to some extent. The influence of other anions on fluoride removal process has a little influence which follows the order phosphate > sulfate > bromide > chloride > nitrate.

Keywords: Acetic Acid, Adsorption, Assam, Calcite, Calcite, Citric Acid, Defluoridation, District, Drinking-Water, Fixed Bed Reactor, Fluoride Removal, Groundwater, India, Limestone, Precipitation, Semiconductor Waste-Water, T, Treatment, Water

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Full Text: [2010\Cle-Soi Air Wat38, 649.pdf](2010/Cle-Soi%20Air%20Wat38,%20649.pdf)

Abstract: The present study was aimed at removing cadmium ions from aqueous solution through batch studies using adsorbents, such as, granular activated carbon (GAC) and activated clay (A-clay). GAC was of commercial grade where as the A-clay was prepared by acid treatment of clay with 1 mol/L of H2SO4. Bulk densities of A-clay and GAC were 1,132 and 599 kg/m3, respectively. The surface areas were 358 m2/g for GAC and 90 m2/g for A-clay. The adsorption studies were carried out to optimize the process parameters, such as, pH, adsorbent dosage, and contact time. The results obtained were analyzed for kinetics and adsorption isotherm studies. The pH value was optimized at pH 6 giving maximum Cd removal of 84 and 75.2% with GAC and A-clay, respectively. The adsorbent dosage was optimized and was found to be 5 g/L for GAC and 10 g/L for A-clay. Batch adsorption studies were carried out with initial adsorbate (Cd) concentration of 100 mg/L and adsorbent dosage of 10 g/L at pH 6. The optimum contact time was found to be 5 h for both the adsorbents. Kinetic studies showed Cd removal a pseudo second order process. The isotherm studies revealed Langmuir isotherm to better fit the data than Freundlich isotherm.

Keywords: Acid Treatment, Acid-Treatment, Activated Carbon, Activated Clay, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Isotherm, Aqueous Solution, Bagasse Fly-Ash, Batch, Batch Adsorption, Batch Studies, Cadmium, Cadmium Ions, Carbon, Cd, Cd(II), Clay, Concentration, Copper, Data, Equilibrium, Freundlich, Freundlich Isotherm, GAC, Granular Activated Carbon, Heavy-Metal Ions, Ions, Isotherm, Kinetic, Kinetic Studies, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Muloorina Illite, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Removal, Second Order, Second-Order, Solution, Surface, Surface Areas, Tea Factory Waste, Treatment, Value, Water

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Full Text: [2010\Cle-Soi Air Wat38, 670.pdf](2010/Cle-Soi%20Air%20Wat38,%20670.pdf)

Abstract: Batch sorption technique was carried out for the removal of anionic dye Congo red (CR) from aqueous solution using raw rectorite (R-REC) and organified rectorite (CTA(+)-REC) modified by cetyltrimethylammonium bromide (CTAB) as adsorbents. The effects of organification degree of CTA(+)-REC as well as the process parameters including the pH of dye solution, sorption time, and initial dye concentration on adsorption capacity for CR were investigated and the sorption kinetics was also evaluated. The results showed that the sorption behaviors of R-REC and CTA(+)-REC for CR followed pseudo-second-order kinetic model and the sorption equilibrium data perfectly obeyed the Langmuir isotherm. The thermodynamic parameters including entropy of sorption (ΔS°), enthalpy of sorption (ΔH°), and Gibbs free energy of sorption (ΔG°) were obtained and analyzed. Fourier transform infrared study revealed that a chemisorption process occurred between CR and CTA(+)-REC. REC modified by cationic surfactants showed the higher adsorption capacities for CR compared to R-REC and in theory would be used as an efficient and promising adsorbent for the removal of anionic dyes in wastewater treatment.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Behavior, Adsorption Capacities, Adsorption Capacity, Anionic Dyes, Aqueous Solution, Basic-Dyes, Bromide, Capacity, Chemisorption, Concentration, Congo Red, Cr, CTAB, Data, Dye, Dyes, Energy, Enthalpy, Entropy, Equilibrium, Gibbs Free Energy, Isotherm, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Methylene-Blue, Model, Modified, Montmorillonite, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rectorite, Removal, Solution, Sorption, Sorption Equilibrium, Sorption Isotherm, Sorption Kinetics, Surface-Area, Surfactants, Theory, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Treatment, Wastewater, Wastewater Treatment

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Full Text: [2010\Cle-Soi Air Wat38, 758.pdf](2010/Cle-Soi%20Air%20Wat38,%20758.pdf)

Abstract: The adsorption behavior of methyl orange (MO) from aqueous solution onto raw bentonite (RB) sample was investigated as a function of parameters such as pH, inorganic anion, contact time, and temperature. The Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms. Langmuir adsorption capacity was found to be 34.34 mg/g at pH 4.0. The pseudo-first-order, pseudo-second-order kinetic, and the intra-particle diffusion models were used to describe the kinetic data. The values of the energy (E-a), enthalpy (ΔH-/-), and entropy of activation (ΔS-/-) were calculated as 38.62 kJ/mol, 36.04 kJ/mol, and -150.05 J/mol K, respectively, at pH 4.0.

Keywords: Activated Carbon, Activation, Adsorption, Adsorption Behavior, Adsorption Capacity, Aqueous Solution, Aqueous-Solutions, Azo Dye, Behavior, Bentonite, Capacity, Clay, Congo Red, Data, Desorption, Diffusion, Dye, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherms, Freundlich, Function, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherms, Kinetic, Kinetics, Langmuir, Mechanism, Methyl Orange, Methylene-Blue, Mo, Models, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Reactive Dye, Removal, Solution, Sorption, Temperature, Textile Dye, Thermodynamic

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Full Text: [2010\Cle-Soi Air Wat38, 775.pdf](2010/Cle-Soi%20Air%20Wat38,%20775.pdf)

Abstract: Bacillus subtilis and its extracellular polysaccharide (EPS) were used in free form as well as immobilized form as biosorbent for the removal of an anionic dye Procion Red MX 5B. Low pH was favourable for biosorption. Immobilization resulted in reduced biosorption of the dye. The presence of functional groups responsible for the high adsorption capacity in free cells (FC) and EPS was confirmed by FTIR analysis. High *Q*max and b values were noted in the case of FC and free EPS in contrast to immobilized cells and EPS. The kinetics data showed that the adsorption system followed pseudo-first-order reaction at low dye concentration. Desorption of the dye was found to be 100% in 1N NaOH. In the case of immobilized biomass and EPS the alginate was found to be unstable under high alkaline conditions of NaOH.

Keywords: Adsorption, Adsorption Capacity, Alginate, Alginate Beads, Analysis, Aqueous-Solutions, Bacillus, Bacillus Subtilis, Biomass, Biosorbent, Biosorption, Capacity, Concentration, Congo Red, Corynebacterium-Glutamicum, Data, Desorption, Dye, EPS, Free Cells, FT-IR Spectroscopy, FTIR, FTIR Analysis, Functional Groups, Fungal Biomass, Heavy-Metal Biosorption, Immobilization, Immobilized, Immobilized Biomass, Immobilized Cells, Kinetics, Modified Mycelial Biomass, NaOH, pH, Polysaccharide, Procion Red, Pseudo First Order, Pseudo-First-Order, Removal, Trametes-Versicolor

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Full Text: [2010\Cle-Soi Air Wat38, 831.pdf](2010/Cle-Soi%20Air%20Wat38,%20831.pdf); [2010\Cle-Soi Air Wat2.pdf](2010/Cle-Soi%20Air%20Wat2.pdf); [2010\Cle-Soi Air Wat1.pdf](2010/Cle-Soi%20Air%20Wat1.pdf)

Abstract: Aluminium oxide, which could be an alternative filter media for phosphorus uptake from aqueous solution, was selected as an adsorbent for the isotherm study of phosphorus uptake from aqueous solution. Batch method was adopted to investigate the adsorption behavior of phosphorus onto aluminium oxide. The Langmuir, Freundlich, and Redlich-Peterson isotherms were used to analyse the experimental data by both the linear and non-linear regression methods. The adsorption experiment was conducted at the various temperatures, to choose the appropriate method and obtain the creditable adsorption parameters for phosphorus uptake studies. The results indicated that the non-linear regression method might be a better way to compare the best-fitting isotherm and obtain the parameters for the adsorption of phosphorus onto aluminium oxide. Both the Redlich-Peterson and the Freundlich isotherms had high coefficients of determination for the adsorption of phosphorus onto aluminium oxide at various temperatures. In addition, a new relationship between the Redlich-Peterson and the Freundlich isotherm parameters was presented.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Behavior, Alternative, Aluminum, Aluminum Oxide, Aqueous Solution, Batch Method, Behavior, Data, Experiment, Experimental, Filter Media, Freundlich, Freundlich Isotherm, Gases, Isotherm, Isotherm Parameters, Isotherms, Langmuir, Media, Methods, Nonlinear Regression, Oxide, Phosphorus, Redlich-Peterson, Regression, Solution, Sorption Isotherm, Uptake

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Full Text: [2010\Cle-Soi Air Wat38, 843.pdf](2010/Cle-Soi%20Air%20Wat38,%20843.pdf)

Abstract: An adsorbent obtained by microwave activation of defective coffee press cake was evaluated for malachite green (MG) removal from aqueous solutions. Batch adsorption tests were performed and the effects of particle size, contact time, adsorbent dosage, initial solution pH, and initial dye concentration on MG removal from aqueous solutions were investigated. Adsorption kinetics was determined by fitting pseudo-first-and second-order kinetic models to the experimental data, with the second-order model providing the best description of MG adsorption onto the prepared adsorbent. The experimental adsorption equilibrium data were better described by the Langmuir model in comparison to Freundlich. The results presented in this study show that the produced adsorbent presents great potential as an inexpensive and easily available alternative for the removal of cationic dyes in wastewater treatments.

Keywords: Activation, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Agri-Food Waste, Agricultural Waste Biomass, Alternative, Aqueous Solutions, Aqueous-Solution, Batch Adsorption, Biodiesel Production, Carbon, Cationic Dyes, Comparison, Concentration, Data, Dye, Dyes, Equilibrium, Experimental, Freundlich, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Model, Malachite Green, Mechanism, Mg, Microwave, Microwave Activation, Model, Models, Particle Size, pH, Potential, Removal, Rice Straw, Second Order, Second-Order, Second-Order Model, Size, Solution, Solutions, Wastewater

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Full Text: [2010\Cle-Soi Air Wat38, 850.pdf](2010/Cle-Soi%20Air%20Wat38,%20850.pdf)

Abstract: The effects of various parameters such as initial concentration, adsorbent loading, pH, and contact time on kinetics and equilibrium of adsorption of Cd2+ metal ion from its aqueous solution by castor seed hull (CSH) and also by activated carbon have been investigated by batch adsorption experiments. The amount of adsorption increases with initial metal ion concentration, contact time, solution pH, and the loading of adsorbent for both the systems. Kinetic experiments indicate that adsorption of cadmium metal ion on both CSH and on activated carbon consists of three steps - a rapid adsorption of cadmium metal ion, a transition phase, and an almost flat plateau region. This has also been confirmed by the intraparticle diffusion model. The lumped kinetic results show that the cadmium adsorption process follows a pseudo-second order rate law. The kinetic parameters including the rate constant are determined at different initial metal ion concentrations, pH, amount, and type of adsorbent, respectively. The Langmuir and Freundlich adsorption isotherm models are used to describe the experimental data. The Langmuir model yields a better correlation coefficient than the other model. A comparison of the monolayer adsorption capacity (*q*m) of CSH, activated carbon, and several other reported adsorbents has been provided. The value of separation factor (RL) calculated from the Langmuir equation also gives an indication of favorable adsorption of the metal ion. From comparative studies, it has been found that CSH is a potentially attractive adsorbent than commercial activated carbon for cadmium metal ion (Cd2+) removal.

Keywords: Activated Carbon, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption Models, Aqueous Solution, Batch, Batch Adsorption, By-Products, Cadmium, Cadmium Adsorption, Capacity, Carbon, Castor Hull, Cd2+, Chromium(VI), Comparison, Concentration, Correlation, Correlation Coefficient, Data, Diffusion, Diffusion Model, Dyes, Equilibrium, Experimental, Experiments, Freundlich, Freundlich Adsorption Isotherm, Heavy-Metals, Indication, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Parameters, Kinetics, Langmuir, Langmuir Equation, Langmuir Model, Law, Loading, Metal, Model, Models, Monolayer, pH, Porous-Media, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constant, Rate Law, Removal, Separation, Solution, Systems, Tamarind-Wood, Value, Waste-Water, Zinc

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Full Text: [2010\Cle-Soi Air Wat38, 877.pdf](2010/Cle-Soi%20Air%20Wat38,%20877.pdf)

Abstract: This paper presents a biosorption procedure for the preconcentration of Pb2+ ions using *Saccharomyces cerevisiae* biomass. The influence of several factors including pH, biomass dosage, contact time, and temperature on biosorption efficiency were optimized. At optimum value of all the equilibrium, thermodynamic, and kinetic parameters of Pb2+ ion biosorption was investigated by testing the Langmuir and Freundlich models and first and second order kinetic models were applied. The biosorption capacity of S. cerevisiae biomass was determined 89.6 mg/g, while the retained Pb2+ ions by S. cerevisiae were reversibly eluted using 5 mol/L HNO3. Due to the high stability of S. cerevisiae the applied biomass can be used successively ten times with a slightly decrease (about 20%) in the recovery of Pb2+ ions. The calculated thermodynamic parameters, ΔGº, ΔHº, and ΔSº showed that the biosorption of Pb2+ ion onto *S. cerevisiae* biomass was feasible, spontaneous, and endothermic under examined conditions. The results of kinetic analysis showed that the biosorption processes of Pb2+ ions onto *S. cerevisiae* biomass followed pseudo second order kinetics.

Keywords: Absorption Spectrometric Determination, Activated Carbon, Amberlite XAD-4, Analysis, Aspergillus-niger, Biomass, Biosorption, Capacity, Cu(II) Ions, Efficiency, Endothermic, Equilibrium, First, Freundlich, Heavy-Metal Biosorption, Ions, Isotherms, Kinetic, Kinetic Analysis, Kinetic Models, Kinetic Parameters, Kinetic Studies, Kinetics, Langmuir, Lead, Lead Ions, Models, Pb2+, pH, Preconcentration, Procedure, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Recovery, *Rhizopus-arrhizus*, *Saccharomyces cerevisiae*, Second Order, Second Order Kinetics, Second-Order, Solid-Phase Extraction, Stability, Temperature, Testing, Thermodynamic, Thermodynamic Parameters, Value, Waste Biomass, Water Samples

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Full Text: [2010\Cle-Soi Air Wat38, 936.pdf](2010/Cle-Soi%20Air%20Wat38,%20936.pdf)

Abstract: For the first time ever Enteromorpha compressa macroalgae (ECM) which is commonly found in Turkey has been used as biosorbent by us This study aims to investigate the biosorption of Cd2+ from aqueous solutions in a batch system by using an alga of ECM in different concentrations pH levels agitation rates (90-150 rpm) and contact periods The maximum biosorption capacity of the ECM was found to be 9 50 mg/g at pH 6 Cd2+ initial concentration of 10 mg/L and agitation rate 150 rpm Cadmium removal efficiency was about 95% The experimental isotherm data were analyzed using the Langmuir and Freundlich equations Isotherm parameters for both equations were determined and discussed The stated biosorption mechanism is explained by the Freundlich isotherm (r2 = 0 998) theory Two simplified kinetic models including a pseudo-first and second order equation were selected to follow the biosorption process Kinetic parameters rate constants equilibrium adsorption capacities and related correlation coefficients for each kinetic model were calculated and discussed It was shown that the biosorption of cadmium onto ECM could be described by the pseudo-second order equation (r2 > 0 99).

Keywords: Adsorption, Algae, Aqueous Solutions, Batch, Batch System, Biomass, Biosorbent, Biosorbents, Biosorption, Cadmium, Cadmium, Cadmium Removal, Capacity, Cd(II), Cd2+, Copper(II), Data, Dyes, Equilibrium, Freundlich, Freundlich Isotherm, Heavy-Metal Ions, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Lead, Macroalgae, Model, Models, pH, Process, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Removal Efficiency, Second-Order, Sorption, System, Theory, Turkey

? Laohaprapanon, S., Marques, M. and Hogland, W. (2010), Removal of organic pollutants from wastewater using wood fly ash as a low-cost sorbent. *Clean-Soil Air Water*, **38** (11), 1055-1061.

Full Text: [2010\Cle-Soi Air Wat38, 1055.pdf](2010/Cle-Soi%20Air%20Wat38,%201055.pdf)

Abstract: In this study untreated and treated wood fly ash (WA) was used as a low cost sorbent in batch sorption tests to investigate the removal of organic pollutants from a real wastewater generated by cleaning/washing of machinery in a wood laminate floor industry in Sweden The experiments focused on the effect of the WA dosage and particle size on the removal efficiency for organic compounds With a WA dosage of 160 g L-1 and a particle size less thin 1 mm the reductions of chemical oxygen demand (COD) biologic oxygen demand and total organic carbon were 37±0 4 24±0 4 and 30±0 3% respectively Pre treatment of WA with hot water improved the COD removal efficiency by absorption from 37±0 4 to 42±1 6% when the same dosage (160 g L-1) was applied Sorption isotherm and sorption kinetics for COD using untreated WA can be explained by Freundlich isotherm and pseudo-second-order kinetic models Intra particle diffusion model indicates that pore diffusion is not the rate limiting step for COD removal Based on the experimental data WA could be used as an alternative low cost sorption media/filter for removal of organic compounds from real industrial wastewater.

Keywords: Absorption, Adsorption, Alternative, Aqueous-Solutions, Batch, Bottom Ash, Carbon, Chemical, Chemical Oxygen Demand, Cod, Cost, Data, Demand, Diffusion, Diffusion Model, Dye, Efficiency, Equilibrium, Experimental, Experiments, Fly Ash, Freundlich, Freundlich Isotherm, Granular Activated Carbon, Industrial Wastewater, Intra Particle Diffusion, Isotherm, Kinetic, Kinetic Models, Kinetics, L1, Lead, Low Cost, Low Cost Sorbents, Model, Models, Nov, Organic, Organic Carbon, Organic Compounds, Organic Pollutants, Oxygen, Oxygen-Demand Cod, Particle Diffusion, Particle Diffusion Model, Particle Size, Pollutants, Pore Diffusion, Pre Treatment, Pre-Treatment, Pseudo Second Order, Pseudo-Second-Order, Rate Limiting Step, Removal, Removal Efficiency, Size, Sorbent, Sorption, Sorption Isotherm, Sorption Kinetics, Sweden, Treatment, Wastewater, Water, Wood, Wood Fly Ash

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Full Text: [2010\Cle-Soi Air Wat38, 1062.pdf](2010/Cle-Soi%20Air%20Wat38,%201062.pdf)

Abstract: Bioremediation of Zn(II) by biosorption across aqueous phase on to surface of euca lyptus leaf powder has been investigated in present research work The adsorptive potential of eucalyptus leaf powder was evaluated as function of pH temperature contact time agitation rate and particle size Maximum metal ion uptake and per centage removal capacity of eucalyptus leaf powder were 23 5 mg g(-1) and 94% respectively at optimized pH 5 20±1º C contact time 6 h particle size 0 5mm and agitation rate 200 rpm The biomass surface analysis revealed the fact that the biomass surface was heterogeneous and porous in nature The functional groups like amine amide carboxyl hydroxyl and methyl groups significantly important for metal ion binding were present on biomass surface in tremendous amount Additionally the Fourier transformation IR spectrum analysis of acid and base activated eucalyptus leaf biomass ruled out all the possibilities of the presence of surface functional groups mentioned above The reaction rate was studied by applying two rate limiting models pseudo first and pseudo second order Pseudo second order model was found to be more suitable (R-2 = 0 998) in comparison to pseudo first order (R-2 = 0 724) Adsorption equilibrium of batch stirred reaction data fitting shows the dominance of Langmuir isotherm (R-2 = 0 99) against Freundlich isotherm (R-2 = 0 887) model with equipartitional involvement of both film and ultra particle diffusion as rate limiting steps at differential status of contact time.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Agitation, Analysis, Aqueous Phase, Aqueous-Solutions, Batch, Binding, Biomass, Bioremediation, Biosorption, Capacity, Comparison, Competitive Adsorption, Data, Diffusion, Equilibrium, Eucalyptus, First, First Order, Freundlich, Freundlich Isotherm, Function, Functional Groups, Industrial-Waste, Intra Particle Diffusion, Ir, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Metal, Metal-Ions, Model, Modeling, Models, Nov, Particle Diffusion, Particle Size, pH, Potential, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Reaction, Pseudo-First-Order, Pseudo-Second-Order, Removal, Research, Research Work, Rice Husk Ash, Second Order, Second-Order, Size, Spectrum Analysis, Surface, Surface Functional Groups, Temperature, Transformation, Uptake, Waste-Water, Work, Zinc Ions, Zn(II), Zn(II) Ion

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Full Text: [2010\Cle-Soi Air Wat38, 1131.pdf](2010/Cle-Soi%20Air%20Wat38,%201131.pdf)

Abstract: Magnetite nanoparticles were applied to remove Ni(II) from aqueous solutions as a function of pH, contact time, supporting electrolyte concentration, and analytical initial Ni(II) concentration. The highly crystalline nature of the magnetite structure with 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 m(2)/g. Surface chemical properties of magnetite at 25 degrees C in aqueous suspensions were investigated. The point of zero charge (pHzpc) was found to be 7.33 and the intrinsic acidity constants (pK(a1)(s) and pK(a2)(s)) were found to be 9.3 and 5.9, respectively. The surface functional groups were investigated with Fourier transform-infrared spectroscopy (FTIR) as well. Batch experiments were carried out to determine the adsorption kinetics and mechanism of Ni(II) by these magnetite nanoparticles. The adsorption process was found to be pH dependent. In NaCl solutions, Ni(II) adsorption increased with increasing ionic strength while in NaClO4 solutions, Ni(II) adsorption exhibited little dependence on the ionic strength of the solution. The adsorption process better followed the pseudo-second order equation and Freundlich isotherm.

Keywords: Acidity, Adsorption, Adsorption Kinetics, Aqueous Solutions, Biomass, Charge, Chemical, Complexation, Concentration, Cr(VI), Electron Microscopy, Experiments, Freundlich, Freundlich Isotherm, FTIR, Function, Functional Groups, Ionic Strength, Isotherm, Kinetics, Mackinawite, Magnetite, Mechanism, NaCl, Nanoparticles, Ni(II), pH, pH-Dependent, Point of Zero Charge, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Reduction, Removal, Separation, Solution, Solutions, Sorption, Spectroscopy, Strength, Structure, Surface, Surface Area, Surface Functional Groups, Tem, Transmission, Water, X-Ray, XRD

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Full Text: [2011\Cle-Soi Air Wat39, 74.pdf](2011/Cle-Soi%20Air%20Wat39,%2074.pdf)

Abstract: Adsorptive removal of toxic amaranth dye by alumina reinforced polystyrene (ARP) composite was studied as a function of contact time, pH, initial dye concentration, and temperature. The results indicated that adsorption was strongly dependent on pH and temperature of the dye solution. The adsorption was favored at low pH with the maximum removal at pH 2.0. Langmuir, Freundlich, Temkin, and Dubinin-Radushkevich (D-R) models were used for the description of adsorption equilibrium data and the best interpretation for the experimental data was given by the D-R model. The adsorption kinetics was tested using pseudo first order, pseudo second order, Elovich, intraparticle, and film diffusion models and the removal by ARP followed a pseudo second order kinetics. Thermodynamic studies revealed that both adsorption and desorption was spontaneous and endothermic in nature. From the exhausted adsorbent, about 70 and 96% desorption was obtained with (99%) CH3OH and 0.1M NaOH, respectively.

Keywords: Adsorption, Amaranth, Aqueous-Solutions, Bottom Ash, Congo Red, De-Oiled-Soya, Desorption, Isotherms, Kinetics, Langmuir, Malachite-Green, Methylene-Blue, Recovery, Removal, Sorption, Waste Materials

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Full Text: [2011\Cle-Soi Air Wat39, 162.pdf](2011/Cle-Soi%20Air%20Wat39,%20162.pdf)

Abstract: This study investigates the potential use of activated carbon prepared from the peel of Cucumis sativa fruit for the removal of malachite green (MG) dye from simulated wastewater. The effects of different system variables, adsorbent dosage, initial dye concentration, pH, and contact time were investigated and optimal experimental conditions were ascertained. The results showed that when the amount of the adsorbent increased, the percentage of dye removal increased accordingly. Optimum pH value for dye adsorption was 6.0. Maximum dye was sequestered within 50 min of the start of every experiment. The adsorption of MG followed the pseudo-second-order rate equation and fits the Langmuir, Freundlich, Dubinin-Radushkevich (D-R), and Tempkin equations well. The maximum removal of MG was obtained at pH 6 as 99.86% for adsorbent dose of 1 g/50 mL and 25 mg L-1 initial dye concentration at room temperature. Activated carbon developed from the peel of C. sativa fruit can be an attractive option for dye removal from diluted industrial effluents since test reaction made on simulated dyeing wastewater showed better removal percentage of MG.

Keywords: Activated Carbon, Activated Carbon, Adsorption, Cationic Dyes, Cucumis Sativa, Dye, Freundlich, Kinetic-Model, Kinetics, Langmuir, Low-Cost Adsorbents, Malachite Green, Methylene-Blue, Mg, Model Parameters, Nonlinear Methods, pH, Removal, Rice Husk, Sorption Isotherms, Tempkin, Waste-Water, Wastewater

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Full Text: [2011\Cle-Soi Air Wat39, 250.pdf](2011/Cle-Soi%20Air%20Wat39,%20250.pdf)

Abstract: Ulmus carpinifolia tree leaves were successfully used to remove Tl(I) from aqueous solution in a batch system. In order to improve the uptake capacity of sorbent, it was modified by various chemical agents such as NaOH, HNO3, NH3, NaCl, NaHCO3, and CaCl2. Among the modifiers, NaCl was the best. Equilibrium behavior of sorbent with Tl(I) was examined by the several isotherms. Considering modified U. carpinifolia equilibrium data fitted well to the Langmuir model with maximum capacity of 54.6 mg/g. The other isotherms such as: Freundlich and Dubinin-Redushkevich (D-R) models were also examined. The central composite design (CCD) was successfully employed for optimization of biosorption process. An empirical model was given through using response surface methodology. Also its validation was recognized by using relevant statistical tests such as ANOVA. The optimum conditions of biosorption: pH, m (amount of sorbent) and C (initial concentration) were found to be 7.9, 11.4 g/L, and 8.8 mg/L, respectively. On the other hand thermodynamic parameters: DG, DH, and DS were evaluated: the obtained results show that biosorption process was spontaneous and exothermic. Eventually, FT-IR analysis confirmed that the main functional groups of sorbent have been involved through the biosorption process.

Keywords: Adsorption, Aqueous-Solution, Aspergillus-Niger, Biosorption, Biosorption, Characterization, Equilibrium, Freundlich, FT-IR, FTIR, Heavy-Metals, Ions, Isotherm, Isotherms, Langmuir, Modified, Optimization, pH, Pretreatment, Removal, Response Surface Methodology, Sorption, Thallium, Thallium(I), Thermodynamic, Thermodynamic Parameters, Ulmus Carpinifolia

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Full Text: [2011\Cle-Soi Air Wat39, 274.pdf](2011/Cle-Soi%20Air%20Wat39,%20274.pdf)

Abstract: Batch kinetic studies were carried out for the removal of safranin from aqueous solution using a biomatrix prepared from rice husk. The adsorption kinetic data were modeled using the pseudo-first-order and pseudo-second-order kinetic equations. The linear and non-linear forms of these two widely used kinetic models were compared in this study. In order to determine the best-fitting equation, the coefficient of determination (r2), the sum of the squares of the errors (SSE), sum of the absolute errors (SAE), average relative error (ARE), hybrid fractional error function (HYBRID), Marquardt’s percent standard deviation (MPSD), and the Chi-squared test (χ2) were used as error analysis methods. Results showed that the non-linear forms of pseudo-first-order and pseudo-second-order models were more suitable than the linear forms for fitting the experimental data. Non-linear method is thus more appropriate for estimating the kinetic parameters and should primarily be used to describe adsorption kinetics.

Keywords: Activated Carbon, Adsorption, Agricultural Waste, Aqueous-Solutions, Basic Dye, Coir Pith, Dye Removal, Error Functions, Hazelnut Shells, Heavy-Metals, Kinetic, Kinetic Models, Kinetics, Linear Method, Low-Cost Adsorbents, Methylene-Blue, Non-Linear Method, Nonlinear

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Full Text: [2011\Cle-Soi Air Wat39, 289.pdf](2011/Cle-Soi%20Air%20Wat39,%20289.pdf)

Abstract: The natural cotton fiber was used to synthesize an anion exchange, containing ZrO2 film on its surface, NCFZC (natural cotton fiber/ZrO2 composite). This anion exchanger was produced by the reaction of the zirconium oxychloride and hydroxyl groups on surface of the natural cotton fiber. The material was used for Cr(VI) ions adsorption studies. Adsorption equilibrium time and optimum pH for Cr(VI) adsorption were found to be 6 h and 4.0, respectively. The Langmuir and Temkin isotherms were used to models adsorption equilibrium data. The adsorption capacity of NCFZC was found to be 1.33 mmol/g. Kinetic studies showed that the rate of adsorption of Cr(VI) on NCFZC obeyed a pseudo-second-order kinetic model.

Keywords: Adsorption, Anion Exchange, Aqueous-Solution, Cellulose, Chromium(VI), Cotton Fiber, Equilibrium, Hexavalent Chromium, Isotherms, Kinetic, Kinetic Model, Langmuir, Parameters, pH, Removal, Selective Adsorption, Temkin Isotherm, Vi, Wastes, Zero-Valent, ZrO2

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Full Text: [2011\Cle-Soi Air Wat39, 384.pdf](2011/Cle-Soi%20Air%20Wat39,%20384.pdf)

Abstract: The present investigation evaluates the adsorption effectiveness of Cd(II) ions on Ficus religiosa leaf powder (FRL). The experimental parameters chosen included time, pH, particle size, temperature, adsorbate, anion, and Pb(II) concentrations. The time data followed pseudo-second-order kinetics. Cd(II) adsorption increased from 1.38 to 75.17% with the increase in pH from 2 to 4 and further increase in pH to 5.5 resulted in its marginal increase to 77.52%. Based on regression coefficient values, the isothermic data fitted the various models in the order Langmuir > Redlich-Peterson > Temkin > Freundlich model. The maximum loading capacity of FRL was estimated to be 27.14 mgg-1. The presence of Cl-, SO42-, or Pb2+ exhibited adverse effect on Cd(II) uptake. The thermodynamic parameters of enthalpy (ΔH-0) and entropy (ΔS-0) were estimated to be 8.31 kJ mol-1 and 38.22 J mol-1, respectively. SEM-EPMA of the loaded FRL showed Cd(II) distribution at specific sites. The XRD patterns of Cd(II) loaded FRL sample showed disappearance of some peaks corresponding to beta-Ca(PO3)2; shifting of peaks and decrease in %RI corresponding to gamma-CaSO4 phase. Positive shift of IR bands for the Cd(II) loaded sample was observed.

Keywords: Adsorption, Agricultural Waste, Aqueous Solution, Biosorption, Cadmium, Cd(Ii), Characterization, Equilibrium, Equilibrium, Ficus Religiosa Leaf Powder, Freundlich, Heavy-Metals, Ions, Kinetics, Kinetics, Langmuir, Low-Cost Adsorbents, Pb(Ii), pH, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Wheat Bran

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Full Text: [2011\Cle-Soi Air Wat39, 392.pdf](2011/Cle-Soi%20Air%20Wat39,%20392.pdf)

Abstract: This study reports on the adsorption characteristics of Pb(II) ions from aqueous solutions using ZnCl2-activated date (Phoenix dactylifera) bead (ADB) carbon with respect to change in adsorbent dosage, initial pH, contact time, initial concentration, and temperature of the solution. Kinetic studies of the data showed that the adsorption follows the pseudo-second-order kinetic model. Thermodynamic parameters, enthalpy change (Δ*H*º = 55.11 kJ/mol), entropy change (Δ*S*º = -0.193 kJ/mol/K), and Gibbs free energy change (Δ*G*º) were also calculated for the uptake of Pb(II) ions. These parameters show that adsorption on the surface of ADB was feasible, spontaneous in nature, and endothermic between temperatures of 298.2 and 318.2 K. The equilibrium data better fitted the Langmuir and Freundlich isotherm models than the D-R adsorption isotherm model for studying the adsorption behavior of Pb(II) onto the ADB carbon. It could be observed that the maximum adsorption capacity of ADB was 76.92 mg/g at 318.2 K and pH 6.5.

Keywords: Adsorption, Adsorption Isotherm, Biomass, Biosorption, Carbon, Cd(II), Coconut Shell, Date Bead, Equilibrium, Freundlich, Freundlich Isotherm, Heavy-Metal, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Lead II Ions, Monolayer, Pb(II), Pb(II) Ion, pH, Removal, Surfaces, Thermodynamic, Thermodynamic Parameters

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Full Text: [2011\Cle-Soi Air Wat39, 475.pdf](2011/Cle-Soi%20Air%20Wat39,%20475.pdf)

Abstract: In this study, the removal of zinc(II) ion from an aqueous solution by pistachio shells (PS) is investigated. The dynamic behavior of the adsorption is examined on the effects of pH, adsorbent dosage, and contact time. The adsorption rates are determined quantitatively and simulated by the Lagergren first order, pseudo-second order, Elovich, and intra-particle diffusion kinetic models. The adsorption kinetic models are also tested for validity. The thermodynamic parameters, which are also deduced from adsorption experiments, are very useful in elucidating the nature of adsorption. The experimental results reveal that the optimum pH value and the contact time for the adsorption of Zn2+ onto PS are found as 6 and 10 min, respectively. According to these parameters, adsorption process follows the pseudo-second order kinetic model with high correlation coefficients (R-2 = 0.999). The obtained results demonstrate that PS is a reasonably effective adsorbent for the removal of Zn2+ from aqueous leachate of hazardous waste.

Keywords: Adsorption, Aqueous Solution, Aqueous-Solutions, Basic Dye, Biosorption, Cadmium Ions, Competitive Adsorption, Copper(II), Diffusion, Equilibrium, Heavy Metal, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics, Leachate, Lead(II), pH, Pistachio Shell, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Waste, Zinc, Zinc(II)

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Full Text: [2011\Cle-Soi Air Wat39, 549.pdf](2011/Cle-Soi%20Air%20Wat39,%20549.pdf)

Abstract: The adsorption of three cationic dyes (rhodamine B, RB; crystal violet, CV; and malachite green, MG) onto termite feces, a low-cost adsorbent, was investigated. The adsorbent was characterized by IR spectroscopy, point of zero charge measurement, and the Boehm titration method. The adsorption follows the pseudo-second-order kinetic model and the Langmuir-Freundlich isotherm with maximum adsorption capacities of 95.53 mg g-1 (RB), 75.71 mg g-1 (CV), and 44.78 mg g-1 (MG). The study of thermodynamics showed that the adsorption is a spontaneous and endothermic process. This work suggests that termite feces can be used as a new low-cost adsorbent for cationic dye removal.

Keywords: Activated Carbons, Adsorbent, Adsorption, Azo-Dye, Cationic Dyes, Congo Red, Crystal Violet, Decolorization, Dye Removal, Dyes, Isotherm, Kinetics, Lignin, Low-Cost Adsorbent, Malachite Green, Measurement, Model, Pseudo-Second-Order, Removal, Rhodamine-B, Termite Feces, Thermodynamics

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Full Text: [2011\Cle-Soi Air Wat39, 549.pdf](2011/Cle-Soi%20Air%20Wat39,%20549.pdf)

Abstract: The adsorption of three cationic dyes (rhodamine B, RB; crystal violet, CV; and malachite green, MG) onto termite feces, a low-cost adsorbent, was investigated. The adsorbent was characterized by IR spectroscopy, point of zero charge measurement, and the Boehm titration method. The adsorption follows the pseudo-second-order kinetic model and the Langmuir-Freundlich isotherm with maximum adsorption capacities of 95.53 mg g(-1) (RB), 75.71 mg g(-1) (CV), and 44.78 mg g(-1) (MG). The study of thermodynamics showed that the adsorption is a spontaneous and endothermic process. This work suggests that termite feces can be used as a new low-cost adsorbent for cationic dye removal.

Keywords: Activated Carbons, Adsorbent, Adsorption, Azo-Dye, Cationic Dyes, Congo Red, Crystal Violet, Decolorization, Dye Removal, Dyes, Isotherm, Kinetics, Lignin, Low-Cost Adsorbent, Malachite Green, Measurement, Model, Pseudo-Second-Order, Removal, Rhodamine-B, Termite Feces, Thermodynamics

? Özkahraman, B., Acar, I. and Emik, S. (2011), Removal of Cu2+ and Pb2+ Ions using CMC based thermoresponsive nanocomposite hydrogel. *Clean-Soil Air Water*, **39** (7), 658-664.

Full Text: [2011\Cle-Soi Air Wat39, 658.pdf](2011/Cle-Soi%20Air%20Wat39,%20658.pdf)

Abstract: In this study, carboxymethylcellulose (CMC) based thermoresponsive nanocomposite hydrogel was synthesized for the removal of Cu2+ and Pb2+ ions from aqueous solutions. To prepare nanocomposite hydrogel, graft copolymerization of N-isopropyl acrylamide (NIPAm) and acrylic acid (AA) onto CMC was carried out in Na-montmorillonite (MMT)/water suspension media and ammonium persulfate (APS) used as initiator. The chemical structures of hydrogels were characterized by Fourier transform infrared (FT-IR) and X-ray diffraction spectroscopy (XRD). Lower critical solution temperature (LCST), pH responsivity, swelling, and deswelling properties of the hydrogels were also examined. In addition competitive and non-competitive removal of Cu2+ and Pb2+ studies were carried out. According to heavy metal sorption studies results, removal capacities of nanocomposite hydrogel for both metal ions were found to be higher than those of pure hydrogel. The analyzed adsorption data showed that the adsorption process of Cu2+ and Pb2+ could be explained by pseudo-second order kinetic model. Moreover, according to competitive sorption studies, it is found to be that both hydrogels are more selective to Cu2+ ion rather than Pb2+.

Keywords: Acrylic Acid Copolymers, Adsorption, Ammonium, Aqueous-Solutions, Cellulose Graft-Copolymers, Cmc, Competitive Removal, Copper, FT-IR, FTIR, Graft Copolymerization, Heavy Metal Removal, Heavy-Metal Ions, Hydrogel, Hydrogels, Kinetic, Kinetic Model, Montmorillonite, Nanocomposite, Nipam, pH, Removal, Selective, Sorption, Starch, Superabsorbent Composite, Swelling Behavior, Temperature, X-Ray Diffraction

? Morsy, F.M., Hassan, S.H.A. and Koutb, M. (2011), Biosorption of Cd(II) and Zn(II) by *Nostoc commune*: Isotherm and kinetics studies. *Clean-Soil Air Water*, **39** (7), 680-687.

Full Text: [2011\Cle-Soi Air Wat39, 680.pdf](2011/Cle-Soi%20Air%20Wat39,%20680.pdf)

Abstract: In this study, Nostoc commune (cyanobacterium) was used as an inexpensive and efficient biosorbent for Cd(II) and Zn(II) removal from aqueous solutions. The effect of various physicochemical factors on Cd(II) and Zn(II) biosorption such as pH 2.0-7.0, initial metal concentration 0.0-300 mg/L and contact time 0-120 min were studied. Optimum pH for removal of Cd(II) and Zn(II) was 6.0, while the contact time was 30 min at room temperature. The nature of biosorbent and metal ion interaction was evaluated by infrared (IR) technique. IR analysis of bacterial biomass revealed the presence of amino, carboxyl, hydroxyl, and carbonyl groups, which are responsible for biosorption of Cd(II) and Zn (II). The maximum biosorption capacities for Cd(II) and Zn(II) biosorption by N. commune calculated from Langmuir biosorption isotherm were 126.32 and 115.41 mg/g, respectively. The biosorption isotherm for two biosorbents fitted well with Freundlich isotherm than Langmuir model with correlation coefficient (r2 < 0.99). The biosorption kinetic data were fitted well with the pseudo-second-order kinetic model. Thus, this study indicated that the N. commune is an efficient biosorbent for the removal of Cd(II) and Zn(II) from aqueous solutions.

Keywords: Algal Biomass, Aqueous-Solutions, Biomass Oedogonium Sp, Biosorbent, Biosorbents, Biosorption, Cd(II), Contaminated Water, Copper Ions, Freundlich, Freundlich Isotherm, Heavy Metals, Heavy-Metals, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Lyophilized Cells, Nostoc Commune, pH, Pseudo-Second Order, Pseudomonas-Aeruginosa, Removal, Temperature, Zinc

? Shashirekha, V., Sridharan, M.R. and Swamy, M. (2011), Bioremediation of tannery effluents using a consortium of blue-green algal species. *Clean-Soil Air Water*, **39** (9), 863-873.

Full Text: [2011\Cle-Soi Air Wat39, 863.pdf](2011/Cle-Soi%20Air%20Wat39,%20863.pdf)

Abstract: Trivalent chromium in the form of basic chromium sulfate (BCS) is used for tanning hides/skins and is a strong pollutant of the soil and water bodies. Significant quantities of unutilized chemicals, such as sulfates, chlorides, are also discharged, contributing to high levels of total dissolved solids (TDS), biochemical oxygen demand (BOD), chemical oxygen demand (COD), etc. Though many treatment techniques are being practiced, biotechnological methods are gaining importance. Biosorption is recognized as a cost-effective technology worldwide; one potential sorbent being blue-green algae (BGA), for treating metal-bearing effluents. This work studies the feasibility of using a species each of Spirulina, Oscillatoria, and Synechocystis, individually and as a consortium, as sorbents to remove Cr3+ from a segregated stream, viz. exhaust chrome liquor (ECL) and synthetic BCS solution. The species studied were found to be effective in removing Cr3+ considerably at varying concentrations, besides reducing sulfates, BOD, COD, etc. The results of ECL experiments were more encouraging than those for BCS solution. The kinetic data on Cr3+ sorption onto algal biomass fit well into the pseudo-second order model. The equilibrium data were analyzed using the classic Langmuir and Freundlich isotherm models, yielding good fits. The results of the experiments indicate that algal consortia could be good alternatives to the conventional treatment methods for leather and other industrial wastewaters containing chromium.

Keywords: Activated-Sludge, Aqueous-Solution, Bioremediation, Biosorption, Blue-Green Algae, Brown Seaweed, Chromium, Consortium, Equilibrium, Freundlich, Freundlich Isotherm, Heavy-Metal Ions, Hexavalent Chromium, Isotherm, Kinetic, Langmuir, Pollutant, Pseudo Second Order, Removal, Soil, Sorbent, Sorption, *Spirulina* sp, Tannery Effluent, Trivalent Chromium, Waste-Water, Water

? Saha, T.K., Bhoumik, N.C., Karmaker, S., Ahmed, M.G., Ichikawa, H. and Fukumori, Y. (2011), Adsorption characteristics of reactive black 5 from aqueous solution onto chitosan. *Clean-Soil Air Water*, **39** (10), 984-993.

Full Text: [2011\Cle-Sol Air Wat39, 984.pdf](2011/Cle-Sol%20Air%20Wat39,%20984.pdf)

Abstract: Adsorption of reactive black 5 (RB5) from aqueous solution onto chitosan was investigated in a batch system. The effects of solution pH, initial dye concentration, and temperature were studied. Adsorption data obtained from different batch experiments were modeled using both pseudo first-and second-order kinetic equations. The equilibrium adsorption data were fitted to the Freundlich, Tempkin, and Langmuir isotherms over a dye concentration range of 45-100 mu mol/L. The best results were achieved with the pseudo second-order kinetic and Langmuir isotherm equilibrium models, respectively. The equilibrium adsorption capacity (q(e)) was increased with increasing the initial dye concentration and solution temperature, and decreasing solution pH. The chitosan flakes for the adsorption of the dye was regenerated efficiently through the alkaline solution and was then reused for dye removal. The activation energy (E(a)) of sorption kinetics was estimated to be 13.88 kJ/mol. Thermodynamic parameters such as changes in free energy (ΔG), enthalpy (ΔH), and entropy (ΔS) were evaluated by applying the van't Hoff equation. The thermodynamics of reactive dye adsorption by chitosan indicates its spontaneous and endothermic nature.

Keywords: Activated Carbon, Activation, Adsorption, Anionic Dyes, Chitosan, Desorption, Dye Removal, Equilibrium, Fly-Ash, Isotherm, Kinetics, Langmuir, Low-Cost Adsorbent, Malachite Green, Organic-Matter, pH, Reactive Dye, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Waste-Water

? Özkahraman, B., Bal, A., Acar, I. and Güçlü, G. (2011), Adsorption of brilliant green from aqueous solutions onto crosslinked chitosan graft copolymers. *Clean-Soil Air Water*, **39** (11), 1001-1006.

Full Text: [2011\Cle-Soi Air Wat39, 1001.pdf](2011/Cle-Soi%20Air%20Wat39,%201001.pdf)

Abstract: In this study, graft copolymerization of itaconic acid (IA) and crotonic acid (CA) onto the crosslinked chitosan beads were carried out using ammonium persulfate as initiator. Grafted chitosan beads were characterized by FT-IR analysis and grafting percentage determination. Grafting efficiency and add-on percentages values of grafted chitosan beads were determined as 23-29 and 32-47%, respectively. Then, equilibrium isotherms and kinetics of brilliant green adsorption onto grafted chitosan beads were investigated. The results indicated that the pseudo-second-order kinetic model fitted better than the data obtained from pseudo-first-order model for the adsorption of brilliant green onto grafted chitosan beads. The fit of data for brilliant green (BG) adsorption onto grafted chitosan beads suggested that the Langmuir model gave closer fittings than the Freundlich model.

Keywords: Acid Dye, Acrylic-Acid, Adsorption, Azo Dyes, Basic Dye, Basic-Dyes, Beads, Behavior, Brilliant Green, Chitosan, Crotonic Acid, Freundlich, FTIR, Grafting, Ions, Itaconic Acid, Kinetic, Kinetics, Langmuir, Nanocomposite Hydrogels, Removal, Sorption

? Kaur, P. and Sud, D. (2011), Adsorption kinetics, isotherms, and desorption of monocrotophos and dichlorvos on various Indian soils. *Clean-Soil Air Water*, **39** (12), 1060-1067.

Full Text: [2011\Cle-Soi Air Wat39, 1060.pdf](2011/Cle-Soi%20Air%20Wat39,%201060.pdf)

Abstract: Pesticide sorption on to the soil has a significant role in deciding the fate and behavior of pesticides in soil and aquatic environment. The present study investigates the adsorption of monocrotophos (MCP) and dichlorvos (DDVP) on the three soils of Malwa region of Punjab, India under different conditions. Batch adsorption experiments were preformed in replicates using 2?g of air-dried soil and varying concentrations of pesticides and 20?mL of 0.01?M CaCl2 as background electrolyte. The results revealed high adsorption of MCP and DDVP in soil B with kf-values 0.1261 and 0.0498 and n-values 2.7345 and 1.831, respectively. The adsorption isotherms obtained were analyzed and the data was subjected to classical Langmuir, Freundlich, and Temkin models. The experimental data best fitted to the logarithm form of Freundlich and Temkin model. Kinetics analyses were performed using pseudo-first order, pseudo-second order, and intraparticle diffusion models. The regression results showed that the experimental data fitted very well with the pseudo-second order kinetic model as correlation coefficient value is very closer to 1 and also followed the intraparticle diffusion model, whereas, diffusion is not only the rate controlling step. The percentages desorption with tap and distilled water is 3264% for MCP and 2548% for DDVP.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Isotherms, Aqueous-Solutions, Batch, Carbofuran, Degradation, Desorption, Dyes, Freundlich, Isotherms, Kinetic, Kinetics, Langmuir, Model, Pesticide, Pesticide Sorption, Pesticides, Sepiolite, Soil, Sorption, Toxicity

? Zhou, Q., Gong, W.Q., Yang, D.J., Xie, C.X., Li, Y.B., Liu, X.F., Bai, C.P. and Wang, R. (2011), Assessment of the biosorption characteristics of a spent cottonseed husk substrate for the decolorization of methylene blue. *Clean-Soil Air Water*, **39** (12), 1087-1094.

Full Text: [2011\Cle-Soi Air Wat39, 1087.pdf](2011/Cle-Soi%20Air%20Wat39,%201087.pdf)

Abstract: This study concentrates on the possible application of the spent cottonseed husk substrate (SCHS), an agricultural waste used after the cultivation of white rot fungus Flammulina velutipes, to adsorb methylene blue (MB) from aqueous solutions. Batch studies were carried out with variable initial solution pH, adsorbent amount, reaction time, temperature, and initial MB concentration. MB uptake was favorable at pH ranging from 4.0 to 12.0, and the equilibrium adsorption capacity of 143.5mgg-1 can be reached promptly within about 240min. The combination analysis of FTIR and BET techniques revealed that the massive functional groups on the biosorbent surface, such as hydroxyl and carboxyl, were responsible for the biosorption of MB. It was found that adsorption data matched the pseudo-second order kinetic and Langmuir isotherm models. Thermodynamic parameters of free energy (Δ*G*º), enthalpy (Δ*H*º), and entropy (Δ*S*º), obtained from biosorption MB ranging from 293 to 313K, showed that the sorption experiment was a spontaneous and endothermic process. The study highlighted a new pathway to develop a new potential utilization of SCHS as a low-cost sorbent for the removal of MB pollutants from wastewater.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous-Solution, Batch, BET, Biosorbent, Biosorption, Cationic Dye, Concentration, Enthalpy, Entropy, Equilibrium, FTIR, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbent, Methylene Blue, pH, Removal, Rice Husk, Sorption, Spent Cottonseed Husk Substrate, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake, Waste, Wastewater

? Nabi, S.A., Shahadat, M., Shalla, A.H. and Khan, A.M.T. (2011), Removal of heavy metals from synthetic mixture as well as pharmaceutical sample via cation exchange resin modified with rhodamine B: its thermodynamic and kinetic studies. *Clean-Soil Air Water*, **39** (12), 1120-1128.

Full Text: [2011\Cle-Soi Air Wat39, 1120.pdf](2011/Cle-Soi%20Air%20Wat39,%201120.pdf)

Abstract: A new sorbent was prepared by loading rhodamine B on Amberlite IR-120. Various physico-chemical parameters such as effects of adsorbate concentration, contact time, pH, and temperature on the sorption of the dye have been studied. Thermodynamic parameters (Δ*H*º and Δ*S*º) were also evaluated for the sorption of dye. Kinetic studies revealed that the sorption of the dye was best fit for pseudo-second-order kinetic. The metal ion uptake in different solvent systems has been explored through column studies. On the basis of distribution coefficient (K(d)), some heavy metal ions of analytical interest from binary mixtures have been separated. The limit of detection (LOD) for the Ni2+ and Fe3+ metal ions was 0.81 and 0.60 mu gL-1, and the limit of quantification (LOQ) was found to be 2.72 and 2.0 mu gL-1. This sorbent has also been successfully applied in the analysis of multivitamin formulation. The applicability of the modified resin in the separation of heavy metals constituting real and synthetic samples has been explored.

Keywords: Adsorption, Aqueous-Solution, Binary Mixtures, Concentration, Heavy Metal, Heavy Metals, Industrial Wastewater, Ion-Exchange, Kinetic, Kinetic Studies, Kinetics, Malachite Green, Metal Ion, Metal Ions, Metal Ions Separation, Metals, Modified Resin, Pb(II) Ions, pH, Preconcentration, Removal, Resin, Selective Separation, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Uptake, Waste-Water, Zn2+

# Title: Clean Technologies and Environmental Policy

Full Journal Title: [Clean Technologies and Environmental Policy](http://www.springeronline.com/sgw/cda/frontpage/0,11855,5-175-70-1134038-0,00.html)

ISO Abbrev. Title: Clean Technol. Environ. Policy

JCR Abbrev. Title: Clean Technol Envir

ISSN: 1618-954X

Issues/Year: 4

Language: English

Journal Country/Territory: United States

Publisher: Springer

Publisher Address: 233 Spring St, New York, NY 10013

Subject Categories:

Engineering, Environmental: Impact Factor 1.016, 29/42 (2009)

Environmental Sciences: Impact Factor 1.016, 129/180 (2009)

Meunier, F. (2001), Adsorptive cooling: A clean technology. *Clean Technologies and Environmental Policy*, **3** (1), 8-20.

Full Text: [C\Cle Tec Env Pol3, 8.pdf](C/Cle%20Tec%20Env%20Pol3,%208.pdf)

Abstract: As a consequence of the Kyoto Protocol and its predecessor, the Montreal Protocol, environmental considerations will play an important role in the choice of a refrigeration or heat pump system. Accordingly, sorption technology is expected to develop for cooling as well as for heat pump applications because it uses benign fluids. At the moment, liquid absorption technology is the leading technology in that field; however, adsorption offers advantages that cannot be achieved by liquid absorption technology. This article addresses the measures to reduce halocarbon emissions and the possibilities of adsorption technology. Not only are the direct emissions taken into account but also the indirect ones due to energy consumption. Several cases that show that adsorption cooling is very promising, from the global warming point of view, are considered in this article. They are: waste heat adsorption chilling, natural gas adsorption chilling, trigeneration and natural gas reversible heat pump. Adsorption air conditioning for automobiles is also discussed as a very challenging possibility for adsorption cooling.

Chu, K.H. and Hashim, M.A. (2002), Adsorption characteristics of trivalent chromium on palm oil fuel ash. *Clean Technologies and Environmental Policy*, **4** (1), 8-15.

Full Text: [C\Cle Tec Env Pol4, 8.pdf](C/Cle%20Tec%20Env%20Pol4,%208.pdf)

Abstract: The metal uptake characteristics of ash particles obtained from the combustion of oil palm solid waste (referred to as palm oil fuel ash) are evaluated using trivalent chromium as a model adsorbate. The equilibrium and kinetic properties of Cr(III) are studied in batch stirred-tank experiments. The extent of Cr(III) removal increases with an increase in solution pH. The maximum equilibrium uptake capacity at pH 6 is 0.31 mmol/g of sorbent. A Langmuir isotherm model with pH-dependent parameters accounts very well for the measured equilibrium data. Modeling studies using a second order irreversible reaction model and a pseudo-first order kinetic model indicate that transient profiles obtained experimentally for a range of initial metal concentrations and sorbent dosages are in good agreement with calculated curves of both models. The two kinetic models can be employed for a useful summary of the experimental data so long as their rate coefficients are empirically correlated with the two system variables: initial metal concentration and sorbent dosage.

Schmotzer, M., Castro, M.E. and Shadman, F. (2002), Activated carbon removal of organic contaminants in ultra-pure water systems with recycle. *Clean Technologies and Environmental Policy*, **4** (2), 125-132.

Full Text: [C\Cle Tec Env Pol4, 125.pdf](C/Cle%20Tec%20Env%20Pol4,%20125.pdf)

Abstract: A combination of experimental and process modeling methods is utilized to determine the fundamental equilibrium and kinetic parameters for multi-component adsorption of organic impurities on activated carbon. The operating conditions are generally relevant to the activated carbon application in industrial ultra-pure water plants with recycle; in particular, the study is focused on silicon wafer processing plants. Some compounds, such as IPA, are not adsorbed on granular activated carbon effectively and show poor removal. Removal improves as molecular size increases or as the molecule’s polarity decreases. Equilibrium conditions cannot be assumed for these cases and the kinetic adsorption/desorption parameters should be considered in the process analysis and design. Multi-component interactions are found to be a source of impurity leaching during wastewater treatment and recycle.

? Visa, M., Pricop, F. and Duta, A. (2011), Sustainable treatment of wastewaters resulted in the textile dyeing industry. *Clean Technologies and Environmental Policy*, **13** (6), 855-861.

Full Text: [2011\Cle Tec Env Pol13, 855.pdf](2011/Cle%20Tec%20Env%20Pol13,%20855.pdf)

Abstract: Adsorption on fly-ash-based substrates is discussed as a possible alternative to the industrial processes used for the treatment of wastewaters resulted in the dyeing industry. Three samples, containing four dyes and one conditioner, were collected from the dyeing and rinsing baths in a textile company. Adsorption on fly ash was comparatively discussed with adsorption and photocatalysis, both on fly ash and a mixed suspension with TiO2. The fly-ash crystalline substrates are characterized by X-ray diffraction (XRD) and morphology studies were done using atomic force microscopy. The wastewater, before and after treatment is characterized by quality indicators (pH, TDS, BOD(5), COD, TOC, color, and total chromium content). The studies allow to calculate the efficiency of the dyes removal process and the kinetic parameters, for the pseudo-second order mechanism. The results show that, in designing an industrial wastewater treatment process, the results obtained in the investigations on single-dye solutions must be completed with data specifically obtained on industrial wastewaters. The data also support the assumption of competitive adsorption, between the initial components and between these and the possible by-products resulted after photocatalysis.

Keywords: Adsorption, Adsorption, Adsorption Kinetic, Dyes, Fly Ash, Industrial Wastewater Treatment, Low-Cost Adsorbents, pH, Removal, Waste-Water, Wastewater Treatment

# Title: Cleveland Clinic Journal of Medicine

Full Journal Title: Cleveland Clinic Journal of Medicine

ISO Abbreviated Title: Clevel. Clin. J. Med.

JCR Abbreviated Title: Clev Clin J Med

ISSN: 0891-1150

Issues/Year: 10

Journal Country/Territory: United States

Language: English

Publisher: Cleveland Clinic

Publisher Address: 9500 Euclid Ave, Cleveland, OH 44106

Subject Categories:

Medicine, General & Internal: Impact Factor 0.788, / (2001)

? Smith, F.W. (2003), Severe acute respiratory syndrome (SARS): Update on a moving target. *Cleveland Clinic Journal of Medicine*, **70** (5), 413-??.

# Title: Climate Research

Full Journal Title: Climate Research

ISO Abbreviated Title: Clim. Res.

JCR Abbreviated Title: Clim Res

ISSN: 0936-577X

Issues/Year: 9

Language: English

Journal Country/Territory: Germany

Publisher: Inter-Research

Publisher Address: Nordbunte 23, D-21385 Oldendorf Luhe, Germany

Subject Categories:

Environmental Sciences: Impact Factor 2.250, 57/181 (2009)

Meteorology & Atmospheric Sciences: Impact Factor 2.250, 19/63 (2009)

Notes: highly cited

? New, M., Lister, D., Hulme, M. and Makin, I. (2002), A high-resolution data set of surface climate over global land areas. *Climate Research*, **21** (1), 1-25.

Full Text: [2002\Cli Cha21, 1.pdf](2002/Cli%20Cha21,%201.pdf)

Abstract: We describe the construction of a 10’ latitude/longitude data set of mean monthly surface climate over global land areas, excluding Antarctica. The climatology includes 8 climate elements-precipitation, wet-day frequency, temperature, diurnal temperature range, relative humidity, sunshine duration, ground frost frequency and windspeed-and was interpolated from a data set of station means for the period centred on 1961 to 1990. Precipitation was first defined in terms of the parameters of the Gamma distribution, enabling the calculation of monthly precipitation at any given return period. The data are compared to an earlier data set at 0.5degrees latitude/longitude resolution and show added value over most regions. The data will have many applications in applied climatology, biogeochemical modelling, hydrology and agricultural meteorology and are available through the International Water Management Institute World Water and Climate Atlas (http://www.iwmi.org) and the Climatic Research Unit (littp://www.cru,uea.ac.uk).

Keywords: High Resolution Data Set, Surface Climate, Applied Climatology, Precipitation Probability, Iwmi Climate Atlas, CRU, Air-Temperature Variations, Precipitation Measurement, United-States, Time, Trends, Model, Bias, Variability, Maximum, Minimum

# Title: Climatic Change

Full Journal Title: [Climatic Change](http://www.swetswise.com/eAccess/viewTitleIssues.do?titleID=42773)

ISO Abbreviated Title: Clim. Change

JCR Abbreviated Title: Climatic Change

ISSN: 0165-0009

Issues/Year: 12

Journal Country/Territory: Netherlands

Language: English

Publisher: Kluwer Academic Publ

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

Subject Categories:

Environmental Sciences: Impact Factor 1.870, / (2001)

Meteorology & Atmospheric Sciences: Impact Factor 1.870, / (2001)

? Stanhill, G. (1996), The growth of climate change science: A scientometric study. *Climatic Change*, **48** (2-3), 515-524.

Full Text: [1996\Cli Cha48, 515.pdf](1996/Cli%20Cha48,%20515.pdf)

Abstract: A quantitative description of the growth of climate change science is presented based on the increase in the number of abstracts of scientific publications dealing with the many aspects of this broad subject. This number now totals 7000 and is doubling every 11 years. The annual rate of publication per author and number of authors per paper in climate change science, 1.75 and 2.5 respectively, were similar to those for scientific publications in general but, based on the U.S. data, the cost per publishing scientist is very high largely because of the sums allocated to satellite programs related to climate change research. The total global cost of current climate change research is estimated at three billion U.S. dollars annually. Two plausible but very different interpretations of the growth curve of climate change research are presented and used to discuss its future. The importance of extra-scientific factors in controlling the growth of climate change studies is emphasized, limiting the predictive value of the scientometric analysis presented.

? Bjurstrom, A. and Polk, M. (2011), Physical and economic bias in climate change research: A scientometric study of IPCC Third Assessment Report. *Climatic Change*, **108** (1-2), 1-22.

Full Text: [2011\Cli Cha108, 1.pdf](2011/Cli%20Cha108,%201.pdf)

Abstract: This study demonstrates that IPCC Third Assessment Report is strongly dominated by Natural sciences, especially the Earth sciences. The Social sciences are dominated by Economics. The IPCC assessment also results in the separation of the Earth, Biological and Social sciences. The integration that occurs is mainly between closely related scientific fields. The research community consequently imposes a physical and economic bias and a separation of scientific fields that the IPCC reproduces in the policy sphere. It is argued that this physical and economic bias distorts a comprehensive understanding of climate change and that the weak integration of scientific fields hinders climate change from being fully addressed as an integral environmental and social problem. If climate change is to be understood, evaluated and responded to in its fullness, the IPCC must broaden its knowledge base and challenge the anthropocentric worldview that places humans outside of nature.

Keywords: Assessment, Bias, Change Science, Climate Change, Construction, Domains, Economics, Environmental, Global Environmental-Change, Humans, Intergovernmental Panel, IPCC, Knowledge, Policy, Protection Policy, Research, Sciences, Scientific Advice, Social, Social Sciences, Society, Sociology, Uncertainty

# Title: Clinica Chimica Acta

Full Journal Title: Clinica Chimica Acta

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0009-8981

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Vankampe, E.J., Reinking, W.A. and Heerspin, W. (1966), 51Cr uptake by erythrocytes kinetic studies. *Clinica Chimica Acta*, **13** (1), 52-60.

Full Text: [1960-80\Cli Chi Act13, 52.pdf](1960-80/Cli%20Chi%20Act13,%2052.pdf)

Abstract: Kinetic studies of the Na2[51Cr]O4 uptake by normal human erythrocytes have revealed that this reaction can be described by a complex first order reaction. The equilibrium state at maximum 51Cr uptake can be represented as an adsorption isotherm.—Difficulties of the method are discussed.

? Panteghini, M., Linsinger, T., Wu, A.H.B., Dati, F., Apple, F.S., Christenson, R.H., Mair, J. and Schimmel, H. (2004), Standardization of immunoassays for measurement of myoglobin in serum. Phase 1: Evaluation of candidate secondary reference materials. *Clinica Chimica Acta*, **341** (1-2), 65-72.

Full Text: [C\Cli Chi Act341, 65.pdf](C/Cli%20Chi%20Act341,%2065.pdf)

Abstract: Background: Myoglobin is a low-molecular weight protein present in the cytosol of striated muscles. Its concentrations in serum can be measured by immunoassays and are used as an early indicator of myocardial necrosis. Since variability among commercial myoglobin assays exists, standardization of myoglobin assays is needed. Methods: An international collaborative study was organized with the involvement of seven companies using 12 different automated platforms for measuring myoglobin. Five candidate secondary, i.e., matrixed, reference materials were assayed in relation to linearity, imprecision, recovery rate and commutability to demonstrate a possible identity between the materials and the usual routine serum samples. Results: One Iyophilized candidate material (human heart myoglobin in human serum) was selected as the most suitable secondary reference material, based on the criteria examined. Used as a calibrator a posteriori, the bias between the various myoglobin assays for a frozen human serum pool was reduced from 32% to 13%. Conclusion: This study provides the basis for the selection of an internationally recognized secondary reference material. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Myoglobin, Standardization, Commutability, Reference Materials, Acute Myocardial-Infarction, Cardiac Markers, Troponin-I, Assays, MB

# Title: Clinica Terapeutica

Full Journal Title: [Clinica Terapeutica](http://www.seu-roma.it/clinica_terapeutica/apps/autos.php)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tambone, V. and Pennacchini, M. (2009), From a case of plagiarism to rethinking the use of impact factor. *Clinica Terapeutica*, **160** (4), 295-297.

Full Text: 2009\Cli Ter160, 295.pdf

Abstract: In Italy the impact factor (IF) is used to evaluate individual or collective scientific research (Universities, Departments and Research groups); such Universities’ evaluation is also used to assign funds by Government. The IF is an indicator of a journal’s prestige. It varies a lot according to: 1. type of discipline and thematic area which the journal cover; 2. authors’ number; 3. weight given to citations: 4. self-citations. On these data it seems to us that IF, normalized also, is little profit to evaluate scientific quality of a work and/or researchers’ activity. Additionally, such use of the IF: 1. hits made it difficult to use the same Science Citation Index, since unjustified citations and self-citations are augmented; 2. can compromise the research and increase the cases of scientific misconduct, since researchers are inclined to publish also in absence of meaningful scientific results, only to augment own IF. Quality of a research depends on intrinsic factors (i.e. originality, methodology, etc.), that are perceivable only by experts (peer-reviewers), and it doesn’t depend on external factors as the place of publication or the citation success. Conclusions: scientific literature hits to reacquire its role: to introduce best evidence for scientific research avoiding contaminations caused by economic affairs and competition consequent IF. To such end the evaluation from peer-reviewers is a more reliable way, even though not perfect. Clin Ter 2009; 160(4):295-297.

Keywords: Citation, Citations, Evaluation, Impact Factor, Journals, Peer-Review, Quality, Research, Scientific Research, Universities

# Title: Clinical Anatomy

Full Journal Title: [Clinical Anatomy](http://portalt.wok.mimas.ac.uk/portal.cgi?DestApp=WOS&Func=Frame)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Lukić, I.K., Lukić, A., Glunčić, V., Katavić, V., Vučenik, V. and Marušić, A. (2004), Citation and quotation accuracy in three anatomy journals. *Clinical Anatomy*, **17** (7), 534-539.

Full Text: [2004\Cli Ana17, 534.pdf](2004/Cli%20Ana17,%20534.pdf)

Abstract: Citation and quotation errors are common in medical journals. We assessed the prevalence of those errors in gross anatomy journals, where articles often cite old anatomical studies. The study included 199 randomly selected references from articles published in the first 2001 issue of three major gross anatomy journals: Annals of Anatomy, Clinical Anatomy, and Surgical and Radiologic Anatomy. The selected references were checked for accuracy against the original articles. Citation errors were classified as major, intermediate, and minor. Quotation errors were classified as major and minor. Citations errors were found in 27% (54/199) of the references and 38% of them were major errors. Errors occurred in 19% (52/272) of quotations and nearly all (94%) were major. Furthermore, 24% of the quotations were indirect references to a secondary, instead of original, source. There was no statistically significant difference in the rates of citation or quotation errors between the references published before or after the introduction of MEDLINE (chi(2) test, P > 0.05) in 1963, and the prevalence of these errors in gross anatomy journals was similar to that found in other medical fields. A high proportion of major citation errors, a very high proportion of major quotation errors, and the substantial number of indirect quotations call for serious editorial action in anatomy journals. (C) 2004 Wiley-Liss, Inc.

Keywords: Bibliography, Documentation, Literature, Periodicals, Publishing, Medical Journals, References, Anesthesia, Dissection, Paper

? Turp, J.C., Arma, T. and Minagi, S. (2005), Is the posterior belly of the digastric muscle palpable? A qualitative systematic review of the literature. *Clinical Anatomy*, **18** (5), 318-322.

Full Text: 2005\Cli Ana18, 318.pdf

Abstract: Palpation of the posterior belly of the digastric muscle in the postmandibular region is included in many study protocols and examination schemes of the masticatory system. The aim of the present investigation was to systematically search the dental/medical literature to find evidence for the palpability of this muscle. In August 2004, a systematic search was carried out using different electronic databases (PUBMED, Cochrane Library, Web of Science, Japana Centra Revuo Medicina, MedPilot, Latin American and Caribbean Health Sciences, and three on-line databases of dental journals not listed currently in MEDLINE), supplemented by manual search in the Austrian journal Stoniatologie. Additional manual searches were carried out in the Journal of Orofacial Pain and Journal of Dental Research to identify pertinent abstracts of scientific congresses. One relevant hit was found in the Japanese database. The manual search showed one pertinent congress abstract. In both publications, the authors concluded that due to anatomical reasons the posterior belly of the digastric muscle was not palpable. Hence, evidence is lacking that the posterior digastric muscle is accessible to palpation. Because the postmandibular region is usually tender upon palpation, a high incidence of positive findings can be expected even among healthy subjects. This may lead to wrong clinical judgments, possibly provoking unnecessary diagnostic and therapeutic measures. (c) 2005 Wiley-Liss, Inc.

Keywords: Authors, Clinical Examination, Cochrane, Databases, Diagnosis, Health, Japanese, Journal, Journals, Latin American, Lead, Literature, Mandibular Dysfunction, Palpation, Palpation, Prevalence, Publications, PUBMED, Research, Review, Science, Systematic, Systematic Review, Temporomandibular Disorders, Temporomandibular Joint Disorders, Validity, Web of Science

? Loukas, M., Akiyama, M., Shoja, M.M., Yalçin, B., Tubbs, R.S. and Cohen-Gadol, A.A. (2010), John Browne (1642-1702): Anatomist and plagiarist. *Clinical Anatomy*, **23** (1), 1-7.

Full Text: [2010\Cli Ana23, 1.pdf](2010/Cli%20Ana23,%201.pdf)

Abstract: In contrast to many other physicians of his age, John Browne (1642-1702), an English anatomist and surgeon, managed to strike a balance in his career that spanned relative obscurity, prestige, and notoriety. Among his more prestigious credits, Browne was Surgeon in Ordinary to King Charles II and William III. He also had numerous publications to his name, some of which are credited as great innovations. His career, however, was tempered by his most important book, which has been critiqued by his contemporaries as well as modern historians as plagiarism. Although Browne undeniably copied the works of others and published them under his name, he was not alone in this practice. Various forms of intellectual thievery were common in Browne’s day, and there were many perpetrators. The life of this overlooked figure in the history of anatomy and the stigma attached to him will be examined. Clin. Anat. 23:1-7, 2010. (C) 2009 Wiley-Liss, Inc.

Keywords: Anatomy, England, History, Plagiarism, Publications

# Title: Clinical Cancer Research

Full Journal Title: Clinical Cancer Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Nagorsen, D. and Thiel, E. (2006), Clinical and immunologic responses to active specific cancer vaccines in human colorectal cancer. *Clinical Cancer Research*, **12** (10), 3064-3069.

Abstract: Colorectal cancer is a common malignant disease, which, despite some progress, still requires improved therapeutic options. Several clinical studies have used active specific immunotherapy (i.e., vaccination) in colorectal cancer. However, the literature still lacks a comprehensive meta-analysis of this approach in advanced colorectal cancer. We did a systematic review with a meta-analysis of clinical studies to evaluate the objective clinical and immunologic response to active specific immunotherapy in patients with colorectal cancer. We conducted a search of MEDLINE and the Web of Science, manually reviewed the literature, and consulted with experts. Criteria for including studies were colorectal cancer patients, active specific immunotherapy to induce a response directed against cancer or cancer antigens, an evaluable tumor burden (i.e., advanced or metastatic colorectal cancer), and precise classification of the patient, disease, and response. Response rates were assessed according to WHO criteria. Primary end points were the objective clinical response rate and the rate of immunologic responses. The secondary end point was the distribution of immune and clinical responses in relation to the route of vaccination and the type of vaccine. Thirty-two phase I/II studies reporting on 527 patients with advanced or metastatic colorectal cancer met all inclusion criteria. Pooled analysis showed an overall response rate (complete response + partial response) of 0.9% for advanced/metastatic colorectal cancer patients who underwent active specific immunization with a broad variety of substances (e.g., autologous tumor cells, peptide vaccine, dendritic cells, idiotypic antibody, and virus-based vaccine). Humoral immune responses were reported in 59%, and cellular ones were reported in 44% of the cases. Mixed or minor responses and disease stabilization are described in 1.9% and 8.3% of colorectal cancer patients, respectively. Pooled results of clinical trials reveal a very weak clinical response rate of 0% for active specific immunization procedures currently available for advanced colorectal cancer. Immune response induction is described in approximately half the patients.

Keywords: Analysis, Antibody Vaccine, Burden, Cancer, Carcinoma Patients, Clinical Trials, Colony-Stimulating Factor, Colorectal Cancer, Dendritic Cells, Disease, Encoding Carcinoembryonic Antigen, Gastrointestinal Malignancies, Human, I, Ii, Immune-Responses, Immunization, Immunotherapy, Literature, Meta-Analysis, Peptide Vaccine, Phase-I Trial, Points, Pooled Analysis, Primary, Review, Science, Systematic, Systematic Review, Tumor-Cell Vaccine, Vaccination, Vaccine, Vaccines, Web of Science, Who

? Maitland, M.L., Hudoba, C., Snider, K.L. and Ratain, M.J. (2010), Analysis of the yield of phase II combination therapy trials in medical oncology. *Clinical Cancer Research*, **16** (21), 5296-5302.

Abstract: Purpose: Phase II clinical studies screen for treatment regimens that improve patient care, but screening combination regimens is especially challenging. We hypothesized that recognized flaws of single-arm trials could be magnified in combination treatment studies, leading to many reported positive phase II trials but with a low fraction resulting in practice-changing phase III trials. Experimental Design: We searched MEDLINE and identified 363 combination chemotherapy clinical trials published in 2001 and 2002. Studies were rated as positive, negative, or inconclusive based on a standardized review of abstract and text. The Web of Science Index (Thomson Reuters, NY, NY) was searched for all articles published between January 2003 and October 2007 that cited at least one of these 363 published trials. Results: of 363 published phase II combination chemotherapy trials, 262 (72%) were declared to be positive. Among 3,760 unique subsequent citing papers, 20 reported randomized phase III trials of the same combination in the same disease as the source paper, and 10 of these resulted in improved standards of care. Estimating from these data, the likelihood that a published, positive phase II combination chemotherapy trial will result in a subsequent trial showing an improvement in standard of care within five years was 0.038 (95% confidence interval, 0.016-0.064). Conclusions: The contributory value of combination chemotherapy phase II trials done by 2001-2002 standards is low despite the participation of more than 16,000 subjects. Future phase II studies of combination regimens require better methods to screen for treatments most likely to improve standards of care. Clin Cancer Res; 16(21); 5296-302. (C)2010 AACR.

Keywords: Cancer, Carboplatin, Cell Lung-Cancer, Chemotherapy, Clinical Trials, Clinical-Trials, Design, Disease, MEDLINE, Oncology, Outcomes, Paclitaxel, Papers, Predictors, Rates, Review, Science, Screening, Standards, Success, Targeted Agents, Treatment, Web of Science

# Title: Clinical Chemistry

Full Journal Title: [Clinical Chemistry](http://www.clinchem.org/); [Clinical Chemistry](http://www.clinchem.org/)

ISO Abbreviated Title: Clin. Chem.

JCR Abbreviated Title: Clin Chem

ISSN: 0009-9147

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Amer Assoc Clinical Chemistry

Publisher Address: 2101 L Street NW, Suite 202, Washington, DC 20037-1526

Subject Categories:

Medical Laboratory Technology: Impact Factor 4.261, / (2000)

? Rice, E.W. (1983), Bibliometric evaluations of modern *Clinical Chemistry* are needed. *Clinical Chemistry*, **29** (10), 1858-1859.

Full Text: [1983\Cli Che29, 1858.pdf](1983/Cli%20Che29,%201858.pdf)

? Campos, C. and Redondo, F.L. (1991), Bibliometrics and *Clinical Chemistry*. *Clinical Chemistry*, **37** (2), 303-304.

Full Text: [1991\Cli Che37, 303.pdf](1991/Cli%20Che37,%20303.pdf)

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Full Text: [1995\Cli Che41, 1325.pdf](1995/Cli%20Che41,%201325.pdf)

? Miura, Y., Ichikawa, Y., Ishikawa, T., Ogura, M., De Fries, R., Shimada, H. and Mitsuhashi, M. (1996), Fluorometric determination of total mRNA with oligo(dT) immobilized on microtiter plates. *Clinical Chemistry*, **42** (11), 1758-1764.

Full Text: [1996\Cli Che42, 1758.pdf](1996/Cli%20Che42,%201758.pdf)

Abstract: We have developed a rapid and nonradioactive method of quantifying cytosolic mRNA from crude cell lysates by using plastic plates to which oligonucleotides containing poly(dT) sequences were previously immobilized. Captured mRNA on the plate was mixed with Yoyo-1 fluorescent indicator dye, and the resulting Yoyo-1 fluorescence of the mRNA-Yoyo-1 complex was measured in a fluorometer. Because Yoyo-1 signals were linearly increased in proportion to the amount of applied mRNA in the range 10-250 ng, the amount of mRNA in test samples can be determined by comparing their Yoyo-1 fluorescence with that of known concentrations of calibrator mRNA. Using this system, we found that the amount of cytosolic mRNA in undifferentiated U937 and HL-60 cells was 268.6±13.1 and 282.0±7.8 ng/106 cells, respectively, significantly (P < 0.01) more than that of phorbol ester-induced differentiated U937 and HL-60 cells (145.3±13.9 and 164.7±11.6), respectively. Therefore, the present system may be applicable to both medical molecular biology research and diagnostics.

Keywords: Cytosol, Cellular Growth, Cellular Differentiation, Yoyo-1, Plastic Plates, Messenger-RNA, Ribosomal-RNA, Growing Cells, Growth, Fibroblast, Evolution, Ratio, Gene

Peters, T. (1998), Citation classics in intermediary metabolism. *Clinical Chemistry*, **44** (7), 1371-1375.

Full Text: [1998\Cli Che44, 1371.pdf](1998/Cli%20Che44,%201371.pdf)

Gotto, A.M. and Cooper, G.R. (1998), Citation classics in lipid measurement and applications. *Clinical Chemistry*, **44** (11), 2234-2237.

Full Text: [1998\Cli Che44, 2234.pdf](1998/Cli%20Che44,%202234.pdf)

Keywords: Density-Lipoprotein Cholesterol, Education-Program Recommendations, Definitive Method, Serum, Triglycerides, Plasma, A-1

Rice, E.W. (1999), “Citation classics in Clinical Chemistry”: Contributions by AACC members duly noted. *Clinical Chemistry*, **45** (2), 311.

Full Text: [1999\Cli Che45, 311.pdf](1999/Cli%20Che45,%20311.pdf)

Arndt, T. (2001), Carbohydrate-deficient transferrin as a marker of chronic alcohol abuse: A critical review of preanalysis, analysis, and interpretation. *Clinical Chemistry*, **47** (1), 13-27.

Full Text: [2001\Cli Che47, 13.pdf](2001/Cli%20Che47,%2013.pdf)

Abstract: Background: Carbohydrate-deficient transferrin (CDT) is’ used for diagnosis of chronic alcohol abuse. Some 200-300 reports on CDT have been published in impact factor-listed journals. The aims of this review were to condense the current knowledge and to resolve remaining issues on CDT.

Approach: The literature (1976-2000) was searched using MEDLINE and Knowledge Server with “alcohol and CDT”-as the search items. The data were reviewed systematically, checked for redundancy, and organized in sequence based on the steps involved in CDT analysis.

Content: The review is divided into sections based on microheterogeneity of human serum transferrin (Tf), definition of CDT, structure of human serum CDT, pathomechanisms of ethanol induced CDT increase, preanalysis, analysis, and medical interpretation (postanalysis). Test-specific cutoff values for serum CDT and causes of false positives and negatives for chronic alcohol abuse are discussed and summarized. Summary: Asialo-and disialo-Fe-2-Tf, which lack one or. two complete N-glycans, and monosialo-Fe-2-Tf (structure-remains unclear) are collectively referred to as CDT. Diminished mRNA concentration and glycoprotein glycosyltransferase activities involved in Tf N-glycan synthesis and increased sialidase activity most likely account for alcohol-induced increases in CDT. Knowledge about in vivo and in vitro effects on serum CDT is poor. Reliable CDT and non-CDT fractionation is heeded for CDT- measurement. Analysis methods with different analytical, specificities and recoveries decreased the : comparability of values and statistical parameters of the diagnosis efficiency of CDT. CDT is the most specific marker of chronic alcohol abuse to date. Efforts should concentrate on the pathomechanisms (in vivo), preanalysis, and standardization of CDT analysis. (C) 2001 American Association for Clinical Chemistry.

Keywords: Gamma-Glutamyl-Transferase, Capillary-Zone-Electrophoresis, Mean Corpuscular Volume, Human-Serum Transferrin, Liver-Disease, Exchange Chromatography, Differential-Diagnosis, Clinical-Significance, Glycoprotein Syndrome, Sialo-Transferrins

Siebers, R. (2001), How accurate are references in clinical chemistry? *Clinical Chemistry*, **47** (3), 606-607.

Full Text: [C\Cli Che47, 606.pdf](C/Cli%20Che47,%20606.pdf)

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Full Text: [2001\Cli Che47, 606.pdf](2001/Cli%20Che47,%20606.pdf)

? Yazdanyar, S., Weischer, M. and Nordestgaard, B.G. (2009), Genotyping for NOD2 genetic variants and crohn disease: A metaanalysis. *Clinical Chemistry*, **55** (11), 1950-1957.

Full Text: [2009\Cli Che55, 1950.pdf](2009/Cli%20Che55,%201950.pdf)

Abstract: BACKGROUND: Arg7702Trp, Gly908Arg, and Leu1007fisinsC variants of the NOD2 gene (nucleotide-binding oligomerization domain containing 2; alias, CARD15) influence the risk of Crohn disease. METHODS: We conducted a systematic review to examine,whether Arg702Trp, Gly908Arg, and Leu1007fsinsC are equally Important risk factors for Crohn disease. In addition, we used studies for which combined information from all genotypes was available to compare risks in simple heterozygotes, compound heterozygotes, and homozygotes. PUBMED, EM BASE, and Web of Science were searched. Seventy-five articles (18 727 cases and 17 102 controls) met the inclusion criteria and contributed data to the metaanalyses. RESULTS: The odds ratios per allele for Crohn disease were 2.2 (95% CI, 2.0-2.5) for Arg702Trp, 2.6 (2.2-2.9) for Gly908Arg, and 3.8 (3.4-4.3) for Leu1007fsinsC (z-test results: Arg702Trp vs Gly908Arg, P = 0.03; Arg702Trp vs Leu1007fsinsC, P < 0.001; Gly908Arg vs Leu1007fisinsC, P < 0.001). When all 3 genotypes were combined, odds ratios for Crohn disease were 2.4 (95% CI, 2.0-2.8) for simple heterozygotes, 9.0 (6.0-13.5) for Compound heterozygotes, and 6.7 (4.1-10.9) for homozygotes, compared with noncarriers (z-test results: simple heterozygotes vs compound heterozygotes, P < 0.001; simple heterozygotes vs homozygotes, P < 0.001; compound heterozygotes vs homozygotes, P = 0.18). CONCLUSIONS: The per-allele risk of Crohn disease was markedly higher for Leu1007fsinsC than for Arg702Trp and Gly908Arg. Combining all genotypes revealed the risks of Crohn disease for compound heterozygotes and homozygotes to be similar and markedly higher than for simple heterozygotes. (C) 2009 American Association for Clinical Chemistry.

Keywords: Association, Card15, Inflammatory-Bowel-Disease, Mutations, NOD2, Card15, Phenotype Relationship, Polymorphisms, Population, Prevalence, Risk Factors, Susceptibility

# Title: Clinical Chemistry and Laboratory Medicine

Full Journal Title: [Clinical Chemistry and Laboratory Medicine](http://web.ebscohost.com/ehost/detail?vid=1&hid=12&sid=8200edf9-f6b9-461e-a559-d2019b3b8374%40sessionmgr12&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=9EC)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Language:

Journal Country/Territory:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Uysal, S., Tuglu, B., Ozalp, Y. and Onvural, B. (2008), Fate of abstracts presented at the 2002 IFCC meeting. *Clinical Chemistry and Laboratory Medicine*, **46** (11), 1562-1567.

Full Text: [2008\Cli Che Lab Med46, 1562.pdf](2008/Cli%20Che%20Lab%20Med46,%201562.pdf)

Abstract: Background: Poster presentations at major meetings serve to rapidly present and share study results with the scientific community. On the other hand, full-text publication of abstracts in peer-reviewed journals provides dissemination of knowledge. The purpose of this study was to evaluate the publication rate of abstracts presented at the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) Meeting, to assess the factors influencing publication and determine the impact factor of these journals. Methods: All poster abstracts presented at the 2002 IFCC Meeting were included in the study. A Medline search was performed to identify a matching journal article. Topics, country of origin, study type, study center and publication year were tabulated. Journals and impact factors of publication were noted. Results: Out of 900 presented abstracts, 125 (13.9%) were published as full-text articles. Publication rates according to topics of the meeting, country of origin and university affiliation demonstrated significant differences. Abstracts from multi-centered studies had higher publication rates, and the journals they were published in had higher impact factors than single center studies. The median impact factor of the journals was 2.093. According to regression analysis, the major predictors for publication were interventional research and university affiliation (odds ratios 2.916 and 1.782, respectively; p<0.05). Conclusions: The publication rate for abstracts of this clinical chemistry meeting was lower than rates from other fields of medicine. Factors leading to failure require elucidation. Encouraging authors to submit their presentations for full-text publication might improve the rate of publication.

Keywords: Affiliation, Analysis, Association, Authors, Chemistry, Clinical, Clinical Chemistry, Community, Country, Country of Origin, Factors, Failure, Impact, Impact Factor, Impact Factors, Journal, Journal Article, Journals, Knowledge, Matching, Medicine, Meeting, Meetings, NOV, Origin, Peer Reviewed Journals, Peer-Reviewed, Predictors, Publication, Publication Rate, Publish, Purpose, Rates, Regression, Regression Analysis, Research, Search, Society, Subsequent Publication, Trials, University

? Siest, G. and Jahnke, H. (2008), *CCLM* Award for the most cited paper recently published. *Clinical Chemistry and Laboratory Medicine*, **46** (12), 1663.

Full Text: [2008\Cli Che Lab Med46, 1663.pdf](2008/Cli%20Che%20Lab%20Med46,%201663.pdf)

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Full Text: [2009\Cli Che Lab Med47, 1211.pdf](2009/Cli%20Che%20Lab%20Med47,%201211.pdf)

Abstract: Over the past decade, research in Biochemistry and Molecular Biology has developed rapidly worldwide. The present study was designed to study the characteristics of publications in Biochemistry and Molecular Biology journals between 1999 and 2008 from the six top-ranking countries - the United States (USA), Japan, Germany, United Kingdom (UK), China and France. We also examined the research output from three different regions - Mainland China (ML), Hong Kong (HK) and Taiwan (TW). The USA contributed 34.1% of the world’s total output and ranked first, but its percentage of research articles in this field went down. In total, 26,867 articles were published in journals with an impact factor (IF) < 10.000, and 46.5% of these were from the USA. China contributed 4.2% of the total in 268 journals, 0.5% of which were journals with the top 10 IF. Our analysis describes the output from each country and region, and reveals the positive trend in China during the period of 1999-2008. In contrast to other countries, our results suggest that China is behind in conducting high-quality research. Clin Chem Lab Med 2009;47:1211-6.

Keywords: Biochemistry And Molecular Biology, China, Impact Factor, Journal Citation Reports, Science Citation Index Expanded, Life Sciences, Journals, Biotechnology, Health, Impact

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Full Text: [2011\Cli Che Lab Med49, 941.pdf](2011/Cli%20Che%20Lab%20Med49,%20941.pdf)

# Title: Clinical Endocrinology

Full Journal Title: Clinical Endocrinology

ISO Abbreviated Title: Clin. Endocrinol.

JCR Abbreviated Title: Clin Endocrinol

ISSN: 0300-0664

Issues/Year: 12

Journal Country/Territory: England

Language: English

Publisher: Blackwell Science Ltd

Publisher Address: PO Box 88, Osney Mead, Oxford OX2 0NE, Oxon, England

Subject Categories:

Endocrinology & Metabolism: Impact Factor

? Rosen, T., Wiren, L., wilhelmsen, L., Wiklund, I. and Bengtsson, B.A. (1994), Decreased psychological well-being in adult patients with growth-hormone deficiency. *Clinical Endocrinology*, **40** (1), 111-116.

Full Text: [1994\Cli End40, 111.pdf](1994/Cli%20End40,%20111.pdf)

Abstract: OBJECTIVE Besides effects on body composition, bone mineral content and lipid metabolism, GH seems to influence quality of life, according to previous studies of limited numbers of patients with GH deficiency of childhood and adult origin. In this study psychological wellbeing was assessed in a large number of patients with GH deficiency of adult origin. DESIGN A follow-up study of patients with hypopituitarism on routine replacement therapy with L-thyroxine, cortisone acetate and sex steroids.

PATIENTS Eighty-six patients (51 men, mean age 55.4 years and 35 women, mean age 54.9 years) diagnosed as having growth hormone deficiency on the basis of low IGF-I concentration or a maximum GH response less than 5 mU/I after an insulin/glucagon tolerance test.

MEASUREMENTS Quality of life was measured with a self-rating questionnaire, the Nottingham Health Profile, and the results were compared with the results from 86 controls matched for age, gender, marital status and socioeconomic class. Furthermore, the observed and expected number of disablement pensions were calculated.

RESULTS The mean total score of the patients was higher, i.e. worse (P<0.05), than that of the matching controls, indicating a higher level of perceived health problems among the patients. There were higher scores (poorer life quality) for energy (P<0.001), social isolation (P<0.01), emotional reaction (P = 0.056) and sex life (P<0.001) among patients compared with controls. Finally, the observed number of disablement pension among the patients tended to be higher than expected (19 vs 12.4, P = 0.09).

CONCLUSIONS Adult patients with GH deficiency have a decreased psychological well-being in terms of energy, social isolation and emotional reaction and a disturbed sex life compared with normals. Furthermore, there is a tendency to a higher frequency of early retirement.

Keywords: Perceived Health-Problems, Performance, Quality, Life

Norrelund, H. and Moller, N. (2000), Reply. *Clinical Endocrinology*, **53** (4), 541.

Full Text: [2000\Cli End53, 541.pdf](2000/Cli%20End53,%20541.pdf)

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Full Text: [2007\Cli End67, 693.pdf](2007/Cli%20End67,%20693.pdf)

Abstract: Background Increased mortality has been reported in patients with pituitary disease, with some studies showing higher standard mortality rates (SMR) in women than in men. Objective To assess overall SMR for men and women with benign pituitary disease without excessive ATCH or GH secretion and to investigate associations between SMR and time period of diagnosis. Design From searches in PUBMED, EMBASE and Web of Science databases, and reference lists of major reviews and original articles, we included original studies providing SMR values and 95% confidence intervals (CI) for men and women separately. Thirty articles were studied in detail. Six studies were eligible for the meta-analysis of sex-specific mortality, and seven for the analysis of association between SMR and diagnosis period. Results Individual studies (total 5412 patients) reported total SMR values (men and women together) ranging from 1.21 to 3.80. SMR varied from 0.98 to 3.36 in men and from 2.11 to 4.54 in women. Weighted SMR values were significantly higher in women (2.80; CI 2.59-3.02) than in men (2.06; CI 1.94-2 20) (P < 0.0001). SMR was negatively correlated with first year of diagnosis in individual studies (partial correlation analysis controlling for sex, P = 0.017), and approached normal in recent studies in men but not in women. Conclusions In our meta-analysis of patients with pituitary disease without ACTH or GH excess, SMR was significantly higher in women than in men. SMR reached normal levels in men treated in recent decades, but remained elevated in women.

Keywords: Analysis, Cardiovascular-Disease, Confidence Intervals, Databases, Diagnosis, Disease, GH-Deficient Adults, Hormone-Therapy, Hypopituitarism, Life Expectancy, Meta-Analysis, Mortality, Normal, Premature Mortality, PUBMED, Science, Web of Science, Women

? Dong, M., Parsaik, A.K., Erwin, P.J., Farnell, M.B., Murad, M.H. and Kudva, Y.C. (2011), Systematic review and meta-analysis: Islet autotransplantation after pancreatectomy for minimizing diabetes. *Clinical Endocrinology*, **75** (6), 771-779.

Full Text: [2011\Cli End75, 771.pdf](2011/Cli%20End75,%20771.pdf)

Abstract: Objective Islet autotransplantation (IAT) may decrease the morbidity and mortality of postpancreatectomy diabetes mellitus. The current systematic review and meta-analysis examined the rate of insulin independence (II) and mortality after IAT post-total (TP) or partial pancreatectomy (PP). Methods Ovid MEDLINE, EMBASE, Web of Science, SCOPUS and reference lists were searched until 31 January 2011. Eligible studies enrolled adult patients with IAT post-TP or PP, regardless of study design, sample size and language. Two investigators identified eligible studies and extracted data independently. From each study, 95% confidence intervals (CIs) were estimated and pooled using random effects meta-analysis. Results Fifteen observational studies were eligible (11 IAT post-TP, two post-PP and two including both). The II rates for IAT post-TP at last follow-up and transiently during the study were 4.62 per 100 person-years (95% CI: 1.53-7.72) and 8.34 per 100 person-years (95% CI: 3.32-13.37), respectively. In the later group, patients achieved transient II lasting 15.57 months (95% CI: 10.35-20.79). The II rate at last follow-up for IAT post-PP was 24 28 per 100 person-years (95% CI: 0.00-48.96). Whereas the 30-day mortality for IAT post-TP and post-PP was 5% (95% CI: 2-10%) and 0, respectively, the long-term mortality was 1 38 per 100 personyears (95% CI: 0.66-2.11) and 0.70 per 100 person-years (95% CI: 0 00-1 80) respectively. Conclusions IAT postpancreatectomy offers some patients a chance for insulin independence. Better data reporting are essential to establish the risks and benefits of IAT after pancreatic surgery.

Keywords: Adult, Auto-Transplantation, Cell Transplantation, Confidence Intervals, Design, Diabetes, Diabetes Mellitus, Embase, Experience, Follow-Up, Humans, Insulin, Liberase, Management, Medline, Meta Analysis, Meta-Analysis, Methods, Morbidity, Mortality, Observational, Observational Studies, Outcomes, Patients, Resection, Review, Science, Scopus, Severe Chronic-Pancreatitis, Surgery, Systematic, Systematic Review, Web of Science

# Title: Clinical and Experimental Allergy

Full Journal Title: Clinical and Experimental Allergy

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Language:

Journal Country/Territory:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Boyle, R.J., Bath-Hextall, F.J., Leonardi-Bee, J., Murrell, D.F. and Tang, M.L.K. (2009), Probiotics for the treatment of eczema: A systematic review. *Clinical and Experimental Allergy*, **39** (8), 1117-1127.

Abstract: P>Background Probiotics have been proposed as a treatment for eczema, but the results of intervention trials have been mixed. Objective To evaluate the efficacy of probiotics for treating eczema by performing a systematic review of randomized-controlled trials (RCTs). Design We searched the Cochrane Skin Group Specialised Register, Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, PsycINFO, AMED, LILACS, ISI Web of Science, the reference lists of articles, ongoing clinical trial registers and conference proceedings. RCTs of live orally ingested microorganisms for the treatment of eczema were eligible for inclusion. Results Twelve trials (781 participants) were identified. Meta-analysis of data from five of these trials showed that there was no significant reduction in eczema symptoms with probiotic treatment compared with placebo (mean difference -0.90 points on a 20-point visual analogue scale; 95% confidence interval -2.84, 1.04). Meta-analysis of data from seven trials showed no significant difference in investigator rated eczema severity between probiotic and placebo treatments. Subgroup analysis by eczema severity or presence of atopy did not identify a specific population in which probiotic treatment was effective. There was significant heterogeneity between studies; however, the results of three studies that used the same probiotic strain were concordant. The adverse events search identified case reports of sepsis and bowel ischaemia caused by probiotics. Conclusions Currently, probiotics cannot be recommended for treating eczema. The heterogeneity between studies may be attributable to probiotic strain-specific effects, which means that novel probiotic strains may still have a role in eczema management.

Keywords: Analysis, Case Reports, Children, Clinical Trial, Cochrane, Double-Blind, Eczema, Efficacy, EMBASE, Fecal Microbiota, Gastrointestinal Symptoms, Intervention, Intestinal Microflora, Ischaemia, ISI, Lactobacillus-Rhamnosus Gg, Management, MEDLINE, Meta Analysis, Meta-Analysis, Microorganisms, Pediatric Atopic-Dermatitis, Placebo-Controlled Trial, Points, Probiotic, Probiotics, Randomized Controlled Trials, Randomized Controlled-Trial, Review, Saccharomyces-Cerevisiae Fungemia, Science, Symptoms, Systematic, Systematic Review, Treatment, Web of Science

# Title: Clinical and Experimental Dermatology

Full Journal Title: Clinical and Experimental Dermatology

ISO Abbreviated Title:

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: Impact Factor

? (2011), Laser resurfacing for facial acne scars: A summarised cochrane review. *Clinical and Experimental Dermatology*, **36** (6), 699-700.

Full Text: [2011\Cli Exp Der36, 699.pdf](2011/Cli%20Exp%20Der36,%20699.pdf)

Abstract: Background Most people have acne at some stage during their life, with about one per cent being left with permanent acne scars. Recent laser techniques are thought to be more effective than chemical peels and dermabrasion. Objectives To assess the effects of laser resurfacing for treating facial acne scars. Search strategy We searched MEDLINE (1966 to April 1999), EMBASE (1980 to April 1999), Science Citation Index (1981 to April 1999), the Cochrane Controlled Trials Register (April 1999), DARE (April 1999), INAHTA (April 1999), NHS HTA Internet site (April 1999). Dermatological Surgery (1995 to March 1999) and the British Journal of Dermatology (1995 to September 1999) were handsearched. We searched the reference lists of relevant articles and contacted experts and commercial laser manufacturers. Selection criteria Randomised controlled trials which compare different laser resurfacing techniques for treating patients with facial acne scars, or compare laser resurfacing with other resurfacing techniques or no treatment. Data collection and analysis Two reviewers independently extracted data and assessed trial quality. Two reviewers independently selected studies, assessed the quality of studies and extracted data. Main results No randomised controlled trials where laser treatment was compared to either placebo or a different type of laser were found. Most of the 27 studies uncovered were poor quality case series with small numbers of acne-scarred patients. Authors’ conclusions The lack of good quality evidence does not enable any conclusions to be drawn about the effectiveness of lasers for treating atrophic or ice-pick acne scars. Well designed randomised controlled comparisons of carbon dioxide versus Erbium: YAG laser are urgently needed.

Keywords: Case Series, Citation, Embase, Journal, Medline, Review, Science, Science Citation Index, Search Strategy

# Title: Clinical and Experimental Ophthalmology

Full Journal Title: [Clinical and Experimental Ophthalmology](http://www3.interscience.wiley.com/journal/123208572/grouphome/home.html)

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Publisher Address: 54 University St, P O Box 378, Carlton, Victoria 3053, Australia

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Ophthalmology: Impact Factor

? Mcghee, C.N.J. (2003), The future of *Clinical and Experimental Ophthalmology*. *Clinical and Experimental Ophthalmology*, **31** (1), 1-3.

Full Text: [2003\Cli Exp Oph31, 1.pdf](2003/Cli%20Exp%20Oph31,%201.pdf)

Sims, J.L. and McGhee, C.N.J. (2003), Citation analysis and journal impact factors in ophthalmology and vision science journals. *Clinical and Experimental Ophthalmology*, **31** (1), 14-22.

Full Text: [2003\Cli Exp Oph31, 14.pdf](2003/Cli%20Exp%20Oph31,%2014.pdf)

Abstract: Citation analysis has evolved over the last 50 years as one parameter for assessing the quality of research published in scientific, technology and social science journals. This is based on the assumption that influential research is widely cited by other scientists and clinicians. With the advent of the Internet, Journal Citation Reports from the Institute for Scientific Information (ISI-JCR) have become widely available to individuals and institutions. In an increasingly competitive research environ-ment, aspects of citation analysis have been suggested as simple proxy, objective measures to evaluate the research quality of a journal, published articles, research institutions and even individual researchers. This review article provides an overview of citation analysis, including definitions, uses of these reports, and related controversies and potential abuses. As it has become the most commonly used indicator, there is a particular focus on the use of the Journal Impact Factor (JIF). This is a widely quoted measure indicating the frequency with which the average article published in a journal of interest will be quoted within a specified time frame that therefore allows approximate comparisons of journals within a particular field of interest. Given the relative paucity of information in this area, emphasis is placed on citation analysis within ophthalmology, in particular in regard to the 43 ophthal-mology, vision science and optometry journals that are listed in the ISI-JCR 2001 reports.

Keywords: Citation Analysis, Journal Impact Factors, Journal Citation Reports, Ophthalmology, Optometry, Vision Science, Medical Journals

Davis, M. and Wilson, C.S. (2003), Research contributions in ophthalmology: Australia’s productivity. *Clinical and Experimental Ophthalmology*, **31** (4), 286-293.

Full Text: [2003\Cli Exp Oph31, 286.pdf](2003/Cli%20Exp%20Oph31,%20286.pdf)

Abstract: Background: In 2000, the Australian and New Zealand Journal of Ophthalmology (ANZJO) changed title to Clinical and Experimental Ophthalmology. At this time, a review of Australia’s contributions to the literature over the previous 21 years appears timely. Bibliometric indicators are used extensively to assess research performance as they offer views of a field that might not otherwise be apparent. The aim of this study was to explore publication output data to construct a picture of ophthalmology that may be of benefit to researchers and ophthalmologists. Methods: Science Citation Index and Social Sciences Citation Index databases were used to collate data on ophthal-mology research literature from 1980 to 2000. Subsequent analysis particularly focused on Australia’s contribution to this literature, including publication frequency vis-a-vis the world, collaboration, and the journals in which Australian researchers frequently publish. These data were also compared with other countries of similar scientific stature or language. Results: Since 1980, Australia has ranked in the top 10 nations contributing to world ophthalmology research. Its contribution was close to world average in the 1980s, but increasing numbers of researchers and papers show Australia exceeding the world average during the 1990s. Most ophthalmology research collaboration by Australians is within Australia. Although fewer in number, collaborative papers with overseas researchers include 28 other countries. Data on the journals in which Australians publish show that Australian researchers continue to exhibit a preference for publication in their own regional journals. Conclusions: This paper, one of a series on the literature of the vision sciences, provides some initial benchmarks on Australia’s standing and contribution to the field of ophthalmology research.

Keywords: Collaboration, Comparative National Productivity, Fields, Journals, Journals, Ophthalmological Literature, Research Performance, University

? Pon, J.A.M.C., Carroll, S.C. and Mcghee, C.N.J. (2004), Analysis of New Zealand’s research productivity in ophthalmology and vision science: 1993-2002. *Clinical and Experimental Ophthalmology*, **32** (6), 607-613.

Full Text: [2004\Cli Exp Oph32, 607.pdf](2004/Cli%20Exp%20Oph32,%20607.pdf)

Abstract: Aim: To assess New Zealand’s research productivity in the area of ophthalmology and vision science over the decade 1993-2002. Methods: New Zealand-based researchers involved in ophthalmology or vision science research, including ophthalmologists, optometrists and vision scientists were identified via professional colleges, universities and electronic databases. Peer-reviewed publications by these authors were identified by both searching electronic databases (MEDLINE/PUBMED) and personal communication with individual researchers. Results: Eighty-five New Zealand-based researchers involved in ophthalmology or vision science research published 446 articles in 84 scientific journals during the 10-year period. The cohort consisted of 59 ophthalmologists and 26 other researchers based in a diverse range of ophthalmology, optometry and university departments. Significant collaboration was observed between groups within New Zealand and with international institutions. Comparing ophthalmologists and ‘other’ researchers, ophthalmologists produced 69% of all ophthalmology and vision science research publications and those classified as ‘active ophthalmologist researchers’ published an average of 11 (range 5-55) papers each during this decade, compared to eight (range 5-25) for the group ‘other active researchers’. This was also reflected in the high productivity rate by ophthalmologists of 277 publications per 1000. Publications were identified in a wide range of journals with the majority in top 20-ranked ophthalmology journals. The trend over the decade highlighted an increase in number of scientific publications, from 43 per annum in 1993, to 68 per annum in 2002. Conclusions: Despite a relatively small and geographically isolated population, New Zealand ophthalmology and vision science research is highly active and collaborative, with significantly increased research productivity during the period 1993-2002. The present study is the first to document these trends and provides strong evidence to justify continued support for ophthalmology and vision science research in New Zealand.

Keywords: Cohort, Collaboration, Communication, Databases, Evidence, First, Highly Active, Institutions, International, Journals, New Zealand, Papers, Population, Productivity, Professional Colleges, Publications, Research, Research Productivity, Science, Science Research, Scientific Journals, Scientific Publications, Small, Support, Trend, Trends, Universities, University

? Fan, J.C. and Mcghee, C.N.J. (2008), Citation analysis of the most influential authors and ophthalmology journals in the field of cataract and corneal refractive surgery 2000-2004. *Clinical and Experimental Ophthalmology*, **36** (1), 54-61.

Full Text: [2008\Cli Exp Oph36, 54.pdf](2008/Cli%20Exp%20Oph36,%2054.pdf)

Abstract: Purpose: To identify the most published authors on the topics of ‘cataract’ and ‘LASIK’, the journals in which they publish, and the citation patterns of the most-cited articles by these authors over a 5-year publication period. Methods: Science Citation Index Expanded (SCI) was used to identify the 30 most-published authors in ‘cataract’ and ‘laser in situ keratomileusis’ (LASIK) (2000-2004 inclusive). SCI was subsequently used to analyse the recorded articles for each author in terms of source journal, the most commonly cited articles and citation source. Results: Of the 30 most-published authors in the fields of cataract and LASIK, the USA was the most well-represented source country, accounting for 33%; 20% were from Australia, and 17% from Austria. Germany and Japan each contributed 7%. Eighty per cent of the publications produced by these 30 authors (2000-2004) were in 10 journals, of which the Journal of Cataract and Refractive Surgery (JCRS) published more than one-third. Of the three most-cited articles for each author, the greatest number were published in JCRS (35.6%). The citation count of the articles had a weak correlation to the journal impact factor of the source journal; however, the self-citation rate of these articles did not. Conclusions: The USA and Australia together were the source of more than half of the most-published authors on cataract and LASIK and the majority of articles published by the 30 most prolific authors were published in only 10 journals. The impact factors of the publication journals preferred by these authors are influenced by the article citation counts, not vice versa.

Keywords: Articles, Association, Australia, Cataract, Citation, Citation Analysis, Citation Count, Citation Counts, Correlation, Germany, Impact, Impact Factor, Impact Factors, Impact-Factor, Indexes, Intravitreal Triamcinolone, Journal, Journal Impact, Journal Impact Factor, Journals, Lasik, Macular Edema, Microvascular Complications, Most-Cited Articles, Ophthalmology Publication, Productivity, Publication, Publications, Quality, Refractive Surgery, SCI, Science, Science Citation Index, Self-Citation, Surgery, Topics, USA

? Chou, C.Y., Chew, S.S.L., Patel, D.V., Ormonde, S.E. and Mcghee, C.N.J. (2009), Publication and citation analysis of the *Australian and New Zealand Journal of Ophthalmology* and *Clinical and Experimental Ophthalmology* over a 10-year period: The evolution of an ophthalmology. *Clinical and Experimental Ophthalmology*, **37** (9), 868-873.

Full Text: [2009\Cli Exp Oph37, 868.pdf](2009/Cli%20Exp%20Oph37,%20868.pdf)

Abstract: P>Purpose: To analyse the pattern of change in publication content and citations generated by a mid-ranking ophthalmology journal as it evolved from the Australian and New Zealand Journal of Ophthalmology (ANZJO) to its successor, Clinical 0mp; Experimental Ophthalmology (CEO). Methods: The Science Citation Index was used to analyse the publications of ANZJO and CEO over two 10-year periods (1990-1999 and 2000-2009, respectively). Publication and citation patterns were analysed in terms of source authors, institutions and countries. As a secondary measure, journal impact factors (JIFs) were retrieved from the Journal Citation Reports at the end of each period. Results: Over the specified periods, 859 articles published in ANZJO were cited 1210 times, and 1529 articles published in CEO were cited 5374 times. Australia was the largest contributing country to both journals; however, the proportional contributions from other countries including New Zealand, UK, USA, India and China increased significantly in CEO. Articles were cited by authors from 793 institutions in 60 countries for ANZJO and 2997 institutions in 95 countries for CEO. The contribution by key authors (identified as the top 10 most-published authors) towards total journal publications was 24% in ANZJO, but only 16% in CEO; however, these publications were responsible for 26.6% and 28.8% of the total citations, respectively. With respect to the most recent JIFs, ANZJO was 0.433 in 1999 (ranked 33 of 43 journals) and CEO was 1.35 in 2008 (ranked 27 of 48 journals). Conclusion: CEO has substantially increased the number of publications, citation counts and international sources compared with its well-established predecessor, ANZJO, over the assessed periods. CEO also appears to have a higher international profile with increasing citations counts from more countries. This evolution from a regional, to a more international, journal has been substantial and is reflected by a significant increment in JIF, and a modest increase in overall JIF-ranking, for CEO.

Keywords: Australian And New Zealand Journal of Ophthalmology, China, Citation, Citation Analysis, Citation Counts, Citations, Clinical and Experimental Ophthalmology, Impact, Impact Factor, Impact Factors, Indexes, Journal Citation Reports, Journal Impact Factor, Journals, Publication, Publications, Quality, Science, Science Citation Index, UK

# Title: Clinical and Experimental Rheumatology

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Language:

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Subject Categories:

: Impact Factor

? Ow, M.Y.L., Ho, P.C., Thumboo, J. and Wee, H.L. (2010), Factors associated with health service utilisation in patients with systemic lupus erythematosus: A systematic review. *Clinical and Experimental Rheumatology*, **28** (6), 892-904.

Abstract: Objectives. SLE patients require varying levels of health services since disease severity and activity differ among individuals. Understanding the factors associated with health service utilisation would be useful in improving equitable access. It would also help to identify modifiable factors and current good practices so as to improve quality of care and thus reduce utilisation. Thus, the objective of this review is to identify factors associated with health services utilisation. Methods. Five electronic databases (PUBMED, PsycINFO, EMBASE, International Pharmaceutical Abstract, Web of Science) and bibliographies of short-listed articles were searched. All indicators of health service utilisation (physician and specialist visits, hospitalisations, direct costs) and alternative medicine utilisation were accepted as outcomes in primary studies. Two authors independently selected the studies based on pre-specified inclusion and exclusion criteria. Results. of 1,276 papers retrieved from electronic and hand searches, 25 were finally selected and reviewed in totality, of which 13 were cross-sectional, 5 were prospective, and 7 were retrospective studies. A variety of service types (e.g. outpatient visits, hospitalisations, etc.) and factors (e.g. demographic, socioeconomic, laboratory indices, etc.) were evaluated. Type of health insurance, poorer physical functioning and greater disease severity were found to be associated with higher utilisation across several studies. Conclusion. Modifying the choice or coverage of health insurance plans of SLE patients is a possible option in improving equitable access. Better management of patient reported outcomes such as physical functioning and timely management of SLE to reduce disease severity may reduce health services utilisation in the long term.

Keywords: 3 Ethnic-Groups, Access, Authors, Care Costs, Costs, Coverage, Databases, Disease, EMBASE, Health Economics, Health Services, Health Services Evaluation, Hospitalization, Lumina Cohort, Management, Medicaid, Medicine, Methods, Mortality, Outcomes, Papers, Predictors, Primary, PUBMED, Quality of Care, Review, Rheumatology, Rheumatology, Science, SLE, Systematic, Systematic Review, Systemic Lupus Erythematosus, Utilisation, Web of Science

# Title: Clinical Gastroenterology and Hepatology

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Subject Categories:

: Impact Factor

? Andresen, V., Montori, V.M., Keller, J., West, C.P., Layer, P. and Camilleri, M. (2008), Effects of 5-hydroxytryptamine (serotonin) type 3 antagoniosts on symptom relief and constipation in nonconstipated irritable bowel syndrome: A systematic review and meta-analysis of randomized controlled trials. *Clinical Gastroenterology and Hepatology*, **6** (5), 545-555.

Abstract: Background & Aims: We performed a systematic review and meta-analyses to estimate treatment efficacy and constipation rate of 5-hydroxytryptamine (serotonin) (5-HT3) antagonists in patients with nonconstipated (NC) or diarrhea-predominant (D)-irritable bowel syndrome (IBS). Methods: Two reviewers independently searched MEDLINE, EMBASE, and Web of Science (January 1, 1966 to December 15, 2006) for randomized controlled trials of 5-HT3 antagonists in IBS reporting clinical end points of the IBS symptom complex and safety parameters. Study characteristics, markers of methodologic quality, and outcomes for the intention-to-treat population for each randomized controlled trial were extracted independently. Results: We found 14 eligible randomized controlled trials of alosetron (n = 3024) or cilansetron (n = 1116) versus placebo (n = 3043) or mebeverine (n = 304). Random-effects meta-analyses found 5-HT3 antagonists more effective than the comparators in achieving global improvement in IBS symptoms (pooled relative risk, 1.60; 95% confidence interval [0], 1.49-1.72; I-2 = 0%) and relief of abdominal pain and discomfort (pooled relative risk, 1.30; 95% CI, 1.22-1.39; 12 = 22%). Benefit was apparent for both agents, in patients of either sex. These agents were more likely to cause constipation (pooled relative risk, 4.28; 95% CI, 3.28-5.60, 12 = 65%); there was less constipation with 5-HT3 antagonists in D-IBS patients than in mixed populations (NC-IBS and D-IBS; relative risk ratio, 0.65; 95% CI, 0.41-0.99). Nine patients (0.2%) using 5-HT3 antagonists had possible ischemic colitis versus none in control groups. Conclusions: 5-HT3 antagonists significantly improve symptoms of NC-IBS or D-IBS in men and women. There is an increased risk of constipation with 5-HT3 antagonists, although the risk is lower in those with D-IBS.

Keywords: 5-Ht3 Receptor Antagonist, Abdominal Pain, Alosetron, Clinical-Trials, Colonic Transit, Constipation, Control, Control Groups, Double-Blind, Efficacy, EMBASE, Health-Care, Irritable Bowel Syndrome, Ischemic Colitis, MEDLINE, Meta-Analysis, Methods, Outcomes, Pain, Placebo-Controlled Trial, Points, Predominance Ibs-D, Randomized Controlled Trial, Randomized Controlled Trials, Ratio, Relative Risk, Review, Risk, Safety, Science, Serotonin, Symptoms, Systematic, Systematic Review, Treatment, Web of Science, Women

? Loomba, R., Rowley, A.K., Wesley, R., Smith, K.G., Liang, T.J., Pucino, F. and Csako, G. (2008), Hepatitis B immunoglobulin and lamivudine improve hepatitis B-related outcomes after liver transplantation: Meta-analysis. *Clinical Gastroenterology and Hepatology*, **6** (6), 696-700.

Abstract: Background & Aims: HBV recurrence increases morbidity and mortality in HBsAg+ patients undergoing liver transplantation. We aimed to estimate the relative efficacy of combined therapy with hepatitis B immunoglobulin (HBIG) and lamivudine (LAM) versus HBIG monotherapy for preventing HBV-related morbidity and mortality in this setting. Methods: We performed a meta-analysis of clinical trials that met the prespecified criteria and provided data for risk estimation of HBV recurrence in HBsAg+ liver transplant patients receiving HBIG and LAM versus HBIG alone. Databases searched until May 2007 included MEDLINE (Ovid), PUBMED, EMBASE, Toxnet, Scopus, and Web of Science. Literature search and data extraction were conducted independently by 2 study investigators; then 2 other investigators reviewed and screened eligible studies. Odds ratios (ORs) for the risk reduction with HBIG and LAM versus HBIG alone were calculated by using a random-effects model. Results: Two prospective and 4 retrospective studies were included in the meta-analysis. The OR showing risk reduction in HBV recurrence with HBIG and LAM (n = 193) versus HBIG alone (n = 124) was 0.08 (95% confidence interval [CI], 0.03-0.21). HBV-related death and all-cause mortality could only be assessed in 3 studies each. The ORs showing HBV-related death and all-cause mortality reduction with HBIG and LAM versus HBIG alone were 0.08 (95% CI, 0.02-0.33) and 0.02 (95% CI, 0.06-0.82), respectively. Conclusions: Although this meta-analysis was limited by small studies and varying levels of immunosuppression, it is apparent that adding LAM to HBIG improved HBV-related morbidity and mortality in HBsAg+ recipients of liver transplants.

Keywords: Anti-HBS, Clinical Trials, Combination, Databases, Efficacy, HBIG, HBV, Hepatitis, Immune Globulin, Liver Transplantation, MEDLINE, Meta Analysis, Meta-Analysis, Methods, Model, Monotherapy, Morbidity, Mortality, Outcomes, Prevention, Prophylaxis, PUBMED, Recurrence, Replication, Risk, Risk Reduction, Science, Scopus, Therapy, Virus Recurrence, Web of Science

? Loomba, R., Wesley, R., Bain, A., Csako, G. and Pucino, F. (2009), Role of fluoroquinolones in the primary prophylaxis of spontaneous bacterial peritonitis: Meta-analysis. *Clinical Gastroenterology and Hepatology*, **7** (4), 487-493.

Abstract: Background & Aims: The use of antibiotics in the primary prophylaxis for spontaneous bacterial peritonitis (SBP) in patients with cirrhosis is controversial. Our purpose was to determine the beneficial effect of fluoroquinolones as compared with placebo in primary prophylaxis of SBP in high-risk patients with cirrhosis by using meta-analysis. Methods: MEDLINE, EMBASE, Cochrane, and Web of Science databases were searched in all languages until August 2008 for randomized placebo-controlled studies evaluating the role of fluoroquinolones in primary prevention of SBP in patients with low protein ascites (total ascitic protein, < 1.5 g/dL) and without history of SBP. Two investigators independently performed literature search and data extraction, and then another investigator independently reviewed whether the studies met prespecified criteria and rechecked data extraction. Odds ratios (Peto method) for the risk reduction with fluoroquinolones were calculated for each study and combined by using a random-effects model. Results: Four randomized controlled studies met predefined criteria. The odds ratios for developing first episode of SBP, serious infections, and mortality with fluoroquinolone prophylaxis (n = 194) versus placebo (n = 190) were 0.18 (95% confidence interval [CI], 0.09-0.35), 0.18 (95% Cl, 0.10-0.32), and 0.60 (95% Cl, 0.37-0.97), respectively. All studies were unidirectional in showing the beneficial effect of fluoroquinolone prophylaxis. We were limited by finding few studies with relatively small sample sizes. Conclusions: Daily oral fluoroquinolone prophylaxis reduces the risk of development of first episode of SBP and mortality in cirrhotic patients with low total protein in the ascitic fluid. Fluoroquinolones might be advisable for the primary prophylaxis of SBP in selected high-risk patients with cirrhosis.

Keywords: Antibiotics, Ascitic Fluid, Cirrhosis, Cirrhotic-Patients, Cochrane, Controlled Studies, Databases, Development, High-Risk Patients, History, Literature, Management, Meta-Analysis, Methods, Model, Mortality, Norfloxacin, Peritonitis, Prevention, Primary, Primary Prevention, Risk, Risk Reduction, Science, Trials, Web of Science

# Title: Clinical Genetics

Full Journal Title: Clinical Genetics

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? Borry, P., Stultiens, L., Nys, H., Cassiman, J.J. and Dierickx, K. (2006), Statement on genetic diagnosis in children and adolescents. *Clinical Genetics*, **70** (5), 374-381.

Abstract: The objective of this study is to review ethical and clinical guidelines and position papers concerning the presymptomatic and predictive genetic testing of minors. The databases MEDLINE, Philosopher’s Index, Biological Abstracts, Web of Science and Google Scholar were searched using keywords relating to the presymptomatic and predictive testing of children. We also searched the websites of the national bioethics committees indexed on the websites of World Health Organization (WHO) and the German Reference Centre for Ethics in the Life Sciences, the websites of 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 27 different papers dealing with guidelines or position papers that fulfilled our search criteria. They encompassed the period 1991-2005 and originated from 31 different organizations. The main justification for presymptomatic and predictive genetic testing was the direct benefit to the minor through either medical intervention or preventive measures. If there were no urgent medical reasons, all guidelines recommend postponing testing until the child could consent to testing as a competent adolescent or as an adult. Ambiguity existed for childhood-onset disorders for which preventive or therapeutic measures are not available and for the timing of testing for childhood-onset disorders. Although the guidelines covering presymptomatic and predictive genetic testing of minors agree strongly that medical benefit is the main justification for testing, a lack of consensus remains in the case of childhood-onset disorders for which preventive or therapeutic measures are not available.

Keywords: Adolescent, Adolescents, Adult, Ambiguity, Anyway, Bioethics, Child, Children, Clinical Guidelines, Confidentiality, Databases, Diagnosis, Ethics, Genetic, Genetic Testing, Google Scholar, Guidelines, Health, Human, Information, Intervention, Medical, Minors, Onset, Papers, Predictive Genetic Testing, Predictive Testing, Presymptomatic, Review, Science, Web of Science, Websites, WHO

# Title: Clinical Genitourinary Cancer

Full Journal Title: Clinical Genitourinary Cancer

ISO Abbreviated Title:

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Language:

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Subject Categories:

: Impact Factor

? Chu, D., Lacouture, M.E., Weiner, E. and Wu, S.H. (2009), Risk of hand-foot skin reaction with the multitargeted kinase inhibitor sunitinib in patients with renal cell and non-renal cell carcinoma: A meta-analysis. *Clinical Genitourinary Cancer*, **7** (1), 11-19.

Abstract: Hand-foot skin reaction (HFSR) is an emerging issue in cancer treatment with multitargeted tyrosine kinase inhibitors (TKIs), leading to morbidity, suboptimal dosing, and poor compliance. The overall risk of HFSR is not clear for sunitinib, a TKI effective for metastatic renal cell carcinoma (RCC) and gastrointestinal stromal tumor. We therefore conducted a systematic review and a meta-analysis to determine the risk of developing HFSR with sunitinib. Databases from PUBMED and Web of Science for articles from July 1966 until July 2007 and abstracts presented at the American Society of Clinical Oncology conferences were searched to identify relevant studies. Eligible studies were prospective clinical trials that had described events of HFSR for patients who received single-agent sunitinib. Incidence and relative risk (RR) were calculated using a random-effects or fixed-effects model. A total of 5005 patients with RCC and other cancers from 10 clinical trials were included for analysis. Among patients receiving sunitinib, the summary incidences of all-grade and high-grade HFSR were 18.9% (95% Cl, 14.1%-24.8%) and 5.5% (95% Cl, 3.9%-7.9%), respectively. Interestingly, patients with RCC have significantly decreased risk of HFSR compared with patients with non-RCC malignancy (RR, 0.56; 95% Cl, 0.50-0.64; P < .001). In addition, sunitinib was associated with a significantly increased risk of all-grade HFSR (RR, 9.86; 95% Cl, 3.1-31.31; P < .001) in comparison with controls. There is a significant risk of developing HFSR in patients with cancer receiving sunitinib. Adequate monitoring and intervention are recommended for reducing the toxicity.

Keywords: Activation, Advanced Solid Tumors, Analysis, Angiogenesis, C-Kit, Cancer, Carcinoma, Clinical Trials, Compliance, Databases, Gastrointestinal, Gastrointestinal Stromal Tumor, Growth, Human Keratinocytes, Intervention, Kit-Ligand, Malignancy, Meta Analysis, Meta-Analysis, Model, Monitoring, Morbidity, Oncology, PUBMED, Relative Risk, Renal, Review, Risk, Safety, Science, Sorafenib, Su11248, Systematic, Systematic Review, Therapy, Toxicity, Treatment, Tyrosine Kinase Inhibitor, Von Hippel-Lindau, Web of Science

# Title: Clinical Hemorheology

Full Journal Title: [Clinical Hemorheology](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=02715198)

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Tomov, D., Georgieva, Z.H. and Mileva, V. (1995), International communication patterns in the field of microcirculation and hemorheology. *Clinical Hemorheology*, **15** (3), 587.

Full Text: [C\Cli Hem15, 587.pdf](C/Cli%20Hem15,%20587.pdf)

Abstract: The rising interest of the world scientific community in actual issues of clinical and experimental microcirculatory research should be more intensively investigated in order to provide valuable information about trends and priorities in the field.

The purpose of the present scientometric study was to reveal the contribution of single countries involved by their authors and journals in the international system of communications. The *MEDLINE* data-base of the NLM (USA) was screened for the period from 1990 to 1994. The *OVID* software of the CD-PLUS (USA) was used. The following parameters were examined: addresses of the authors of the papers, journal titles and national affiliation of the journals. Several bibliometric distributions were constructed to characterize the rising internationalization of research.

There were a total of 2190 single primary publications during this period. A certain tendency towards augmentation of the number of papers in subsequent years was found out. A total of 248 journals published in 31 countries contained 475 papers by authors from 39 countries in 1990, while a total of 146 journals published in 17 countries contained 266 papers by authors from 32 countries. The most significant research teams and journals were identified.

The results from this analysis could be successfully used for improvement of the communication environment of the scientists in the small European countries and for establishing fruitful international collaboration in the field of microcirculation and hemorheology.

# Title: Clinical Infectious Diseases

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Immunology: Impact Factor 2.972, 26/116 (2000); Impact Factor 3.545, 24/114 (2001); Impact Factor 4.750, 17/119 (2002); Impact Factor 5.393, 14/114 (2003); Impact Factor 5.594, 15/111 (2004); Impact Factor 6.510, 11/115 (2005); Impact Factor 8.195, 11/128 (2009); Impact Factor 8.286, 11/134 (2010)

Infectious Diseases: Impact Factor 2.972, 9/36 (2000); Impact Factor 3.545, 7/37 (2001); Impact Factor 4.750, 5/38 (2002); Impact Factor 5.393, 3/41 (2003); Impact Factor 5.594, 5/41 (2004); Impact Factor 6.510, 2/43 (2005); Impact Factor 8.195, 2/57 (2009); Impact Factor 8.286, 2/58 (2010)

Microbiology: Impact Factor 2.972, 16/83 (2000); Impact Factor 3.545, 16/81 (2001); Impact Factor 4.750, 10/82 (2002); Impact Factor 5.393, 9/84 (2003); Impact Factor 5.594, 10/84 (2004); Impact Factor 6.510, 9/86 (2005); Impact Factor 8.195, 8/95 (2009); Impact Factor 8.286, 9/107 (2010)

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Full Text: Cli Inf Dis33, 101

Lockhart, P.B., Brennan, M.T., Fox, P.C., Norton, H.J., Jernigan, D.B. and Strausbaugh, L.J. (2002), Decision-making on the use of antimicrobial prophylaxis for dental procedures: a survey of infectious disease consultants and review. *Clinical Infectious Diseases*, **34** (12), 1621-1626.

Full Text: [C\Cli Inf Dis34, 1621.pdf](C/Cli%20Inf%20Dis34,%201621.pdf)

? Cheng, V.C.C., Peiris, M. and Yuen, K.Y. (2003), SARS bulletin from Hong Kong: 30 March-4 April 2003. *Clinical Infectious Diseases*, **36** (8), III.

Full Text: [C\Cli Inf Dis36, 8III.pdf](C/Cli%20Inf%20Dis36,%208III.pdf)

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Full Text: [C\Cli Inf Dis36, 9III.pdf](C/Cli%20Inf%20Dis36,%209III.pdf)

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Full Text: [C\Cli Inf Dis36, III.pdf](C/Cli%20Inf%20Dis36,%20III.pdf)

? McGinigle, K.L., Gourlay, M.L. and Buchanan, I.B. (2008), The use of active surveillance cultures in adult intensive care units to reduce methicillin-resistant Staphylococcus aureus-related morbidity, mortality, and costs: A systematic review. *Clinical Infectious Diseases*, **46** (11), 1717-1725.

Full Text: 2008\Cli Inf Dis46, 1717.pdf

Abstract: Active surveillance cultures (ASCs) are universal or targeted microbiological screening cultures for patients admitted to a hospital. ASCs have been proposed to control the increasing numbers of infections due to multidrug-resistant organisms, but their efficacy and cost-effectiveness are unproven. We conducted a systematic review of the literature pertaining to the use of ASCs and control of methicillin-resistant Staphylococcus aureus (MRSA). We searched revelant journals and the PUBMED MEDLINE, Web of Science, CINAHL, and Cochrane Library databases. No randomized, controlled trials were identified. Sixteen observational studies and 4 economic analyses were reviewed. Only 2 of the observational studies had a control group. None of the studies were of good quality. Thus, we identified important gaps in the literature, including a need for a clear definition of ASCs, a clear implementation protocol, and rigorous economic evaluations. Existing evidence may favor the use of ASCs, but the evidence is of poor quality, and definitive recommendations cannot be made.

Keywords: Active Surveillance, Adult, Bacteremia, Carriage, Cochrane, Contact Isolation, Control, Cost-Effectiveness, Costs, Databases, Efficacy, Hospital, Hospital Admission, Impact, Infection, Intensive Care, Journals, Literature, Morbidity, Mortality, Mrsa Carriers, Observational Studies, Precautions, Prevent, Protocol, PUBMED, Review, Science, Screening, Selective Screening-Program, Surveillance, Systematic, Systematic Review, Web of Science

? Sligl, W.I., Milner, D.A., Sundar, S., Mphatswe, W. and Majumdar, S.R. (2009), Safety and efficacy of corticosteroids for the treatment of septic shock: A systematic review and meta-analysis. *Clinical Infectious Diseases*, **49** (1), 93-101.

Full Text: 2009\Cli Inf Dis49, 93.pdf

Abstract: Background. Septic shock is common and results in significant morbidity and mortality. Adjunctive treatment with corticosteroids is common, but definitive data are lacking. We aimed to determine the efficacy and safety of corticosteroid therapy among patients with septic shock. Methods. MEDLINE, EMBASE, Cochrane Library, Web of Science, and Google Scholar were searched for randomized trials and observational studies published from January 1993 through December 2008. Studies were selected if they included adults with septic shock, discussed treatment with intravenous corticosteroids, and reported at least 1 outcome of interest (e. g., mortality, shock reversal, or incidence of superinfection). Two reviewers independently agreed on eligibility, assessed methodologic quality, and abstracted data. Results. Pooled relative risks (RRs) and 95% confidence intervals (CIs) were estimated for 28-day all-cause mortality, shock reversal at 7 days, and incidence of superinfection with use of random-effects models. Analyses, stratified by adrenal responsiveness, were prespecified. Eight studies (6 randomized trials) involving a total of 1876 patients were selected. Overall, corticosteroid therapy did not result in a statistically significant difference in mortality (42.2% [369 of 875 patients] vs. 38.4% [384 of 1001]; RR, 1.00; 95% CI, 0.84-1.18). A statistically significant difference in the incidence of shock reversal at 7 days was observed between patients who received corticosteroids and those who did not (64.9% [314 of 484 patients] vs. 47.5% [228 of 480]; RR, 1.41; 95% CI, 1.22-1.64), with similar point estimates for both corticotropin stimulation test responders and nonresponders. No statistically significant difference was found in the incidence of superinfection between patients treated with corticosteroids and patients not treated with corticosteroids (25.3% [114 of 450 patients] vs. 22.7% [100 of 441]; RR, 1.11; 95% CI, 0.86-1.42). Conclusions. In patients with septic shock, corticosteroid therapy appears to be safe but does not reduce 28-day all-cause mortality rates. It does, however, significantly reduce the incidence of vasopressor-dependent shock, which may be a clinically worthwhile goal.

Keywords: Adults, Antimicrobial Treatment, Care, Cochrane, Confidence Intervals, Corticosteroid, Dose Steroid-Therapy, Efficacy, Epidemiology, Google Scholar, Hydrocortisone, Hypotension, Interest, Management, Methods, Morbidity, Mortality, Observational Studies, Outcome, Review, Safety, Science, Severe Sepsis, Survival, Systematic, Systematic Review, Therapy, Treatment, United-States, Web of Science

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Full Text: 2010\Cli Inf Dis51, 496.pdf

Abstract: Background. The efficacy of tenofovir disoproxil fumarate (TDF) as part of combination antiretroviral treatment (ART) has been demonstrated in several randomized, controlled trials. However, an increasing number of case reports suggest that TDF use may be associated with significant nephrotoxicity. Our objective was to determine the renal safety of TDF-containing ART regimens for HIV-infected individuals. Methods. MEDLINE, EMBASE, Global Health, Scopus, Biosis Previews, Cochrane Library, Web of Science, and existing systematic reviews were searched. Prospective studies comparing TDF-containing with non-TDF containing ART regimens were selected for inclusion. We extracted data on study characteristics, participant characteristics, therapeutic interventions, renal function, bone density, and fracture rates. Results. A total of 17 studies (including 9 randomized, controlled trials) met the selection criteria. Median sample size was 517 participants. Constituent ART regimens were diverse. There was a significantly greater loss of kidney function among the TDF recipients, compared with control subjects (mean difference in calculated creatinine clearance, 3.92 mL/min; 95% confidence interval [CI], 2.13-5.70 mL/min), as well as a greater risk of acute renal failure (risk difference, 0.7%; 95% CI, 0.2-1.2). There was no evidence that TDF use led to increased risk of severe proteinuria, hypophosphatemia, or fractures. Conclusions. Although TDF use was associated with a statistically significant loss of renal function, the clinical magnitude of this effect was modest. Our findings do not support the need to restrict TDF use in jurisdictions where regular monitoring of renal function and serum phosphate levels is impractical.

Keywords: Active Antiretroviral Therapy, Antiretroviral, Art, Bone, Case Reports, Chronic Kidney-Disease, Cochrane, Control, Efficacy, EMBASE, Fanconi-Syndrome, Fracture, Glomerular-Filtration Rates, Health, Health-Care Interventions, Hiv-1-Infected Patients, Interventions, MEDLINE, Meta Analysis, Meta-Analysis, Methodological Quality, Methods, Monitoring, Nephrogenic Diabetes-Insipidus, Nephrotoxicity, Patients Receiving Tenofovir, Prospective Studies, Proteinuria, Renal, Renal Function, Review, Risk, Safety, Science, Scopus, Systematic, Systematic Review, Systematic Reviews, Treatment, Tubular Dysfunction, Web of Science

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Full Text: 2010\Cli Inf Dis51, 550.pdf

Abstract: Background. Prolonged catheterization is the primary risk factor for catheter-associated urinary tract infection (CAUTI). Reminder systems are interventions used to prompt the removal of unnecessary urinary catheters. To summarize the effect of urinary catheter reminder systems on the rate of CAUTI, urinary catheter use, and the need for recatheterization, we performed a systematic review and meta-analysis. Methods. Studies were identified in MEDLINE, the Cochrane Library, Biosis, the Web of Science, EMBASE, and CINAHL through August 2008. Only interventional studies that used reminders to physicians or nurses that a urinary catheter was in use or stop orders to prompt catheter removal in hospitalized adults were included. A total of 6679 citations were identified; 118 articles were reviewed, and 14 articles met the selection criteria. Results. The rate of CAUTI (episodes per 1000 catheter-days) was reduced by 52% (P < .001) with use of a reminder or stop order. The mean duration of catheterization decreased by 37%, resulting in 2.61 fewer days of catheterization per patient in the intervention versus control groups; the pooled standardized mean difference (SMD) in the duration of catheterization was -1.11 overall (P = .070), including a statistically significant decrease in studies that used a stop order (SMD, -0.30; P = .001) but not in those that used a reminder (SMD, -1.54; P = .071). Recatheterization rates were similar in control and intervention groups. Conclusion. Urinary catheter reminders and stop orders appear to reduce the rate of CAUTI and should be strongly considered to enhance the safety of hospitalized patients.

Keywords: Adults, Catheterization, Citations, Cochrane, Control, Control Groups, Duration, EMBASE, Feedback, Infection, Intervention, Interventions, MEDLINE, Meta-Analysis, Methods, Nurses, Physicians, Primary, Reminder Systems, Reminders, Review, Risk, Safety, Science, Staff, Systematic, Systematic Review, Tract, Web of Science

? Sibanda, E.L., Weller, I.V.D., Hakim, J.G. and Cowan, F.M. (2011), Does trimethoprim-sulfamethoxazole prophylaxis for hiv induce bacterial resistance to other antibiotic classes? Results of a systematic review. *Clinical Infectious Diseases*, **52** (9), 1184-1194.

Full Text: 2011\Cli Inf Dis52, 1184.pdf

Abstract: Background. Trimethoprim-sulfamethoxazole (TMP-SMX) prophylaxis has long been recommended for immunosuppressed HIV-infected adults and children born to HIV-infected women. Despite this, many resource-limited countries have not implemented this recommendation, partly because of fear of widespread antimicrobial resistance not only to TMP-SMX, but also to other antibiotics. We aimed to determine whether TMP-SMX prophylaxis in HIV-infected and/or exposed individuals increases bacterial resistance to antibiotics other than TMP-SMX. Methods. A literature search was conducted in MEDLINE, Global Health, EMBASE, Web of Science, ELDIS, and ID21. Results. A total of 501 studies were identified, and 17 met the inclusion criteria. Only 8 studies were of high quality, of which only 2 had been specifically designed to answer this question. Studies were classified as (1) studies in which all participants were infected and/or colonized and in which rates of bacterial resistance were compared between those taking or not taking TMP-SMX and (2) studies comparing those who had a resistant infection with those who were not infected. Type 1 studies showed weak evidence that TMP-SMX protects against resistance. Type 2 studies provided more convincing evidence that TMP-SMX protects against infection. Conclusion. There was some evidence that TMP-SMX prophylaxis protects against resistance to other antibiotics. However, more carefully designed studies are needed to answer the question conclusively.

Keywords: Adults, Antibiotic, Antibiotics, Antiretroviral Therapy, Children, Cote-Divoire, Cotrimoxazole Prophylaxis, Health, HIV, Human-Immunodeficiency-Virus, Infection, Literature, Methods, Opportunistic Infections, Positive Outpatients, Resistance, Review, Risk-Factors, Science, South-African Children, Staphylococcus-Aureus Mrsa, Streptococcus-Pneumoniae, Systematic, Systematic Review, Type 2, Web of Science, Women

# Title: Clinical Journal of the American Society of Nephrology

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? Lu, J.C.T., Coca, S.G., Patel, U.D., Cantley, L. and Parikh, C.R. (2009), Searching for genes that matter in acute kidney injury: A systematic review. *Clinical Journal of the American Society of Nephrology*, **4** (6), 1020-1031.

Abstract: Background and Objectives: Identifying patients who may develop acute kidney injury (AKI) remains challenging, as clinical determinants explain only a portion of individual risk. Another factor that likely affects risk is intrinsic genetic variability. Therefore, a systematic review of studies was performed that related the development or prognosis of AKI to genetic variation. Design, setting, participants, and measurements: MEDLINE, EMBASE, HuGEnet, SCOPUS, and Web of Science were searched for articles from 1950 to Dec 2007. Two independent researchers screened articles using predetermined criteria. Studies were assessed for methodological quality via an aggregate scoring system. Results: The 16 included studies were of cohort or case-cohort design and investigated 35 polymorphisms in 21 genes in association with AKI. Fifteen gene-gene interactions were also investigated in four separate studies. Study populations were primarily premature infants or adults who were critically ill or postcardiac bypass patients. Among the studies, five different definitions of AKI were used. Only one polymorphism, APO E e2/e3/e4, had greater than one study showing a significant impact (P < 0.05) on AKI incidence. The mean quality score of 5.8/10 (range four to nine), heterogeneity in the studies, and the dearth of studies precluded additional meta-analysis of the results. Conclusions: Current association studies are unable to provide definitive evidence linking genetic variation to AKI. Future success will require a narrow consensus definition of AKI, rigorous epidemiologic techniques, and a shift from a priori hypothesis-driven to genome-wide association studies. Clin J Am Soc Nephrol 4: 1020-1031, 2009. doi: 10.2215/CJN.05411008.

Keywords: Acute-Renal-Failure, Adults, Cardiac-Surgery, Complications, Critically-Ill Patients, Definitions, Determinants, Development, EMBASE, Genetic, Genome-Wide Association, Impact, Infants, Injury, Kidney, MEDLINE, Meta-Analysis, Mortality, Outcomes, Polymorphism, Polymorphisms, Prognosis, Researchers, Review, Risk, Science, Scopus, Sepsis, Success, Systematic, Systematic Review, Variability, Web of Science

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Full Text: [2011\Cli J Ame Soc Nep6, 2364.pdf](file:///H:\Bibliometric%20References\2011\Cli%20J%20Ame%20Soc%20Nep6,%202364.pdf)

Abstract: Background and objectives Observational studies have reported an association between metabolic syndrome (MetS) and microalbuminuria or proteinuria and chronic kidney disease (CKD) with varying risk estimates. We aimed to systematically review the association between MetS, its components, and development of microalbuminuria or proteinuria and CKD. Design, setting, participants and measurements and population We searched MEDLINE (1966 to October 2010), SCOPUS, and the Web of Science for prospective cohort confidence interval (CI) studies that reported the development of microalbuminuria or proteinuria and/or CKD in participants with MetS. Risk estimates for eGFR <60 ml/min per 1.73 m(2) were extracted from individual studies and pooled using a random effects model. The results for proteinuria outcomes were not pooled because of the small number of studies. Results Eleven studies (n = 30,146) were included. MetS was significantly associated with the development of eGFR <60 ml/min per 1.73 m(2) (odds ratio, 1.55; 95% CI, 1.34, 1.80). The strength of this association seemed to increase as the number of components of MetS increased (trend P value = 0.02). In patients with MetS, the odds ratios (95% Cl) for development of eGFR <60 ml/min per 1.73 m(2) for individual components of MetS were: elevated blood pressure 1.61 (1.29, 2.01), elevated triglycerides 1.27 (1.11, 1.46), low HDL cholesterol 1.23 (1.12, 1.36), abdominal obesity 1.19 (1.05, 1.34), and impaired fasting glucose 1.14 (1.03, 1.26). Three studies reported an increased risk for development of microalbuminuria or overt proteinuria with MetS. Conclusions MetS and its components are associated with the development of eGFR <60 ml/min per 1.73 m2 and microalbuminuria or overt proteinuria. J Am Soc Nephrol 6: 2364-2373, 2011. doi: 10.2215/CJN.02180311.

Keywords: Association, Blood, Blood Pressure, Cardiovascular-Disease, Cholesterol, Chronic Kidney Disease, Cohort, Development, Diabetes-Mellitus, Diagnosis, Disease, Fasting, HDL, HDL Cholesterol, Insulin-Resistance, Kidney, Kidney Disease, Low, Medline, Meta Analysis, Meta-Analysis, Model, Obesity, Outcomes, Patients, Pressure, Proteinuria, Ratio, Review, Risk, Science, Scopus, Strength, Systematic, Systematic Review, Trend, Urinary Albumin Excretion, US Adults, Web of Science

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? Turk, D.C. (2010), Impact of articles published in the *Clinical Journal of Pain*: most frequently cited papers published from 2002 to 2009. *Clinical Journal of Pain*, **26** (3), 173-174.

Full Text: [2010\Cli J Pai26, 173.pdf](2010/Cli%20J%20Pai26,%20173.pdf)

Keywords: Diabetic-Neuropathy

? Stevens, B., Johnston, C., Taddio, A., Gibbins, S. and Yamada, J. (2010), The premature infant pain profile: Evaluation 13 years after development. *Clinical Journal of Pain*, **26** (9), 813-830.

Full Text: 2010\Cli J Pai26, 813.pdf

Abstract: Objective: To review the (1) reliability, validation, feasibility, and clinical utility and (2) the use of the Premature Infant Pain Profile (PIPP) from 1996 to 2009 to determine the effectiveness of pain management strategies. Methods: Data sources included MEDLINE, CINAHL, EMBASE, PsycINFO, and the Web of Science. Published studies evaluating the measurement properties of the PIPP and intervention studies using the PIPP as an outcome measure of acute pain were included. One reviewer screened studies for relevance and inclusion. Four reviewers rated intervention studies for methodological quality and extracted data for the evidence tables. Results: of the 62 studies included, 14 focused on the measurement properties of the PIPP. Reliability of the PIPP was supported in 5 studies and construct validation was supported in 13 studies. The feasibility of the PIPP was addressed in 4 studies, whereas clinical utility was discussed in 2 studies. Twenty-seven of the 48 studies that were considered to have high methodological quality used the PIPP as the major outcome to evaluate the effectiveness of pain management interventions in infants. Discussion: The PIPP continues to be a reliable and valid measure of acute pain in infants with numerous positive validation studies. There is substantial support for the use of the PIPP as an effective outcome measure in pain intervention studies in infants. Further research with health professionals is required to better support the feasibility and clinical utility of this measure.

Keywords: Behavioral States, Clinical Utility, Crossover Trial, Effectiveness, EMBASE, Evaluation, Feasibility, Heel Lance, Infants, Intervention, Intervention Studies, Interventions, Kangaroo Mother Care, Management, Measurement, MEDLINE, Methods, Neonatal Pain, Orally-Administered Glucose, Outcome, Pain, Premature Infant Pain Profile, Procedural Pain, Profile, Randomized Controlled-Trial, Reliability, Research, Review, Science, Validation, Ventilatory Support, Vulnerable Infants, Web of Science

? Fuentes, J.P., rmijo-Olivo, S., Magee, D.J. and Gross, D.P. (2011), Effects of exercise therapy on endogenous pain-relieving peptides in musculoskeletal pain a systematic review. *Clinical Journal of Pain*, **27** (4), 365-374.

Full Text: 2011\Cli J Pai27, 365.pdf

Abstract: Objective: To review the literature regarding the effects of exercise in patients with musculoskeletal pain on modifying: (1) the plasma or cerebral spinal fluid concentrations of pain-relieving peptides and (2) changing the cerebral activity of areas linked with pain processing and modulation systematically. Methods: An extensive search of bibliographic databases including MEDLINE, EMBASE, EBM Reviews-Cochrane Central Register of Controlled Trials, ISI Web of Science, Scopus, PeDro, AMED, and CINAHL was made. Two independent investigators screened the titles of publications and completed quality assessment of the selected studies. Results: The search of the literature resulted in a total of 1819 published studies. of these only 1 study of low methodological quality was considered to be relevant. The agreement between reviewers to select the articles was kappa=1. The agreement for the methodological quality evaluation was kappa=0.9. Discussion: Given the small number of studies identified and the low quality of research, no firm conclusions could be reached about the impact of therapeutic exercise on modifying concentrations of pain-relieving peptides or its effect on changing the cerebral activity of areas linked with pain processing in patients with musculoskeletal pain. There is a clear need for well-designed trials examining exercise therapy interventions and their effect on both pain-relieving peptides and cerebral activity in patients with musculoskeletal pain.

Keywords: Aerobic Exercise, Assessment, Bibliographic, Bibliographic Databases, Blood-Pressure, Clinical-Trial, Databases, EMBASE, Evaluation, Evidence-Informed Management, Exercise, Exercise Therapy, Impact, Interventions, ISI, Isometric-Exercise, Literature, Low-Back-Pain, MEDLINE, Methods, Pain, Peptides Opioids, Plasma, Plasma Beta-Endorphin, Pressure Pain, Publications, Randomized Controlled-Trial, Research, Review, Rheumatoid-Arthritis, Science, Scopus, Serotonin, Systematic, Systematic Review, Therapy, Web of Science

? Claydon, L.S., Chesterton, L.S., Barlas, P. and Sim, J. (2011), Dose-specific effects of transcutaneous electrical nerve stimulation (TENS) on experimental pain: A systematic review. *Clinical Journal of Pain*, **27** (7), 635-647.

Full Text: 2011\Cli J Pai27, 635.pdf

Abstract: Objective: To determine the hypoalgesic effects of transcutaneous electrical nerve stimulation (TENS) parameter combinations on experimental models in healthy humans. Methods: Searches were performed using the electronic databases Ovid MEDLINE, CINAHL, AMED, and Web of Science (from inception to December 2009). Manual searches of journals and reference lists of retrieved trials were also performed. Randomized controlled trials (RCTs) were included in the review if they compared the hypoalgesic effect of TENS relative with placebo and control, using an experimental pain model in healthy human participants. Two reviewers independently selected the trials, assessed their methodologic quality and extracted data. Results: Forty-three RCTs were eligible for inclusion. A best evidence synthesis revealed: Overall “conflicting” (inconsistent findings in multiple RCTs) evidence of TENS efficacy on experimental pain irrespective of TENS parameters used. Overall intense TENS has “moderate” evidence of efficacy (1 high-quality and 2 low-quality trials). Conventional TENS has overall conflicting evidence of efficacy, this is derived from “strong” evidence of efficacy (generally consistent findings in multiple high-quality RCTs) on pressure pain but strong evidence of inefficacy on other pain models. “Limited” evidence (positive findings from 1 RCT) of hypoalgesia exists for some novel parameters. Low-intensity, low-frequency, local TENS has strong evidence of inefficacy. Inappropriate TENS (using “barely perceptible” intensities) has moderate evidence of inefficacy. Discussion: The level of hypoalgesic efficacy of TENS is clearly dependent on TENS parameter combination selection (defined in terms of intensity, frequency, and stimulation site) and experimental pain model. Future clinical RCTs may consider these TENS dose responses.

Keywords: Amplitude, Analgesia, Clinical-Trials, Cold-Induced Pain, Control, Databases, Efficacy, Electrical Stimulation, Experimentally Induced Pain, Frequency, Healthy-Human Participants, Heat Pain, High-Frequency, Human, Humans, Induced Ischemic Pain, Interferential Currents, Journals, MEDLINE, Methods, Model, Pain, Parameter Manipulation, Pressure, Pressure Pain, Randomized Controlled Trials, Randomized-Trials, Review, Science, Stimulation Site, Systematic, Systematic Review, Web of Science

# Title: Clinical Journal of Sport Medicine

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? Warsh, J.M., Constantin, S.A., Howard, A. and Macpherson, A. (2009), A systematic review of the association between body checking and injury in youth ice hockey. *Clinical Journal of Sport Medicine*, **19** (2), 134-144.

Abstract: Objective: The objective of this study is to systematically examine the risk of injury associated with body checking in youth ice hockey. Data Sources: A systematic review of the relevant electronic databases was conducted including PUBMED and Web of Science. The main search terms included “hockey, ice hockey, injury., body checking, child, adolescent, and pediatric.” Study Selection: The initial search identified 898 potential articles, and, after verifying inclusion criteria, 260 articles were selected for further assessment. The Downs and Black instrument for non-randomized Studies (Downs 1998.) was used to assess the quality of the articles. Data Extraction: Studies included reported on body checking as a mechanism of injury and compared injury rates in checking to non-checking leagues in children 20 years or Younger. Data Synthesis: Twenty studies met the inclusion criteria and they predominantly found increased injuries associated with body checking. The relative risk of injury associated with body checking in comparative studies ranged from 0.6 to 39.8. Checking was the reported mechanism of injury between 2.9% and 91% of injuries. All but I study that met Our inclusion criteria found an increased risk of injuries when body checking was permitted. Conclusions: Increased injuries attributable to checking were found where checking was allowed. This study supports policies that disallow body checking to reduce injuries in young children.

Keywords: Adolescent, Assessment, Body Checking, Bodychecking, Child, Children, Concussions, Databases, Epidemiology, Extraction, Hockey, Injury, Mechanism, Players, Policies, PUBMED, Rates, Relative Risk, Review, Risk, Science, Season, Sources, Spoils, Systematic, Systematic Review, Web of Science, Youth

? Klugl, M., Shrier, I., McBain, K., Shultz, R., Meeuwisse, W.H., Garza, D. and Matheson, G.O. (2010), The prevention of sport injury: an analysis of 12 000 published manuscripts. *Clinical Journal of Sport Medicine*, **20** (6), 407-412.

Abstract: Objective: To identify the nature and extent of research in sport injury prevention with respect to 3 main categories: (1) training, (2) equipment, and (3) rules and regulations. Data Sources: We searched PUBMED, CINAHL, Web of Science, EMBASE, and SPORTDiscus to retrieve all sports injury prevention publications. Articles were categorized according to the translating research into injury prevention practice model. Results: We retrieved 11 859 articles published since 1938. Fifty-six percent (n = 6641) of publications were nonresearch (review articles and editorials). Publications documenting incidence (n = 1354) and etiology (n = 2558) were the most common original research articles (33% of total). Articles reporting preventive measures (n = 708) and efficacy (n = 460) were less common (10% of the total), and those investigating implementation (n = 162) and effectiveness (n = 32) were rare (1% of total). Six hundred seventy-seven studies focused on equipment and devices to protect against injury, whereas 551 investigated various forms of physical training related to injury prevention. Surprisingly, publications studying changes in rules and regulations aimed at increasing safety and reducing injuries were rare (<1%; n = 63) with a peak of only 20 articles over the most recent 5-year period and an average of 10 articles over the preceding 5-year blocks of time. Conclusions: Only 492 of 11 859 publications actually assessed the effectiveness of sports injury prevention interventions or their implementation. Research in the area of regulatory change is underrepresented and might represent one of the greatest opportunities to prevent injury.

Keywords: Articles, Consensus Statement, Critical Appraisal, Data-Collection Procedures, Effectiveness, Efficacy, Etiology, Former Soccer Players, Health, Injury, Injury Prevention, Interventions, Model, Olympic Games, Osteoarthritis, Physical-Activity, Practice, Prevention, Professional Football, Publications, PUBMED, Randomized Controlled-Trial, Research, Review, Rugby Union, Safety, Science, Sources, Sport, Sport Injury, Sports, Training, Web of Science

? Matheson, G.O., Shultz, R., Bido, J., Mitten, M.J., Meeuwisse, W.H. and Shrier, I. (2011), Return-to-play decisions: Are they the team physician’s responsibility? *Clinical Journal of Sport Medicine*, **21** (1), 25-30.

Abstract: Objective: Return-to-play (RTP) decisions are a central component of the Team Physician’s clinical work, yet there is little more than anecdotal reference to these in the literature. We recently published a 3-step model for return-to-play medical decision making and, in the current paper, undertook a systematic review of the literature to determine the level of evidence in support of this model. Data Sources: PUBMED, Web of Science, and CINAHL electronic databases. Any article specifically related to concussion, head injuries, neck injuries, illness, medical conditions (including cardiovascular and renal), and preparticipation in sport or that reported RTP as a clinical outcome was excluded. Any article that contained a discussion on one of the components of the 3-step decision-based RTP model was included. Results: We reviewed 148 articles that met the criteria for inclusion and found 98 review articles, 39 original articles, 6 case reports, and 5 editorials. of these, 141 articles mentioned Step 1 of the medical decision-making process for RTP (Medical Factors), 26 mentioned Step 2 (Sport Risk Modifiers), and 20 mentioned Step 3 (Decision Modifiers). of the 148 articles in total, only 13 focused on RTP as the main subject and the remaining 135 mentioned RTP anecdotally. of these 13 articles, 5 were reviews, 4 were editorials, and 4 were original research. Conclusions: Although 148 articles we retrieved mention RTP in relation to a specific injury, medical condition, or specific topic, only 13 articles focused specifically on the RTP decision-making process, and 6 of 13 were restricted to Step 1 of the 3-step model (Medical Factors). Return-to-play is a fertile field for research and thought leadership beginning with a focus on the Team Physician’s appropriate role in RTP decision making, particularly considering the factors identified in Step 3 (Decision Modification).

Keywords: Cardiovascular, Care, Case Reports, Costs, Criteria, Cruciate Ligament Reconstruction, Databases, Decision Making, Decision-Making, Injury, Issues, Knee, Literature, Medical, Medical Decision Making, Model, Outcome, Perspective, PUBMED, Research, Return to Play, Review, Science, Serious Injury, Sources, Sport, Sport Participation, Surgery, Systematic, Systematic Review, Web of Science

# Title: Clinical Laboratory

Full Journal Title: Clinical Laboratory

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Language:

Journal Country/Territory:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lippi, G., Favaloro, E.J. and Guidi, G.C. (2009), The impact factor and journals in *Laboratory Medicine*. *Clinical Laboratory*, **55** (1-2), 49-52.

Abstract: The impact factor, originally devised by Eugene Garfield, offsets the advantages of journal size and age, and is a tool often used for the evaluation of journals and scientists, and is considered to provide a reliable trend of basic and clinical research worldwide.

Overall, the median impact factor of all medical laboratory journals increased by 23% from 2001 to 2007, but it was slightly decreased from that of the previous year (-4.1%). Moreover, the aggregate impact factor of all these journals, which takes into account the number of citations for all journals in this category and the number of articles from all journals in the same category, increased from 2.042 in 2003 to 2.153 in 2004, but decreased to 2.060 in 2005 and has remained fairly stable in subsequent years (2.054 in 2006 and 2.080 in 2007), reflecting remarkable increases and substantial reductions observed for individual journals. This trend mirrored that of biochemistry and molecular biology journals, whereas journals listed under the subject categories “pathology”, “surgery” and “Medicine, general and internal” substantially increased their aggregate impact factor from 2003 to 2007.

According to the impact factor trend of laboratory medicine journals, it appears that medical laboratory science has reached a steady state. This might be partially due to the radical changes that have occurred within medical laboratory science since the beginning of the last millennium and raises the question of whether laboratory professionals should consider embracing new areas of research, such as the role of laboratory diagnostics in surgery and internal medicine.

Keywords: Impact Factor, Citation, Science, Clinical Chemistry

# Title: Clinical Nephrology

Full Journal Title: Clinical Nephrology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Language:

Journal Country/Territory:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? van den Beukel, T.O., Jager, K.J., Siegert, C.E.H., Schoones, J.W. and Dekker, F.W. (2010), Racial minority groups on dialysis in Europe a literature review. *Clinical Nephrology*, **74**, S78-S84.

Abstract: Aims To provide an overview of the existing data on non-Caucasian dialysis patients within Europe, and to explore whether these data confirm differences between non-Caucasian and Caucasian dialysis patients that were found in other parts of the world Method A query consisting of the combination “dialysis”, “ethnicity”, and “Europe” was applied in PUBMED, EMBASE, Web of Science, CINAHL, and the Cochrane Library Results Ten papers were included in this study Studies from the United Kingdom (UK) and the Netherlands confirm the higher incidence of end-stage renal disease (ESRD) in non-Caucasians In other European countries these findings were not confirmed In studies from the UK, the Netherlands, and Spain a younger age at initiation of dialysis treatment for non-Caucasians compared to Caucasians was reported, this is also found in non-European studies Regarding comorbid conditions at the start of renal replacement therapy (RRT), vascular disease was less common, while diabetes was more common among non-Caucasians compared to Caucasians Large non-European studies also demonstrated less vascular disease among non-Caucasians initiating RRT than among Caucasians The survival advantage for non-Caucasian compared to Caucasian RRT patients is confirmed in one large study from the UK and in a Dutch study Reasons for the better survival of non-Caucasians are not understood completely Conclusions Only a few studies are available on non-Caucasian dialysis patients in Europe The available data confirm findings of other studies throughout the world on racial differences on dialysis More research is needed to understand the higher incidence and better survival in non-Caucasian patients, and also in countries where there are currently no relevant data.

Keywords: Cochrane, Diabetes, Dialysis, Disease, EMBASE, Erythropoietin, Ethnicity, Europe, Hemodialysis-Patients, Immigrant, Literature, Literature Review, Mortality, Netherlands, Non-Caucasian, Outcomes, Overview, Papers, Practice Patterns, PUBMED, Race, Research, Review, Science, Spain, Survival, Therapy, Treatment, UK, United Kingdom, Web of Science

# Title: Clinical Neuropsychologist

Full Journal Title: Clinical Neuropsychologist

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Language:

Journal Country/Territory:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Sweet, J.J., King, J.H., Malina, A.C., Bergman, M.A. and Simmons, A. (2002), Documenting the prominence of forensic neuropsychology at national meetings and in relevant professional journals from 1990 to 2000. *Clinical Neuropsychologist*, **16** (4), 481-494.

Abstract: Numerous authors have opined that forensic activities have become more prominent within clinical neuropsychology. To investigate the merits of these claims, the entire contents of Archives of Clinical Neuropsychology (ACN), Journal of Clinical and Experimental Neuropsychology (JCEN), and The Clinical Neuropsychologist (TCN) from 1990 through 2000 were reviewed and cataloged. These three journals were selected because they are the highest-ranking clinical subscription journals according to surveys of neuropsychology practitioners. Prior to rating journal content, various categories of interest were delineated and practice ratings were obtained until the two raters reached 92% agreement. Each of the raters read the journal contents and recorded content ratings for half of the journal issues under review. Results of the 8323 ratings demonstrated increases across time in the absolute numbers of articles related to forensic neuropsychology, although variable and different for each journal. Published articles that were partially or substantially forensic in nature in the three journals combined increased from 4% in 1990 to 14% in 2000. An annual peak in absolute number (n = 32; 16%) of forensic journal articles occurred in 1997. The most common topic of 139 articles published in ACN, JCEN, and TCN from 1990 to 2000 was malingering, which appeared in 86% of the general forensic articles. Forensic presentations at annual NAN meetings ranged from 3.9 to 11.3% (M = 8%) of the convention programs, whereas within Division 40’s programs at the American Psychological Association meeting, the average percentage ranged from 2.3 to 11.7% (M = 6%). Results pertaining to each journal and to specific forensic topics are presented and implications of these and other results are discussed.

Keywords: Clinical, Forensic, General, Journal, Journal Articles, Journals, Malingering, Practice, Review, Surveys

# Title: Clinical Nutrition

Full Journal Title: [Clinical Nutrition](http://www.sciencedirect.com/science/journal/02615614)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Awad, S., Constantin-Teodosiu, D., Macdonald, I.A. and Lobo, D.N. (2009), Short-term starvation and mitochondrial dysfunction - A possible mechanism leading to postoperative insulin resistance. *Clinical Nutrition*, **28** (5), 497-509.

Full Text: [2009\Cli Nut28, 497.pdf](2009/Cli%20Nut28,%20497.pdf)

Abstract: Background: Preoperative starvation results in the development of insulin resistance. Measures to attenuate the development of insulin resistance, such as preoperative carbohydrate loading, lead to clinical benefits. However, the mechanisms that underlie the development of insulin resistance during starvation and its attenuation by preoperative carbohydrate loading remain to be defined. Insulin resistance associated with type 2 diabetes and ageing has been linked to mitochondrial dysfunction. The metabolic consequences of preoperative starvation and carbohydrate loading and mechanisms linking insulin resistance to impaired mitochondrial function are discussed. Methods: Searches of the Medline and Science Citation Index databases were performed using various key words in combinations with the Boolean operators AND, OR and NOT. Key journals, nutrition and metabolism textbooks and the reference lists of key articles were also hand searched. Results: Animal studies have shown that short-term energy deprivation decreases mitochondrial ATP synthesis capacity and complex activity, and increases oxidative injury. Furthermore, evidence from human studies suggests that the development of insulin resistance during starvation may be linked to impaired mitochondrial function. Conclusions: There is evidence from animal studies that short-term starvation causes mitochondrial dysfunction. Future studies should investigate whether mitochondrial dysfunction underlies the development of insulin resistance in patients undergoing elective surgery. (C) 2009 Elsevier Ltd and European Society for Clinical Nutrition and Metabolism. All rights reserved.

Keywords: Ageing, Articles, Capacity, Carbohydrate, Citation, Complex, Complex-I Activity, Critically-Ill Patients, Databases, Development, Elsevier, Fasting, Feeding, Food-Deprivation, Glucose-Infusion, High-Fat Diet, Human Skeletal-Muscle, Insulin Resistance, Insulin Sensitivity, Journals, Lead, Mechanism, Mechanisms, Medline, Metabolic, Mitochondria, Oral Carbohydrate Treatment, Oxidative-Phosphorylation, Perioperative, Randomized Clinical-Trial, Rat-Liver Mitochondria, Science, Science Citation Index, Starvation, Stress, Surgery

? Nieuwenhuizen, W.F., Weenen, H., Rigby, P. and Hetherington, M.M. (2010), Older adults and patients in need of nutritional support: Review of current treatment options and factors influencing nutritional intake. *Clinical Nutrition*, **29** (2), 160-169.

Full Text: [2010\Cli Nut29, 160.pdf](2010/Cli%20Nut29,%20160.pdf)

Abstract: Background & aims: Many older adults and patients do not achieve sufficient nutritional intake to support their minimal needs and are at risk of, or are suffering from, (protein-energy) malnutrition. Better understanding of current treatment options and factors determining nutritional intake, may help design new strategies to solve this multifactorial problem. Methods: Medline, Science Citation Index, ScienceDirect and Google databases (until December 2008) were searched with the keywords malnutrition, elderly, older adults, food intake, energy density, variety, taste, satiety, and appetite. Results: 37 Factors affecting nutritional intake were identified and divided in three categories: those related to the environment, the person, and the food. For older adults in nursing homes, encouragement by carers and an appropriate ambiance seem particularly important. Meal fortification, offering variety, providing frequent small meals, snacks and particularly Oral Nutritional Supplements (ONS) between meals are other possibilities for this group. Product factors that stimulate intake include palatability, high energy density, low volume, and liquid format. Conclusion: The current review gives a comprehensive overview of factors affecting nutritional intake and may help carers to improve nutritional intake in their patients. The product factors identified here suggest that especially small volume, energy and nutrient dense ONS can be effective to improve nutritional intake. (C) 2009 Elsevier Ltd and European Society for Clinical Nutrition and Metabolism. All rights reserved.

Keywords: Affects Energy-Intake, Body-Weight, Citation, Databases, Elderly, Elsevier, Energy Density, Environment, Fat-Content, Food-Intake, Malnourished Patients, Malnutrition, Meal-Replacement Products, Medline, Nursing, Nursing-Home Residents, Nutrition Support, Older Adults, Oral Nutritional Supplement, Quality-of-Life, Randomized Controlled-Trial, Review, Risk, Science, Science Citation Index, Treatment, Unintentional Weight-Loss, Volume

# Title: Clinical Oral Implants Research

Full Journal Title: [Clinical Oral Implants Research](http://www3.interscience.wiley.com/journal/117978803/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bachle, M. and Kohal, R.J. (2004), A systematic review of the influence of different titanium surfaces on proliferation, differentiation and protein synthesis of osteoblast-like MG63 cells. *Clinical Oral Implants Research*, **15** (6), 683-692.

Full Text: 2004\Cli Ora Imp Res15, 683.pdf

Abstract: Objectives: Titanium is the standard material for dental and orthopaedical implants. The good biocompatibility has been proven in many experimental and clinical investigations. Different titanium topographies were tested in vitro using different cell culture models. The aim of this systematic review was to evaluate and summarize the medical/dental literature to assess on which kind of titanium surface structure the osteoblast-like osteosarcoma cells MG63 show the best proliferation and differentiation rate, and the best protein synthesis. Methods: A systematic search was carried out using different on-line databases (PUBMED, Web of Science, Cochrane Library, International Poster Journal), supplemented by handsearch in selected journals and by examination of the bibliographies of the identified articles. Inclusion and exclusion criterias were applied when considering relevant articles. Studies which met the inclusion criteria were included and data extraction was undertaken by one reviewer. Results: The search yielded 348 references. Nine articles referring to nine different studies were relevant to our question. Additionally 8 less relevant articles were identified. It was found that regularly textured surfaces of pure titanium with R-a values (average roughness) of around 4 mum are well-accepted by MG63 cells. Conclusions: The surfaces and culture conditions vary widely. Therefore it is still difficult to recommend one particular surface. It seems that there are no differences in cell proliferation and differentiation on surfaces treated by blasting and etching. Standardization in fabrication and size of the different test surfaces as well as homogeneity in culture times and plating densities should be aspects for future research.

Keywords: Behavior, Bone-Formation, Cartilage Cells, Cochrane, Culture, Databases, Differentiation, Extracellular-Matrix, Growth-Factor-Beta, Implants, In-Vitro, In-Vitro Studies, Journal, Journals, Kinase-A, Literature, Methods, Mg-63, Osteoblast-Like Mg63 Cells, Protein Synthesis, PUBMED, Research, Review, Roughness, Science, Standardization, Systematic, Systematic Review, Titania, Hydroxyapatite Composite Coatings, Titanium Surfaces, Web of Science

? Türp, J.C., Motschall, E., Schindler, H.F. and Heydecke, G. (2007), In patients with temporomandibular disorders do particular interventions influence oral health-related quality of life? A qualitative systematic review of the literature. *Clinical Oral Implants Research*, **18** (S3), 127-137.

Full Text: [2007\Cli Ora Imp Res18, 127.pdf](2007/Cli%20Ora%20Imp%20Res18,%20127.pdf)

Abstract: Objectives: The use of patient-based outcomes to measure therapeutic effectiveness is increasing, because a growing number of clinical scientists are attempting to evaluate the impact of therapy on the recipient. There are indications that patients suffering from temporomandibular disorders (TMDs) may also show a reduced oral health-related quality of life (OHQoL). It was the purpose of this paper to answer the question as to whether therapeutic interventions in TMD patients have a positive effect on their OHQoL. Material and methods: A systematic electronic search (Ovid Medline (R) 1966-2006; Science Citation Index 1945-2006) of the literature was carried out to identify pertinent articles of randomized and non-randomized clinical trials. Reports on retrospective and prospective studies that specifically focused on OHQoL changes in TMD patients as a consequence of therapeutic interventions were included. The reference lists of the identified articles were screened to find additional pertinent publications. Results: The investigation yielded seven relevant contributions from Medline (R). A quantitative analysis of the seven identified articles was not possible. There was considerable heterogeneity among the investigations with regard to study design, patient characteristics, and provided therapy. Three of the identified articles reported about prospective controlled studies, of which one was an RCT. Four additional investigations were retrospective. According to the results of the only RCT, a 6-week course of the nonselective cyclooxygenase (COX) inhibitor naproxen may lead to slightly better OHQoL in patients with temporomandibular joint (TMJ) arthralgia than the selective COX-2 inhibitor celecoxib. The two other articles reporting of a controlled study showed that selective serotonine uptake inhibitors accompanied by psychological therapy improved OHQoL in individuals with TMJ arthralgia. In contrast, TMJ surgery did not improve OHQoL. Conclusion: It appears that all therapeutic interventions reported in the identified publications led to at least some improvement of OHQoL. The only exception were patients with multiple TMJ surgeries.

Keywords: Articles, Characteristics, Chronic Pain, Citation, Clinical Trials, Craniomandibular Disorders, Effectiveness, Follow-up, German, Health-Related Quality of Life, Heterogeneity, Impact, Impact Profile Ohip, Lead, Literature, Medline, Methods, Oral Health Impact Profile, Outcomes, Positive, Publications, Quantitative, Quantitative Analysis, Randomized Clinical-Trial, Review, Satisfaction, Science, Science Citation Index, Short-Form, Study Design, Surgery, Survey SF-36, Systematic Review, Therapy, Validation, Version

? Türp, J.C., Jokslad, A., Motschall, E., Schindler, H.J., Windecker-Gétaz, I. and Ettlin, D.A. (2007), Is there a superiority of multimodal as opposed to simple therapy in patients with temporomandibular disorders? A qualitative systematic review of the literature. *Clinical Oral Implants Research*, **18** (S3), 138-150.

Full Text: [2007\Cli Ora Imp Res18, 138.pdf](2007/Cli%20Ora%20Imp%20Res18,%20138.pdf)

Abstract: Background: Pain is the most common motivation for patients with temporomandibular disorders (TMDs) to seek care. Therapeutic options range from patient education to joint surgery. Objectives: To conduct a systematic review of articles reporting on simple and multimodal management strategies in TMD patients. ‘Simple therapy’ was defined as care provided by a dentist, without using technical dental interventions, whereas ‘multimodal’ refers to at least two different modalities. We followed the null hypothesis of no difference between these two approaches. Material and methods: A systematic search was carried out in the following databases: Ovid (R) Medline (1966-2006), Cochrane Library (Issue 3/2006), and Science Citation Index (1945-2006). Subsequently, the reference lists of the identified articles were searched to find additional pertinent publications. We divided the study reports according to the main presenting symptom: (1) disc displacement without reduction, with pain; (2) TMD pain, without major psychological symptoms; and (3) TMD pain, with major psychological symptoms. Results: Eleven articles representing nine different clinical studies were identified. (1) In the disc displacement group with pain, multimodal therapy was not superior to explanation and advice. (2) A combination of occlusal appliance and biofeedback-assisted relaxation/stress management was not significantly superior to either of these therapies after 6 months. Furthermore, brief information alone or combined with relaxation training or occlusal appliance, respectively, were equally efficacious at the 6-month follow-up. There was no superiority of multimodal therapy including splints as compared with simple care. A slightly better outcome was reported for a combination of education and home physical therapy regimen than for patient education alone. (3) In temporomandibular pain patients with major psychological disturbances, patients benefited more from a combined therapeutic approach compared with simple care. Conclusion: Current research suggests that individuals without major psychological symptoms do not require more than simple therapy. In contrast, patients with major psychological involvement need multimodal, interdisciplinary therapeutic strategies. The clinician’s acceptance of the importance of psychological factors in TMD pain forms the platform for convincingly educating patients about the need for multimodal management.

Keywords: Adolescents, Appliance, Articles, Chronic Pain, Citation, Craniomandibular Disorders, Databases, Disc Displacement, Dysfunction, Education, Efficacy, Health-Care, Interdisciplinary, Literature, Management, Medline, Methods, Pain, Publications, Randomized Clinical-Trial, Randomized-Controlled Trial, Reduction, Regression, Research, Review, Science, Science Citation Index, Surgery, Systematic Review, Temporomandibular Pain, Therapy, Training

? Nieri, M., Clauser, C., Franceschi, D., Pagliaro, U., Saletta, D. and Pini-Prato, G. (2007), Randomized clinical trials in implant therapy: Relationships among methodological, statistical, clinical, paratextual features and number of citations. *Clinical Oral Implants Research*, **18** (4), 419-431.

Full Text: [2007\Cli Ora Imp Res18, 419.pdf](2007/Cli%20Ora%20Imp%20Res18,%20419.pdf)

Abstract: Objectives: The aim of the present study was to investigate the relationships among reported methodological, statistical, clinical and paratextual variables of randomized clinical trials (RCTs) in implant therapy, and their influence on subsequent research. Materials and methods: The material consisted of the RCTs in implant therapy published through the end of the year 2000. Methodological, statistical, clinical and paratextual features of the articles were assessed and recorded. The perceived clinical relevance was subjectively evaluated by an experienced clinician on anonymous abstracts. The impact on research was measured by the number of citations found in the Science Citation Index. A new statistical technique (Structural learning of Bayesian Networks) was used to assess the relationships among the considered variables. Results: Descriptive statistics revealed that the reported methodology and statistics of RCTs in implant therapy were defective. Follow-up of the studies was generally short. The perceived clinical relevance appeared to be associated with the objectives of the studies and with the number of published images in the original articles. The impact on research was related to the nationality of the involved institutions and to the number of published images. Conclusions: RCTs in implant therapy (until 2000) show important methodological and statistical flaws and may not be appropriate for guiding clinicians in their practice. The methodological and statistical quality of the studies did not appear to affect their impact on practice and research. Bayesian Networks suggest new and unexpected relationships among the methodological, statistical, clinical and paratextual features of RCTs.

Keywords: 2 Treatment Modalities, Articles, Bayesian Networks, Blade-Vent Implants, Citation, Citations, Clinical Features, Clinical Trials, Cooperative Dental Implant, Dental Implants, Fixed Partial Dentures, Guided Bone Regeneration, Impact, Learning, Methodological Features, Methodology, Methods, Networks, Paratextual Features, Patient Satisfaction, Randomized Clinical Trials, Removable Partial Dentures, Research, Retained Mandibular Overdentures, Science, Science Citation Index, Stage-II Surgery, Statistical Features, Statistics, Structural, Therapy, Within-Subject Comparisons

? Teughels, W., Merheb, J. and Quirynen, M. (2009), Critical horizontal dimensions of interproximal and buccal bone around implants for optimal aesthetic outcomes: A systematic review. *Clinical Oral Implants Research*, **20**, 134-145.

Full Text: 2009\Cli Ora Imp Res20, 134.pdf

Abstract: Objective This systematic review was initiated to explore the critical horizontal interproximal and buccal bone dimensions around implants for an optimal aesthetic outcome. Materials and methods PUBMED, the Cochrane and the ISI web of Science databases were searched to identify eligible human studies that reflect on the aesthetic outcome of implants in relation to the thickness of the buccal bone after osteotomy preparation, and in relation to the tooth-to-implant or interimplant distance. Vertical bone dimensions were not considered. Results and discussion Articles relating horizontal buccal bone dimensions to aesthetic outcome could not be retrieved. The relation between horizontal buccal bone dimensions and vertical bone resorption could also not be confirmed. In relation to horizontal interproximal bone dimensions, some uniformity was detected among the limited number of articles. Conclusions Interproximally, a 3 mm interelement distance seems to result more frequently in an adequate papillary fill. In the bucco-oral direction, there is insufficient evidence to set a threshold for minimal buccal bone thickness to ensure an optimal aesthetic outcome. Many additional factors appear to be of importance and interact with each other. To cite this article:Teughels W, Merheb J, Quirynen M. Critical horizontal dimensions of interproximal and buccal bone around implants for optimal aesthetic outcomes: a systematic review.Clin. Oral Impl. Res. 20 (Suppl. 4), 2009; 134-145.doi: 10.1111/j.1600-0501.2009.01782.x.

Keywords: Adjacent Implants, Anterior Maxilla, Articles, Bone, Buccal Bone, Cochrane, Critical, Databases, Fresh Extraction Sockets, Human, Immediate Restoration, Implant Position, Implants, Interimplant Distance, Interimplant Distance, Interproximal Bone, ISI, Life-Table Analysis, Outcome, Outcomes, Patient Satisfaction, Preparation, Prospective Multicenter, Review, Science, Single-Tooth Implants, Soft-Tissue, Systematic, Systematic Review, Tooth-Implant Distance

# Title: Clinical Orthopaedics and Related Research

Full Journal Title: Clinical Orthopaedics and Related Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tuli, S.M. (2007), Tuberculosis of the spine - A historical review. *Clinical Orthopaedics and Related Research*, **460**, 29-38.

Full Text: 2007\Cli Ort Rel Res460, 29.pdf

Abstract: Almost all ancient civilizations described tuberculous bacilli in their old scripts, and these bacteria have been found in prehistoric skeletal remains. The clinical availability of specific antitubercular drugs was the most important breakthrough in managing spinal tuberculosis. Any attempt at surgical excision of the disease prior to the antitubercular era met with serious complications, dissemination of disease and high mortality (nearly 50%). Antitubercular drugs markedly improved the results of management by operative treatment. Excellent healing of disease was also observed in those patients who were treated nonoperatively. However, it took many years (1950-1970) for clinicians to appreciate the efficacy of antitubercular drugs. Operations for spinal tuberculosis are now indicated less for control of disease (5-10% of all cases) than for complications, including nonresponding neural deficit (nearly 40% of neural complications), prevention or correction of severe kyphotic deformity, and for tissue diagnosis (approximately 5% of all cases). For a classic spondylodiscitis when surgery is required for debridement and decompression, an anterior approach through an extrapleural anterolateral route or through transpleural route is recommended. Healthy posterior elements should not be jeopardized by surgery. The real control of tuberculous disease requires a serious and sustained global effort to eliminate immunocompromised states, poverty, malnutrition, and overcrowding.

Keywords: Potts-Disease, Joint Tuberculosis, Radical Treatment, Follow-Up, Conservative Treatment, Skeletal Tuberculosis, Ambulant Treatment, Vertebral Bodies, Chemotherapy, Fusion

? Mavrogenis, A.F., Ruggieri, P. and Papagelopoulos, P.J. (2010), Editorial: Self-citation in publishing. *Clinical Orthopaedics and Related Research*, **468** (10), 2803-2807.

Full Text: [2010\Cli Ort Rel Res468, 2803.pdf](2010/Cli%20Ort%20Rel%20Res468,%202803.pdf)

Keywords: Eigenfactor(TM) Metrics, Journal Impact Factor, Medical Journals, Orthopedic Journals, Science, Scientific Journals, SCIMAGO, Self-Citation

? Lefaivre, K.A., Shadgan, B. and O’Brien, P.J. (2011), 100 most cited articles in orthopaedic surgery. *Clinical Orthopaedics and Related Research*, **469** (5), 1487-1497.

Full Text: [2011\Cli Ort Rel Res469, 1487.pdf](2011/Cli%20Ort%20Rel%20Res469,%201487.pdf)

Abstract: Citation analysis reflects the recognition a work has received in the scientific community by its peers, and is a common method to determine ‘classic’ works in medical specialties. We determined which published articles in orthopaedic journals have been most cited by other authors by ranking the 100 top-cited works. By analyzing characteristics of these articles, we intended to determine what qualities make an orthopaedic article important to the specialty. Finally, we determined if there was a change in level of evidence of studies on this list with time. Science Citation Index Expanded was searched for citations to articles published in any of the 49 journals in the subject category “ORTHOPEDICS.” Each of the 49 journals was searched separately using the “cited reference search” to determine the 100 most often cited articles. Each article was reviewed for basic information including year of publication, country of origin, source journal of the article, article type, and level of evidence. We categorized the journal article by field of research where possible. The number of citations ranged from 1748 to 353. The 100 most often cited articles in orthopaedic surgery were published in 11 of the 49 journals, spanning from general to more specific subspecialty journals. The majority of the papers (76) were clinical, with the remaining representing some type of basic science research. The most common level of evidence was IV (42 of the 76 studies). Of the 76 clinical articles, 27 introduced or tested classification systems or outcome measurement tools. Authors aiming to write a highly cited article in an orthopaedic surgery journal will be favored by language of publication, source journal, country of origin, and introduction of a classification scheme or outcome tool.

Keywords: Analysis, Articles, Authors, Characteristics, Citation, Citation Analysis, Citation-Classics, Citations, Classification, Clinical, Community, Country, Country of Origin, Emergency-Medicine, Evidence, Field, General, Impact, Information, Iv, Journal, Journal Article, Journals, Measurement, Medical, Origin, Outcome, Papers, Publication, Ranking, Reference, Research, Science, Science Citation Index, Science Citation Index Expanded, Science Research, Source, Specialty, Surgery, Systems, Trauma, Work

? Morris, M.D. and Mandair, G.S. (2011), Raman assessment of bone quality. *Clinical Orthopaedics and Related Research*, **469** (8), 2160-2169.

Full Text: 2011\Cli Ort Rel Res469, 2160.pdf

Abstract: Progress in the diagnosis and prediction of fragility fractures depends on improvements to the understating of the compositional contributors of bone quality to mechanical competence. Raman spectroscopy has been used to evaluate alterations to bone composition associated with aging, disease, or injury. In this survey we will (1) review the use of Raman-based compositional measures of bone quality, including mineral-to-matrix ratio, carbonate-to-phosphate ratio, collagen quality, and crystallinity; (2) review literature correlating Raman spectra with biomechanical and other physiochemical measurements and with bone health; and (3) discuss prospects for ex vivo and in vivo human subject measurements. ISI Web of Science was searched for references to bone Raman spectroscopy in peer-reviewed journals. Papers from other topics have been excluded from this review, including those on pharmaceutical topics, dental tissue, tissue engineering, stem cells, and implant integration. Raman spectra have been reported for human and animal bone as a function of age, biomechanical status, pathology, and other quality parameters. Current literature supports the use of mineral-to-matrix ratio, carbonate-to-phosphate ratio, and mineral crystallinity as measures of bone quality. Discrepancies between reports arise from the use of band intensity ratios rather than true composition ratios, primarily as a result of differing collagen band selections. Raman spectroscopy shows promise for evaluating the compositional contributors of bone quality in ex vivo specimens, although further validation is still needed. Methodology for noninvasive in vivo assessments is still under development.

Keywords: Age-Related-Changes, Aging, Animal Age, Assessment, Bone, Collagen Cross-Links, Deficient Mice, Development, Diagnosis, Disease, Human, Human Cortical Bone, In Vivo, Injury, ISI, Journals, Literature, Mechanical-Properties, Methodology, Mineralized Tissues, Osteonal Bone, Pathology, Quality, Ratio, Review, Review Literature, Science, Spectroscopic Analysis, Survey, Topics, Trabecular Bone, Validation, Web of Science

? Bracco, P. and Oral, E. (2011), Vitamin E-stabilized UHMWPE for total joint implants: A review. *Clinical Orthopaedics and Related Research*, **469** (8), 2286-2293.

Full Text: [2011\Cli Ort Rel Res469, 2286.pdf](2011/Cli%20Ort%20Rel%20Res469,%202286.pdf)

Abstract: Osteolysis due to wear of UHMWPE limits the longevity of joint arthroplasty. Oxidative degradation of UHMWPE gamma-sterilized in air increases its wear while decreasing mechanical strength. Vitamin E stabilization of UHMWPE was proposed to improve oxidation resistance while maintaining wear resistance and fatigue strength. We reviewed the preclinical research on the development and testing of vitamin E-stabilized UHMWPE with the following questions in mind: (1) What is the rationale behind protecting irradiated UHMWPE against oxidation by vitamin E? (2) What are the effects of vitamin E on the microstructure, tribologic, and mechanical properties of irradiated UHMWPE? (3) Is vitamin E expected to affect the periprosthetic tissue negatively? We performed searches in PUBMED, Scopus, and Science Citation Index to review the development of vitamin E-stabilized UHMWPEs and their feasibility as clinical implants. The rationale for using vitamin E in UHMWPE was twofold: improving oxidation resistance of irradiated UHMWPEs and fatigue strength of irradiated UHMWPEs with an alternative to postirradiation melting. Vitamin E-stabilized UHMWPE showed oxidation resistance superior to that of irradiated UHMWPEs with detectable residual free radicals. It showed equivalent wear and improved mechanical strength compared to irradiated and melted UHMWPE. The biocompatibility was confirmed by simulating elution, if any, of the antioxidant from implants. Vitamin E-stabilized UHMWPE offers a joint arthroplasty technology with good mechanical, wear, and oxidation properties. Vitamin E-stabilized, irradiated UHMWPEs were recently introduced clinically. The rationale behind using vitamin E and in vitro tests comparing its performance to older materials are of great interest for improving longevity of joint arthroplasties.

Keywords: Alpha-Tocopherol, Beam Irradiation Oxidation, Citation, Crack Propagation Resistance, Cross-Linked Polyethylene, Development, Electron-Spin Resonance, Fatigue Resistance, Hap-Paul-Award, Mechanical-Properties, Molecular-Weight Polyethylene, PUBMED, Research, Review, Science Citation Index, Scopus, Total Hip-Arthroplasty

# Title: Clinical Otolaryngology

Full Journal Title: Clinical Otolaryngology

ISO Abbreviated Title: Clin. Otolaryngol.

JCR Abbreviated Title: Clin Otolaryngol All

ISSN: 0307-7772

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Journal Country/Territory: England

Language: English

Publisher: Blackwell Publishing Ltd

Publisher Address: 9600 Garsington Rd, Oxford OX4 2DG, Oxon, England

Subject Categories:

Otorhinolaryngology: Impact Factor

Fenton, J.E., Brazier, H., de Souza, A., Hughes, J.P. and McShane, D.P. (2000), The accuracy of citation and quotation in otolaryngology/head and neck surgery journals. *Clinical Otolaryngology*, **25** (1), 40-44.

Full Text: [2000\Cli Oto All Sci25, 40.pdf](2000/Cli%20Oto%20All%20Sci25,%2040.pdf)

Abstract: A high rate of errors of citation and quotation has been reported in the publications of many medical specialties. The aim of this study was to determine the prevalence of citation and quotation errors in otolaryngology/head and neck surgery journals. A retrospective analysis was performed based on the first issue for 1997 of each of four journals: Laryngoscope; Annals of Otology, Rhinology and Laryngology; Clinical Otolaryngology; and Journal of Laryngology and Otology. A sample of 50 references from each journal was randomly selected and each was checked for accuracy against the original referenced paper. Citation errors were categorized as major, intermediate or minor and quotation errors as major or minor. Citation errors occurred in 37.5% of the references, 11.9% of which were considered major errors. Quotation errors occurred in 17%, with 11.1% major errors. This prevalence is similar to the established error rate in medical literature.

Keywords: Otolaryngology, Bibliography (Standards), Periodicals (Stndards), Publishing References

De, S., Jones, T., Brazier, H., Jones, A.S. and Fenton, J.E. (2001), The accuracy of MEDLINE and Journal contents pages for papers published in *Clinical Otolaryngology*. *Clinical Otolaryngology*, **26** (1), 39-42.

Full Text: [2001\Cli Oto All Sci26, 39.pdf](2001/Cli%20Oto%20All%20Sci26,%2039.pdf)

Abstract: MEDLINE is widely used as a source for identifying and reviewing medical journal literature. Its accuracy is generally taken fur granted, as is that. of the contents pages published by the journals themselves. In this study of citation accuracy we examined the articles published in Clinical Otolaryngology and Allied Sciences from 1976 to 1998. The entries in MEDLINE were compared with the entries in the Journal’s contents pages, and with the actual articles. Of 1651 articles published in the journal, one was omitted from MEDLINE and 25 (1.5%) were incorrectly cited, while 88 (5.3%) were incorrectly cited in the contents pages. Twenty-one (84%) of the errors in MEDLINE involved names of authors. Apart from incomplete retrieval of information for practice and research, errors could result in an author not getting credit for publications.

Keywords: Medline, Clinical Otolaryngology, Periodicals, Abstracting and Indexing, Errors, Vocabulary, Medicine, Mesh

? Sandhu, G.S. and Wright, A. (2001), Publishing trends in otorhinolaryngology from January 1997 to December 1999 in the UK. *Clinical Otolaryngology*, **26** (3), 249-252.

Full Text: [2001\Cli Oto All Sci26, 249.pdf](2001/Cli%20Oto%20All%20Sci26,%20249.pdf)

Abstract: In the last 10 years there have been many changes in otorhinolaryngology training and academic resources. The Calman reforms were introduced to our speciality in July 1996 and the last decade has also seen the number of professorial chairs in the UK rise from two to 12. One would therefore expect an increase in academic output, in terms of published works. despite the impediments generated by the Calman Training System. A search of eight leading English language otorhinolaryngology journals was carried out from January 1997 to December 1999 looking for articles with British authors. The results were compared with similar research carried out 10 years ago. There has been no major growth in the output of otorhinolaryngological publications from the UK in the last 10 years.

Keywords: Changes, Growth, Journals, Publications, Published Works, Research, Training, Trends, UK

Motamed, M., Mehta, D., Basavaraj, S. and Fuad, F. (2002), Self citations and impact factors in otolaryngology journals. *Clinical Otolaryngology*, **27** (5), 318-320.

Full Text: [2002\Cli Oto All Sci27, 318.pdf](2002/Cli%20Oto%20All%20Sci27,%20318.pdf)

Abstract: Self citation of a journal may affect its impact factor. Self citations during 1997 and 1998 were investigated in six ‘general’ otolaryngology journals. The citations each journal gave to other journals, including itself, and the citations each journal received from the other journals, differed significantly among the six journals (χ2= 2794, d.f. = 25, *P* < 0.0001). *Acta Otolaryngologica* and *Laryngoscope* had the highest self-citing rates (11.9% and 10.02%). *Clinical Otolaryngology* had the lowest self-citing rate (4%). There was no significant correlation between self-citing rates and impact factors for the six otolaryngology journals (*r* = -0.3143, *P* = 0.56).

Fenton, J.E. and Jones, A.S. (2002), Integrity in medical research and publication. *Clinical Otolaryngology*, **27** (6), 436-439.

Full Text: [C\Cli Oto All Sci27, 436.pdf](C/Cli%20Oto%20All%20Sci27,%20436.pdf)

? Jaunoo, S.S. and Lo, S. (2006), A higher self-citing rate is not necessarily a bad thing: More correspondence equals more stimulation. *Clinical Otolaryngology*, **31** (6), 561-562.

Full Text: [2006\Cli Oto All Sci31, 561.pdf](2006/Cli%20Oto%20All%20Sci31,%20561.pdf)

? Wormald, R.N., Ahmed, I. and Fenton, J.E. (2007), The facial nerve: One editorial, two authors, top-cited. *Clinical Otolaryngology*, **32** (5), 397-398.

Full Text: [2007\Cli Oto All Sci32, 397.pdf](2007/Cli%20Oto%20All%20Sci32,%20397.pdf)

Keywords: Grading Systems, Science

? Sacks, P.L., Harvey, R.J., Rimmer, J., Gallagher, R.M. and Sacks, R. (2011), Topical and systemic antifungal therapy for the symptomatic treatment of chronic rhinosinusitis. *Clinical Otolaryngology*, **36** (5), 489-490.

Full Text: [2011\Cli Oto All Sci36, 489.pdf](2011/Cli%20Oto%20All%20Sci36,%20489.pdf)

Abstract: Background Chronic rhinosinusitis (CRS) is an inflammatory disorder of the nose and sinuses. Since fungi were postulated as a potential cause of CRS in the late 1990s, there has been increasing controversy about the use of both topical and systemic antifungal agents in its management. Although interaction between the immune system and fungus has been demonstrated in CRS, this does not necessarily imply that fungi are the cause of CRS or that antifungals will be effective its management. Objectives To assess the effectiveness of topical or systemic antifungal therapy in the treatment of CRS. Search Strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ICTRP and additional sources for published and unpublished trials. The date of the most recent search was 8 March 2011. Selection criteria All randomised, placebo-controlled trials considering the use of topical or systemic antifungal therapy in the treatment of CRS and allergic fungal sinusitis (AFS). CRS was defined using either the European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) or American Academy of Otolaryngology - Head and Neck Surgery (AAO-HNS) criteria. Data collection and analysis We reviewed the titles and abstracts of all studies obtained from the searches and selected trials that met the eligibility criteria. We extracted data using a pre-determined data extraction form. There was significant heterogeneity of outcome data reporting with reports containing both parametric and non-parametric representations of data for the same outcomes. Means and standard deviations for change data were unavailable for a number of trials. Due to the limited reported data, we contacted authors and used original data for data analysis. Main Results Six studies were included (380 participants). Five studies investigated topical antifungals and one study investigated systemic antifungals. The risk of bias in all included studies was low, with all trials being double-blinded and randomised. Pooled meta-analysis showed no statistically significant benefit of topical or systemic antifungals over placebo for any outcome. Symptom scores in fact statistically favoured the placebo group. Adverse event reporting was statistically significantly higher in the antifungal group. Authors’ conclusions On the basis of this meta-analysis, there is no evidence to support the use of either topical or systemic antifungal treatment in the management of CRS.

Keywords: Analysis, Authors, Bias, Cochrane, Cr, Disorder, Effectiveness, Embase, Extraction, Fungus, Immune, Low, Management, Meta Analysis, Meta-Analysis, Nonparametric, Outcome, Outcomes, Pubmed, Rhinosinusitis, Risk, Science, Selection, Sinusitis, Surgery, Therapy, Treatment, Web of Science

? Diakos, E.A., Gallos, I.D., El-Shunnar, S., Clarke, M., Kazi, R. and Mehanna, H. (2011), Dexamethasone reduces pain, vomiting and overall complications following tonsillectomy in adults: A systematic review and meta-analysis of randomised controlled trials. *Clinical Otolaryngology*, **36** (6), 531-542.

Full Text: [2011\Cli Oto All Sci36, 531.pdf](2011/Cli%20Oto%20All%20Sci36,%20531.pdf)

Abstract: Background: Tonsillectomy is one of the most common surgical procedures, but there is debate whether systemic steroids should be used to reduce pain and post-operative complications. Objective of review: To determine whether perioperative steroids reduce post-tonsillectomy pain and complications in adults. Type of review: Systematic review and meta-analysis of randomised controlled trials. Search strategy: We searched MEDLINE (1950-2010), EMBASE (1980-2010), CINAHL (1981-2010), Web of Science, ProQuest, metaRegister, Conference Proceedings Citation Index, the Cochrane Library and reference lists of relevant studies. Evaluation method: Two reviewers independently selected trials and extracted data on their quality, characteristics and results. Trials included adults (age > 16 years) undergoing elective tonsillectomy where peri-operative steroids were used, and the results were compared with control or placebo. Results: There were seven randomised controlled trials (580 patients) reporting post-operative pain. Meta-analysis demonstrates that dexamethasone in adults reduces the pain level experienced in the first post-tonsillectomy day [standard mean difference (SMD): -0.63, 95% CI: -1.13 to -0.12] with significant heterogeneity (I(2) = 84%, P < 0.00001). Sub-group analysis to explore heterogeneity demonstrated this reduction in pain was mostly with high total dose steroids (total >10 mg over first 24 h postoperatively; SMD: -1.48, 95% CI: -2.17 to -0.79, P < 0.00001), especially when given both intra-operatively and post-operatively. There was no significant effect with low doses (SMD: -0.12, 95% CI: -0.36 to 0.13, P = 0.35). There were three trials (231 patients) that reported post-operative nausea and vomiting, three other trials (270 patients) reporting on bleeding and three trials (401 patients) reporting other complications (infections and odynophagia). There was a significant reduction in post-operative nausea and vomiting (RR: 0.53, 95% CI: 0.36 to 0.80, P = 0.002, I(2) = 26%) and bleeding (RR: 0.45, 95% CI: 0.25 to 0.80, P = 0.007, I(2) = 0%), but the reduction in the other complications did not reach statistical significance (RR: 0.69, 95% CI: 0.48 to 1.01, P = 0.06, I(2) = 0%). Pooling of these complications (postoperative nausea and vomiting, bleeding, infections and odynophagia) shows that in six trials (501 patients), the use of dexamethasone significantly reduced post-operative complications following tonsillectomy in adults (RR: 0.59, 95% CI: 0.49 to 0.71, P < 0.00001, I(2) = 0%), when compared with placebo or control. Conclusions: Dexamethasone reduces pain, postoperative nausea and vomiting, bleeding and overall postoperative complications in adults undergoing tonsillectomy. However, the effect of the dose of dexamethasone on post-operative pain and whether dexamethasone reduces bleeding require further research.

Keywords: Adults, Analysis, Citation, Cochrane, Complications, Conference, Control, Double-Blind, Embase, Evaluation, Low, Medline, Meta Analysis, Meta-Analysis, Nausea, Pain, Patients, Postoperative Complications, Quality, Reduction, Research, Review, Risk, Science, Search Strategy, Statistical, Steroid-Therapy, Strategy, Surgical, Systematic, Systematic Review, Web of Science, Web-of-Science

# Title: Clinical Pediatrics

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ISO Abbreviated Title: Clin. Pediatr.

JCR Abbreviated Title: Clin Pediatr

ISSN: 0009-9228

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Westminster Publ Inc

Publisher Address: 708 Glen Cove Ave, Glen Head, NY 11545

Subject Categories:

Pediatrics: Impact Factor 1.755, 11/69 (2001)

? Shannon, M. and Graef, J.W. (1989), Lead-intoxication - from lead-contaminated water used to reconstitute infant formula. *Clinical Pediatrics*, **28** (8), 380-382.

? Schiebler, G.L. (1993), Building a responsible system of care. *Clinical Pediatrics*, **32** (10), 607-608.

# Title: Clinical Pharmacy

Full Journal Title: Clinical Pharmacy

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Florentine, M.J. and Sanfilippo, D.J. (1991), Elemental mercury-poisoning. *Clinical Pharmacy*, **10** (3), 213-221.

Abstract: Three siblings with inhaled elemental mercury toxicity are described, and the signs and symptoms of mercury toxicity, interpretation of mercury concentrations, and management of elemental mercury exposure are reviewed.

A 4-year-old girl was admitted to the hospital with a history of fever and increasing irritability, fatigue, malaise, insomnia, headache, anorexia, and ataxia. She was discharged two days later with a diagnosis of acute cerebellar ataxia. During the following 18 days, the child’s condition worsened, and she was rehospitalized. Meanwhile her 11-year-old sister was hospitalized for evaluation of fatigue, weakness, lower back pain, and ataxia. The older girl’s blood mercury concentration, at 5.5-mu-g/dL, was in the toxic range. Twenty-four-hour urine mercury screening confirmed mercury intoxication in both children. Questioning revealed that the girls’ brother had recently spilled 0.5-1 oz of elemental mercury in the house. All family members underwent blood and urine mercury testing. The brother underwent a dimercaprol challenge to determine his tissue mercury burden, which was found to be > 2.4-mu-g/dL. The sisters underwent two courses of chelation therapy with dimercaprol. Symptoms persisted in all three children, and they underwent five 10-day cycles of N-acetyl-D,L-penicillamine (NAP) therapy; the youngest underwent a third dimercaprol regimen. All siblings continued NAP chelation therapy because of extensive tissue mercury burden until the results of repeated urine mercury concentration determinations were normal.

The cases presented illustrate several challenges in diagnosing and managing mercury toxicity: lack of agreement upon toxic versus normal levels of blood and urine mercury, lack of correlation between symptomatology and blood and urine test results, and the absence of endpoints for initiation and cessation of chelation therapy. Treatment options include dimercaprol, penicillamine, and the investigational agents NAP and 2,3-dimercaptosuccinic acid (DMSA).

DMSA may be the most effective agent available for mercury chelation therapy; however, further study is needed to determine toxic levels of blood and urine mercury and endpoints for initiation and cessation of therapy.

Keywords: N-Acetyl-D, L-Penicil-Lamine, Antidotes, Blood Levels, Dimercaprol, Heavy-Metal Antagonists, Mercury, Metals, Pediatrics, Poisoning, Tissue Levels, Toxicity, Toxicity, Environmental, Urine Levels

? Rhoney, D.H., Leader, W.G. and Chandler, M.H.H. (1993), Modified Michaelis-Menten equation for estimating unbound-phenytoin concentrations. *Clinical Pharmacy*, **12** (12), 913-917.

Keywords: DEC

# Title: Clinical Physiology

Full Journal Title: [Clinical Physiology](http://www.blackwell-synergy.com/loi/cpf.1)

ISO Abbreviated Title: Clin. Physiol.

JCR Abbreviated Title: Clin Physiol

ISSN: 0144-5979

Issues/Year: 6

Journal Country/Territory: England

Language: English

Publisher: Blackwell Science Ltd

Publisher Address: P O Box 88, Osney Mead, Oxford OX2 0NE, Oxon, England

Subject Categories:

Physiology: Impact Factor 1.104, / (2001)

? Hansen, H.B., Brinch, K. and Henriksen, J.H. (1996), Scientific publications from departments of clinical physiology and nuclear medicine in Denmark. A bibliometric analysis of ‘impact’ in the years 1989-1994. *Clinical Physiology*, **16** (5), 507-519.

Full Text: [1996\Cli Phy16, 507.pdf](1996/Cli%20Phy16,%20507.pdf)

Abstract: This study reports a bibliometric analysis of scientific publications emanating from departments of clinical physiology and nuclear medicine, Denmark, during the years 1989-1994. The total number of publications during this period was 860 (763 scientific journal papers, 71 book/book chapters and 26 theses). Whereas the number of publications per year (188-113) decreased significantly with time (r = -0.94, P < 0.02), the number of authors (mean 4.1) was almost constant over time. University/university-related departments accounted for 96% of the papers. Only 8% of the papers resulted from a collaboration between two or more departments of clinical physiology and nuclear medicine, but the collaboration with other medical specialities and institutions was much greater (85%). The 763 papers were published in 239 different scientific journals, 80% in journals with an official ‘impact factor’, a bibliometric measure of quality (the average number of times a paper is cited in a journal in the publishing year and the subsequent year). Twenty per cent (20%) and 8.4% were printed in journals with an impact factor, respectively, of above 2.1 (the 500 journals most cited) and 3.7 (the 200 most cited), which is significantly above the national average (16.6% and 6.0%, P < 0.001). The ‘cumulated impact’ (i.e. the impact of all papers) showed a borderline significant decrease over time (r = -0.77, P = 0.1), whereas the average impact per paper (1.53) remained almost constant and was significantly above the national average (1.10, P < 0.001). A close relationship was found between the number of papers from a department and its cumulated impact (r = -0.97, P < 0.001).

It is concluded that the total number of scientific papers from Danish departments of clinical physiology and nuclear medicine fell in the period, whereas the volume of quality, as assessed on the cumulated impact, only fell with borderline significance, and the impact per paper was almost constant from 1989 to 1994, and was above the national average.

Keywords: Clinical Physiology, Impact Factor, Nuclear Medicine, Research Evaluation, Science

? Hansen, H.B. and Henriksen, J.H. (1997), How well does journal ‘impact’ work in the assessment of papers on clinical physiology and nuclear medicine. *Clinical Physiology*, **17**, 409-418.

Full Text: [1997\Cli Phy17, 409.pdf](1997/Cli%20Phy17,%20409.pdf)

# Title: Clinical Psychology Review

Full Journal Title: Clinical Psychology Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? van Ijzendoorn, M.H. and Schuengel, C. (1996), The measurement of dissociation in normal and clinical populations: Meta-analytic validation of the dissociative experiences scale (DES). *Clinical Psychology Review*, **16** (5), 365-382.

Abstract: The Dissociative Experiences Scale (DES) has now been used in over 100 studies on dissociation. This article reports on a series of meta-analyses to test some of the theoretical assumptions underlying the DES and to examine the instrument’s reliability and validity. Studies with the DES were identified through Psychlit, MEDLINE, Social Sciences Citation Index, and Current Contents. Across studies in similar domains (e.g., studies on multiple Personality disorders) combined effect sizes were computed using the Rosenthal-Mullen approach. The DES showed excellent convergent validity with other dissociative experiences questionnaires and interview schedules (combined effect size: d = 1.82; N = 5,916). The DES also showed impressive predictive validity, in particular concerning dissociative disorders (Multiple Personality Disorder: combined effect size d = 1.05; N = 1,705) and traumatic experiences (post-traumatic stress disorder: combined effect size d = 0.75; N = 1,099; and abuse: combined effect size d = 0.52; N = 2,108). However, the discriminant validity was less well established. The DES is sensitive to response and experimenter biases. It is recommended to average DES-scores over mwe points in time and over more judges. The DES seems to measure the current view on past dissociative experiences. The model of dissociation as a form of autohypnosis failed to receive support from the data. A developmental model to interpret dissociation is proposed.

Keywords: Abuse, Approach, Assumptions, Clinical, Convergent Validity, Data, Discriminant, Effect Size, Measure, Measurement, Model, N, Normal, Populations, Post-Traumatic Stress, Post-Traumatic Stress Disorder, Posttraumatic Stress, Posttraumatic Stress Disorder, Predictive, Questionnaires, Reliability, Scale, Size, Stress, Support, Traumatic, Validation, Validity

? Brooks, S., Prince, A., Stahl, D., Campbell, I.C. and Treasure, J. (2011), A systematic review and meta-analysis of cognitive bias to food stimuli in people with disordered eating behaviour. *Clinical Psychology Review*, **31** (1), 37-51.

Abstract: Aim: Maladaptive cognitions about food, weight and shape bias attention, memory and judgment and may be linked to disordered eating behaviour. This paper reviews information processing of food stimuli (words, pictures) in people with eating disorders (ED). Method: PUBMED, Ovid, ScienceDirect, PsychInfo, Web of Science, Cochrane Library and Google Scholar were searched to December 2009. 63 studies measured attention, memory and judgment bias towards food stimuli in women with ED. Results: Stroop tasks had sufficient sample size for a meta-analyses and effects ranged from small to medium. Other studies of attention bias had variable effects (e.g. the Dot-Probe task, distracter tasks and Startle Eyeblink Modulation). A meta-analysis of memory bias studies in ED and RE yielded insignificant effect. Effect sizes for judgment bias ranged from negligible to large. Conclusions: People with ED have greater attentional bias to food stimuli than healthy controls (HC). Evidence for a memory and judgment bias in ED is limited. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Anorexia Nervosa, Anorexia-Nervosa, Attention, Attentional Biases, Bias, Bulimia Nervosa, Bulimia-Nervosa, Cochrane, Cognitive Bias, Dietary Restraint, Google Scholar, Information, Information Processing, Judgment, Memory, Meta-Analysis, PUBMED, Quantitative Measure, Restrained Eaters, Restrained Eaters, Review, Science, Shape-Related Words, Stroop Test, Systematic, Systematic Review, Thought Suppression, Unrestrained Eaters, Web of Science, Women

# Title: Clinical Radiology

Full Journal Title: [Clinical Radiology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6744&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=708255847719e858344bfa370c72ece0)

ISO Abbreviated Title: Clin. Radiol.

JCR Abbreviated Title: Clin Radiol

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Journal Country/Territory: England

Language: English

Publisher: W B Saunders Co Ltd

Publisher Address: 24-28 Oval Rd, London NW1 7DX, England

Subject Categories:

Radiology, Nuclear Medicine & Medical Imaging: Impact Factor 1.048, / (2002)

Ahuja, A. (2003), Radiological findings in severe acute respiratory syndrome. *Clinical Radiology*, **58** (6), 496.

Full Text: [C\Cli Rad58, 496.pdf](C/Cli%20Rad58,%20496.pdf)

? Gilbert, F.J. and Denison, A.R. (2003), Research misconduct. *Clinical Radiology*, **58** (7), 499-504.

Full Text: [2003\Cli Rad58, 499.pdf](2003/Cli%20Rad58,%20499.pdf)

Abstract: Good research practice is important to the scientific community. An awareness of what constitutes poor practice is important. Various types of research misconduct are defined in this article. The extent of research misconduct in the field of radiology has been assessed by contacting five English language radiology journals. Redundant or duplicate publication has been reported infrequently, Radiology (1), American Journal of Roentgenology (3), Clinical Radiology (3), British Journal of Radiology (2) and European Radiology (1). The issue of how the radiology community might tackle research misconduct is discussed with reference to guidance from the Medical Research Council, the Wellcome Trust and the Committee of Publication Ethics. (C) 2003 The Royal College of Radiologists. Published by Elsevier Science Ltd. All rights reserved.

Keywords: Fraud, Scientific Misconduct, Research Misconduct, Duplicate Publication, Plagiarism, Good Research Practice, Magnetic-Resonance Cholangiopancreatography, Duplicate Publication, Direct Cholangiography, Diagnostic-Accuracy, Medical-Research, Notice, Choledocholithiasis, Plagiarism, Authorship

? Johnson, C.A. and Toms, A.P. (2009), The impact of European research ethics legislation on UK radiology research activity: A bibliometric analysis. *Clinical Radiology*, **64** (10), 983-987.

Full Text: [2009\Cli Rad64, 983.pdf](2009/Cli%20Rad64,%20983.pdf)

Abstract: AIM: To determine whether there is evidence of a reduction in radiology research activity in the UK following the implementation of the European research ethics legislation, which came in to force in 2001 and has been widely criticised as an impediment to research. MATERIALS AND METHODS: A bibliometric analysis was performed by searching PUBMED for all first-author publications from UK departments of “radiology” or “medical imaging” between 1995 and 2007. Results were subcategorized into those papers published in the highest cited general radiology journals and by publication type: original research, reviews, and case reports. RESULTS: From 1995 to 2007 the total number of publications rose by 6.5% from 137 to 146 with the increase occurring in non-general radiology journals. Original articles fell from 18 in 1995 to 12 in 2003, but then rose to 24 by 2007 (33% rise). This dip was paralleled by a fall and then recovery in case report publications. The most dramatic change has been in the number of review articles, which has increased more than eightfold from seven in 1995 to 65 in 2007 to become the most common form of publication. CONCLUSION: The overall number of original scientific articles, published by first-author UK radiologists, has increased slightly over the last 12 years despite a temporary fall associated with the introduction of new research ethics legislation. (C) 2009 The Royal College of Radiologists. Published by Elsevier Ltd. All rights reserved.

Keywords: Bibliometric Analysis, Corec, Research Governance

# Title: Clinical Rehabilitation

Full Journal Title: Clinical Rehabilitation

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? McKeown, L.P., Porter-Armstrong, A.P. and Baxter, G.D. (2003), The needs and experiences of caregivers of individuals with multiple sclerosis: A systematic review. *Clinical Rehabilitation*, **17** (3), 234-248.

Full Text: [2003\Cli Reh17, 234.pdf](2003/Cli%20Reh17,%20234.pdf)

Abstract: Primary objective: To appraise recent studies regarding the needs and experiences of caregivers of individuals with multiple sclerosis (MS). Design: The following computerized databases were searched: CINAHL, BIDS IBSS, ASSIA, MEDLINE, PSYCHINFO, British Nursing Index, ISI Web of Science, Zetoc, AMED (1990-April 2002). The computer-based search was supplemented by manual searches of the reference lists of all retrieved studies and review articles. Inclusion and exclusion criteria were formulated. Results: Twenty-four studies from across the world that met the inclusion criteria were reviewed. The majority of studies were descriptive in nature. The studies covered a variety of topics, including how carers assist people with MS, the effect of providing care on a carer’s physical and psychological wellbeing, social life, financial situation and overall quality of life, and how carers cope with the stresses of providing care. Conclusions: Providing care for a person with MS has a major impact on all areas of the caregiver’s life. Perceived social support has been shown to have a beneficial impact on the caregiver. Limitations in design and variation in methodology of studies limits the generalizability of findings. There is a need for further research, in particular the development of reliable and valid disease-specific caregiver assessment instruments.

Keywords: Adjustment, Assessment, Carers, Databases, Development, Disability, Financial Situation, Impact, ISI, Life, MEDLINE, Methodology, Nursing, Primary, Psychometric Characteristics, Quality, Quality of Life, Questionnaire, Research, Resources, Review, Scale, Science, Services, Social, Symptoms, Systematic, Systematic Review, Topics, Web of Science

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Full Text: [2009\Cli Reh23, 195.pdf](2009/Cli%20Reh23,%20195.pdf)

Abstract: Objective: To assess the effectiveness of information provision strategies in improving the outcome for stroke patients and/or their identified caregivers. Data sources: We searched: the Cochrane Stroke Group Trials Register; the Cochrane Central Register of Controlled Trials; electronic databases MEDLINE; EMBASE; CINAHL; PsycINFO; Science Citation Index and Social Science Citation Index; Assia; Index to UK theses; Dissertation Abstracts; ongoing trials and research registers; bibliographies of retrieved papers, relevant articles, and books; the Journal of Advanced Nursing. We also contacted researchers for additional information. Review methods: Two review authors independently assessed trial eligibility, extracted data and assessed methodological quality. Primary outcomes were knowledge about stroke and impact on mood. Meta-analyses were undertaken for the domains of knowledge, mood, satisfaction, and mortality. Results: Seventeen trials were identified and 11 contributed data to the meta-analyses. There were significant effects in favour of the intervention on patient knowledge (standardized mean difference (SMD) 0.29, 95% confidence interval (CI) 0.12 to 0.46), caregiver knowledge (SMD 0.74 95% Cl 0.06 to 1.43), patient depression scores (weighted mean difference (WMD) -0.52, 95% Cl -0.93 to -0.10), and one aspect of patient satisfaction (odds ratio (OR) 2.07, 95% Cl 1.33 to 3.23). Post-hoc subgroup analyses showed that strategies which actively involved patient and caregivers had a significantly greater effect on patient anxiety (P<0.05) and depression (P<0.02) than passive strategies. Conclusion: There is some evidence to support the routine provision of information to stroke patients and their families. Although the best way to provide information is still not clear, the results of this review suggest that strategies which actively involve patients and caregivers should be used in routine practice.

Keywords: Carers, Citation, Depression, Education-Program, Impact, Intervention, Knowledge, Medline, Mortality, Nursing, Outcomes, Quality, Randomized Controlled-Trial, Research, Satisfaction, Support, UK

? Babyar, S.R., Peterson, M.G.E., Bohannon, R., Perennou, D. and Reding, M. (2009), Clinical examination tools for lateropulsion or pusher syndrome following stroke: A systematic review of the literature. *Clinical Rehabilitation*, **23** (7), 639-650.

Full Text: [2009\Cli Reh23, 639.pdf](2009/Cli%20Reh23,%20639.pdf)

Abstract: Objective: To examine the clinimetric properties and clinical applicability of published tools for ‘quantifying’ the degree of lateropulsion or pusher syndrome following stroke. Data sources: Search through electronic databases (MEDLINE, EMBASE, CINAHL, Science Citation Index) with the terms lateropulsion, pushing, pusher syndrome, validity, reliability, internal consistency, responsiveness, sensitivity, specificity, posture and stroke. Databases were searched from their inception to October 2008. Review methods: Abstracts were selected by one author. A panel of experts then determined which should be included in this review. Five abstracts were reviewed and the panel agreed to omit one abstract because those authors did not write a full manuscript. The panel critiqued manuscripts according to predetermined criteria about clinical and clinimetric properties. Results: Four manuscripts referencing three tools for examining lateropulsion were found. Validity and reliability data support the clinical use of the Scale for Contraversive Pushing, the Modified Scale for Contraversive Pushing and the Burke Lateropulsion Scale. The Scale for Contraversive Pushing has the most extensive testing of clinimetric properties. The other tools show promising preliminary evidence of clinical and research utility. More testing is needed with larger, more diverse samples. Reviewers’ conclusions: The Scale for Contraversive Pushing, the Modified Scale for Contraversive Pushing and the Burke Lateropulsion Scale are reliable and valid measures with good clinical applicability. Larger, more varied samples should be used to better delineate responsiveness and other clinimetric properties of these examination tools.

Keywords: Behavior, Citation, Manuscripts, Medline, Orientation, Research, Scale, Systematic Review, Validity

? Malhotra, S., Pandyan, A.D., Day, C.R., Jones, P.W. and Hermens, H. (2009), Spasticity, an impairment that is poorly defined and poorly measured. *Clinical Rehabilitation*, **23** (7), 651-658.

Full Text: [2009\Cli Reh23, 651.pdf](2009/Cli%20Reh23,%20651.pdf)

Abstract: Objective: To explore, following a literature review, whether there is a consistent definition and a unified assessment framework for the term ‘spasticity’. The congruence between the definitions of spasticity and the corresponding methods of measurement were also explored. Data sources: The search was performed on the electronic databases Web of Science, Science Direct and MEDLINE. Review methods: A systematic literature search of publications written in English between the years 1980 and 2006 was performed with the following keywords: spasticity and tone. The search was limited to the following keywords: stroke, hemiplegia, upper, hand and arm. Results: Two hundred and fifty references contributed to this review (190 clinical trials, 46 literature reviews, and 14 case reports). Seventy-eight used the Lance definition; 88 equated spasticity with increased muscle tone; 78 provided no definition; and six others used their own definitions for spasticity. Most papers used a single measure and some used more than one. Forty-seven papers used neurophysiological methods of testing, 228 used biomechanical methods of measurement or assessment, 25 used miscellaneous clinical measures (e.g. spasm frequency scales) and 19 did not explicitly describe a measure. Conclusion: The term spasticity is inconsistently defined and this inconsistency will need to be resolved. Often, the measures used did not correspond to the clinical features of spasticity that were defined within a paper (i.e. internal validity was compromised). There is need to ensure that this lack of congruence is addressed in future research.

Keywords: Assessment, Case Reports, Clinical Trials, Databases, Definitions, Frequency, Literature, Literature Review, Measurement, MEDLINE, Of-The-Literature, Papers, Publications, Research, Review, Scales, Science, Stroke, Systematic, Validity, Web of Science

? Borisova, Y. and Bohannon, R.W. (2009), Positioning to prevent or reduce shoulder range of motion impairments after stroke: A meta-analysis. *Clinical Rehabilitation*, **23** (8), 681-686.

Full Text: [2009\Cli Reh23, 681.pdf](2009/Cli%20Reh23,%20681.pdf)

Abstract: Objective: To assess the effectiveness of positioning on range of motion of the paretic shoulder following stroke. Data sources: We searched PUBMED, CINAHL, EMBASE, Science Citation Index, PEDro, Cochrane Controlled Trails Register and article reference lists. Review methods: Randomized controlled trials reporting range of motion outcomes of shoulder positioning programmes for patients with stroke were examined independently by the two authors. Studies reporting external rotation range of motion outcomes were abstracted and their quality was rated. Results: Five studies, all published in 2000 or later, were included. Shoulder external rotation range of motion was lost by control groups (mean 11.0-18.4 degrees) and experimental (positioning) groups (mean 6.1 degrees to 19.2 degrees) in every study. The standardized mean difference between groups was -0.216 (95% confidence interval -0.573 to 0.141). These findings and the demonstration of homogeneity between and within groups do not support positioning (as practised) as an effective intervention for preventing or slowing the development of range-of-motion impairments of the paretic shoulder after stroke. Conclusion: This meta-analysis failed to support the benefit of positioning the paretic upper extremity to prevent or reduce shoulder external rotation range of motion impairments after stroke.

Keywords: Arm, Citation, Contracture, Hemiplegic Shoulders, Muscle, Outcomes, Pain, Patient, Quality, Randomized Controlled-Trial, Stretch, Therapy

? Unver, B., Senduran, M., Kocak, F.U., Gunal, I. and Karatosun, V. (2009), Reference accuracy in four rehabilitation journals. *Clinical Rehabilitation*, **23** (8), 741-745.

Full Text: [2009\Cli Reh23, 741.pdf](2009/Cli%20Reh23,%20741.pdf)

Abstract: Objective: To investigate the incidence of reference errors in major peer-reviewed general physical therapy and rehabilitation journals (American Journal of Physical Medicine and Rehabilitation (AJPMR), Archives of Physical Medicine and Rehabilitation (APMR), Clinical Rehabilitation (CR) and Physical Therapy (PT)). Design: Descriptive, comparative. Main outcome measures: All issues of the AJPMR, APMR, CR and PT between 2003 and 2007 were studied. For each journal, references from articles were consecutively numbered, and using a random number generator, 100 references were selected from each journal. For each reference, ease of retrieval on MEDLINE and the presence of citation errors were noted. If discrepancies were identified, the reference was compared with the original publication. Two observers independently evaluated each reference for citation errors. Results: The total number of citations with errors among all published journals was 123 (30.7%). The reference error rates by journal ranged from 23% to 44%. Most errors (48.0%) occurred in the author element, followed by the title (31.7%), journal (8.9%), page (5.7%), year (4.1%), and volume (1.6%). Only 8 (2%) were likely to make retrieval of the reference difficult. Conclusions: Errors in references still appear in current physical therapy and rehabilitation literature, but most are not severe.

Keywords: Accuracy, Citation, Citation Errors, Citations, Cr, Error, Errors, General, Incidence, Journal, Journals, Literature, Medical Journals, Medicine, Medline, Observers, Outcome, Outcome Measures, Peer-Reviewed, Physical, Physical Therapy, Publication, Rates, Reference, Reference Errors, References, Rehabilitation, Therapy, Volume

? Bogosian, A., Moss-Morris, R. and Hadwin, J. (2010), Psychosocial adjustment in children and adolescents with a parent with multiple sclerosis: A systematic review. *Clinical Rehabilitation*, **24** (9), 789-801.

Full Text: [2010\Cli Reh24, 789.pdf](2010/Cli%20Reh24,%20789.pdf)

Abstract: Objective: This systematic review explored the potential impact of parental multiple sclerosis on their offspring. It considered adjustment to parental multiple sclerosis at different developmental stages and the factors associated with good versus poor adjustment. Data sources: MEDLINE, EMBASE, PsycINFO, CINAHL and Web of Science were searched for studies on children with a parent with multiple sclerosis. Inclusion and exclusion criteria were formulated. Hand-searching journals and reference lists, contacting authors and multiple sclerosis societies for additional unpublished papers complemented the searches. Review methods: Twenty studies that satisfied the inclusion criteria were included. The research articles were ranked according to a quality assessment checklist and were categorized as good, medium or poor quality. Results: The review found good evidence to suggest that parental multiple sclerosis has a negative impact on children’s social and family relationships and their psychological well-being. The review also identified potential factors associated with poor adjustment. These factors included parental negative emotions, increased illness severity, family dysfunction, children’s lack of knowledge about the illness and lack of social support. Adolescent children also seemed to be more at risk for psychosocial problems than school-age children. Conclusions: There is good evidence that parental multiple sclerosis has a negative psychosocial impact on children, especially on adolescents.

Keywords: Adolescent, Adolescents, Anxiety, Assessment, Authors, Cancer, Children, Depression, Disability, EMBASE, Families, Ill Parent, Impact, Journals, Knowledge, MEDLINE, Mothers, Papers, Parent, Psychological Distress, Psychosocial, Research, Review, Risk, Science, Social, Support, Systematic, Systematic Review, Web of Science

? Fliess-Douer, O., Vanlandewijck, Y.C., Manor, G.L. and Van Der Woude, L.H.V. (2010), A systematic review of wheelchair skills tests for manual wheelchair users with a spinal cord injury: Towards a standardized outcome measure. *Clinical Rehabilitation*, **24** (10), 867-886.

Full Text: [2010\Cli Reh24, 867.pdf](2010/Cli%20Reh24,%20867.pdf)

Abstract: Objective: To review, analyse, evaluate and critically appraise available wheelchair skill tests in the international literature and to determine the need for a standardized measurement tool of manual wheeled mobility in those with spinal cord injury. Data sources: A systematic review of literature (databases PUBMED, Web of Science and Cochrane Library (1970-December 2009). Subjects: Hand rim wheelchair users, mainly those with spinal cord injury. Review methods: Studies’ content and methodology were analysed qualitatively. Study quality was assessed using the scale of Gardner and Altman. Results: Thirteen studies fell within the inclusion criteria and were critically reviewed. The 13 studies covered 11 tests, which involved 14 different skills. These 14 skills were categorized into: wheelchair manoeuvring and basic daily living skills; obstacle-negotiating skills; wheelie tasks; and transfers. The Wheelchair Skills Test version 2.4 (WST-2.4) and Wheelchair Circuit tests scored best on the Gardner and Altman scale, the Obstacle Course Assessment of Wheelchair User Performances (OCAWUP) test was found to be the most relevant for daily needs in a wheelchair. The different tests used different measurement scales, varying from binary to ordinal and continuous. Comparison of outcomes between tests was not possible because of differences in skills assessed, measurement scales, environment and equipment selected for each test. A lack of information regarding protocols as well as differences in terminology was also detected. Conclusion: This systematic review revealed large inconsistencies among the current available wheelchair skill tests. This makes it difficult to compare study results and to create norms and standards for wheelchair skill performance.

Keywords: Assessment, Circuit, Cochrane, Construct-Validity, Databases, Environment, Inconsistencies, Information, Injury, Instrument, Literature, Measurement, Methodology, Mobility, Outcome, Outcomes, Participation, Performance, PUBMED, Reliability, Responsiveness, Review, Science, Standards, Systematic, Systematic Review, Validation, Web of Science

? Klingels, K., Jaspers, E., Van de Winckel, A., De Cock, P., Molenaers, G. and Feys, H. (2010), A systematic review of arm activity measures for children with hemiplegic cerebral palsy. *Clinical Rehabilitation*, **24** (10), 887-900.

Full Text: [2010\Cli Reh24, 887.pdf](2010/Cli%20Reh24,%20887.pdf)

Abstract: Objective: To identify psychometrically sound and clinically feasible assessments of arm activities in children with hemiplegic cerebral palsy for implementation in research and clinical practice. Data sources: PUBMED, CINAHL, Cochrane Library, Web of Science and reference lists of relevant articles were searched. Review methods: A systematic search was performed based on the following inclusion criteria: (1) evaluative tools at the activity level according to the International Classification of Functioning, Disability and Health; (2) previously used in studies including children with hemiplegic cerebral palsy aged 2-18 years; (3) at least one aspect of reliability and validity in children with cerebral palsy should be established. Descriptive information, psychometric properties and clinical utility were reviewed. Results: Eighteen assessments were identified of which 11 met the inclusion criteria: eight functional tests and three questionnaires. Five functional tests were condition-specific, three were generic. All functional tests measure different aspects of activity, including unimanual capacity and performance during bimanual tasks. The questionnaires obtain information about the child’s abilities at home or school. The reliability and validity have been established, though further use in clinical trials is necessary to determine the responsiveness. Conclusions: To obtain a complete view of what the child can do and what the child actually does, we advise a capacity-based test (Melbourne Assessment of Unilateral Upper Limb Function), a performance-based test (Assisting Hand Assessment) and a questionnaire (Abilhand-Kids). This will allow outcome differentiation and treatment guidance for the arm in children with cerebral palsy.

Keywords: Activities, Aged, Assessment, Botulinum-Toxin-A, Cerebral Palsy, Child, Children, Classification, Clinical Trials, Clinical Utility, Cochrane, Differentiation, Disability Inventory, Extremity Skills Test, Functional, Health, Induced Movement Therapy, Information, Intensive Therapy, Melbourne Assessment, Outcome, Pediatric Evaluation, Practice, PUBMED, Questionnaire, Questionnaires, Randomized Control Trial, Reliability, Research, Review, Science, Systematic, Systematic Review, Treatment, Upper-Limb Function, Validity, Web of Science

? Evering, R.M.H., van Weering, M.G.H., Groothuis-Oudshoorn, K.C.G.M. and Vollenbroek-Hutten, M.M.R. (2011), Daily physical activity of patients with the chronic fatigue syndrome: A systematic review. *Clinical Rehabilitation*, **25** (2), 112-133.

Full Text: [2011\Cli Reh25, 112.pdf](2011/Cli%20Reh25,%20112.pdf)

Abstract: Objective: To give an overview of the physical activity level of patients with chronic fatigue syndrome in comparison with asymptomatic controls. Data sources: MEDLINE, Web of Science, EMBASE, PsycINFO, Picarta, the Cochrane Controlled Trial Register that is included in the Cochrane Library and reference tracking. Review methods: A systematic literature search was conducted focusing on studies concerning physical activity levels of patients with chronic fatigue syndrome compared to controls. A meta-analysis was performed to pool data of the studies. Results: Seventeen studies were included with 22 different comparisons between patients with chronic fatigue syndrome and controls. Fourteen studies, including 18 comparisons, showed lower physical activity levels in patients with chronic fatigue syndrome as compared to controls. Four studies, including four comparisons, showed no differences between both groups. The meta-analysis included seven studies and showed a daily physical activity level in patients with chronic fatigue syndrome of only 68% of the physical activity level observed in control subjects. The pooled mean coefficient of variation in patients with chronic fatigue syndrome was higher as compared to control subjects (34.3% versus 31.5%), but this difference did not reach significance. Conclusion: Patients with chronic fatigue syndrome appear to be less physically active compared with asymptomatic controls. There is no difference in variation of physical activity levels between patients with chronic fatigue syndrome and healthy control subjects, but the validity and reliability of some methods of measuring physical activity is questionable or unknown.

Keywords: Accelerometer, Actigraphic Assessment, Activity Patterns, Children, Chronic Pain, Cochrane, Computer-Science, Control, EMBASE, Exercise, Fatigue, Literature, MEDLINE, Meta-Analysis, Overview, Physical Activity, Prevalence, Primary-Care, Reliability, Review, Science, Systematic, Systematic Review, Validation, Validity, Web of Science

? Fok, P., Farrell, M., McMeeken, J. and Kuo, Y.L. (2011), The effects of verbal instructions on gait in people with Parkinson’s disease: A systematic review of randomized and non-randomized trials. *Clinical Rehabilitation*, **25** (5), 396-407.

Full Text: [2011\Cli Reh25, 396.pdf](2011/Cli%20Reh25,%20396.pdf)

Abstract: Objective: To collate and appraise empirical evidence relating to the effects of verbal instructions (verbal commands given by another person) on stride length, gait velocity and stride variability in people with Parkinson’s disease. Data sources: Cinahl, Cochrane, EMBASE, MEDLINE, PEDro, PsycINFO and Web of Science. Review methods: Independent reviewers extracted data from eligible studies and assessed methodological quality. The level of evidence was determined by best evidence synthesis based upon the experimental design, methodological quality and statistical findings of individual studies. Results: One randomized controlled study and 12 non-controlled studies fulfilled the selection criteria and involved 149 participants. Five types of verbal instructions were examined which included ‘take big steps’, ‘walk fast’, ‘swing arms when walking’, ‘count rhythm when walking’ and ‘walk fast with big steps’. Best evidence synthesis found indicative evidence in support of the use of the instruction to take big steps in walking training for stride length improvement in people with mild to moderate Parkinson’s disease who are without cognitive impairment. There was insufficient evidence in support of effects on gait velocity and stride variability. There was also insufficient evidence in support of effects of other instructions on any of the gait variables. Conclusion: The empirical evidence in support of the benefits from verbal instructions is weak. The evidence is limited to short-term stride length improvement from the use of the instruction to take big steps in walking training.

Keywords: Cochrane, Cues, Disease, Disorders, Gait, Parkinson’s Disease, Review, Rhythm, Science, Statistical, Strategies, Systematic, Systematic Review, Task, Training, Variability, Walking, Web of Science

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Full Text: [2011\Cli Reh25, 975.pdf](2011/Cli%20Reh25,%20975.pdf)

Abstract: Objective: A systematic review and meta-analysis of randomized controlled trials was undertaken to determine whether whole body vibration improves bone mineral density and leg muscle strength in older adults. Data sources: Sources included MEDLINE, CINAHL, EMBASE, PEDro, PubMed, Science Citation Index and the reference list of each eligible article. Review methods: Article search and selection was performed independently by two researchers. The methodological quality of each selected article was rated by the PEDro scale. Results: Thirteen randomized trials (18 articles) totalling 896 subjects fulfilled the selection criteria. Four were considered to have good or excellent methodological quality and the rest were rated as fair. Meta-analyses revealed that whole body vibration has no significant effect on hip or lumbar spine bone mineral density in older women when compared with no intervention or active exercise (P > 0.05). Whole body vibration, however, had a significant treatment effect on knee extension dynamic strength (standardized mean difference = 0.63, P=0.006), leg extension isometric strength (standardized mean difference = 0.57, P = 0.003), and functional measures of leg muscle strength such as jumping height (standardized mean difference 0.51, P = 0.010) and performance in sit-to-stand (standardized mean difference = 0.72, P < 0.001) among older adults compared with no intervention. Conclusion: Whole body vibration is beneficial for enhancing leg muscle strength among older adults. However, the review suggests that whole body vibration has no overall treatment effect on bone mineral density in older women. No randomized trial has examined the effects of whole body vibration on bone mineral density in older men.

Keywords: Adults, Aging, Back-Pain, Bed Rest, Bone, Bone Mineral Density, Chronic Stroke, Citation, Clinical-Trial, Embase, Exercise, Exercise, Frequency, Functional, Geriatrics, Intervention, Knee, Medline, Men, Meta Analysis, Meta-Analysis, Older Adults, Older Men, Osteoporosis, Postmenopausal Women, Postural Control, Pubmed, Randomized Controlled Trials, Randomized-Controlled-Trial, Rehabilitation, Researchers, Review, Risk, Science, Science Citation Index, Sources, Spine, Strength, Systematic, Systematic Review, Therapy, Treatment, Vibration, Women

? Pereira, L.M., Obara, K., Dias, J.M., Menacho, M.O., Guariglia, D.A., Schiavoni, D., Pereira, H.M. and Cardoso, J.R. (2012), Comparing the Pilates method with no exercise or lumbar stabilization for pain and functionality in patients with chronic low back pain: Systematic review and meta-analysis. *Clinical Rehabilitation*, **26** (1), 10-20.

Full Text: [2012\Cli Reh26, 10.pdf](2012/Cli%20Reh26,%2010.pdf)

Abstract: Objective: To perform a systematic review with meta-analyses that evaluates the effectiveness of the Pilates method on the pain and functionality outcome in adults with non-specific chronic low back pain. Data sources: The search was performed in the following databases: Medline, Embase, AMED, Cinahl, Lilacs, Scielo, SportDiscus, ProQuest, Web of Science, PEDro, Academic Search Premier and the Cochrane Central Register of Controlled Trials from 1950 to 2011; the following keywords were used: ‘Pilates’, ‘Pilates-based’, ‘back exercises’, ‘exercise therapy’, ‘low back pain’, ‘back pain’ and ‘backache.’ Review methods: The inclusion criteria were studies that assessed the effects of the Pilates method on patients with chronic low back pain. Results: Five studies met the inclusion criteria. The total number of patients was 71 in the Pilates group and 68 in the control group. Pilates exercise did not improve functionality (standardized mean difference (SMD = -1.34; 95% confidence interval (CI) -2.80, 0.11; P = 0.07) or pain between Pilates and control groups (SMD - -1.99; 95% CI -4.35, 0.37; P - 0.10). Pilates and lumbar stabilization exercises presented no significant difference in functionality (mean difference (MD) - -0.31; 95% CI-1.02, 0.40; P - 0.39) or pain (MD = -0.31; 95% CI -1.02, 0.40; P = 0.39). Conclusion: The Pilates method did not improve functionality and pain in patients who have low back pain when compared with control and lumbar stabilization exercise groups.

Keywords: Adults, Author, Brazil, Cochrane, Control, Control Groups, Databases, Disability, Effectiveness, Exercise, Exercise Therapy, Exercises, Guidelines, Low, Medline, Meta Analysis, Meta-Analysis, Outcome, Pain, Patients, Persistent, Physiotherapy, Randomized Controlled-Trial, Rehabilitation Interventions, Review, Science, Strategies, Systematic, Systematic Review, Therapy, Web of Science, Web-of-Science

# Title: Clinical Rheumatology

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Publisher: Springer-Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Rheumatology: Impact Factor 0.724, 17/23 (2000)

? Li, B., Wang, P. and Li, H. (2010), The association between TNF-alpha promoter polymorphisms and ankylosing spondylitis: A meta-analysis. *Clinical Rheumatology*, **29** (9), 983-990.

Full Text: 2010\Cli Rhe29, 983.pdf

Abstract: The relationship of TNF-alpha promoter polymorphisms and ankylosing spondylitis (AS) has been reported with conflicting results. We perform this meta-analysis to collect all the relevant studies up to date to further clarify the association of TNF-alpha promoter polymorphisms with AS. A review was conducted of studies reporting on the association between TNF-alpha promoter polymorphisms and AS susceptibility in MEDLINE, PUBMED, EMBASE, and Web of Science. The numbers of individuals with various genotypes and alleles in both the case and control groups were extracted from relevant studies. Odds ratios (ORs) with 95% confidence interval (CI) were used to estimate the association. Fourteen eligible studies, contributing data on 3,880 subjects (1,766 patients; 2,114 controls), were included in this meta-analysis. The ORs of various comparisons indicated that there was no association between TNF-alpha 238, 308 polymorphisms, and AS susceptibility in the overall population. For HLA-B27+ population, although the frequency of 308 A allele decreased in AS patients (OR = 0.721; 95%CI = 0.522-0.995), the result was no longer statistically significant after excluding the Hardy-Weinberg equilibrium violation studies (OR = 1.150; 95%CI = 0.568-2.310). No relationship was found between TNF-alpha promoter 238 polymorphisms and AS in HLA-b27+ population. No association was found between TNF-alpha promoter 238/308 polymorphisms and ankylosing spondylitis susceptibility in both the overall and HLA-B27+ population.

Keywords: Ankylosing Spondylitis, Contributes, Control, Control Groups, Disease, Equilibrium, Frequency, Gene Polymorphisms, Haplotypes, HLA-B27 Positive Individuals, Meta-Analysis, Polymorphisms, Region, Review, Rheumatoid-Arthritis, Science, Spondyloarthritis, Susceptibility, TNF-Alpha Promoter, Tumor-Necrosis-Factor, Web of Science

# Title: Clinical Science

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Subject Categories:

Medicine, Research & Experimental: Impact Factor

? Goode, H.F., Kelleher, J., Walker, B.E., Hall, R.I. and Guillou, P.J. (1990), Cellular and muscle zinc in surgical patients with and without gastrointestinal cancer. *Clinical Science*, **79** (3), 247-252.

# Title: Clinical Therapeutics

Full Journal Title: [Clinical Therapeutics](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6242&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=2e7570b630109ca5ac2aeefb8d76d2f4)

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Subject Categories:

Pharmacology & Pharmacy: Impact Factor 2.069, 51/181 (2000)

Shahidi, N.T. (2001), A review of the chemistry, biological action, and clinical applications of anabolic-androgenic steroids. *Clinical Therapeutics*, **23** (9), 1355-1390.

Full Text: [2001\Cli The23, 1355.pdf](2001/Cli%20The23,%201355.pdf)

Abstract: *Background:* Since its discovery in 1935, numerous derivatives of testosterone have been synthesized, with the goals of prolonging its biological activity in vivo, producing orally active androgens, and developing products, commonly referred to as anabolic-androgenic steroids (AAS), that are more anabolic and less androgenic than the parent molecule.

*Objective:* This article reviews the structure, biotransformation, and mechanism of action of testosterone and some of the most commonly used AAS. Clinical applications of the AAS are discussed, and guidelines and therapeutic maneuvers for minimizing their side effects are outlined.

*Methods:* Literature for inclusion in this review was identified using the libraries of the University of Wisconsin Medical School and School of Pharmacy, the author’s files, and searches of MEDLINE, Science Citation Index, Biological Abstracts, and Chemical Abstracts.

*Results:* The myotrophic action of testosterone and its derivatives and their stimulatory effects on the brain have led to widespread use of AAS by athletes and “recreational” drug users. Consequently, all AAS were classified as class III controlled substances in 1991. Nonetheless, AAS have shown benefit in a variety of human disorders, including HIV-related muscle wasting and other catabolic conditions such as chronic obstructive pulmonary disease, severe burn injuries, and alcoholic hepatitis. Because of their diverse biological actions, AAS have been used to treat a variety of other conditions, including bone marrow failure syndromes, constitutional growth retardation in children, and hereditary angioedema. AAS therapy is associated with various side effects that are generally dose related; therefore, illicit use of megadoses of AAS for the purpose of bodybuilding and enhancement of athletic performances can lead to serious and irreversible organ damage. The most common side effects of AAS are some degree of masculinization in women and children, behavioral changes (eg, aggression), hepatotoxicity, and alteration of blood lipid levels and coagulation factors.

*Conclusions:* To minimize or avoid serious toxicities with AAS therapy, close medical supervision and periodic monitoring are important, with dose adjustment as appropriate to achieve the minimum effective dose. Given the biological effects and potential adverse effects of AAS, administration of these agents should be avoided in pregnant women, women with breast cancer or hypercalcemia, men with carcinoma of the prostate or breast, and patients with nephrotic syndromes or significant liver dysfunction.

Keywords: Testosterone, Anabolic-Androgenic Steroids, Anabolic Steroids

Chilcott, J., Tappenden, P., Jones, M.L. and Wight, J.P. (2001), A systematic review of the clinical effectiveness of pioglitazone in the treatment of type 2 diabetes mellitus. *Clinical Therapeutics*, **23** (11), 1792-1823.

Full Text: [2001\Cli The23, 1792.pdf](2001/Cli%20The23,%201792.pdf)

Abstract: Background: Pioglitazone is a member of a recently developed class of glucose-lowering agents, the thiazolidinediones. used in the treatment of type 2 diabetes mellitus. In the United States, it is approved for use both as monotherapy and in combination with metformin. a sulfonylurea, or insulin: in Europe, it is approved for use in combination with metformin or a sulfonylurea but not insulin.

Objective: This article presents a systematic review of the published literature on the effectiveness of pioglitazone in the treatment of type 2 diabetes, both as monotherapy and in combination with other antidiabetic agents.

Methods: The peer-reviewed English- and foreign-language literature was searched using MEDLINE. PUBMED, EMBASE, Science Citation Index, the Cochrane Database of Systematic Reviews. the Cochrane Controlled Trials Register, the UK National Health Service Centre for Reviews and Dissemination databases, and the Office of Health Economics Health Economic Evaluations Database. Searches were not limited to specific publication types, study designs, dates, or languages. The latest search was performed in March 2001. For a trial to be included in the review, at least 1 outcome measure had to involve the effects of pioglitazone on glycemic control or cardiovascular risk factors, or its side effects. Because of the heterogeneity of studies, no formal meta-analysis was performed.

Results: Eleven studies met the inclusion criteria. 6 involving pioglitazone monotherapy and 5 involving combination therapy. Full reports were available for only 6 of the 11 studies. No studies directly compared pioglitazone with other antidiabetic drugs. Both as monotherapy and in combination therapy, pioglitazone produced decreases in blood glucose levels (up to 95 mg/dL) and glycosylated hemoglobin (up to 2.6%). At doses of greater than or equal to 30 mg/d. pioglitazone was associated with reductions in triglyceride levels (similar to 30-70 mg/dL) and increases in high-density lipoprotein cholesterol (HDL-C) levels (similar to4-5 mg/dL). Pioglitazone treatment was associated with significant weight gain (up to 4 kg over 16 weeks). Adverse effects included mild edema (in up to 11.7% of patients) and a clinically nonsignificant decrease in hemoglobin concentrations. Abnormal results on liver function testing were no more common in treated patients than in control groups.

Conclusions: Pioglitazone has been shown to reduce blood glucose levels in patients with type 2 diabetes. Although the observed decreases in triglyceride levels and increases in HDL-C levels could be expected to lead to a reduction in cardiovascular risk, the effects of weight gain may counteract this benefit. The evidence suggests that the preferred role for pioglitazone may be as an adjunct to metformin or a sulfonylurea in patients whose condition is not well controlled with monotherapy and for whom a metformin-sulfonylurea combination is contraindicated. There is a need for large-scale, long-term studies comparing the effectiveness of combination therapy that includes pioglitazone with that of other combinations of antidiabetic drugs.

Keywords: Pioglitazone, Systematic Review, Diabetes, Thiazolidinediones, Oral Hypoglycemic Agents, Trials

? Campbell, R.K., White, J.R., Levien, T. and Baker, D. (2001), Insulin glargine. *Clinical Therapeutics*, **23** (12), 1938-1957.

Full Text: 2001\Cli The23, 1938.pdf

Abstract: Background: In diabetes mellitus, the clinical goal of intensive glycemic control (lowering blood glucose concentrations to normal or near-normal levels) has been hindered by the lack of insulin regimens that duplicate the basal-bolus secretion of insulin by the healthy pancreas. In particular, intensive therapy has been associated with a risk of hypoglycemia. Objective: This article reviews the pharmacology, pharmacokinetics, dosing guidelines, adverse effects, and potential drug interactions of insulin glargine, a new long-acting recombinant human insulin analogue, Results of clinical trials of its efficacy and tolerability as a basal insulin in the treatment of type 1 and type 2 diabetes are summarized. Methods: Primary research and review articles on insulin glargine were identified through a search of MEDLINE from 1966 to July 2001. Abstracts were identified through a search of the Institute for Scientific Information Web of Science from 1995 to July 2001 and proceedings of American Diabetes Association scientific meetings. Additional information was obtained from the product information for insulin glargine, All identified articles and abstracts were evaluated for relevance, and all relevant information was included in the review. Priority was given to data from the primary medical literature. Results: Insulin glargine has a slower onset of action than human neutral protamine Hagedorn (NPH) insulin, a longer duration of action (up to 24 hours ), and no pronounced peak. It has similar tolerability and produces similar glycemic control to once- or twice-daily human NPH insulin, with a similar glucose-lowering effect on a molar basis. A decreased incidence of hypoglycemia, particularly at night, has been reported with insulin glargine compared with human NPH insulin. Insulin glargine appears’ to be comparable to human NPH insulin in terms of toxicity, adverse effects, immunogenicity, and potential for drug interactions. Results of clinical trials of insulin glargine in both type 1 and type 2 diabetes support its use in combination with a short-acting insulin, insulin lispro, or oral antidiabetic medications. Although insulin glargine cannot be mixed with other insulin preparations, it has the potential convenience of providing basal insulin with once-daily bedtime dosing. Conclusions: Based on the as yet small amount or data from full clinical study reports in peer-reviewed publications, insulin glargine appears to be a well-tolerated and effective basal insulin preparation for patients with type 1 or type 2 diabetes (including pediatric patients). Its delayed onset of action and prolonged, flat time-action profile mimic the action of endogenous basal insulin (or an insulin pump), decreasing the risk of hypoglycemic episodes. Insulin glargine may be a useful new option for meeting overnight insulin requirements, although most patients will require a rapid-acting insulin such as insulin lispro with or before meals for optimal management of blood glucose levels.

Keywords: Adverse Effects, Analogs, Blood, Clinical Trials, Control, Diabetes, Diabetes Mellitus, Diabetes-Mellitus, Drug, Drug Interactions, Efficacy, Glucose Control, Glycemic Control, Guidelines, Hoe-901, Human, Hypoglycemia, Information, Insulin, Insulin Analogue, Insulin Glargine, Less Nocturnal Hypoglycemia, Literature, Management, Medical, MEDLINE, Methods, Normal, Nph Insulin, Pediatric, Peer-Reviewed Publications, Pharmacokinetics, Preparation, Primary, Profile, Publications, Research, Review, Risk, Science, Scientific Information, Subcutaneous Injection, Therapy, Toxicity, Treatment, Type 1, Type 2, Type 2 Diabetes, Web of Science

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Full Text: 2003\Cli The25, 2991.pdf

Abstract: Background: Type 2 diabetes mellitus typically involves abnormal beta-cell function that results in relative insulin deficiency, insulin resistance accompanied by decreased glucose transport into muscle and fat cells, and increased hepatic glucose output, all of which contribute to hyperglycemia. Objective: This review examines the pharmacology, pharmacokinetics, drug-interaction potential, adverse effects, and dosing guidelines for metformin hydrochloride, a biguanide agent for the treatment of type 2 diabetes. Clinical trial data are reviewed, including efficacy and tolerability information, with a focus on studies of dual metformin therapy (metformin plus another oral agent or insulin) published from 1998 to the present. Pharmacoeconomic considerations are also discussed. Methods: Primary research and review articles were identified through a search of MEDLINE (1966-May 2003) and International Pharmaceutical Abstracts (1970-May 2003) using the terms metformin and/or Glucophage. Web of Science (1995-May 2003) was used to search for additional abstracts. The package inserts for metformin and metformin combination products were consulted. All identified articles and abstracts were assessed for relevance, and all relevant information was included. Priority was given to the primary medical literature and clinical trial reports. Results: Metformin is the only currently available oral antidiabetic/hypoglycemic agent that acts predominantly by inhibiting hepatic glucose release. Because patients with type 2 diabetes often have excess hepatic glucose output, use of metformin is effective in lowering glycosylated hemoglobin (HbA(1c)) by 1 to 2 percentage points when used as monotherapy or in combination with other blood glucose-lowering agents or insulin. Other metabolic variables (eg, dyslipidemia, fibrinolysis) may be improved with the use of metformin. Body weight is often maintained or slightly reduced from baseline. Metformin is well tolerated and is associated with few clinically deleterious adverse events. The most important and potentially life-threatening adverse event associated with its use is lactic acidosis, which occurs very rarely. Conclusions: Metformin has multiple benefits in patients with type 2 diabetes. It can effectively lower HbA(1c) values, positively affect lipid profiles, and improve vascular and hemodynamic indices. Adverse effects are generally tolerable and self-limiting. The availability of products combining metformin with a sulfonylurea or rosiglitazone has expanded the array of therapies for the management of type 2 diabetes. Copyright (C) 2003 Excerpta Medica, Inc.

Keywords: Adverse Effects, Blood, Blood-Glucose Control, Clinical Trial, Combination Therapy, Combination Therapy, Copyright, Diabetes, Diabetes Mellitus, Dyslipidemia, Efficacy, Guidelines, Hyperglycemia, Hypoglycemia, Improved Glycemic Control, Information, Insulin, Insulin Sensitivity, Lactic-Acidosis, Lipid, Literature, Management, Medical, MEDLINE, Metformin, Methods, Monotherapy, Niddm Patients, Oral Hypoglycemic Agents, Pharmacological-Treatment, Plus Metformin, Points, Primary, Randomized Controlled-Trial, Research, Resistance, Review, Science, Therapy, Treatment, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Web of Science

? Dong, B.J. (2005), Cinacalcet: An oral calcimimetic agent for the management of hyperparathyroidism. *Clinical Therapeutics*, **27** (11), 1725-1751.

Full Text: 2005\Cli The27, 1725.pdf

Abstract: Background: Uncontrolled hyperpara thyroid ism (HPT), particularly HPT resulting from chronic kidney disease (CKD), is associated with significant morbidity and cardiovascular mortality. Traditional medical therapy (eg, vitamin D sterols, calcium, phosphate binders) has been inadequate for the management of HPT and its vascular and skeletal complications. Objective: The goal of this article was to review the efficacy and safety profile of cinacalcet, a second-generation calcimimetic, in the management of HPT secondary to CKD, primary HPT, and parathyrold carcinoma. Methods: MEDLINE, Web of Science, and International Pharmaceutical Abstracts were searched from 1995 to July 2005 using the terms cinacalcet, AMG 073, KRN 1493, calcimimetics, hypercalcemia, and hyperparathyroidism. Results: Compared with placebo, cinacalcet significantly reduced parathyroid hormone levels within 2 to 4 hours after administration (P < 0.05). In Phase III trials involving 1136 patients with secondary HPT, 56% of those who received cinacalcet achieved the National Kidney Foundation Kidney Disease Outcomes Quality Initiative target of a reduction in parathyroid hormone to <300 pg/mL, 65% achieved a calcium-phosphorus product <55 mg(2)/dL(2), and a respective 49% and 46% achieved normalized serum calcium and phosphorus levels (P < 0.001). Cinacalcet’s effects were similar regardless of patients’ demographic characteristics, duration or mode of dialysis, severity of HPT, or use of concomitant medical therapy. Preliminary evidence suggests that cinacalcet may reverse cortical bone loss. Cinacalcet was well tolerated, with nausea (31%) and vomiting (27%) being the most commonly reported adverse effects. Hypocalcemia was transient in 5% of patients, was usually asymptomatic, and was corrected by dose reduction. Conclusions: Based on the available evidence, cinacalcet is effective and well tolerated in the treatment of secondary HPT and refractory parathyroid carcinoma. Its use in primary HPT appears promising. Further investigations are needed to determine if cinacalcet can prevent the long-term complications of HPT and reduce mortality.

Keywords: Adverse Effects, Bone, Bone Loss, Calcimimetic, Calcium, Calcium-Sensing Receptor, Carcinoma, Cardiovascular, Chronic Kidney Disease, Cinacalcet, Dialysis, Disease, Efficacy, Hci Amg-073, Hemodialysis-Patients, Kidney, Kidney Disease, Management, Medical, MEDLINE, Methods, Morbidity, Mortality, Mortality Risk, Normalizes Serum-Calcium, Outcomes, Parathyroid Carcinoma, Persistent Hyperparathyroidism, Plasma Parathyroid-Hormone, Primary, Primary Hyperparathyroidism, Profile, Quality, Receiving Dialysis, Review, Safety, Science, Secondary Hyperparathyroidism, Secondary Hyperparathyroidism, Stage Renal-Disease, Therapy, Treatment, Vitamin D, Web of Science

? Iltz, J.L., Baker, D.E., Setter, S.M. and Campbell, R.K. (2006), Exenatide: An incretin mimetic for the treatment of type 2 diabetes mellitus. *Clinical Therapeutics*, **28** (5), 652-665.

Full Text: 2006\Cli The28, 652.pdf

Abstract: Background: Exenatide is a subcutaneously injected incretin mimetic. It is indicated as adjunctive therapy to improve glycemic control in patients with type 2 diabetes mellitus (T2DM) who are already receiving therapy with metformin, a sulfonylurea, or both but continue to have suboptimal glycemic control. Objective: This article reviews available information on the clinical pharmacology, comparative efficacy, tolerability, drug interactions, contraindications and precautions, dosage and administration, availability and storage, and cost of exenatide. Methods: MEDLINE (1966-April 2006) and Web of Science (1995-April 2006) were searched for original research and review articles published in the English language. The search terms used were exenatide, exendin-4, glucagon-like peptide-1, GLP-1, and incretin mimetic. The reference lists of identified articles were also consulted, as was selected information from the package insert for exenatide. All relevant comparative efficacy studies that were available in published form were included in the review. Results: Naturally occurring incretins, such as glucagon-like peptide-1 (GLP-1), exhibit insulinotropic properties after release into the circulation from the gut. As a GLP-1 agonist, exenatide improves glucose homeostasis by mimicking the actions of naturally occurring GLP-1. It improves glycemic control by reducing fasting and postprandial glucose concentrations through a combination of known mechanisms, including glucose-dependent insulin secretion, restoration of first-phase insulin response, regulation of glucagon secretion, delaying gastric emptying, and decreasing food intake. Three Phase III comparative efficacy trials were identified that enrolled a total of 1446 patients who received exenatide 5 mu g SC BID, exenatide 10 mu g SC BID, or placebo for 30 weeks in addition to their existing therapy with metformin, sulfonylurea, or both. In these trials, the addition of exenatide was associated with significant reductions in glycosylated hemoglobin (HbA(1c)) values (P < 0.001- P < 0.002), greater proportions of patients achieving an HbA(1c) <= 7%, significant decreases in fasting plasma glucose concentrations (P < 0.001-P < 0.005), and a dose-dependent progressive weight loss compared with placebo. Nausea (43.5%) was the most commonly reported adverse event in the combined exenatide groups. Other adverse events occurring in > 10% of patients receiving exenatide were hypoglycemia (19.6%), diarrhea (12.8%), and vomiting (12.8%). Conclusions: During clinical trials, exenatide added to existing metformin and/or sulfonylurea therapy in patients with T2DM reduced fasting and postprandial glucose concentrations, with improvements in HbA(1c) and modest weight loss. The main adverse effect associated with exenatide therapy was nausea.

Keywords: Clinical Trials, Control, Diabetes, Diabetes Mellitus, Drug, Drug Interactions, Efficacy, Exenatide, Exendin-4, Fasting, Glp-1, Glucagon-Like Peptide-1, Glucose, Glycemic Control, Hypoglycemia, Incretin Mimetic, Information, Insulin, Insulin-Secretion, MEDLINE, Metformin, Methods, Pharmacokinetics, Plasma, Research, Restoration, Review, Science, Sulfonylurea, Synthetic Exendin-4, Therapy, Treated Patients, Treatment, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Web of Science, Weight, Zucker Rats

? Setter, S.M., Levien, T.L., Iltz, J.L., Odegard, P.S., Neumiller, J.J., Baker, D.E. and Campbell, R.K. (2007), Inhaled dry powder insulin for the treatment of diabetes mellitus. *Clinical Therapeutics*, **29** (5), 795-813.

Full Text: 2007\Cli The29, 795.pdf

Abstract: Background: Inhaled dry powder insulin (IDPI) is the first inhaled insulin approved for the treatment of type I and type 2 diabetes mellitus (DM). Objective: This article reviews available information on IDPI, focusing on Its clinical pharmacokinetics, comparative efficacy, tolerability, adverse events, dosage and administration, and cost. Methods: MEDLINE (1966-July 2006) and Web of Science (1995-July 2006) were searched for original research and review articles published in English. The search terms used were inhaled insulin, inhaled human insulin, rDNA origin inhalation powder, inhaled dry powder insulin, and IDPI All published comparative efficacy studies were included in the review, as well as selected information from the package insert for IDPI. Results: IDPI is an inhaled dry powder form of regular human insulin (RHI) that is used as a premeal insulin to improve glycemic control by reducing postprandial glucose excursions. The literature search identified 5 efficacy trials comparing reductions in glycosylated hemoglobin (HbA(1c)) in a total of 582 patients with type 1 DM who received either premeal IDPI plus neutral protamine Hagedorn (NPH) or Ultralente insulin or injectable RHI plus NPH or Ultralente insulin. The search identified 5 comparative efficacy studies of IDPI monotherapy or the addition of IDPI to the current regimen in a total of 1413 patients with type 2 DM that was uncontrolled with diet and exercise, metformin, a sulfonylurea, metformin and a sulfonylurea, or a secretagogue plus an insulin sensitizer. The use of IDPI as a mealtime insulin in these studies was associated with absolute changes in HbA(1c) ranging from -0.6% to +0.1% in patients with type I DM and from -1.4% to -2.9% in patients with type 2 DM. HbA(1c) values < 7% were achieved in 16.9% to 28.2% of patients with type 1 DM and 16.7% to 44.0% of patients with type 2 DM. The most common nonrespiratory adverse event noted during clinical trials of IDPI was hypoglycemia (type 1 DM: 8.6-9.3 episodes/subject-month; type 2 DM: 0.3-1.4 episodes/subject-month), and the most common adverse event involving the pulmonary system was cough (21.9%-29.5%). Conclusions: IDPI is the first available inhaled insulin. It provides an additional option for the achievement of HbA(1c) goals with a premeal insulin.

Keywords: 2-Year Period, Adjunctive Therapy, Clinical Trials, Comparative Trial, Control, Diabetes, Diabetes Mellitus, Efficacy, Exercise, Exubera, Human, Hypoglycemia, Idpi, Improves Glycemic Control, Information, Inhaled Dry Powder Insulin, Inhaled Insulin, Insulin, Literature, Long-Term, MEDLINE, Metformin, Methods, Monotherapy, Oral-Agents, Pulmonary Safety, Research, Review, Science, Shows Sustained Efficacy, Time-Action Profile, Treatment, Treatment Satisfaction, Type 1, Type 1 Diabetes, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Web of Science

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Full Text: 2008\Cli The30, 443.pdf

Abstract: Background: Oral bisphosphonates are routinely prescribed or the treatment of postmenopausal osteoporosis. In clinical trials, oral bisphosphonates have been found to increase bone mineral density (BMD) and decrease fracture risk in the majority of the treated population. However, in both clinical trials and clinical practice, not all patients experience significant increases in BMD. In clinical trials, nonresponse is often defined as a BMD change of <= 0 %. In clinical practice, a decrease in BMD greater than the calculated least significant change (LSC) is considered nonresponse to therapy. It is important to discern whether patients with a decline in BMD may still benefit from oral bisphosphonate therapy, that is, have a reduced risk for fracture, despite having a suboptimal BMD response. Objectives: The objectives of this review were to determine whether meaningful BMD nonresponder rates exist with all oral bisphosphonates and to examine the relationship between BMD nonresponder status and fracture risk. Finally, we discuss the potential implications of BMD nonresponse for patients in clinical practice. Methods: Publications on BMD response and bone loss during treatment with bisphosphonates were identified by searches of MEDLINE (1990-October 2007) and ISI Web of Science (1997-October 2007). Search terms included nonresponse, responder, osteoporosis, bone mineral density, bisphospbonate, alendronate, risedronate, ibandronate, bone loss, and fracture. Results: In clinical trials of alendronate, risedronate, and ibandronate, the percentages of patients with a change in BMD <= 0% at the lumbar spine after 2 years of treatment ranged from 8% to 25%. Results from post hoc analyses of clinical trial data from studies of alendronate and risedronate that have examined fracture risk among BMD responders, BMD non-responders, and patients receiving placebo suggest that patients who experienced an increase in BMD have reduced vertebral fracture risk relative to those with a decline in BMD (range, 38%-50%). Additional analyses suggest that patients who experience a decline in BMD while receiving oral bisphosphonate therapy still appear to receive some benefit (fracture risk reduction, 38%-60%) from treatment compared with patients receiving placebo. Conclusions: Results from post hoc analyses of clinical trial data suggest that patients receiving oral bisphosphonate therapy who experience a decline in BMD have a higher risk for fracture compared with patients whose BMD increases, but may have a reduced fracture risk compared with patients receiving placebo. Further investigation is needed to determine how these results impact patients in clinical practice whose BMD loss exceeds the LSC.

Keywords: Alendronate, Antifracture Efficacy, Antiresorptive Therapies, Bisphosphonates, Bone, Bone Loss, Bone Mineral Density, Clinical Trial, Clinical Trials, Fracture, Fracture Intervention Trial, Impact, ISI, MEDLINE, Methods, Nonresponder, Nonvertebral Fractures, Osteoporosis, Postmenopausal Osteoporosis, Practice, Publications, Randomized-Trial, Review, Risedronate, Risk, Risk Reduction, Science, Spine, Therapy, Treatment, Vertebral Fractures, Web of Science, Women

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Full Text: 2008\Cli The30, 1565.pdf

Abstract: Objective: The aim of this review was to discuss data from double-blind, randomized controlled trials (RCTs) that have investigated the effects of oral and long-acting Injectable risperidone on cognitive and psychomotor functioning in patients with schizophrenia or schizoaffective disorder. Methods: PUBMED/MEDLINE and the Institute of Scientific Information Web of Science database were searched for relevant English-language double-blind RCTs published between March 2000 and July 2008, using the terms schizophrenia, schizoaffective disorder, cognition, risperidone, psychomotor, processing speed, attention, vigilance, working memory, verbal learning, visual learning, reasoning, problem solving, social cognition, MATRICS, and long-acting. Relevant studies included patients with schizophrenia or schizoaffective disorder. Cognitive domains were delineated at the Consensus Conferences of the National Institute of Mental Health-Measurement And Treatment Research to Improve Cognition in Schizophrenia (NIMH-MATRICS). The tests employed to assess each domain and psychomotor functioning, and the within-group and between-group comparisons of risperidone with haloperidol and other atypical antipsychotics, are presented. The results of individual tests were included when they were individually presented and interpretable for either drug; outcomes that were presented as cluster scores or factor structures were excluded. Results: A total of 12 articles were included in this review. Results suggested that the use of oral risperidone appeared to be associated with within-group improvements on the cognitive domains of processing speed, attention/vigilance, verbal and visual learning and memory, and reasoning and problem solving in patients with schizophrenia or schizoaffective disorder. Risperidone and haloperidol seemed to generate similar beneficial effects (on the domains of processing speed, attention/vigilance, [verbal and nonverbal] working memory, and visual learning and memory, as well as psychomotor functioning), although the results for verbal fluency, verbal learning and memory, and reasoning and problem solving were not unanimous, and no comparative data on social cognition were available. Similar cognitive effects were found with risperidone, olanzapine, and quetiapine on the domains of verbal working memory and reasoning and problem solving, as well as verbal fluency. More research is needed on the domains in which study results were contradictory. For olanzapine versus risperidone, these were verbal and visual learning and memory and psychomotor functioning. No comparative data for olanzapine and risperidone were available for the social cognition domain. For quetiapine versus risperidone, the domains in which no unanimity was found were processing speed, attention/vigilance, nonverbal working memory, and verbal learning and memory. The limited available reports on risperidone versus clozapine suggest that: risperidone was associated with improved, and clozapine with worsened, performance on the nonverbal working memory domain; risperidone improved and clozapine did not improve reasoning and problem-solving performance; clozapine improved, and risperidone did not improve, social cognition performance. Use of long-acting injectable risperidone seemed to be associated with improved performance in the domains of attention/vigilance, verbal learning and memory, and reasoning and problem solving, as well as psychomotor functioning. The results for the nonverbal working memory domain were indeterminate, and no clear improvement was seen in the social cognition domain. The domains of processing speed, verbal working memory, and visual learning and memory, as well as verbal fluency, were not assessed. Conclusions: The results of this review of within-group comparisons of oral risperidone suggest that the agent appeared to be associated with improved functioning in the cognitive domains of processing speed, attention/vigilance, verbal and visual learning and memory, and reasoning and problem solving in patients with schizophrenia or schizoaffective disorder. Long-acting injectable risperidone seemed to be associated with improved functioning in the domains of attention/vigilance, verbal learning and memory, and reasoning and problem solving, as well as psychomotor functioning, in patients with schizophrenia or schizoaffective disorder. (Clin Ther. 2008;30:15651589) (C) 2008 Excerpta Medica Inc.

Keywords: Antipsychotic Treatment, Antipsychotics, Attention, Clinical-Trials, Cognition, Complex Figure Test, Continuous Performance-Test, Disorder, Double-Blind, Drug, Learning, Matrics, Memory, Methods, Neuropsychological Change, Normative Data, Outcomes, Psychomotor, Randomized Controlled Trials, Research, Review, Risperidone, Schizoaffective Disorder, Schizophrenia, Science, Scientific Information, Social, Social Competence, Spatial Working-Memory, Verbal-Learning Test, Web of Science

? Sonnett, T.E., Levien, T.L., Neumiller, J.J., Gates, B.J. and Setter, S.M. (2009), Colesevelam hydrochloride for the treatment of type 2 diabetes mellitus. *Clinical Therapeutics*, **31** (2), 245-259.

Full Text: 2009\Cli The31, 245.pdf

Abstract: Background: Colesevelam hydrochloride is a bile acid sequestrant approved in January 2008 by the US Food and Drug Administration (FDA) for the treatment of adult patients with type 2 diabetes mellitus (DM) in combination with a sulfonylurea, metformin, and/or insulin therapy. Objective: The purpose of this article was to review the pharmacology, pharmacokinetics, efficacy, adverse effects and tolerability, drug-drug interactions, contraindications/precautions, dosage and administration, pharmacoeconomics, and the overall role of colesevelam in the management of adult patients with type 2 DM. Methods: A literature Search using MEDLINE (1966-October 27, 2008), PUBMED (1950-October 27, 2008), Science Direct (1994-October 27, 2008), Web of Science (1980-October 27, 2008), American Diabetes Association Scientific Abstracts (2004-2008), and International Pharmaceutical Abstracts (1970-October 27, 2008) was performed using the term colesevelam. English-language, original research and review articles were examined, and citations from these articles were assessed. Manufacturer prescribing information and the FDA review of the new drug application for colesevelam were also examined. Results: Colesevelam is a hydrophilic, water-Insoluble polymer, with negligible absorption and systemic distribution, that is excreted primarily In the feces. Through a mechanism still under investigation, colesevelam effectively lowers glycosylated hemoglobin (HbA(1c)) when used in combination with a sulfonylurea, metformin, and/or insulin therapy. Three completed, published Phase III clinical trials investigating colesevelam for the treatment of type 2 DM were evaluated for information, data, and Conclusions. At dosing of 1.875 g BID or 3.75 g once daily in combination with one of the aforementioned agents versus placebo, reductions in HbA(1c) in all 3 Phase III clinical trials of colesevelam ranged from 0.5% to 0.7% (P < 0.02). In clinical trials, colesevelam was well tolerated, with hypoglycemia occurring in similar to 3% of studied patients. Conclusions: When used in combination with a sulfonylurea, metformin, and/or insulin therapy, colesevelam has been reported to significantly reduce HbA(1c) in adult patients with type 2 DM. Colesevelam’s role in the management of type 2 DM remains undefined, however; further investigation into its mechanism of action and long-term efficacy and safety Should be performed. (Clin Ther. 2009;31:245-2.59) (C) 2009 Excerpta Medica Inc.

Keywords: Administration, Adult, Adverse Effects, Bile Acid Sequestrant, Bile-Acid Sequestrants, Blood-Glucose Control, Citations, Clinical Trials, Colesevelam, Cost-Effectiveness, Diabetes, Diabetes Mellitus, Drug, Drug-Interactions, Efficacy, Farnesoid-X-Receptor, Hypoglycemia, Improves Glycemic Control, Information, Insulin, Insulin-Based Therapy, Ldl Cholesterol, Literature, Management, Mechanism, Mechanism of Action, MEDLINE, Metformin, Methods, Nuclear Receptor, Pharmacoeconomics, Primary Hypercholesterolemia, PUBMED, Research, Review, Safety, Science, Therapy, Treatment, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, US, Web of Science

? Cersosimo, R.J. (2009), Romiplostim in chronic immune thrombocytopenic purpura. *Clinical Therapeutics*, **31** (9), 1887-1907.

Full Text: [2009\Cli The31, 1887.pdf](2009/Cli%20The31,%201887.pdf)

Abstract: Background: Immune thrombocytopenic purpura (ITP) is characterized by platelet deficiency due to platelet destruction and/or inadequate production. Initial therapy consists of corticosteroids or intravenous immunoglobulin (IVIg). Patients with chronic refractory disease might undergo splenectomy. Although there is no treatment of choice in those who do not respond to splenectomy, immunosuppressive agents are typically prescribed. Romiplostim is the first available drug in a recently developed class of agents that work through stimulation of the thrombopoietin (TPO) receptor (c-Mpl) to increase platelet production. Objective: The aim of this report was to review the mechanism of action, pharmacology, clinical activity, and adverse events associated with the use of romiplostim for the treatment of thrombocytopenia in patients with chronic ITP. Methods: MEDLINE, Google Scholar, International Pharmaceutical Abstracts, and Web of Science were searched for English-only clinical trials and reviews (publication dates: 2000-June 1, 2009; key terms: romiplostim, Nplate, ITP, and idiopatbic and immune thrombocytopenic purpura). Abstracts from the 2000-2008 meetings of the American Society of Hematology and references from relevant articles were reviewed. Results: A total of 6 studies were included. Romiplostim is the first marketed agent developed to directly stimulate the bone marrow to produce platelets. Produced in Escberichia coli using recombinant DNA technology, it is an Fc-peptide fusion protein. It works intracellularly in a manner similar to that of the naturally occurring TPO to activate the transcriptional pathways, leading to increased platelet production via stimulation of the c-Mpl receptor. Romiplostim was approved by the US Food and Drug Administration for the treatment of chronic ITP primarily based on the findings from 2 multicenter, randomized, placebo- controlled, parallel-group studies in 125 adult patients with chronic ITP and an insufficient response to corticosteroids, IVIg, and/or splenectomy. The most common prior treatments were corticosterolds (94%) and IVIg (80%). Sixty-three patients (50%) were splenectomized a median of 6.6 years earlier. Baseline platelet counts were <30 x 10(9) cells/L. The initial dose of romiplostim was 1 μg/kg/wk SC, with adjustments to maintain platelet counts between 50 and 200 x 109 cells/L. The primary end point was a durable platelet response (>= 50 x 10(9) cells/L for >= 6 of the last 8 weeks of treatment). The proportion of patients in whom a durable platelet response was achieved was significantly greater with romiplostim than with placebo (49% vs 2%, respectively; P < 0.001). Overall platelet responses (durable plus transient) were achieved in 83% (69/83) with romiplostim and 7% (3/42) with placebo (P < 0.001). An interim report of findings from an ongoing extension study found that response was maintained for up to 156 weeks (median, 69 weeks) with romiplostim. The most common adverse events were headache (37%), nasopharyngitis (32%), contusion (30%), epistaxt’s (30%), fatigue (30%), arthralgia (25%), and diarrhea (25%). Conclusions: Based on the findings from this review, romiplostim administration has been associated with a durable platelet response in these patients with refractory chronic ITP. Romiplostim has been found to be generally well tolerated. (Clin Ther. 2009;31: 1887-1907) (C) 2009 Excerpta Medica Inc.

Keywords: Adult Patients, Amg-531, Anti-D Treatment, Children, Chronic ITP, Efficacy, Immune (Idiopathic) Thrombocytopenic Purpura, International, Intravenous Immunoglobulin, ITP, Management, Nplate, Platelet Count, Romiplostim, Thrombopoiesis-Stimulating Peptibody

? Carroll, C., Cooper, K., Papaioannou, D., Hind, D., Pilgrim, H. and Tappenden, P. (2010), Supplemental calcium in the chemoprevention of colorectal cancer: A systematic review and meta-analysis. *Clinical Therapeutics*, **32** (5), 789-803.

Full Text: 2010\Cli The32, 789.pdf

Abstract: Objective: The aim of the review was to assess the evidence for the effectiveness of calcium in reducing the recurrence of adenomas and the occurrence of colorectal cancer among populations at high, intermediate, and low risk of the disease. Methods: A systematic review of randomized controlled trials (RCTs) was performed to compare calcium alone, and with other agents, versus placebo. Nine data-bases (Cochrane Library, MEDLINE, PreMEDLINE, CINAHL, EMBASE, Web of Science, Biological Abstracts, the National Research Register, and Current Controlled Trials) were searched for published and unpublished trials. Searches were not restricted by either language or date of publication. All searches were completed in January 2010. Database thesaurus and free text terms for calcium and adenomas or colorectal cancer were used to search for trial reports; additional terms were used to search for other agents of interest, such as NSAIDs and folic acid. Search terms consisted of a combination of terms for colorectal cancer (eg, colon or colorectal and neoplasm or cancer or adenoma) and terms for calcium and RCTs. The initial searches were conducted in June 2008, with update searches in January 2010 to identify more recent studies. The reference lists of relevant studies were also searched for additional papers not identified by the search of electronic databases. Studies had to satisfy the following criteria to be included: RCTs about calcium, with or without other chemopreventive agents, in adults with familial adenomatous polyposis (FAP), hereditary nonpolyposis colorectal cancer, or a history of colorectal adenomas, or with no increased baseline risk of colorectal cancer. Meta-analysis was performed. For discrete and numerical outcomes, relative risks (RRs) and risk differences were reported with 95% CIs. The random-effects model was used to account for clinical and methodologic variations between trials. Results: The original and update searches of electronic databases produced 3835 citations, of which 6 studies (8 papers) met the inclusion criteria. Supplemental calcium had no effect on the number of adenomas in 1 small trial of patients with FAP. Meta-analysis of 3 trials in individuals with a history of adenomas showed a statistically significant reduction in the RR for adenoma recurrence (RR = 0.80 [95% CI, 0.69-0.94], P = 0.006) for those receiving calcium 1 200 to 2000 mg/d, but no effect was seen in advanced adenoma (RR = 0.77 [95% CI, 0.50-1.17], P = NS). Meta-analysis of 2 trials in populations with no increased baseline risk for colorectal cancer suggested that calcium, with or without vitamin D, had no effect on the RR for colorectal cancer (RR = 0.62 [95% CI, 0.11-3.40], P = NS). Conclusion: Published reports indicated that supplemental calcium was effective for the prevention of adenoma recurrence in populations with a history of adenomas, but no similar effect was apparent in populations at higher or lower risk. (Clinicaltrials.gov identifier: NCT00486512. (Clin Ther. 2010;32:789-803) (C) 2010 Excerpta Medica Inc.

Keywords: Adenoma, Adenoma Characteristics, Adenomas, Adults, Antioxidant Supplements, Calcium, Cancer, Carcinoma Sequence, Citations, Cochrane, Colorectal Cancer, Databases, Disease, Effectiveness, EMBASE, Folic Acid, History, Interest, MEDLINE, Meta Analysis, Meta-Analysis, Methods, Model, Outcomes, Papers, Polyps, Prevention, Primary Prevention, Publication, Randomized Controlled Trials, Randomized Controlled-Trials, Recurrence, Recurrence, Research, Review, Risk, Risk, Science, Services-Task-Force, Systematic, Systematic Review, Vitamin D, Vitamin-D Supplementation, Web of Science

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Full Text: 2010\Cli The32, 1437.pdf

Abstract: Background: Melioidosis is a serious and often fatal disease that is prevalent in subtropical and tropical climates, primarily in at-risk groups (eg, those with diabetes, alcoholism, or other cause of immunosuppression). Treatment is often unsuccessful, with infection frequently relapsing. Burkholderia pseudomallei, the etiologic agent of melioidosis, is inherently resistant to many antibiotics. Objective: This article reviews available evidence on the development of vaccines against melioidosis, including live attenuated vaccines, inactivated whole cell vaccines, and recombinant subunit vaccines. Methods: Web of Science and PUBMED (1950 February 2010) were searched for relevant reports using the term Burkholderia pseudomallei alone and combined with live attenuated vaccine, inactivated vaccine, animal models, and immunity. The reference lists of identified articles were reviewed for additional relevant publications. Results: Studies in murine models suggest that protective immunity against B pseudomallei may be induced by a range of living and nonliving immunogens. The strongest protective immunity was induced by live attenuated immunogens, although concerns about latency make it unlikely that such vaccines will be appropriate for use in humans. Heat-inactivated immunogens have shown promise, and several candidates for subunit vaccines have been tested. However, in all cases, it has been difficult to achieve induction of sterile immunity and protection against airborne infection. Conclusions: Live attenuated mutants of B pseudomallei have been found to be the most effective immunogens in mice, although it is unlikely that such mutants would be appropriate for a vaccine against melioidosis in humans. The ongoing challenge is to identify nonliving formulations that are able to induce good protective immunity. Both humoral and cell-mediated immunity are likely to be required. In this respect, naked DNA vaccines have the potential to provide high-level protection. (Clin Then 2010;32:1437-1445) (C) 2010 Excerpta Medica Inc.

Keywords: Adaptive Immunity, Alcoholism, Antibiotics, Burkholderia-Pseudomallei Infection, Capsular Polysaccharide, Cell-Mediated-Immunity, Development, Diabetes, Disease, Dna, Gene-Expression, Humans, Inactivated Vaccines, Induced, Infection, Live Vaccines, Melioidosis, Methods, Murine Model, Protective Efficacy, Publications, PUBMED, Review, Science, Septicemic Melioidosis, Signature-Tagged Mutagenesis, Subunit Vaccines, T-Cells, Vaccine, Vaccines, Web of Science

? Zhao, S.H., Liu, E.Q., Chen, P., Cheng, D.X., Lu, S.M., Yu, Q., Wang, Y.L., Wei, K.N. and Yang, P.H. (2010), A comparison of peginterferon Alpha-2A and alpha-2B for treatment-naive patients with chronic hepatitis C virus: A meta-analysis of randomized trials. *Clinical Therapeutics*, **32** (9), 1565-1577.

Full Text: [2010\Cli The32, 1565.pdf](2010/Cli%20The32,%201565.pdf)

Abstract: Background: The standard treatments for chronic infection with the hepatitis C virus (HCV) are peginterferon alpha-2a or alpha-2b plus ribavirin, but it remains unclear if one has a better efficacy and safety profile. Objective: The aim of this study was to perform a meta-analysis of randomized controlled trials (RCTs) comparing peginterferon alpha-2a and alpha-2b (in combination with ribavirin) treatments for chronic HCV. Methods: The Cochrane Central Register of Controlled Trials, MEDLINE, Science Citation Index, and EMBASE were searched (1966 April 2010) to identify RCTs that evaluated the sustained virologic response (SVR) to peginterferon alpha-2a and peginterferon alpha-2b in patients with chronic HCV. The inclusion criteria were: RCT studies designed to compare the therapeutic effects of peginterferon alpha-2a (180 mu g/wk) and peginterferon alpha-2b (1.5 mu g/kg/wk) for treatment-naive patients with chronic HCV; patients treated for >= 24 weeks if infected with HCV genotypes 2 or 3 and for >= 48 weeks if infected with genotypes 1 or 4, with 24-week follow-ups; and publications written in any language. Reports of duplicated studies were excluded by examining the author list, parent institution, sample size, and results. The primary outcome was the SVR, and the other measures included the liver-related morbidity, all-cause mortality, and adverse events leading to treatment discontinuation. Results: The literature search yielded 5580 studies, and 7 RCTs comprising 3212 patients matched the inclusion/exclusion criteria. Overall, the SVR rate was significantly higher in patients treated with peginterferon alpha-2a than in patients treated with peginterferon alpha-2b (50% vs 46%, respectively; relative risk [RR] = 1.11; 95% CI, 1.02-1.20; P < 0.05) and varying levels of ribavirin treatment. The subgroup analysis found that, in patients with genotypes 1 or 4, the difference between SVR rate in patients treated with peginterferon alpha-2a and patients treated with peginterferon alpha-2b was not statistically significant (43% vs 39%; RR = 1.25; 95% CI, 0.99-1.57). A significantly higher SVR rate was achieved in the HCV patients with genotypes 2 or 3 treated with peginterferon alpha-2a compared with the patients treated with peginterferon alpha-2b (86% vs 77%; RR = 1.11; 95% CI, 1.02-1.22; P = 0.02). The meta-analysis of adverse events leading to treatment discontinuation revealed no significant differences between the 2 treatments. Conclusions: The evidence reviewed in this meta-analysis suggests that peginterferon alpha-2a treatment was associated with a higher SVR rate than peginterferon alpha-2b treatment in patients with chronic HCV also treated with ribavirin. However, the available evidence on adverse events was insufficient to make recommendations. (Clin Ther. 2010;32:1565-1577) (C) 2010 Excerpta Medica Inc.

Keywords: Author, Chinese Patients, Chronic Hepatitis C, Citation, Efficacy, Infection, Interferon-Alpha-2B Plus Ribavirin, Open-Label, Peg-Interferon, Peginterferon Alpha-2A, Peginterferon Alpha-2B, Pegylated Interferon-Alpha-2B, Pharmacokinetics, Publications, Quality, Science Citation Index, Virological Response

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Full Text: 2010\Cli The32, 2304.pdf

Abstract: Background: Findings from clinical studies of the efficacy and tolerability of nicotine preparations in maintaining remission of ulcerative colitis (UC) have been inconsistent. Objectives: This systematic review and meta-analysis aimed to assess the efficacy and tolerability of nicotine preparations in inducing remission in UC. Methods: A literature search (1966August 2010) of Scopus (EMBASE), PUBMED, Web of Science, and the Cochrane Central Register of Controlled Trials was conducted for clinical trials that investigated the efficacy and/or tolerability (any adverse events [AEs] and withdrawals due to AEs) of any nicotine preparation for the induction of remission in UC. Results: The electronic searches yielded 788 items. of these, 3 placebo-controlled trials representing 233 patients with UC and 2 randomized controlled trials that compared nicotine to corticosteroids in 81 patients with UC were included in meta-analysis. The summary relative risks (RRs) (95% CI) in comparing nicotine to placebo were 1.40 (0.63-3.12) (P = NS) for clinical remission, 1.95 (1.38-2.78) (P < 0.001) for AEs, and 3.44 (0.71-16.71) (P = NS) for withdrawal due to AEs. The summary RRs in comparing nicotine to corticosteroids (prednisolone/prednisone) were 0.74 (0.5-1.09) (P = NS) for clinical remission in 2 trials and 2.28 (0.76-6.83) (P = NS) for withdrawal due to AEs. Conclusion: The findings from this meta-analysis do not support the efficacy or tolerability of nicotine preparations in inducing remission in UC. (Clin Ther. 2010;32:2304-2315) (C) 2010 Elsevier HS Journals, Inc.

Keywords: Clinical Trials, Cochrane, Crohns-Disease, Efficacy, EMBASE, Inflammatory-Bowel-Disease, Literature, Maintenance, Management, Meta-Analysis, Methods, Nicotine, Nicotine Preparations, Nitric-Oxide, Pathogenesis, Preparation, PUBMED, Randomized Controlled Trials, Remission, Review, Safety, Science, Scopus, Smoking, Systematic, Systematic Review, Therapy, Transdermal Nicotine, Ulcerative Colitis, Web of Science

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Full Text: 2011\Cli The33, 62.pdf

Abstract: Background: The therapeutic benefit of self-administered medications for long-term use is limited by an average 50% nonadherence rate. Patient forgetfulness is a common factor in unintentional nonadherence. Unit-of-use packaging that incorporates a simple day or date feature (calendar packaging) is designed to improve adherence by prompting patients to maintain the prescribed dosing schedule. Objective: To review systematically, in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement, randomized controlled trial evidence of the adherence benefits and harms of calendar blister packaging (CBP) and calendar pill organizers (CPO) for self-administered, long-term medication use. Methods: Data sources included the MEDLINE and Web of Science and Cochrane Library databases from their inception to September 2010 and communication with researchers in the field. Key search terms included blister-calendar pack, blister pack, drug packaging, medication adherence, medication compliance, medication compliance devices, medication containers, medication organizers, multicompartment compliance aid, persistence, pill-box organizers, prescription refill, randomized controlled trials, and refill compliance. Selected studies had an English-language title; a randomized controlled design; medication packaged in CBP or CPO; a requirement of solid, oral medication self-administered daily for longer than 1 month in community-dwelling adults; and at least 1 quantitative outcome measure of adherence. Two reviewers extracted data independently on study design, sample size, type of intervention and control, and outcomes. Results: Ten trials with a total of 1045 subjects met the inclusion criteria, and 9 also examined clinical outcomes (seizures, blood pressure, psychiatric symptoms) or health care resource utilization. Substantial heterogeneity among trials precluded meta-analysis. In 3 studies, calendar packaging was part of a multicomponent adherence intervention. Six of 10 trials reported higher adherence, but it was associated with clinically significant improvement in only 1 study: 50% decreased seizure frequency with a CPO-based, multicomponent intervention. No study reported sufficient information to examine conclusively potential harms related to calendar packaging. Limitations: All trials had significant methodological limitations, such as inadequate randomization or blinding, or reported insufficient information regarding enrolled subjects and attrition, which resulted in a moderate-to-high risk of bias and, in 2 studies, unevaluable outcome data. Trials were generally short and sample sizes small, with heterogeneous adherence outcome measures. Conclusions: Calendar packaging, especially in combination with education and other reminder strategies, may improve medication adherence. Methodological limitations preclude definitive conclusions about the effect size of adherence and clinical benefits or harms associated with CBP and CPO. High-quality trials of adequate size and duration are needed to assess the clinical effectiveness of such interventions. (Clin Ther. 2011;33:62-73) (c) 2011 Elsevier HS Journals, Inc. All rights reserved.

Keywords: Adherence, Adults, Bias, Blood, Blood Pressure, Calendar Packaging, Clinical Effectiveness, Clinical-Trials, Cochrane, Communication, Compliance, Control, Databases, Drug, Education, Effectiveness, Frequency, Health Care, Health-Care Expenditures, Hypertension, Information, Intervention, Interventions, Items, Medication, Medication Adherence, Medication Error, MEDLINE, Meta-Analysis, Methods, Outcome, Outcomes, Patient Compliance, Prescription Refill Compliance, Pressure, Quantitative, Randomized Controlled Trial, Randomized Controlled Trials, Randomized Trial, Researchers, Review, Risk, Science, Strategies, Symptoms, Systematic, Systematic Review, Therapy, Utilization, Value-Added Utilities, Web of Science

? Khan, S.A., Neussler, H., McGuire, T., Dakin, C., Pache, D., Norris, R., Cooper, D. and Charles, B. (2011), Therapeutic options in the management of sleep disorders in visually impaired children: A systematic review. *Clinical Therapeutics*, **33** (2), 168-181.

Full Text: [2011\Cli The33, 168.pdf](2011/Cli%20The33,%20168.pdf)

Abstract: Background: Treatment of sleep disorders in visually impaired children is complicated by a complex pathophysiology, a high incidence of sleep disorders in this population, and a dearth of management options. The significant impact on the health of these children and distress to their caregivers warrant a systematic assessment of the published literature on therapeutic approaches. Objective: This systematic review aims to assess the current therapeutic options in the management of sleep disorders in visually impaired children to identify knowledge gaps and guide future research. Methods: A search of primary literature was conducted using the bibliographic databases PUBMED (1980 August 2010), EMBASE (1990 August 2010), Science Citation Index Expanded (1990 August 2010), and CINHAL (1992 August 2010) and the Cochrane Central Register of Controlled Trials (CENTRAL). Additional studies were identified through snowballing search techniques (manually by searching retrieved references and electronically by using citation-tracking software). Search terms included behavioral treatment, children, circadian rhythm, hypnosedatives, intellectual disability, light therapy, melatonin, phototherapy, random allocation, randomized controlled trial (RCT), sleep disorder, and visual impairment. Randomized and quasi-randomized clinical trials of therapeutic options (behavioral treatment, light therapy, melatonin, or hypnosedatives) used in participants aged 3 months to 18 years who had both a visual impairment and a sleep disorder were included. Independent extraction of articles was performed by 2 authors using predefined data fields, including quality of the therapeutic options, based on the Strength of Recommendation Taxonomy evidence-rating system. Results: Two RCTs were retrieved for melatonin, with improved effect on sleep latency (P = 0.019 and P < 0.05, respectively). However, separate analysis for visual impairment was not conducted. No RCTs were retrieved for behavioral intervention, light therapy, or hypnosedatives. Three studies using behavioral therapy (2 case reports and 1 case series) anecdotally showed improvement in sleep habit. No improvement in sleep rhythm was observed with a case series applying light therapy as an intervention. Conclusions: Children with visual impairment and sleep disorders are a heterogeneous patient group, making diagnosis and treatment difficult. RCTs on treatment options remain in their infancy, with a lack of evidence for appropriate therapeutic strategies. Trials across a range of selected diagnoses need to be conducted with adequate sample populations to differentiate the efficacy of 4 different treatment modalities (behavioral therapy, light therapy, melatonin, and hypnosedatives) as agents for improving sleep. (Clin Then 2011;33:168-181) (C) 2011 Elsevier HS Journals, Inc. All rights reserved.

Keywords: Adolescents, Assessment, Authors, Bibliographic, Bibliographic Databases, Blind-Children, Bright Light, Case Reports, Case Series, Children, Chronobiology, Circadian Rhythm, Circadian-Rhythms, Citation, Clinical Trials, Databases, Diagnosis, Disturbances, Embase, Literature, Melatonin Treatment, Primary, PUBMED, Rat Suprachiasmatic Nucleus, Recommendation, Research, Review, Science Citation Index, Shifts, Sleep Disorder, Systematic Review, Visual Impairment, Wake Cycle Disorders, Young-Adults

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Full Text: [2011\Cli The33, 1609.pdf](2011/Cli%20The33,%201609.pdf)

Abstract: Background: Oral glucose-lowering agents are used to treat patients with type 2 diabetes mellitus (T2DM). Most patients require multiple agents to maintain glycemic targets. Dipeptidyl peptidase-4 (DPP-4) inhibitors are administered as monotherapy and in combination therapy for the treatment of T2DM. Objective: The aim of this article was to provide a thorough review of published tolerability data on 5 DPP-4 inhibitors. Methods: PubMed and Web of Science were searched for English-language clinical trials published from January 2000 to June 2001, using the following key words: dipeptidyl peptidase-4 inhibitor, vildagliptin, alogliptin, sitagliptin, saxagliptin, linagliptin, safety, tolerability, efficacy, effect, AE, and adverse effect. Studies were considered for inclusion if they were randomized, double-blind trials performed in patients >= 18 years of age with T2DM and with a hemoglobin A(1c) of >= 6.5%; included >= 1 arm that received monotherapy with DPP-4; and reported adverse events (AEs). Studies in patients with a history of type 1 or secondary forms of diabetes, significant diabetic complications or cardiovascular disease within the 6 months before the start of the study, hepatic disease or abnormalities, and/or renal abnormalities were excluded. Results: A total of 45 clinical trials, 5 pharmacokinetic studies, and 28 meta-analyses or reviews were included. The duration of studies ranged from 7 days to 104 weeks. The most commonly reported AEs were nasopharyngitis, upper respiratory infections, all-cause infections, headache, gastrointestinal symptoms, and musculoskeletal pain. Based on the findings from the studies, the DPP-4 inhibitors had minimal impact on weight and were not associated with an increased risk for hypoglycemia relative to placebo. Rates of nasopharyngitis were higher with the DDP-4 inhibitors than with placebo. Pancreatitis was reported at lower rates with the DPP-4 inhibitors compared with other oral antihyperglycemic agents. Cardiovascular events were limited, and postmarketing studies are ongoing. Conclusions: The tolerability of DPP-4 inhibitors is supported by published clinical trials. The rates of weight gain, gastrointestinal AEs, and hypoglycemia were minimal with the DPP-4 inhibitors studied. (Clin Ther. 2011;33:1609-1629) (C) 2011 Elsevier HS Journals, Inc. All rights reserved.

Keywords: Adverse Events, Alogliptin, Cardiovascular, Cardiovascular Disease, Cardiovascular Events, Clinical Trials, Combination Therapy, Complications, Diabetes, Diabetes Mellitus, Dipeptidyl Peptidase-4 (Dpp-4) Inhibitor, Disease, Double-Blind, Drug-Naive Patients, Efficacy, Gastrointestinal, History, Hypoglycemia, Impact, Improves Glycemic Control, Incretin-Based Therapies, Inhibitors, Initial Combination Therapy, Japanese Patients, Journals, Linagliptin, Methods, Monotherapy, Once-Daily Sitagliptin, Oral, Pain, Patients, Pubmed, Randomized Controlled-Trial, Renal, Respiratory, Respiratory Infections, Review, Risk, Safety, Saxagliptin, Science, Sitagliptin, Symptoms, Therapy, Treatment, Type 1, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Type-2 Diabetes-Mellitus, Vildagliptin, Vildagliptin Monotherapy, Web of Science, Weight Gain

# Title: Clinical Toxicology

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? Schep, L.J., Slaughter, R.J., Temple, W.A. and Beasley, D.M.G. (2009), Diethylene glycol poisoning. *Clinical Toxicology*, **47** (6), 525-535.

Abstract: Introduction. Diethylene glycol (DEG) is a clear, colorless, practically odorless, viscous, hygroscopic liquid with a sweetish taste. In addition to its use in a wide range of industrial products, it has also been involved in a number of prominent mass poisonings spanning back to 1937. Despite DEG’s toxicity and associated epidemics of fatal poisonings, a comprehensive review has not been published. Methods. A summary of the literature on DEG was compiled by systematically searching OVID MEDLINE and ISI Web of Science. Further information was obtained from book chapters, relevant news reports, and web material. Aim. The aim of this review is to summarize all main aspects of DEG poisoning including epidemiology, toxicokinetics, mechanisms of toxicity, clinical features, toxicity of DEG, diagnosis, and management. Epidemiology. Most of the documented cases of DEG poisoning have been epidemics (numbering over a dozen) where DEG was substituted in pharmaceutical preparations. More often, these epidemics have occurred in developing and impoverished nations where there is limited access to intensive medical care and quality control procedures are substandard. Toxico kin e tics. Following ingestion, DEG is rapidly absorbed and distributed within the body, predominantly to regions that are well perfused. Metabolism occurs principally in the liver and both the parent and the metabolite, 2-hydroxyethoxyacetic acid (HEAA), are renally eliminated rapidly. Mechanisms of toxicity. Although the mechanism of toxicity is not clearly elucidated, research suggests that the DEG metabolite, HEAA, is the major contributor to renal and neurological toxicities. Clinical features. The clinical effects of DEG poisoning can be divided into three stages: The first phase consists of gastrointestinal symptoms with evidence of inebriation and developing metabolic acidosis. If poisoning is pronounced, patients can progress to a second phase with more severe metabolic acidosis and evidence of emerging renal injury, which, in the absence of appropriate supportive care, can lead to death. If patients are stabilized, they may then enter the final phase with various delayed neuropathies and other neurological effects, sometimes fatal. Toxicity of DEG. Doses of DEG necessary to cause human morbidity and mortality are not well established. They are based predominantly on reports following some epidemics of mass poisonings, which may underestimate toxicity. The mean estimated fatal dose in an adult has been defined as similar to 1 mL/kg of pure DEG. Management. Initial treatment consists of appropriate airway management and attention to acid-base abnormalities. Prompt use of fomepizole or ethanol is important in preventing the formation of the toxic metabolite HEAA; hemodialysis can also be critical, and assisted ventilation may be required. Conclusions. DEG ingestion can lead to serious complications that may prove fatal. Prognosis may be improved, however, with prompt supportive care and timely use of fomepizole or ethanol.

Keywords: 2-Hydroxyethoxyacetic Acid, Adult, Airway, Alcohol-Dehydrogenase, Attention, Control, Delayed Neuropathies, Diagnosis, Diethylene Glycol, Epidemic, Epidemiology, Ethanol, Ethylene-Glycol, Fomepizole, Fomepizole, Gastrointestinal, Hemodialysis, Human, Information, Ingestion, Injury, Intoxication, ISI, Lead, Literature, Male-Rats, Management, Mechanism, Medical, MEDLINE, Metabolic Acidosis, Methanol, Methods, Morbidity, Mortality, Parent, Position Paper, Prognosis, Quality Control, Renal Toxicity, Research, Review, Science, Symptoms, Toxicity, Treatment, Web of Science

? Schep, L.J., Slaughter, R.J. and Beasley, D.M.G. (2009), Nicotinic plant poisoning. *Clinical Toxicology*, **47** (8), 771-781.

Abstract: Introduction. A wide range of plants contain nicotinic and nicotinic-like alkaloids. of this diverse group, those that have been reported to cause human poisoning appear to have similar mechanisms of toxicity and presenting patients therefore have comparable toxidromes. This review describes the taxonomy and principal alkaloids of plants that contain nicotinic and nicotinic-like alkaloids, with particular focus on those that are toxic to humans. The toxicokinetics and mechanisms of toxicity of these alkaloids are reviewed and the clinical features and management of poisoning due to these plants are described. Methods. This review was compiled by systematically searching OVID MEDLINE and ISI Web of Science. This identified 9,456 papers, excluding duplicates, all of which were screened. Reviewed plants and their principal alkaloids. Plants containing nicotine and nicotine-like alkaloids that have been reported to be poisonous to humans include Conium maculatum, Nicotiana glauca and Nicotiana tabacum, Laburnum anagyroides, and Caulophyllum thalictroides. They contain the toxic alkaloids nicotine, anabasine, cytisine, n-methylcytisine, coniine, n-methylconiine, and gamma-coniceine. Mechanisms of toxicity. These alkaloids act agonistically at nicotinic-type acetylcholine (cholinergic) receptors (nAChRs). The nicotinic-type acetylcholine receptor can vary both in its subunit composition and in its distribution within the body (the central and autonomic nervous systems, the neuromuscular junctions, and the adrenal medulla). Agonistic interaction at these variable sites may explain why the alkaloids have diverse effects depending on the administered dose and duration of exposure. Toxicokinetics. Nicotine and nicotine-like alkaloids are absorbed readily across all routes of exposure and are rapidly and widely distributed, readily traversing the blood-brain barrier and the placenta, and are freely distributed in breast milk. Metabolism occurs predominantly in the liver followed by rapid renal elimination. Clinical features. Following acute exposure, symptoms typically follow a biphasic pattern. The early phase consists of nicotinic cholinergic stimulation resulting in symptoms such as abdominal pain, hypertension, tachycardia, and tremors. The second inhibitory phase is delayed and often heralded by hypotension, bradycardia, and dyspnea, finally leading to coma and respiratory failure. Management. Supportive care is the mainstay of management with primary emphasis on cardiovascular and respiratory support to ensure recovery. Conclusions. Exposure to plants containing nicotine and nicotine-like alkaloids can lead to severe poisoning but, with prompt supportive care, patients should make a full recovery.

Keywords: Abdominal Pain, Acetylcholine-Receptors, Anabasine, Blue Cohosh, Cardiovascular, Caulophyllum-Thalictroides, Central-Nervous-System, Clinical-Pharmacology, Coniine, Conium, Cytisine, Disposition Kinetics, Green-Tobacco Sickness, Hemlock Conium-Maculatum, Human, Humans, Hypertension, ISI, Laburnum, Lead, Management, MEDLINE, Methods, Nicotiana, Nicotine, Pain, Papers, Plant, Plant Poisoning, Plants, Primary, Quinolizidine Alkaloids, Review, Science, Smoking-Cessation, Symptoms, Toxicity, Web of Science

? Jamaty, C., Bailey, B., Larocque, A., Notebaert, E., Sanogo, K. and Chauny, J.M. (2010), Lipid emulsions in the treatment of acute poisoning: A systematic review of human and animal studies. *Clinical Toxicology*, **48** (1), 1-27.

Abstract: Objective. To assess the evidence regarding the efficacy and safety of intravenous fat emulsion (IFE) in the management of poisoned patients. Methods. We performed a systematic review of the literature with no time or language restriction. The electronic databases were searched from their inception until June 1, 2009 (MEDLINE, EMBASE, ISI web of science, Biological abstract, LILACS, ChemIndex, Toxnet, and Proquest). We also examined the references of identified articles and the gray literature. The target interventions eligible for inclusion were administration of any IFE before, during, or after poisoning in human or animals. All types of studies were reviewed. Eligibility for inclusion and study quality scores, based on criteria by Jadad and the STROBE statement, were evaluated by independent investigators. The primary outcome was mortality. Secondary outcomes included neurologic, hemodynamic, and electrocardiographic variables, as well as adverse effects. Results. of the 938 publications identified by the search strategies, 74 met the inclusion criteria. We identified 23 animal trials, 50 human, and 1 animal case reports. Overall, the quality of evidence was weak and significant heterogeneity prevented data pooling. Available data suggest some benefits of IFE in bupivacaine, verapamil, chlorpromazine, and some tricyclic antidepressants and beta-blockers toxicity. No trial assessed the safety of IFE in the treatment of acute poisoning. Conclusion. The evidence for the efficacy of IFE in reducing mortality and improving hemodynamic, electrocardiographic, and neurological parameters in the poisoned patients is solely based on animal studies and human case reports. The safety of IFE has not been established.

Keywords: Adverse Effects, Antidepressants, Brachial-Plexus Block, Cardiovascular Collapse, Case Reports, Central-Nervous-System, Clinical-Trials, Databases, Efficacy, EMBASE, Fat Emulsion, Human, Induced Asystole, Induced Cardiac-Arrest, Interventions, Intoxication, Intralipids, Intravenous Fat Emulsion, ISI, Literature, Management, Methods, Mortality, Outcome, Outcomes, Overdose, Poisoning, Primary, Publications, Rat Model, Review, Safety, Science, Search Strategies, Successful Resuscitation, Systematic, Systematic Review, Toxicity, Treatment, Verapamil Toxicity, Web of Science

? Schep, L.J., Slaughter, R.J. and Beasley, D.M.G. (2010), The clinical toxicology of metamfetamine. *Clinical Toxicology*, **48** (7), 675-694.

Abstract: Introduction. Metamfetamine is a highly addictive amfetamine analog that acts primarily as a central nervous system (CNS) stimulant. The escalating abuse of this drug in recent years has lead to an increasing burden upon health care providers. An understanding of the drug’s toxic effects and their medical treatment is therefore essential for the successful management of patients suffering this form of intoxication. Aim. The aim of this review is to summarize all main aspects of metamfetamine poisoning including epidemiology, mechanisms of toxicity, toxicokinetics, clinical features, diagnosis, and management. Methods. A summary of the literature on metamfetamine was compiled by systematically searching OVID MEDLINE and ISI Web of Science. Further information was obtained from book chapters, relevant news reports, and web material. Epidemiology. Following its use in the Second World War, metamfetamine gained popularity as an illicit drug in Japan and later the United States. Its manufacture and use has now spread to include East and South-East Asia, North America, Mexico, and Australasia, and its world-wide usage, when combined with amfetamine, exceeds that of all other drugs of abuse except cannabis. Mechanisms of toxicity. Metamfetamine acts principally by stimulating the enhanced release of catecholamines from sympathetic nerve terminals, particularly of dopamine in the mesolimbic, mesocortical, and nigrostriatal pathways. The consequent elevation of intra-synaptic monoamines results in an increased activation of central and peripheral alpha- and beta-adrenergic postsynaptic receptors. This can cause detrimental neuropsychological, cardiovascular, and other systemic effects, and, following long-term abuse, neuronal apoptosis and nerve terminal degeneration. Toxicokinetics. Metamfetamine is rapidly absorbed and well distributed throughout the body, with extensive distribution across high lipid content tissues such as the blood-brain barrier. In humans the major metabolic pathways are aromatic hydroxylation producing 4-hydroxymetamfetamine and N-demethylation to form amfetamine. Metamfetamine is excreted predominantly in the urine and to a lesser extent by sweating and fecal excretion, with reported terminal half-lives ranging from similar to 5 to 30 h. Clinical features. The clinical effects of metamfetamine poisoning can vary widely, depending on dose, route, duration, and frequency of use. They are predominantly characteristic of an acute sympathomimetic toxidrome. Common features reported include tachycardia, hypertension, chest pain, various cardiac dysrhythmias, vasculitis, headache, cerebral hemorrhage, hyperthermia, tachypnea, and violent and aggressive behaviour. Management. Emergency stabilization of vital functions and supportive care is essential. Benzodiazepines alone may adequately relieve agitation, hypertension, tachycardia, psychosis, and seizure, though other specific therapies can also be required for sympathomimetic effects and their associated complications. Conclusion. Metamfetamine may cause severe sympathomimetic effects in the intoxicated patient. However, with appropriate, symptom-directed supportive care, patients can be expected to make a full recovery.

Keywords: 4-Hydroxymetamfetamine, Amfetamine, Amphetamine, Amphetamine Abuse, Apoptosis, Asia, Burden, Cardiovascular, Diagnosis, Drug, Drug Abuse, Emergency-Department, Epidemiology, Frequency, Health Care, Humans, Hypertension, Induced Ischemic Colitis, Information, Intracerebral Hemorrhage, Intranasal Methamphetamine, Intravenous Methamphetamine, ISI, Japan, Lead, Lipid, Literature, Management, Medical, MEDLINE, Metamfetamine, Methamphetamine, Methods, Mexico, Monoamines, Myocardial-Infarction, Necrotizing Vasculitis, Oral Methamphetamine, Pain, Prenatal Methamphetamine Exposure, Psychosis, Review, Science, Serotonin Syndrome, Sympathomimetic Toxidrome, Tachycardia, Toxicity, Treatment, Urine, Web of Science

? Schep, L.J., Slaughter, R.J., Vale, J.A., Beasley, D.M.G. and Gee, P. (2011), The clinical toxicology of the designer “party pills” benzylpiperazine and trifluoromethylphenylpiperazine. *Clinical Toxicology*, **49** (3), 131-141.

Abstract: Introduction. Benzylpiperazine (BZP) and trifluoromethylphenylpiperazine (TFMPP) are synthetic phenylpiperazine analogues. BZP was investigated as a potential antidepressant in the early 1970s but was found unsuitable for this purpose. More recently, BZP and TFMPP have been used as substitutes for amfetamine-derived designer drugs. They were legally available in a number of countries, particularly in New Zealand, and were marketed as party pills, but are now more heavily regulated. This article will review the mechanisms of toxicity, toxicokinetics, clinical features, diagnosis, and management of poisoning due to BZP and TFMPP. Methods. OVID MEDLINE and ISI Web of Science were searched systematically for studies on BZP and TFMPP and the bibliographies of identified articles were screened for additional relevant studies including nonindexed reports. Nonpeer-reviewed sources were also accessed. In all, 179 papers excluding duplicates were identified and 74 were considered relevant. Mechanisms of action. BZP and TFMPP have stimulant and amfetamine-like properties. They enhance the release of catecholamines, particularly of dopamine, from sympathetic nerve terminals, increasing intra-synaptic concentrations. The resulting elevated intra-synaptic monoamine concentrations cause increased activation of both central and peripheral alpha- and beta-adrenergic postsynaptic receptors. BZP has primarily dopaminergic and noradrenergic action while TFMPP has a more direct serotonin agonist activity. Toxicokinetics. There is limited information on the kinetics of these drugs. Following ingestion, peak plasma concentrations are reached after 60 to 90 min. Both drugs would be expected to cross the blood brain barrier and they are metabolized mainly by hydroxylation and N-dealkylation catalyzed by cytochrome P450 and catechol-o-methyl transferase enzymes. In humans, only small amounts of both BZP and TFMPP are excreted in the urine, suggesting a low bioavailability. The serum half-lives of BZP and TFMPP are relatively short with elimination being essentially complete in 44 h for BZP and 24 h for TFMPP. Clinical features. These compounds can cause harmful effects when taken recreationally. Commonly reported features include palpitations, agitation, anxiety, confusion, dizziness, headache, tremor, mydriasis, insomnia, urine retention, and vomiting. Seizures are induced in some patients even at low doses. Severe multiorgan toxicity has been reported, though fatalities have not been recorded conclusively. Management. Supportive care including the termination of seizures is paramount, with relief of symptoms usually being provided by benzodiazepines alone. Conclusions. BZP and TFMP can cause sympathomimetic effects in the intoxicated patient. Appropriate, symptom-directed supportive care should ensure a good recovery.

Keywords: 1-(3-Trifluoromethylphenyl)Piperazine Tfmpp, 3,4-Methylenedioxymethamphetamine Mdma, Antidepressant Agent, Anxiety, Benzylpiperazine, Blood, Brain, BZP, Cytochrome P450, Diagnosis, Dizziness, Dopamine, Drug Abuse, Drug N-Benzylpiperazine, Emergency-Department, Gas Chromatography, Mass Spectrometry, H-3 Noradrenaline Release, Herbal Highs, Humans, Induced, Information, Insomnia, ISI, Kinetics, Management, MEDLINE, Methods, New Zealand, P450, Papers, Party Pills, Plasma, Rat-Brain, Review, Science, Seizures, Serotonin, Serotonin Syndrome, Stimulant, Stimulus Properties, Sympathomimetic Toxidrome, Symptoms, TFMPP, Toxicity, Trifluoromethylphenylpiperazine, Urine, Web of Science

# Title: Clinics

Full Journal Title: [Clinics](http://www.scielo.br/scielo.php?script=sci_issues&pid=1807-5932&lng=en&nrm=iso)

ISO Abbreviated Title: Clinics

JCR Abbreviated Title: Clinics

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tess, B.H., Furuie, S.S., Castro, R.C.F., Barreto, M.D.C. and Nobre, M.R.C. (2009), Assessing the scientific research productivity of a Brazilian healthcare institution: A case study at the heart institute of São Paulo, Brazil. *Clinics*, **64** (6), 571-576.

Full Text: [2009\Clinics64, 571.pdf](2009/Clinics64,%20571.pdf)

Abstract: INTRODUCTION: The present study was motivated by the need to systematically assess the research productivity of the Heart Institute (InCor), Medical School of the University of Sao Paulo, Brazil. OBJECTIVE: To explore methodology for the assessment of institutional scientific research productivity. MATERIALS AND METHODS: Bibliometric indicators based on searches for author affiliation of original scientific articles or reviews published in journals indexed in the databases Web of Science, MEDLINE, EMBASE, LILACS and SciELO from January 2000 to December 2003 were used in this study. The retrieved records were analyzed according to the index parameters of the journals and modes of access. The number of citations was used to calculate the institutional impact factor. RESULTS: Out of 1253 records retrieved from the five databases, 604 original articles and reviews were analyzed; of these, 246 (41%) articles were published in national journals and 221 (90%) of those were in journals with free online access through SciELO or their own websites. Of the 358 articles published in international journals, 333 (93%) had controlled online access and 223 (67%) were available through the Capes Portal of Journals. The average impact of each article for InCor was 2.224 in the period studied. CONCLUSION: A simple and practical methodology to evaluate the scientific production of health research institutions includes searches in the LILACS database for national journals and in MEDLINE and the Web of Science for international journals. The institutional impact factor of articles indexed in the Web of Science may serve as a measure by which to assess and review the scientific productivity of a research institution.

Keywords: Assessment, Bibliometric Indicators, Bibliometrics, Brazil, Cardiology, Citations, Impact Factor, Indicators, Medical Research, Medline, Output, Research, Research Productivity, Sciences, Scientific Production Indicators, Scientific Research, University, Web of Science

? Cardoso, S.C. and Gattas, G.J.F. (2009), The scientific production of full professors of the Faculdade de Medicina da Universidade de São Paulo: A view of the period of 2001-2006. *Clinics*, **64** (9), 903-909.

Full Text: [2009\Clinics64, 903.pdf](2009/Clinics64,%20903.pdf)

Abstract: INTRODUCTION: The scientific production of institutions of higher education, as well as the dissemination and use of this published work by peer institutions, can be assessed by means of quantitative and qualitative measurements. This type of analysis can also serve as the basis of further academic actions. Variables such as the type of evaluation, the number of faculty members and the decision to include or exclude researchers who are not professors are difficult to measure when comparing different schools and institutions. OBJECTIVES: The purpose of this study was to assess the scientific production of tenured faculty from the Universidade de Sao Paulo, Faculdade de Medicina performed from 2001 to 2006. METHODS: Medline/PUBMED database was considered and the Impact factors (IFs-Journal Citation Report, 2006) and the number of generated citations (Web of Science/ISI Thomson) were also evaluated. RESULTS: The analysis of the scientific production of 66 full professors (level MS-6) revealed 1,960 scientific articles published in 630 scientific journals, of which 31.3% were Brazilian and 68.7% were from international sources. Among these, 47% of the articles were published in 62.9% of the journals with IFs above 10, although 16.4% of the journals did not have assigned IF values. We verified that 45% of the published articles received 9,335 citations (average of 11 + 17), with the majority of these (8,968 citations) appearing in international scientific journals. CONCLUSIONS: Our results indicate that it is possible to analyze the scientific production of a learning institution by the number of papers published by full professors, taking into account not only their academic position and influence, but also the fact that publication is an opportunity to stimulate joint projects with other members of the same institution.

Keywords: Bibliometric Indicators, Citation, Citations, Evaluation, Impact, Impact Factor, Medline, Utilization, Research Personnel, Statistics and Numerical Data, Scielo, Scientific Publication Indicators

? Rocha-e-Silva, M. (2009), Recent trends in Brazilian medical research. An overview. *Clinics*, **64** (10), 1007-1013.

Full Text: [2009\Clinics64, 1007.pdf](2009/Clinics64,%201007.pdf)

Abstract: This article reviews 69 original research articles published in 6 Brazilian Medical Journals recently incorporated into the Institute for Scientific Information Journal of Citation Reports, with a view of making them comprehensively available to the readership of CLINICS within a subject category division. We expect this review to increase the visibility of a wide specter of original Brazilian research which may otherwise remain relatively unseen by the interested readership.

Keywords: Brazil, Cancer, Citation, Clinics, Coronary-Artery-Disease, Exercise, Heart-Failure, Journal, Metabolic Syndrome, Myocardial Revascularization, Nutritional-Status, Quality-of-Life, Randomized Clinical-Trial, Research, Review, Sao-Paulo, Scientific Information, Trends, Visibility

? Heldwein, F.L., Hartmann, A.A., Kalil, A.N., Neves, B.V.D., Ratti, G.S.B., Beber, M.C., Souza, R.M. and d’Acampora, A.J. (2010), Cited Brazilian papers in general surgery between 1970 and 2009. *Clinics*, **65** (5), 521-529.

Full Text: [2010\Clinics65, 521.pdf](2010/Clinics65,%20521.pdf)

Abstract: OBJECTIVES: To identify the most cited articles in general surgery published by Brazilian authors. INTRODUCTION: There are several ways for the international community to recognize the quality of a scientific article. Although controversial, the most widely used and reliable methodology to identify the importance of an article is citation analysis. METHODS: A search using the Institute for Scientific Information citation database (Science Citation Index Expanded) was performed to identify highly cited Brazilian papers published in twenty-six highly cited general surgery journals, selected based on their elevated impact factors, from 1970 to 2009. Further analysis was done on the 65 most-cited papers. RESULTS: We identified 1,713 Brazilian articles, from which nine papers emerged as classics (more than 100 citations received). For the Brazilian contributions, a total increase of about 21-fold was evident between 1970 and 2009. Although several topics were covered, articles covering trauma, oncology and organ transplantation were the most cited. The majority of classic studies were done with international cooperation. CONCLUSIONS: This study identified the most influential Brazilian articles published in internationally renowned general surgery journals.

Keywords: 100 Citation-Classics, Cancer, Classical Article, Journals, Peer Review, Surgery, History, Surgery, Statistics and Numerical Data, Transplantation

? Rocha-e-Silva, M. (2011), Continuously variable rating: A new, simple and logical procedure to evaluate original scientific publications. *Clinics*, **66** (12), 2099-2014.

Full Text: [2011\Clinics66, 2099.pdf](2011/Clinics66,%202099.pdf)

Abstract: OBJECTIVE: Impact Factors (IF) are widely used surrogates to evaluate single articles, in spite of known shortcomings imposed by cite distribution skewness. We quantify this asymmetry and propose a simple computer-based procedure for evaluating individual articles.

METHOD: (a) Analysis of symmetry. Journals clustered around nine Impact Factor points were selected from the medical ‘‘Subject Categories’’ in Journal Citation Reports 2010. Citable items published in 2008 were retrieved and ranked by granted citations over the Jan/2008 - Jun/2011 period. Frequency distribution of cites, normalized cumulative cites and absolute cites/decile were determined for each journal cluster. (b) Positive Predictive Value. Three arbitrarily established evaluation classes were generated: LOW (1.3#IF,2.6); MID: (2.6#IF,3.9); HIGH: (IF$3.9). Positive Predictive Value for journal clusters within each class range was estimated. (c) Continuously

Variable Rating. An alternative evaluation procedure is proposed to allow the rating of individually published articles in comparison to all articles published in the same journal within the same year of publication. The general guiding lines for the construction of a totally dedicated software program are delineated.

RESULTS AND CONCLUSIONS: Skewness followed the Pareto Distribution for (1,K,2). Observed Positive Predictive Values ranged from 24 - 43% for over 98% of the selected journals in the ISI database. Continuously Variable Rating is shown to be a simple computer based procedure capable of accurately providing a valid rating for each article within the journal and time frame in which it was published.

Keywords: Scientometrics, Scientific Article Evaluation, Impact Factors, Citations

# Title: Clinics in Endocrinology and Metabolism

Full Journal Title: [Clinics in Endocrinology and Metabolism](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=21374&_auth=y&_acct=C000024058&_version=1&_urlVersion=0&_userid=4191814&md5=65e5e3dd7a01cccf9a363fb3b49c565d)

ISO Abbreviated Title: Clin. Endocrinol. Meta.

JCR Abbreviated Title: Clin Endocrinol Meta

ISSN: 0300-595X

Issues/Year:

Journal Country/Territory:

Language:

Publisher: W B Saunders Co, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Aggett, P.J. (1985), Physiology and metabolism of essential trace-elements: An outline. *Clinics in Endocrinology and Metabolism*, **14** (3), 513-543.

Full Text: [1985\Cli End Met14, 513.pdf](1985/Cli%20End%20Met14,%20513.pdf)

Abstract: Man depends on at least nine trace elements—iron, zinc, copper, manganese, iodine, chromium, selenium, molybdenum and cobalt—for optimum metabolic function. These elements serve a variety of functions including catalytic, structural and regulatory activities in which they interact with macromolecules such as enzymes, pro-hormones, presecretory granules and biological membranes. These micronutrients are involved, therefore, in all major metabolic pathways at levels which are so fundamental that the features of deficiency of many of them are protean and non-specific. In considering the metabolism of the elements themselves, they fall into two groups: those which exist normally as cations and those present as anions. The latter group are absorbed relatively easily and whole-body homeostasis is mediated mainly by renal excretion. The cations need specific pathways for absorption and their homeostasis is effected by gastrointestinal and biliary secretion. Some elements are absorbed more efficiently as organic complexes. The net achievement of the metabolic pathways for each element is to deliver it to its functional site(s) by exploiting its physicochemical characteristics to avoid interactions with other inorganic nutrients.

? Pleban, P.A., Numerof, B.S. and Wirth, F.H. (1985), Trace-element metabolism in the fetus and neonate. *Clinics in Endocrinology and Metabolism*, **14** (3), 545-566.

Full Text: [1985\Cli End Met14, 545.pdf](1985/Cli%20End%20Met14,%20545.pdf)

Abstract: The effects of trace metal nutrition on the fetus and neonate have been described. Since very little research has been done with the human fetus and neonate, much of our knowledge must be extrapolated from animal studies. In addition, most of the work centres around the effects of copper and zinc nutrition. Nutritional requirements (when known) for both enteral and total parenteral feeding of certain trace metals, as well as the bioavailability, have been discussed. Finally, methods of assessment of trace metal nutritional status have been discussed. These include direct measurement of metal concentrations and determination of biochemical indicators, such as metal-dependent enzyme activities—both of which are static indicators of nutritional status, and functional assessment of nutritional status which is a dynamic measure of trace metal nutrition and includes tests measuring the effects of metal nutrition on the function of cells, tissues, organs, and the host in general.

# Title: Clinics and Research in Hepatology and Gastroenterology

Full Journal Title: [Clinics and Research in Hepatology and Gastroenterology](http://www.sciencedirect.com/science/journal/22107401)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Devos, P. (2011), Research and bibliometrics: A long history... *Clinics and Research in Hepatology and Gastroenterology*, **35** (5), 336-337.

Full Text: [2011\Cli Res Hep Gas35, 336.pdf](2011/Cli%20Res%20Hep%20Gas35,%20336.pdf)

Keywords: Bibliometrics, History, Research

? Poynard, T., Thabut, D., Jabre, P., Munteanu, M., Ratziu, V., Benhamou, Y. and Deckmyn, O. (2011), Ranking hepatologists: Which Hirsch’s h-Index to prevent the “e-crise de foi-e”? *Clinics and Research in Hepatology and Gastroenterology*, **35** (5), 375-386.

Full Text: [2011\Cli Res Hep Gas35, 375.pdf](2011/Cli%20Res%20Hep%20Gas35,%20375.pdf)

Abstract: Background: Hirsch’s h-Index (h-I) quantifies and predicts an individual’s scientific output. The h-I can be estimated from several sources, but no “gold-standard” approach has yet been established. The aim was to analyze the discordance rates in Hepatology between five h-I assessments from five databases: Scholar, Scopus, Web of Science (WoS), ScholarL restricted to “liver”, and a specialty h-I HepaTop. Methods: The reference for the main endpoint was “h-I 50”, the median of included authors. Applicability and accuracy were assessed among 158 authors identified in the top 100 of the most cited “clinical” Hepatologists by two independent sources. The accuracy assessment used the area under the receiver operating characteristics curves (AUROCs) standardized or not according to spectrum effect, and the Pearson (PCC), and intraclass (ICC) coefficients of correlation. Results: Performances varied significantly according to h-I (P < 0.001). Applicability was 80% for h-HepaTop and 100% for other h-I. AUROCs ranged from 0.55 (h-Scholar) to 0.88 (h-HepaTop). The h-I were highly inter-correlated but without perfect concordance: ICCs ranged from 0.01 (h-WoS versus h-Scholar) to 0.53 (h-WoS versus h-Scopus; P < 0.0001). There were no differences between the AUROCs for h-Scopus, h-WoS and h-HepaTop, with lower accuracy for h-Scholar. The h-WoS AUROC adjusted for risk factors, scientific age and homonymy, increased in combination with h-HepaTop from 0.83 to 0.94 P = 0.005. Conclusions: The h-I should be carefully checked before any hepatologist’s evaluation. Three factors were associated with applicability and accuracy: the data source, the risk of homonyms, and scientific age. A unique “global” identification number is warranted. (C) 2011 Elsevier Masson SAS. All rights reserved.

Keywords: Accuracy, Assessment, Authors, Bibliometric Indicators, Databases, Evaluation, Google Scholar, h Index, h-Index, Impact, Output, Pathology, Ranking, Researchers, Science, Scopus, Web, Web Of Science

# Title: Cliometrica

Full Journal Title: [Cliometrica](http://www.springerlink.com/content/120412/?p=28a2649a15aa4e58968aadf08550b736&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Di Vaio, G. and Weisdorf, J.L. (2010), Ranking economic history journals: A citation-based impact-adjusted analysis. *Cliometrica*, **4** (1), 1-17.

Full Text: [2010\Cliometrica4, 1.pdf](2010/Cliometrica4,%201.pdf)

Abstract: This study ranks-for the first time-12 international academic journals that have economic history as their main topic. The ranking is based on data collected for the year 2007. Journals are ranked using standard citation analysis where we adjust for age, size and self-citation of journals. We also compare the leading economic history journals with the leading journals in economics in order to measure the influence on economics of economic history, and vice versa. With a few exceptions, our results confirm the general idea about what economic history journals are the most influential for economic history, and that, although economic history is quite independent from economics as a whole, knowledge exchange between the two fields is indeed going on.

Keywords: Citation Analysis, Economic History, Impact Factor, Journal Ranking, Relative Impacts, Scientometrics

# Title: CMAJ

Full Journal Title: [CMAJ](http://www.cmaj.ca/contents-by-date.0.shtml)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kherani, R.B. and Fung, M. (2004), To self-cite or not to self-cite. *CMAJ*, **171** (9), 1024.

Full Text: [2004\CMAJ171, 1024.pdf](2004/CMAJ171,%201024.pdf)

# Title: CNS Drugs

Full Journal Title: CNS Drugs

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher: W B Saunders Co, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Hilty, D.M., Luo, J.S., Morache, C., Marcelo, D.A. and Nesbitt, T.S. (2002), Telepsychiatry - An overview for psychiatrists. *CNS Drugs*, **16** (8), 527-548.

Abstract: Telepsychiatry, in the form of videoconferencing and other modalities, brings enormous opportunities for clinical care, education, research and administration to the field of medicine. A comprehensive review of the literature related to telepsychiatry - specifically videoconferencing - was conducted using the MEDLINE, Embase, Science Citation Index, Social Sciences Citation Index and Telemedicine Information Exchange databases (1965 to June 200 1). The keywords used were telepsychiatry, telemedicine, videoconferencing, Internet, primary care, education, personal digital assistant and handheld computers. Studies were selected for review if they discussed videoconferencing for patient care, satisfaction, outcomes, education and costs, and provided models of facilitating clinical service delivery. Literature on other technologies was also assessed and compared with telepsychiatry to provide an idea of future applications of technology. Published data indicate that telepsychiatry is successfully used for a variety of clinical services and educational initiatives. Telepsychiatry is generally feasible, offers a number of models of care and consultation, in general satisfies patients and providers, and has positive and negative effects on interpersonal behaviour. More quantitative and qualitative research is warranted with regard to the use of telepsychiatry in clinical and educational programmes and interventions.

Keywords: Administration, Behaviour, Care, Clinical, Computers, Consultation, Costs, Data, Databases, Delivery, Education, Field, General, Internet, Interventions, Literature, Medicine, MEDLINE, Modalities, Models, Outcomes, Patient Care, Patients, Primary, Primary Care, Programmes, Providers, Qualitative, Qualitative Research, Research, Review, Satisfaction, Science Citation Index, Service, Services, Technologies, Technology, Telemedicine

# Title: Coal Conversion

Full Journal Title: [Coal Conversion](http://scholar.ilib.cn/Periodical.aspx?P=mtzh)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1004-4248

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liu, Z.N., Zhou, A.N. and Jin, Q.T. (2006), Adsorption of nitrobenzene from aqueous solution by new type coal based adsorbents. *Coal Conversion*, **29** (1), 73-76.

Full Text: [2006\Coa Con29, 73.pdf](2006/Coa%20Con29,%2073.pdf)

Abstract: Tow kinds of new type coal based adso rbents MMCA and AHCA were prepared through superfine milled, chemical treatment, moulding and active treatment using Shenfu coal as raw materials. The adsorption capacity and mechanism of nitrobenzene onto them were studied. The results showed that the kinetic of nitrobenzene onto coal based adsorbents fitted second order kinetic model, the adsorption process of nitrobenzene onto MMCA was controlled by film diffusion but AHCA was controlled by porediffusion. The second adsorption rate constant, the effective diffusion coefficient were calculated. The nitrobenzene adsorption equilibrium on to MMCA and AHCA can be described in terms of Langmuir isotherm, maximum amount of nitrobenzene per unite weigh t of MMCA and AHCA to form a complete mono layer on the surface bond were 109.89 mg/g and 229.57 mg/g.

Keywords: New Type Coal Based Adsorbent, Adsorption, Nitrobenzene

# Title: Coastal Engineering Journal

Full Journal Title: [Coastal Engineering Journal](http://www.worldscinet.com/cej/mkt/archive.shtml)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0578-5634

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Nagai, T. and Ogawa, H. (2004), Characteristics of the observed 2003 Tokachi-off Earthquake tsunami profile. *Coastal Engineering Journal*, **46** (3), 315-327.

Full Text: [C\Coa Eng J46, 315.pdf](C/Coa%20Eng%20J46,%20315.pdf)

Abstract: Observed profiles of tsunami caused by the 2003 Tokachi-off Earthquake at 10 offshore wave gauges and 23 coastal tide stations were compiled and analyzed. Comparison of offshore wave and coastal tide data was conducted in wave-to-wave analysis bases and spectrum analysis bases. The tsunami amplification ratio between offshore station and coastal tide station varied due to seabed topography induced natural frequency difference. The frequency spectrum response was obtained at those harbors. The correlation analysis among the sea-surface fluctuation, on-off-shore current and long-shore current was also conducted at offshore wave stations.

Keywords: Tsunami, Wave Observation, Nowphas, Tide Station, 2003 Tokachi-Off Earthquake

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? Sailas, E. and Fenton, M. (2000), Seclusion and restraint for people with serious mental illnesses. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD001163.

Full Text: [2000\Coc Dat Sys Rev2000, CD001163.pdf](2000/Coc%20Dat%20Sys%20Rev2000,%20CD001163.pdf)

Abstract: BACKGROUND: Seclusion and restraint are interventions used in the treatment and management of disruptive and violent behaviours in psychiatry. The use of seclusion varies widely across institutions. The literature does offer numerous suggestions for interventions to reduce or prevent aggression. OBJECTIVES: 1. To estimate the effects of seclusion and restraint compared to the alternatives for those with serious mental illnesses. 2. To estimate the effects of strategies to prevent seclusion and restraint in those with serious mental illnesses. SEARCH STRATEGY: Electronic searches of The Cochrane Controlled Trials Register (Issue 1, 1999) and The Cochrane Schizophrenia Group’s Register (January 1999) were supplemented with additional searches of Biological Abstracts (1989-1999), CINAHL (1982-1999), EMbase (1980-1999), MEDLINE (1966-1999), MEDIC (1979-1999), PsycLIT (1974-1999), Sociofile (1974-1999), SPRI & SWEMED (1982-1999), Social Sciences Citation Index (1996-1999), and WILP (1983-1999). In addition, trials were sought by hand searching the reference lists of all identified studies and conference abstracts and contacting the first author of each relevant study. SELECTION CRITERIA: Randomised controlled trials were included if they focused on the use (i) of restraint or seclusion; or (II) of strategies designed to reduce the need for restraint or seclusion in the treatment of serious mental illness. DATA COLLECTION AND ANALYSIS: Studies were reliably selected, quality rated and data extracted. For dichotomous data relative risks (RR) with 95% confidence intervals (CI) were estimated. Normal continuous data were summated using the weighted mean difference (WMD). MAIN RESULTS: 1. Effect of seclusion and restraint The search strategy yielded 2155 citations. Of these, the full articles for 35 studies were obtained. No studies met minimum inclusion criteria and no data were synthesised. Most of the 24 excluded studies focused upon the restraint of elderly, confused people and preventing them from wandering or falling. 2. Prevention of seclusion and restraint Work ongoing. REVIEWER’S CONCLUSIONS: No controlled studies exist that evaluate the value of seclusion or restraint in those with serious mental illness. There are reports of serious adverse effects for these techniques in qualitative reviews. Alternative ways of dealing with unwanted or harmful behaviours need to be developed. Continuing use of seclusion or restraint must therefore be questioned from within well-designed and reported randomised trials that are generalisable to routine practice.

Keywords: Adverse Effects, Aggression, Alternatives, Background, Citations, Collection, Confidence, Confidence Intervals, Criteria, Data, Data-Collection, Elderly, First, Institutions, Intervals, Interventions, Literature, Management, MEDLINE, Mental Illness, Minimum, Objectives, Practice, Psychiatry, Qualitative, Quality, Randomised, Reviews, Risks, Search, Search Strategy, Selection, Selection Criteria, Serious Mental Illness, Strategies, Strategy, Techniques, Treatment, Value, Violent

? Thompson, R.L., Summerbell, C.D., Hooper, L., Higgins, J.P., Little, P.S., Talbot, D. and Ebrahim, S. (2001), Dietary advice given by a dietitian versus other health professional or self-help resources to reduce blood cholesterol. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD001366.

Full Text: [2001\Coc Dat Sys Rev2001, CD001366.pdf](2001/Coc%20Dat%20Sys%20Rev2001,%20CD001366.pdf)

Abstract: BACKGROUND: The average level of blood cholesterol is an important determinant of the risk of coronary heart disease. Blood cholesterol can be reduced by dietary means. Although dietitians are trained to provide dietary advice, for practical reasons it is also given by other health professionals and occasionally through the use of self-help resources. OBJECTIVES: To assess the effects of dietary advice given by a dietitian compared with another health professional, or the use of self-help resources, in reducing blood cholesterol in adults. SEARCH STRATEGY: We searched The Cochrane Library (to Issue 2 1999), MEDLINE (1966 to January 1999), EMBASE (1980 to December 1998), Cinahl (1982 to December 1998), Human Nutrition (1991 to 1998), Science Citation Index, Social Sciences Citation Index, hand searched conference proceedings on nutrition and heart disease, and contacted experts in the field. SELECTION CRITERIA: Randomised trials of dietary advice given by a dietitian compared with another health professional or self-help resources. The main outcome was difference in blood cholesterol between dietitian groups compared with other intervention groups. DATA COLLECTION AND ANALYSIS: Two reviewers independently extracted data and assessed study quality. MAIN RESULTS: Eleven studies with 12 comparisons were included, involving 704 people receiving advice from dietitians, 486 from other health professionals and 551 people using self-help leaflets. Four studies compared dietitian with doctor, seven with self-help resources, and one compared dietitian with nurse. Participants receiving advice from dietitians experienced a greater reduction in blood cholesterol than those receiving advice only from doctors (-0.25 mmol/L (95% CI -0.37, -0.12 mmol/L)). There was no statistically significant difference in change in blood cholesterol between dietitians and self-help resources (-0.10 mmol/L (95% CI -0.22, 0.03 mmol/L)). No statistically significant differences were detected for secondary outcome measures between any of the comparisons with the exception of dietitian versus nurse for HDLc, where the dietitian groups showed a greater reduction (-0.06 mmol/L (95% CI -0.11, -0.01)). No significant heterogeneity between the studies was detected. REVIEWER’S CONCLUSIONS: Dietitians were better than doctors at lowering blood cholesterol in the short to medium term, but there was no evidence that they were better than self-help resources. The results should be interpreted with caution as the studies were not of good quality and the analysis was based on a limited number of trials. More evidence is required to assess whether change can be maintained in the longer term. There was no evidence that dietitians provided better outcomes than nurses.

Keywords: Analysis, Background, Blood, Cholesterol, Collection, Criteria, Data, Data-Collection, Dietary Advice, Disease, Doctors, Evidence, Experts, Field, Health, Health Professionals, Heart, Heterogeneity, Intervention, MEDLINE, Nurses, Nutrition, Objectives, Outcome, Outcome Measures, Outcomes, Quality, Reduction, Risk, Science Citation Index, Search, Selection, Selection Criteria, Strategies, Strategy, Term

? White, A.R., Rampes, H. and Ernst, E. (2002), Acupuncture for smoking cessation. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD000009.

Full Text: [2002\Coc Dat Sys Rev2002, CD000009.pdf](2002/Coc%20Dat%20Sys%20Rev2002,%20CD000009.pdf)

Abstract: BACKGROUND: Acupuncture and related techniques are promoted as a treatment for smoking cessation in the belief that they may reduce nicotine withdrawal symptoms. OBJECTIVES: The objective of this review is to determine the effectiveness of acupuncture and the allied therapies of acupressure, laser therapy and electrostimulation, in smoking cessation in comparison with: a) sham treatment, b) other interventions, or c) no intervention. SEARCH STRATEGY: We searched the Cochrane Tobacco Addiction Group trials register, Cochrane Controlled Trials Register, MEDLINE, Embase, BIOSIS Previews, PsycINFO, Science and Social Sciences Citation Index, AMED and CISCOM. Date of last search January 2002. SELECTION CRITERIA: Randomised trials comparing a form of acupuncture, acupressure, laser therapy or electrostimulation with either sham treatment, another intervention or no intervention for smoking cessation. DATA COLLECTION AND ANALYSIS: We extracted data in duplicate on the type of smokers recruited, the nature of the acupuncture and control procedures, the outcome measures, method of randomisation, and completeness of follow-up. We assessed abstinence from smoking at the earliest time-point (before 6 weeks), at six months and at one year or more follow-up in patients smoking at baseline. We used the most rigorous definition of abstinence for each trial, and biochemically validated rates if available. Those lost to follow-up were counted as continuing to smoke. Where appropriate, we performed meta-analysis using a fixed effects model. MAIN RESULTS: We identified 22 studies. Acupuncture was not superior to sham acupuncture in smoking cessation at any time point. The odds ratio (OR) for early outcomes was 1.22 (95% confidence interval 0.99 to 1.49); the OR after 6 months was 1.50 (95% confidence interval 0.99 to 2.27) and after 12 months 1.08 (95% confidence interval 0.77 to 1.52). Similarly, when acupuncture was compared with other anti-smoking interventions, there were no differences in outcome at any time point. Acupuncture appeared to be superior to no intervention in the early results, but this difference was not sustained. The results with different acupuncture techniques do not show any one particular method (i.e. auricular acupuncture or non-auricular acupuncture) to be superior to control intervention. Based on the results of single studies, acupressure was found to be superior to advice; laser therapy and electrostimulation were not superior to sham forms of these therapies. REVIEWER’S CONCLUSIONS: There is no clear evidence that acupuncture, acupressure, laser therapy or electrostimulation are effective for smoking cessation.

Keywords: Acupuncture, Background, Collection, Comparison, Confidence, Control, Criteria, Data, Data-Collection, Effectiveness, Evidence, Fixed Effects Model, Follow-Up, Interval, Intervention, Interventions, Laser, Meta-Analysis, Metaanalysis, Model, Objectives, Odds Ratio, Outcome, Outcome Measures, Outcomes, Patients, Procedures, Psycinfo, Randomisation, Rates, Review, Search, Selection, Selection Criteria, Sham Acupuncture, Smoking, Strategies, Strategy, Symptoms, Techniques, Therapy, Treatment, Trial

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Full Text: [2003\Coc Dat Sys Rev2003, CD003968.pdf](2003/Coc%20Dat%20Sys%20Rev2003,%20CD003968.pdf)

Abstract: BACKGROUND: An increasing number of children suffer with pain that lasts for six months or longer. Traditional treatment for such pain has been pharmacological and/or physical. Increasingly, following developments in the field of adult chronic pain management, psychological therapies are being employed to treat children with chronic or recurrent pain. OBJECTIVES: To assess the effectiveness of psychological therapies in treating chronic or recurrent pain in children and adolescents, and to test the null hypothesis that psychological therapies are no more effective than placebo, waiting list control or standard medical care. SEARCH STRATEGY: Electronic searches of the Cochrane Register of Randomised Controlled Trials, MEDLINE (1966-1999), Social Sciences Citation Index (1981-1999) and PsycLit (1974-1999) were made. RCTs were also sought in references of all identified studies, meta-analyses and reviews, and first authors and experts within the field were contacted. Date of the most recent search: December 1999. SELECTION CRITERIA: RCTs with at least five participants in each study arm which compared psychological therapies with placebo, waiting list or standard medical care for children or adolescents with chronic or recurrent pain were eligible for inclusion. DATA COLLECTION AND ANALYSIS: Data were inspected for heterogeneity. For homogeneous dichotomous data the odds ratio with 95% confidence interval were calculated on an intention to treat basis. MAIN RESULTS: Thirty papers were recovered, representing 28 RCTs. Of these, 18 were analysable and included a total of 808 patients, 438 of whom entered treatment conditions. Fifteen were trials of chronic or recurrent headache; two for recurrent abdominal pain; and one for sickle cell pain. Only pain experience data from 13 trials were meta-analysable. Two meta-analyses were conducted. The first analysis of single treatments versus controls gave a pooled odds ratio of 8.83 (95% CI 4.33 to 18.03; z=5.98, P < 0.00001, df = 12). The second analysis (combined treatment versus control) produced a similar estimate: pooled odds ratio = 8.64 (95% CI = 4.13 to 18.07; z-5.73, P < 0.00001, df = 9). Both analyses indicate that psychological treatment is effective when compared with a pooled group of control conditions. From the pooled data set the NNT was 2.32 (95%CI 1.96 to 2.88). REVIEWER’S CONCLUSIONS: There is very good evidence that psychological treatments, principally relaxation and cognitive behavioural therapy, are effective in reducing the severity and frequency of chronic headache in children and adolescents. There is at present no evidence for the effectiveness of psychological therapies in attenuating pain in conditions other than headache, and little evidence for the effectiveness of psychological therapies in improving non-pain outcomes.

Keywords: Abdominal, Adolescents, Adult, Analyses, Analysis, Background, Care, Children, Chronic, Chronic Pain, Collection, Confidence, Control, Criteria, Data, Data-Collection, Effectiveness, Evidence, Experience, Experts, Field, First, Heterogeneity, Interval, Management, Medical, Medical Care, MEDLINE, Objectives, Odds Ratio, Outcomes, P, Pain, Pain Management, Papers, Patients, Physical, Placebo, Psychological Treatment, Recurrent, Relaxation, Reviews, Search, Selection, Selection Criteria, Standard, Strategies, Strategy, Therapy, Treatment

? Colquitt, J., Clegg, A., Sidhu, M. and Royle, P. (2003), Surgery for morbid obesity. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD003641.

Full Text: [2003\Coc Dat Sys Rev2003, CD003641.pdf](2003/Coc%20Dat%20Sys%20Rev2003,%20CD003641.pdf)

Abstract: BACKGROUND: Obesity is associated with increased morbidity and mortality. Surgery for morbid obesity may be considered when other conventional measures have failed, and a number of procedures are available. However, the effects of these surgical procedures compared with medical management and with each other are uncertain. OBJECTIVES: To assess the effects of surgery for morbid obesity on weight, comorbidities and quality of life. SEARCH STRATEGY: We searched the Cochrane Controlled Trials Register (issue 4, 2001), MEDLINE (SilverPlatter) up to 2001, PUBMED (Internet) 01/01/01-19/10/01, Embase (SilverPlatter) up to 09/2001, PsychINFO up to 10/2001, CINAHL (SilverPlatter) up to 07/2001, Science and Social Sciences Citation Index up to 10/12001, British Nursing Index up to 07/2001, Web of Science Proceedings up to 06/2001, BIOSIS up to10/2001, AMED up to 07/2001, National Research Register (issue 2, 2001), reference lists of relevant articles, and handsearched relevant journals. We also contacted experts in the field. Date of the most recent searches: October 2001. SELECTION CRITERIA: Randomised controlled trials comparing different surgical procedures, and randomised controlled trials and non-randomised controlled trials comparing surgery with non-surgical management for morbid obesity. DATA COLLECTION AND ANALYSIS: Data were extracted by one reviewer and checked independently by two reviewers. Two reviewers independently assessed trial quality. MAIN RESULTS: 18 trials involving 1891 people were included. One randomised controlled trial and one non-randomised controlled trial compared surgery with non-surgical management, and 11 randomised controlled trials compared different surgical procedures. The overall quality of the trials was variable, with just one trial having adequate allocation concealment. A meta-analysis was not possible due to differences in the surgical procedures performed, measures of weight change and length of follow-up. Compared with conventional management, surgery resulted in greater weight loss (23-28 kg more weight loss at two years), with improvements in quality of life and comorbidities. Some complications of surgery occurred, such as wound infection. Gastric bypass was associated with greater weight loss and fewer revisions, reoperations and/or conversions than gastroplasty, but had more side-effects. Greater weight loss and fewer side-effects and reoperations occurred with adjustable gastric banding than vertical banded gastroplasty, while vertical banded gastroplasty was associated with greater weight loss but more vomiting than horizontal gastroplasty. Some postoperative deaths occurred in the studies. Weight loss was similar between open and laparoscopic procedures. Fewer serious complications occurred with laparoscopic surgery. Laparoscopic surgery had a longer operative time, but resulted in reduced blood loss, reduced proportion of patients requiring intensive care unit stay, reduced length of hospital stay, reduced days to return to activities of daily living and reduced days to return to work. REVIEWER’S CONCLUSIONS: The limited evidence suggests that surgery is more effective than conventional management for weight loss in morbid obesity. The comparative safety and effectiveness of different surgical procedures is unclear.

Keywords: Allocation, Background, Blood, Blood Loss, Care, Collection, Complications, Controlled Trial, Conventional, Criteria, Data-Collection, Effectiveness, Evidence, Experts, Field, Follow-Up, Hospital, Hospital Stay, Infection, Intensive Care, Intensive Care Unit, Internet, Journals, Laparoscopic, Laparoscopic Surgery, Length, Life, Living, Management, Medical, Meta-Analysis, Metaanalysis, Morbid Obesity, Morbidity, Mortality, Obesity, Objectives, Open, Operative, Patients, Postoperative, Procedures, PUBMED, Quality, Quality of, Quality of Life, Randomised, Randomised Controlled Trial, Randomised Controlled Trials, Safety, Search, Selection, Selection Criteria, Side Effects, Strategies, Strategy, Surgery, Surgical Procedures, Trial, Vertical, Vomiting, Web of Science, Work, Wound, Wound Infection

? Thompson, R.L., Summerbell, C.D., Hooper, L., Higgins, J.P.T., Little, P.S., Talbot, D. and Ebrahim, S. (2003), Dietary advice given by a dietitian versus other health professional or self-help resources to reduce blood cholesterol. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD001366.

Full Text: [2003\Coc Dat Sys Rev2003, CD001366.pdf](2003/Coc%20Dat%20Sys%20Rev2003,%20CD001366.pdf)

Abstract: BACKGROUND: The average level of blood cholesterol is an important determinant of the risk of coronary heart disease. Blood cholesterol can be reduced by dietary means. Although dietitians are trained to provide dietary advice, for practical reasons it is also given by other health professionals and occasionally through the use of self-help resources. OBJECTIVES: To assess the effects of dietary advice given by a dietitian compared with another health professional, or the use of self-help resources, in reducing blood cholesterol in adults. SEARCH STRATEGY: We searched The Cochrane Library (to Issue 3 2002), the EPOC trial register (October 2002), MEDLINE (1966 to September 2002), EMBASE (1980 to September 2002), Cinahl (1982 to August 2002), Human Nutrition (1991 to 1998), Science Citation Index, Social Sciences Citation Index, hand searched conference proceedings on nutrition and heart disease, and contacted experts in the field. SELECTION CRITERIA: Randomised trials of dietary advice given by a dietitian compared with another health professional or self-help resources. The main outcome was difference in blood cholesterol between dietitian groups compared with other intervention groups. DATA COLLECTION AND ANALYSIS: Two reviewers independently extracted data and assessed study quality. MAIN RESULTS: Twelve studies with 13 comparisons were included, involving 727 people receiving advice from dietitians, 515 from other health professionals and 551 people using self-help resources. Four studies compared dietitian with doctor, seven with self-help resources, and only one study was found for each of the dietitian versus nurse and dietitian versus counsellor comparisons. Participants receiving advice from dietitians experienced a greater reduction in blood cholesterol than those receiving advice only from doctors (-0.25 mmol/L (95% CI -0.37, -0.12 mmol/L)). There was no statistically significant difference in change in blood cholesterol between dietitians and self-help resources (-0.10 mmol/L (95% CI -0.22, 0.03 mmol/L)). No statistically significant differences were detected for secondary outcome measures between any of the comparisons with the exception of dietitian versus nurse for HDLc, where the dietitian group showed a greater reduction (-0.06 mmol/L (95% CI -0.11, -0.01)) and dietitian versus counsellor for body weight, where the dietitian group showed a greater reduction (-5.80 kg (95% CI -8.91, -2.69 kg)). No significant heterogeneity between the studies was detected. REVIEWER’S CONCLUSIONS: Dietitians were better than doctors at lowering blood cholesterol in the short to medium term, but there was no evidence that they were better than self-help resources. The results should be interpreted with caution as the studies were not of good quality and the analysis was based on a limited number of trials. More evidence is required to assess whether change can be maintained in the longer term. There was no evidence that dietitians provided better outcomes than nurses.

Keywords: Analysis, Background, Blood, Body Weight, Cholesterol, Collection, Criteria, Data, Data-Collection, Dietary Advice, Disease, Doctors, Evidence, Experts, Field, Health, Health Professionals, Heart, Heterogeneity, Intervention, MEDLINE, Nurses, Nutrition, Objectives, Outcome, Outcome Measures, Outcomes, Quality, Reduction, Risk, Science Citation Index, Search, Selection, Selection Criteria, Strategies, Strategy, Term, Trial

Anderson, C.S., Hackett, M.L. and House, A.O. (2004), Interventions for preventing depression after stroke. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD003689.

Full Text: [2004\Coc Dat Sys Rev2004, CD003689.pdf](2004/Coc%20Dat%20Sys%20Rev2004,%20CD003689.pdf)

Abstract: BACKGROUND: Abnormal mood is an important consequence of stroke and may affect recovery and outcome. However, depression and anxiety are often not detected or inadequately treated. This may in part be due to doubts about whether anti-depressant treatments commenced early after the onset of stroke will prevent depression and improve outcome. OBJECTIVES: To determine if pharmaceutical or psychological interventions can prevent the onset of depression, including depressive illness and abnormal mood, and improve physical and psychological outcomes, in patients with stroke. SEARCH STRATEGY: We searched the Cochrane Stroke Group trials register (June 2003). In addition we searched the following electronic databases: Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 3, 2002), MEDLINE (1966 to September 2002), EMBASE (1980 to September 2002), CINAHL (1982 to September 2002), PsychINFO (1967 to September 2002), Applied Science and Technology Plus (1986 to September 2002), Arts and Humanities Index (1991 to September 2002), Biological Abstracts (1969 to September 2002), General Science Plus (1994 to September 2002), Science Citation Index (1992 to September 2002), Social Sciences Citation Index (1991 to September 2002), and Sociofile (1974 to September 2002). Reference lists from relevant articles and textbooks were searched, and authors of known studies and pharmaceutical companies who manufacture psychotropic medications were contacted. SELECTION CRITERIA: Randomised and quasi-randomised controlled trials comparing different types of pharmaceutical agents (eg selective serotonin reuptake inhibitors) with placebo, or various forms of psychotherapy against standard care (or attention control), in patients with a recent clinical diagnosis of stroke, where the treatment was undertaken with the explicit intention of preventing depression. DATA COLLECTION AND ANALYSIS: The primary analyses focussed on the proportion of patients who met the standard diagnostic criteria for depression applied in the trials at the end of follow-up. Secondary outcomes included depression or mood scores on standard scales, disability or physical function, death, recurrent stroke, and adverse effects. MAIN RESULTS: Twelve trials involving 1245 participants were included in the review. Data were available for nine trials (11 comparisons) involving different pharmaceutical agents, and three trials of psychotherapy. The time from stroke onset to entry ranged from a few hours to six months, but most patients were recruited within one month of acute stroke. The duration of treatments ranged from two weeks to one year. There was no clear effect of pharmacological therapy on the prevention of depression or on other measures. A significant improvement in mood was evident for psychotherapy, but this treatment effect was small and from a single trial. There was no effect on diagnosed depression. REVIEWERS’ CONCLUSIONS: This review identified a small but significant effect of psychotherapy on improving mood, but no effect of either pharmacotherapy or psychotherapy on the prevention of depressive illness, disability, or other outcomes. More evidence is therefore required before any recommendations can be made about the routine use of such treatments to improve recovery after stroke.

Keywords: Adverse Effects, Analyses, Antidepressant, Anxiety, Background, Care, Clinical, Collection, Control, Criteria, Data-Collection, Databases, Death, Depression, Diagnosis, Diagnostic Criteria, Disability, Duration, Evidence, Follow-Up, Function, Improvement, Interventions, MEDLINE, Objectives, Onset, Outcome, Outcomes, Patients, Pharmaceutical Agents, Pharmacotherapy, Physical, Placebo, Prevention, Primary, Psychotherapy, Recommendations, Recovery, Recurrent, Review, Reviewers, Scales, Science Citation Index, Search, Selection, Selection Criteria, Serotonin, Small, Standard, Strategies, Strategy, Stroke, Textbooks, Therapy, Treatment, Trial

? House, A.O., Hackett, M.L., Anderson, C.S. and Horrocks, J.A. (2004), Pharmaceutical interventions for emotionalism after stroke. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD003690.

Full Text: [2004\Coc Dat Sys Rev2004, CD003690.pdf](2004/Coc%20Dat%20Sys%20Rev2004,%20CD003690.pdf)

Abstract: BACKGROUND: Antidepressants may be useful in the treatment of abnormal crying associated with stroke. OBJECTIVES: To determine whether pharmaceutical treatment reduces the frequency of emotional displays in people who suffer from emotionalism after stroke. SEARCH STRATEGY: We searched the Cochrane Stroke Group Trials Register (last searched June 2003). In addition we searched the following electronic databases: Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 3 2002), MEDLINE (1966 to September 2002), EMBASE (1980 to September 2002), CINAHL (1982 to September 2002), PsychINFO (1967 to September 2002), Applied Science and Technology Plus (1986 to September 2002), Arts and Humanities Index (1991 to September 2002), Biological Abstracts (1969 to September 2002), General Science Plus (1994 to September 2002), Science Citation Index (1992 to September 2002), Social Sciences Citation Index (1991 to September 2002), and Sociofile (1974 to September 2002). We searched reference lists from relevant articles and textbooks, and contacted authors of known studies and pharmaceutical companies who manufacture psychotropic medications. SELECTION CRITERIA: Randomised and quasi-randomised controlled trials, comparing psychotropic medication to placebo, in people with stroke and emotionalism (also known as emotional lability or pathological crying and laughing). DATA COLLECTION AND ANALYSIS: Data were obtained on people who no longer met criteria for emotionalism, as defined in studies, and on reduction in frequency of crying at the end of treatment. Data were not pooled because of the multiplicity of definitions and outcome measures. MAIN RESULTS: Five trials involving 103 participants were included. Four trials showed large effects of treatment: 50% reduction in emotionalism, improvements (reduction) in the frequency of compulsive laughter, and lower (better) scores on the Pathological Laughter and Crying scale. The confidence intervals were wide, however, indicating that treatment may have had only a small positive effect, or even a small negative effect (in one trial). Subgroup analysis was not performed due to the multiple methods of assessment of emotionalism within and between trials. Only one study systematically recorded and reported adverse events; no discernible difference was seen between groups. Participants allocated active treatment were more likely to leave early from trials. REVIEWERS’ CONCLUSIONS: Antidepressants can reduce the frequency and severity of crying or laughing episodes. The effect do not seem specific to one drug or class of drugs. However, our conclusions must be qualified by several methodological deficiencies in the studies. More reliable data are required before recommendations can be made about the treatment of post-stroke emotionalism.

Keywords: Analysis, Assessment, Background, Collection, Confidence, Confidence Intervals, Criteria, Data, Data-Collection, Databases, Drug, Drugs, Events, Intervals, Interventions, MEDLINE, Methods, Objectives, Outcome, Outcome Measures, Placebo, Recommendations, Reduction, Reviewers, Scale, Science Citation Index, Search, Selection, Selection Criteria, Small, Strategies, Strategy, Stroke, Textbooks, Treatment, Trial

? Hackett, M.L., Anderson, C.S. and House, A.O. (2004), Interventions for treating depression after stroke. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD003437.

Full Text: [2004\Coc Dat Sys Rev2004, CD003437.pdf](2004/Coc%20Dat%20Sys%20Rev2004,%20CD003437.pdf)

Abstract: BACKGROUND: Depressive and anxiety disorders following stroke are often undiagnosed or inadequately treated. This may reflect difficulties with the diagnosis of abnormal mood among older people with stroke-related disability, but may also reflect uncertainty about the effectiveness of such therapies in this setting. OBJECTIVES: To determine whether pharmacological, psychological, or electroconvulsive treatment (ECT) of depression in patients with stroke can improve outcome. SEARCH STRATEGY: The Cochrane Stroke Group Trials Register (last searched June 2003). The Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 3, 2002), MEDLINE (1966 to September 2002), EMBASE (1980 to September 2002), CINAHL (1982 to September 2002), PsychINFO (1967 to September 2002), Applied Science and Technology Plus (1986 to September 2002), Arts and Humanities Index (1991 to September 2002), Biological Abstracts (1969 to September 2002), General Science Plus (1994 to September 2002), Science Citation Index (1992 to September 2002), Social Sciences Citation Index (1991 to September 2002), and Sociofile (1974 to September 2002). Reference lists from relevant articles and textbooks were searched, and authors of known studies and pharmaceutical companies who manufacture psychotropic medications were contacted. SELECTION CRITERIA: Randomised and quasi-randomised controlled trials comparing different types of pharmaceutical agents with placebo, or various forms of psychotherapy with standard care (or attention control), in patients with recent, clinically diagnosed, acute stroke, where treatment was explicitly intended of treat depression. DATA COLLECTION AND ANALYSIS: Primary analyses focussed on the prevalence of diagnosable depressive disorder at the end of treatment. Secondary outcomes included depression or mood scores on standard scales, disability or physical function, death, recurrent stroke, and adverse effects. We did not pool the data for summary scores. We performed meta-analysis for only some binary endpoints and data on adverse events. MAIN RESULTS: Nine trials, with 780 participants, were included in the review. Data were available for seven trials of pharmaceutical agents, and two trials of psychotherapy. There were no trials of ECT. The analyses were complicated by the lack of standardised diagnostic and outcome criteria, and differing analytic methods. There was no strong evidence of benefit of either pharmacotherapy or psychotherapy in terms of a complete remission of depression following stroke. There was evidence of a reduction (improvement) in scores on depression rating scales, and an increase in the proportion of participants with anxiety at the end of follow up. REVIEWERS’ CONCLUSIONS: This review found no evidence to support the routine use of pharmacotherapeutic or psychotherapeutic treatment for depression after stroke. More research is required before recommendations can be made about the most appropriate management of depression following stroke.

Keywords: Adverse Effects, Analyses, Anxiety, Anxiety Disorders, Background, Care, Collection, Control, Criteria, Data, Data-Collection, Death, Depression, Diagnosis, Disability, ECT, Effectiveness, Events, Evidence, Follow-Up, Function, Improvement, Management, MEDLINE, Meta-Analysis, Metaanalysis, Methods, Objectives, Older People, Outcome, Outcomes, Patients, Pharmaceutical Agents, Pharmacotherapy, Physical, Placebo, Prevalence, Psychotherapy, Recommendations, Recurrent, Reduction, Research, Review, Reviewers, Scales, Science Citation Index, Search, Selection, Selection Criteria, Standard, Strategies, Strategy, Stroke, Support, Textbooks, Treatment, Uncertainty

? Hart, M.G., Grant, R., Walker, M. and Dickinson, H. (2005), Surgical resection and whole brain radiation therapy versus whole brain radiation therapy alone for single brain metastases. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD003292.

Abstract: Background The treatment of brain metastasis is generally palliative, with whole brain radiation therapy (WBRT), since the majority have uncontrollable systemic cancer. In certain circumstances, such as single brain metastases, death may be more likely from brain involvement than systemic disease. In this group, surgical resection has been proposed to relieve symptoms and prolong survival. Objectives To assess the clinical effectiveness of surgical resection plus WBRT versus WBRT alone in the treatment of single brain metastasis. Search strategy The Cochrane Cancer Network Specialised trials register (July 2003), Cochrane Central Register of Controlled Trials (CENTRAL) (Issue 1 2003), MEDLINE (1966 to July 2003), EMBASE (1980 to July 2003), CANCERLIT (1980 to July 2003), BIOSIS (1985 to July 2003) and SCIENCE CITATION INDEX (1981 to July 2003) were searched. References of identi fi ed studies were hand searched, as was the Journal of Neuro-Oncology over the previous 10 years and Neuro-Oncology over the past 2 years, including all conference abstracts. Specialists in neuro-oncology were also contacted. Selection criteria Randomized controlled trials (RCTs) comparing surgery and WBRT with WBRT alone, in patients with single brain metastasis. Data collection and analysis Two reviewers independently assessed trial quality and extracted data. Main results Three RCTs were identified, with 195 patients in total. No significant difference in survival was noted hazard ratio (HR) 0.74 (95% confidence interval (CI) 0.39 to 1.40, p = 0.35), although there was a high degree of heterogeneity between trials. One trial has shown surgery and WBRT to increase the duration of functionally independent survival (FIS)HR 0.42 (95% CI 0.22 to 0.80, p < 0.008). There is a trend for surgery and WBRT to reduce the number of deaths due to neurological cause odds ratio (OR) 0.57 (95% CI 0.29 to 1.10, p = 0.09). Adverse effects were not found to be statistically more common in any group. Authors’ conclusions Surgery and WBRT may improve FIS but not overall survival. There is a trend that it may reduce the proportion of deaths due to neurological cause. All these results were in a highly selected group of patients. Operating on metastases does not confer significantly more adverse effects.

Keywords: Authors, Brain, Cancer, Citation, Citation Indexes, Citation-Index, Criteria, Effectiveness, Heterogeneity, Index, Indexes, Medline, Neurological, Radiotherapy, Randomized Controlled Trials, Randomized-Trial, Science, Science Citation, Science Citation Index, Science-Citation-Index, Stereotaxic Radiosurgery, Surgery, Therapy, Treatment

? Wake, B.L., McCormack, K., Fraser, C., Vale, L., Perez, J. and Grant, A.M. (2005), Transabdominal pre-peritoneal (TAPP) vs totally extraperitoneal (TEP) laparoscopic techniques for inguinal hernia repair. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD004703.

Full Text: [2005\Coc Dat Sys Rev2005, CD004703.pdf](2005/Coc%20Dat%20Sys%20Rev2005,%20CD004703.pdf)

Abstract: Background The choice of approach to the laparoscopic repair of inguinal hernia is controversial. There is a scarcity of data comparing the laparoscopic transabdominal preperitoneal (TAPP) approach with the laparoscopic totally extraperitoneal (TEP) approach and questions remain about their relative merits and risks. Objectives To compare the clinical effectiveness and relative efficiency of laparoscopic TAPP and laparoscopic TEP for inguinal hernia repair. Search strategy We searched Medline Extra, Embase, Biosis, Science Citation Index, Cochrane Central Register of Controlled Trials (CENTRAL), Journals@Ovid Full Text and the electronic version of the journal, Surgical Endscopy. Recent conference proceedings by the following organisations were hand searched: Association of Endoscopic Surgeons of Great Britain & Ireland; International Congress of the European Association for Endoscopic Surgery; Scientific Session of the Society of American Gastrointestinal & Endoscopic Surgeons (SAGES); and the Italian Society of Endoscopic Surgery. In addition, specialists involved in research on the repair of inguinal hernia were contacted to ask for information about any further completed and ongoing trials, relevant websites were searched and reference lists of the all included studies were checked for additional reports. Selection criteria All published and unpublished randomised controlled trials and quasi-randomised controlled trials comparing laparoscopic TAPP with laparoscopic TEP for inguinal hernia repair were eligible for inclusion. Non-randomised prospective studies were also eligible for inclusion to provide further comparative evidence of complications and adverse events. Data collection and analysis Statistical analyses were performed using the fixed effects model and the results expressed as relative risk (RR) for dichotomous outcomes and weighted mean difference (WMD) for continuous outcomes with 95% confidence intervals (CI). Main results The search identified one RCT which reported no statistical difference between TAPP and TEP when considering duration of operation, haemotoma, length of stay, time to return to usual activity and recurrence. The eight non-randomised studies suggest that TAPP is associated with higher rates of port-site hernias and visceral injuries whilst there appear to be more conversions with TEP. Vascular injuries and deep/mesh infections were rare and there was no obvious difference between the groups. No studies reporting economic evidence were identified. Very limited data were available on learning effects but these data suggest that operators become experienced at between 30 and 100 procedures. Authors’ conclusions There is insufficient data to allow conclusions to be drawn about the relative effectiveness of TEP compared with TAPP. Efforts should be made to start and complete adequately powered RCTs, which compare the different methods of laparoscopic repair.

Keywords: Authors, Citation, Complications, Criteria, Economic, Effectiveness, Groups, Hernioplasty, Herniorrhaphy, International, Journal, Learning, Learning-Curve, Medline, Methods, Model, Multicenter, Outcomes, Preperitoneal, Research, Risk, Science, Science Citation Index, Surgery, Techniques, Transperitoneal, Trial

? Coward, L.J., Featherstone, R.L. and Brown, M.M. (2005), Percutaneous transluminal angioplasty and stenting for vertebral artery stenosis. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD000519.

Full Text: [2005\Coc Dat Sys Rev2005, CD000519.pdf](2005/Coc%20Dat%20Sys%20Rev2005,%20CD000519.pdf)

Abstract: Background Surgery for vertebral artery stenosis is technically difficult, potentially hazardous and is not considered in most centres. There is growing evidence from case series that vertebral artery stenosis may be treated endovascularly by percutaneous transluminal angioplasty and stenting. This may be a feasible alternative to surgery to relieve symptoms caused by significant stenosis. Objectives The objective of this review was to assess the safety and efficacy of vertebral artery percutaneous transluminal angioplasty, with or without stenting, combined with medical care, compared to medical care alone, in patients with vertebral artery stenosis. Search strategy We searched the Cochrane Stroke Group’s trials register (last searched 28 July 2004). In addition we searched the following bibliographic databases: Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 3, 2002), MEDLINE (1966 to July 2004), EMBASE (1980 to July 2004), and Science Citation Index (1981 to July 2004). We also contacted researchers in the field, and balloon catheter and stent manufacturers. Selection criteria We selected randomised trials of endovascular treatment of vertebral artery stenosis combined with best medical therapy, compared with best medical therapy alone, in patients with symptomatic or asymptomatic vertebral artery stenosis. Data collection and analysis Two reviewers independently applied the inclusion criteria, extracted data and assessed trial quality. Main results One completed randomised trial was found. In one subgroup of this trial, 16 patients with symptomatic severe vertebral artery stenosis were randomised to endovascular treatment (n = 8) or medical treatment alone (n = 8). There were no strokes in any arterial territory or deaths from any cause in either group within 30 days of treatment (endovascular group) or 30 days of randomisation (medical group). In the endovascular group, two patients had a posterior circulation TIA at the time of the procedure. In the endovascular group, the mean vessel stenosis at follow up was 47% (range 0% to 80%). Patients were followed up for a mean of 4.5 years in the endovascular group and 4.9 years in the medical group. There were no further vertebrobasilar territory strokes in either group for the duration of follow up. Morbidity and mortality was related to carotid and coronary artery disease in this study. Authors’ conclusions There is currently insufficient evidence to assess the effects of percutaneous transluminal angioplasty with or without stenting or primary stenting for vertebral artery stenosis.

Keywords: Assisted Angioplasty, Authors, Case Series, Circulation, Citation, Consecutive Patients, Criteria, Databases, Endarterectomy, Experience, Follow-up, Management, Medical, Medline, Prevention, Primary, Randomized-Trial, Researchers, Review, Science, Science Citation Index, Surgery, Symptomatic Carotid Stenosis, Therapy, Treatment

? Mabey, D., Fraser-Hurt, N. and Powell, C. (2005), Antibiotics for trachoma. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD001860.

Full Text: [2005\Coc Dat Sys Rev2005, CD001860.pdf](2005/Coc%20Dat%20Sys%20Rev2005,%20CD001860.pdf)

Abstract: Background Trachoma is the world’s leading cause of preventable blindness. In 1997 the World Health Organization launched an initiative on trachoma control based on the ‘SAFE’ strategy (surgery, antibiotics, facial cleanliness and environmental improvement). Objectives To assess the evidence supporting the antibiotic arm of the SAFE strategy by assessing the effects of antibiotics on both active trachoma (primary objective) and on Chlamydia trachomatis infection of the conjunctiva (secondary objective). Search strategy We searched the Cochrane Central Register of Controlled Trials-CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (The Cochrane Library Issue 1, 2005), MEDLINE (1966 to February 2005), and EMBASE (1980 to February 2005). We used the Science Citation Index to look for articles that cited the included studies. We searched the reference lists of identified articles and we contacted authors and experts for details of further relevant studies. Selection criteria We included only randomised trials that satisfied either of two criteria: (a) trials in which topical or oral administration of an antibiotic was compared to placebo or no treatment in people with trachoma, (b) trials in which a topical antibiotic was compared with an oral antibiotic in people with trachoma. A subdivision of particular interest was of trials in which topical tetracycline/chlortetracycline was compared with oral azithromycin, as these are the two World Health Organization recommended treatments. Data collection and analysis Two authors independently assessed trial quality and extracted data. We contacted investigators for missing data. Main results We found 15 studies that randomised a total of 8678 participants. For both outcomes (active trachoma and laboratory evidence of infection) the results of the chi squared tests suggested that there was significant statistical heterogeneity among the trials. There was also marked clinical heterogeneity. No summary statistics were calculated and we therefore present a narrative summary of the results. For the comparisons of oral or topical antibiotic against placebo/no treatment, the data are consistent with there being no effect of antibiotics but are suggestive of a lowering of the point prevalence of relative risk of both active disease and laboratory evidence of infection at three and 12 months after treatment. For the comparison of oral against topical antibiotics the results suggest that oral treatment is neither more nor less effective than topical treatment. Authors’ conclusions There is some evidence that antibiotics reduce active trachoma but results are not consistent and cannot be pooled.

Keywords: Antibiotics, Articles, Authors, Citation, Cluster Randomization, Comparison, Controlled Trial, Criteria, Heterogeneity, Hyper-Endemic Trachoma, Mass Treatment, Medline, Narrative, Oral Azithromycin, Outcomes, Oxytetracycline, Placebo, Prevalence, Primary, Risk, Science, Science Citation Index, Single-Dose Azithromycin, Statistics, Statistics Notes, Surgery, Therapy, Topical Tetracycline, Treatment

? Rabiu, M., Alhaassan, M. and Ejere, H. (2005), Environmental sanitary interventions for preventing active trachoma - art. no. CD004003. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD003292.

Full Text: Coc Dat Sys Rev2005, CD003292.pdf

Abstract: Background Trachoma is the second or third major cause of blindness. It is responsible for about six million blind people worldwide, mostly in the poor communities of developing countries. One of the major strategies advocated for the control of the disease is the application of various environmental sanitary measures to such communities.

Objectives To assess the evidence for the effectiveness of environmental sanitary measures on the prevalence of active trachoma in endemic areas.

Search strategy. We searched the Cochrane Central Register of Controlled Trials-CENTRAL(which contains the Cochrane eyes and Vision Group Trials Register) on The Cochrane Library (Issue 4, 2004), MEDLINE (1996 to January 2005), EMBASE (1980 to January 2005), LILACS (April 2004), the reference list of trials and the Science Citation Index. We also contacted agencies, experts and researchers in trachoma control.

Selection criteria The review included randomised and quasi-randomised controlled trials comparing any form of environmental hygiene measures with no measure. These hygienic measures included fly control, provision of water and health education. Participants in the trials were people normally resident in the trachoma endemic areas.

Data collection and analysis Two authors independently extracted data and assessed the quality of trials. Study authors were contacted for additional information. Three trials met the inclusion criteria but meta-analysis were not conducted due to heterogeneity of the studies.

Main results Two studies that assessed insecticide spray as a fly control measure found that trachoma is reduced by at least 55% to 61% with this measure compared to no intervention; this was, however, not statistically significantly different. Another study revealed that health education on personal and household hygiene reduced the incidence of trachoma such that the odds of reducing trachoma in the health education village was about twice that of the no intervention village. However, all the studies have some methodological concerns relating to concealment of allocation and non-consideration of clustering effect in data analysis.

Authors’ conclusions There is evidence that insecticide spray as a fly control measure reduces trachoma significantly. Latrine provision as a fly control measure has not demonstrated significant trachoma reduction. Health education may be effective in reading trachoma. There is a dearth of data to determine the effectiveness of all aspects of enviornmental sanitation in the control of trachoma.

Keywords: Safe Strategy, Evidence Base, Diarrhea

? Shepperd, S. and Iliffe, S. (2005), Hospital at home versus in-patient hospital care. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD000356.

Full Text: 2005\Coc Dat Sys Rev2005, CD000356.pdf

Abstract: Background Hospital at home is defined as a service that provides active treatment by health care professionals, in the patient’s home, of a condition that otherwise would require acute hospital in- patient care, always for a limited period. Objectives To assess the effects of hospital at home compared with in- patient hospital care. Search strategy We searched the Cochrane Effective Practice and Organisation of CareGroup (EPOC) specialised register (November 2004), MEDLINE (1966 to 1996), EMBASE (1980 to 1995), Social Science Citation Index (1992 to 1995), Cinahl (1982 to 1996), EconLit (1969 to 1996), PsycLit (1987 to 1996), Sigle (1980 to 1995) and the Medical Care supplement on economic literature (1970 to 1990). Selection criteria Randomised trials of hospital at home care compared with acute hospital in- patient care. The participants were patients aged 18 years and over. Data collection and analysis Two reviewers independently extracted data and assessed study quality. Main results Twenty two trials are included in this update of the review. Among trials evaluating early discharge hospital at home schemes we found an odds ratio (OR) for mortality of 1.79 95% CI 0.85 to 3.76 for elderly medical patients (age 65 years and over) (n = 3 trials); OR 0.58; 95% CI 0.29 to 1.17 for patients with chronic obstructive pulmonary disease (COPD) (n = 5 trials); and OR 0.78; 95% CI 0.52 to 1.19 for patients recovering from a stroke (n = 4 trials). Two trials evaluating the early discharge of patients recovering from surgery reported an OR 0.43 (95% CI 0.02 to 10.89) for patients recovering from a hip replacement and an OR 1.01 (95% CI 0.37 to 2.81) for patients with a mix of conditions at three months follow- up. For readmission to hospital we found an OR 1.76; 95% CI 0.78 to 3.99 at 3 months follow- up for elderly medical patients (n = 2 trials); OR 0.81; 95% CI 0.55 to 1.19 for patients with COPD (n = 5 trials); and OR 0.96; 95% CI 0.63 to 1.45 for patients recovering from a stroke (n = 3 trials). No significant heterogeneity was observed. One trial recruiting patients following surgery for hernia or varicose veins reported 0/ 117 versus 2/ 121 patients were re admitted (Ruckley 1978); another that 2/ 37 (5%) versus 1/49 (2%) (difference 3%, 95% CI - 5% to 12%) of patients recovering from a hip replacement, 4/ 47 (9%) versus 1/39 (3%) (difference 6%, 95% CI - 3% to 15%) of patients recovering from a knee replacment, and 7/114 (6%) versus 13/124 (10%) (difference - 4% 95% CI - 11% to 3%) of patients recovering from a hysterectomy were readmitted. A third trial analysing surgical and medical patients together reported that 42/159 versus 17/81 patients were readmitted at 3 months (OR 1.34 95% CI 0.66 to 2.20). Allocation to hospital at home resulted in a small reduction in hospital length of stay, but hospital at home increased overall length of care. Patients allocated to hospital at home expressed greater satisfaction with care than those in hospital, while the view of carers was mixed. Authors’ conclusions Despite increasing interest in the potential of hospital at home services as a cheaper alternative to in-patient care, this review provides insufficient objective evidence of economic benefit. Early discharge schemes for patients recovering from elective surgery and elderly patients with a medical condition may have a place in reducing the pressure on acute hospital beds, providing the views of the carers are taken into account. For these clinical groups hospital length of stay is reduced, although this is offset by the provision of hospital at home. Future primary research should focus on rigorous evaluations of admission avoidance schemes and standards for original research should aim at assisting future meta-analyses of individual patient data from these and future trials.

Keywords: Authors, Chronic, Citation, Cost Minimization Analysis, Criteria, Discharge, Early Discharge, Economic, Elderly, Follow-Up, Groups, Health, Health Care, Health-Care, Heterogeneity, Literature, Medical, Medline, Myocardial-Infarction, Obstructive Pulmonary-Disease, Primary, Randomized Controlled-Trial, Reduction, Research, Review, Science, Science Citation Index, Social Science Citation Index, Southwest Stockholm, Standards, Stroke, Surgery, Terminally-ILL, Treatment, Varicose-Veins

? Newby, E.A., Sawczenko, A., Thomas, A.G. and Wilson, D. (2005), Interventions for growth failure in childhood Crohn’s disease. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD003873.

Full Text: [2005\Coc Dat Sys Rev2005, CD003873.pdf](2005/Coc%20Dat%20Sys%20Rev2005,%20CD003873.pdf)

Abstract: Background Crohn’s disease in childhood is a chronic relapsing condition. Fifteen to forty per cent of children with Crohn’s disease have growth retardation (Griffiths 1993a). Some treatment modalities including corticosteroids have been implicated in growth failure but it is thought mainly to be secondary to uncontrolled disease activity (Motil 1993; Markowitz 1993). Growth is fundamental to the practice of pediatrics, so by taking growth as the primary outcome measure we address issues important to both patients, their families and pediatricians. Objectives To evaluate the effectiveness of the different modalities available for the treatment of childhood Crohn’s disease with regard to the reversal of growth failure and the promotion of normal growth. Search strategy Searches were made of the following databases using the Collaborative Review Group Search Strategy EMBASE (1984-2004), MEDLINE (1966-2004), The Cochrane Central Register of Controlled Trials, The Cochrane Inflammatory Bowel Disease and Functional Bowel Disorders Group Specialized Trials Register and the Science Citation Index. Abstracts from the major gastrointestinal research meetings and references from published articles were also reviewed. Selection criteria Randomized controlled trials pertaining to children less than 18 years of age with Crohn’s disease were selected. Those with growth as an outcome measure were included in the review. Data collection and analysis Data extraction and assessment of the methodological quality of each trial was independently reviewed by two reviewers. Only one good quality randomized controlled trial was included in the review and therefore no statistical analysis was possible. Main results Three randomized controlled trials were identified. One was of good methodological quality (Markowitz 2000). This study looked at the use of 6-mercaptopurine (6-MP) as a steroid sparing agent. No difference in linear growth was observed between the intervention and placebo groups, although the total steroid dose received over the 18 month follow up period was reduced in the group receiving 6-MP. The two remaining randomized controlled trials (Sanderson 1987; Thomas 1993a) consider the use of enteral feeding versus corticosteroids for induction of remission, with height velocity standard deviation score at 6 months as an outcome measure. Although of less rigorous methodological quality, the results of these studies are discussed in detail in the review. In both studies height velocity standard deviation scores were significantly increased in the enteral feeding group compared with the corticosteroid group. Authors’ conclusions In addition to these randomized controlled trials, a body of lower quality evidence does exist relevant to two other important interventions; the use of supplemental enteral nutrition (Morin 1980; Belli 1988; Israel 1995) and the judicious use of surgical interventions in pre-pubertal children with refractory disease (Alperstein 1985; Lipson 1990; McLain 1990). Newer treatments, such as infliximab, are now becoming more widely used and may offer advantages in promoting growth. These effects are as yet unstudied. This review highlights the need for large, multi centre studies of the different treatment options in paediatric Crohn’s disease and the importance of standardised measurements of growth, such as height velocity standard deviation scores and height standard deviation scores as outcome measures.

Keywords: Articles, Assessment, Authors, Body-Composition, Childhood, Children, Chronic, Citation, Criteria, Databases, Double-Blind, Effectiveness, Elemental Diet, Enteral Nutrition, Factor-I, Groups, Growth, Inflammatory-Bowel-Disease, Intervention, Israel, Medline, Necrosis-Factor-Alpha, Parenteral-Alimentation, Placebo, Primary, Promotion, Randomized Controlled Trial, Randomized Controlled Trials, Randomized Controlled-Trial, Research, Retardation, Review, Science, Science Citation Index, Serum Concentrations, Treatment, Velocity

? McIntosh, H.M. and Jones, K.L. (2005), Chloroquine or amodiaquine combined with sulfadoxine-pyrimethamine for treating uncomplicated malaria. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD000386.

Full Text: [2005\Coc Dat Sys Rev2005, CD000386.pdf](2005/Coc%20Dat%20Sys%20Rev2005,%20CD000386.pdf)

Abstract: Background Chloroquine (CQ), amodiaquine (AQ), and sulfadoxine-pyrimethamine (SP) are inexpensive drugs, but treatment failure is a problem. Combination therapy may reduce treatment failure. CQ or AQ plus SP are affordable options of combination treatment, but there is debate about their effectiveness. Objectives To assess the combination of CQ or AQ plus SP compared with SP alone for first-line treatment of uncomplicated falciparum malaria. Search strategy We searched the Cochrane Infectious Diseases Group Specialized Register (April 2005), CENTRAL (The Cochrane Library Issue 2, 2005), MEDLINE (1966 to April 2005), EMBASE (1974 to April 2005), LILACS (1982 to April 2005), Science Citation Index (1981 to April 2005), African Index Medicus (1993 to 1998), and reference lists. We also contacted researchers at relevant organizations and a pharmaceutical company. Selection criteria Randomized controlled trials in adults or children with uncomplicated Plasmodium falciparum malaria were eligible for inclusion. The main outcomes of interest were total and clinical failure at day 28 follow up and serious adverse events. Data collection and analysis Two people independently applied the inclusion criteria. One author extracted data and another checked them independently. We used relative risk (RR) and 95% confidence intervals (CI). Main results Twelve trials (2107 participants) met the inclusion criteria. A meta-analysis of five AQ trials (461 participants) showed a statistically significant reduction in total failure at day 28 with the combination therapy (RR 0.64, 95% CI 0.46 to 0.91), and meta-analysis of three trials (384 participants) showed a significant reduction in clinical failure at day 28 (RR 0.23, 95% CI 0.11 to 0.49). The statistical significance in the total failure analysis was sensitive to losses to follow up. Data from two CQ trials showed no advantage for total failure with combination therapy at day 28. There was no evidence from the included trials of serious adverse events. Authors’ conclusions The evidence base is not strong enough to support firm conclusions. The available evidence suggests that AQ plus SP can achieve less treatment failure than SP, but this might depend on existing levels of parasite resistance to the individual drugs.

Keywords: Children, Citation, Combination Therapy, Confidence Intervals, Consort Statement, Efficacy, Embase, Medline, Meta-Analysis, Outcomes, Plasmodium-Falciparum Malaria, Plus Chloroquine, Randomized-Trials, Science, Science Citation Index, Search Strategy, Statistical, Strategy, Sulfadoxine, Pyrimethamine, Therapeutic Regimens, Western Uganda

? White, A.R., Rampes, H. and Campbell, J.L. (2006), Acupuncture and related interventions for smoking cessation. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD000009.

Full Text: [2006\Coc Dat Sys Rev2006, CD000009.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD000009.pdf)

Abstract: Background Acupuncture and related techniques are promoted as a treatment for smoking cessation in the belief that they may reduce nicotine withdrawal symptoms. Objectives The objectives of this review are to determine the effectiveness of acupuncture and the related interventions of acupressure, laser therapy and electrostimulation, in smoking cessation in comparison with no intervention, sham treatment, or other interventions. Search strategy We searched the Cochrane Tobacco Addiction Group specialized register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, BIOSIS Previews, PsycINFO, Science and Social Sciences Citation Index, AMED and CISCOM. Date of last search January 2005. Selection criteria Randomized trials comparing a form of acupuncture, acupressure, laser therapy or electrostimulation with either no intervention, sham treatment or another intervention for smoking cessation. Data collection and analysis We extracted data in duplicate on the type of smokers recruited, the nature of the acupuncture and control procedures, the outcome measures, method of randomization, and completeness of follow up. We assessed abstinence from smoking at the earliest time-point (before six weeks), and at the last measurement point between six months and one year. We used the most rigorous definition of abstinence for each trial, and biochemically validated rates if available. Those lost to follow up were counted as continuing smokers. Where appropriate, we performed meta-analysis using a fixed-effect model. Main results We identified 24 reports of studies. The only comparison for which there were sufficient studies to combine meaningfully was acupuncture compared with sham acupuncture. The fixed-effect odds ratio (OR) for the short-term effect was 1.36 (95% confidence interval 1.07 to 1.72), but the studies are heterogeneous and the result is strongly influenced by one individual positive study. The significant short-term effect was lost with the random-effects model for pooling, or by removing the outlying study that led to heterogeneity. The long-term result shows no effect of acupuncture compared with sham acupuncture. There was no consistent evidence that acupuncture is superior to no treatment, and no evidence that the effect of acupuncture was different from that of other antismoking interventions, or that any particular acupuncture technique is superior to other techniques.

Keywords: Acupuncture, Analysis, Collection, Comparison, Confidence, Control, Criteria, Data, Effectiveness, Evidence, Follow-Up, Heterogeneity, Interval, Intervention, Interventions, Laser, Long Term, Long-Term, Measurement, MEDLINE, Meta-Analysis, Metaanalysis, Model, Odds Ratio, Outcome, Outcome Measures, Procedures, PsycINFO, Random Effects Model, Randomization, Rates, Review, Sham Acupuncture, Smoking, Symptoms, Techniques, Therapy, Treatment, Trial

? Smith, S., Demicheli, V., Di Pietrantonj, C., Harnden, A.R., Jefferson, T., Matheson, N.J. and Rivetti, A. (2006), Vaccines for preventing influenza in healthy children. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD004879.

Full Text: [2006\Coc Dat Sys Rev2006, CD004879.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD004879.pdf)

Abstract: Background In children and adults the consequences of influenza are mainly absences from school and work, however the risk of complications is greatest in children and people over 65 years old. Objectives To appraise all comparative studies evaluating the effects of influenza vaccines in healthy children; assess vaccine efficacy (prevention of confirmed influenza) and effectiveness (prevention of influenza-like illness) and document adverse events associated with receiving influenza vaccines. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 1, 2005); OLD MEDLINE (1966 to 1969); MEDLINE (1969 to December 2004); EMBASE (1974 to December 2004); Biological Abstracts (1969 to December 2004); and Science Citation Index (1974 to December 2004). We wrote to vaccine manufacturers and a number of corresponding authors of studies in the review. Selection criteria Any randomised controlled trials (RCTs), cohort and case-control studies of any influenza vaccine in healthy children under 16 years old. Data collection and analysis Two authors independently assessed trial quality and extracted data. Main results Fifty-one studies involving 263,987 children were included. Seventeen papers were translated from Russian. Fourteen RCTs and 11 cohort studies were included in the analysis of vaccine efficacy and effectiveness. From RCTs, live vaccines showed an efficacy of 79% (95% confidence interval (CI) 48% to 92%) and an effectiveness of 33% (95% CI 28% to 38%) in children older than two years compared with placebo or no intervention. Inactivated vaccines had a lower efficacy of 59% (95% CI 41% to 71%) than live vaccines but similar effectiveness: 36% (95% CI 24% to 46%). In children under two, the efficacy of inactivated vaccine was similar to placebo. Thirty-four reports containing safety outcomes were included, 22 including live vaccines, 8 inactivated vaccines and 4 both types. The most commonly presented short-term outcomes were temperature and local reactions. The variability in design of studies and presentation of data was such that meta-analysis of safety outcome data was not feasible. Authors’ conclusions Influenza vaccines are efficacious in children older than two years but little evidence is available for children under two. There was a marked difference between vaccine efficacy and effectiveness. That no safety comparisons could be carried out emphasizes the need for standardisation of methods and presentation of vaccine safety data in future studies. It was surprising to find only one study of inactivated vaccine in children under two years, given recent recommendations to vaccinate healthy children from six months old in the USA and Canada. If immunisation in children is to be recommended as public-health policy, large-scale studies assessing important outcomes and directly comparing vaccine types are urgently required.

Keywords: Acute Otitis-Media, Authors, Case-Control, Citation, Cohort, Day-Care, Inactivated Influenza, Live Recombinant, Medline, Meta-Analysis, Neuraminidase-Specific Influenza, Randomized Controlled-Trial, Review, School-Children, Science Citation Index, Temperature, USA, Virus-Vaccine, Whole-Virus, Young-Children

? Aj, S. and Allan, B.D.S. (2006), Photorefractive keratectomy (PRK) versus laser-assisted in-situ keratomileusis (LASIK) for myopia. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD005135.

Full Text: [2006\Coc Dat Sys Rev2006, CD005135.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD005135.pdf)

Abstract: Background Myopia (also known as short-sightedness or near-sightedness) is an ocular condition in which the refractive power of the eye is greater than is required, resulting in light from distant objects being focused in front of the retina instead of directly on it. The two most commonly used surgical techniques to permanently correct myopia are photorefractive keratectomy (PRK) and laser-assisted in-situ keratomileusis (LASIK). Objectives The aim of this review was to compare the effectiveness and safety of PRK and LASIK for correction of myopia. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (2005, Issue 3), MEDLINE (1966 to September 2005), EMBASE (1980 to September 2005) and LILACs (1982 to 3 November 2005). We also searched the reference lists of the studies and the Science Citation Index. Selection criteria We included randomised controlled trials comparing PRK and LASIK for correction of any degree of myopia. We also included data on adverse events from prospective multicentre consecutive case series in the Food and Drugs Administration (FDA) trials database (http//www.fda.gov/cdrh/LASIK/lasers.htm). Data collection and analysis Two authors independently assessed trial quality and extracted data. Data were summarised using odds ratio and mean difference. Odds ratios were combined using a random-effects model after testing for heterogeneity. Main results This review included six randomised controlled trials involving a total of 417 eyes, of which 201 were treated with PRK and 216 with LASIK. We found that although LASIK gives a faster visual recovery than PRK, the effectiveness of these two procedures is comparable. We found some evidence that LASIK may be less likely than PRK to result in loss of best spectacle-corrected visual acuity. Authors’ conclusions LASIK gives a faster visual recovery than PRK but the effectiveness of these two procedures is comparable. Further trials using contemporary techniques are required to determine whether LASIK and PRK are equally safe.

Keywords: Authors, Case Series, Citation, Corneal Sensitivity, Criteria, Database, Diopters, Effectiveness, Excimer-Laser, Follow-up, Heterogeneity, Insitu Keratomileusis, Intraoperative Flap Complications, Lasik, Medline, Model, Recovery, Refractive Surgery, Review, Risk-Factors, Science, Science Citation Index, Techniques, United-States, Visual-Acuity

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Full Text: [2006\Coc Dat Sys Rev2006, CD005966.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD005966.pdf)

Abstract: Background A malaria vaccine is badly needed. SPf66 was one of the earliest vaccines developed. It is a synthetic peptide vaccine containing antigens from the blood stages of malaria linked together with an antigen from the sporozoite stage, and is targeted mainly against the blood (asexual) stages. Objectives To assess the effect of SPf66 malaria vaccines against Plasmodium falciparum, P. vivax, P. malariae, and P. ovale in preventing infection, disease, and death. Search strategy We searched the Cochrane Infectious Diseases Group Specialized Register (September 2005), CENTRAL (The Cochrane Library 2005, Issue 3), MEDLINE (1966 to September 2005), EMBASE (1980 to September 2005), LILACS (1982 to September 2005), Science Citation Index (1981 to September 2005), and reference lists of articles. We also contacted organizations and researchers in the field. Selection criteria Randomized and quasi-randomized controlled trials comparing SPf66 vaccine with placebo or routine antimalarial control measures in people of any age receiving an artificial challenge or natural exposure to malaria infection (any species). Data collection and analysis Two people independently assessed trial quality and extracted data, including adverse events. Results were expressed as relative risks (RR) with 95% confidence intervals (CI). Main results Ten efficacy trials of SPf66 involving 9698 participants were included. Results with SPf66 in reducing new episodes of P. falciparum malaria were heterogeneous: it was not effective in four African trials (RR 0.98, 95% CI 0.90 to 1.07; 2371 participants) or in one Asian trial (RR 1.06, 95% CI 0.90 to 1.25; 1221 participants). In four trials in South America the number of first attacks with P. falciparum was reduced by 28% (RR 0.72, 95% CI 0.63 to 0.82; 3807 participants). It did not reduce episodes of P. vivax malaria or admission to hospital with severe malaria. Trials have not indicated any serious adverse events with SPf66 vaccine. Authors’ conclusions There is no evidence for protection by SPf66 vaccines against P. falciparum in Africa. There is a modest reduction in attacks of P. falciparum malaria following vaccination with SPf66 in South America. There is no justification for further trials of SPf66 in its current formulation. Further research with SPf66 vaccines in South America or with new formulations of SPf66 may be justified.

Keywords: Africa, Citation, Confidence Intervals, Control, Efficacy, Efficacy Trial, Embase, Field Trial, Follow-Up, Gambian Infants, Global Distribution, Hospital, Immune-Responses, Medline, Pilot Safety, Plasmodium-Falciparum Malaria, Research, Science, Science Citation Index, Search Strategy, Strategy, Synthetic Vaccine, Tanzanian Children, Vaccination, Vaccine

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Full Text: [2006\Coc Dat Sys Rev2006, CD003171.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD003171.pdf)

Abstract: Background Congenital cataracts are opacities of the lens in one or both eyes of children that cause a reduction in vision severe enough to require surgery. Cataract is the largest treatable cause of visual loss in childhood. Paediatric cataracts provide different challenges to those in adults. Intense inflammation, amblyopia and posterior capsule opacification can affect results of treatment. Two treatments commonly considered for congenital cataract are lensectomy and lens aspiration. Objectives The objective of this review was to assess the effects of surgical treatments for bilateral symmetrical congenital cataracts. Success was measured according to the vision attained and occurrence of adverse events. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) on The Cochane Library, which contains the Cochrane Eyes and Vision Group Trials Register (2005, Issue 2), MEDLINE (1966 to June 2005), EMBASE (1980 to June 2005, week 27), LILACS (6 July 2005), the Science Citation Index and the reference list of the included studies. We also contacted trial investigators and experts in the field for details of further studies. Selection criteria We included all prospective, randomised controlled trials that compared one type of cataract surgery to another, or to no surgery, in children with bilateral congenital cataracts aged 15 years or younger. Data collection and analysis Two authors extracted data. No meta-analysis was performed. Main results Four trials met the inclusion criteria. All trials were concerned with reducing the development of visual axis opacification (VAO). This was achieved with techniques that included an anterior vitrectomy or optic capture. Posterior capsulotomy alone was inadequate except in older children. Authors’ conclusions Evidence exists for the care of children with congenital or developmental bilateral cataracts to reduce the occurrence of visual axis opacification. Further randomised trials are required to inform modern practice about other concerns including the timing of surgery, age for implantation of an intraocular lens and development of long-term complications such as glaucoma and retinal detachment.

Keywords: Anterior Vitrectomy, Aspiration, Authors, Capsulorhexis, Cataract, Childhood, Children, Citation, Clinical-Trial, Criteria, Development, Evidence, Intraocular-Lens Implantation, Lensectomy, Medline, Meta-Analysis, Occurrence, Optic Capture, Posterior Capsule Opacification, Reduction, Review, Science, Science Citation Index, Surgery, Techniques, Treatment

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Full Text: [2006\Coc Dat Sys Rev2006, CD004641.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD004641.pdf)

Abstract: Background Epidemiological evidence on the effects of potassium on blood pressure is inconsistent. Objectives To evaluate the effects of potassium supplementation on health outcomes and blood pressure in people with elevated blood pressure. Search strategy We searched the Cochrane Library, MEDLINE, EMBASE, Science Citation Index, ISI Proceedings, ClinicalTrials.gov, Current Controlled Trials, CAB abstracts, and reference lists of systematic reviews, meta-analyses and randomised controlled trials (RCTs) included in the review. Selection criteria Inclusion criteria were: 1) RCTs of a parallel or crossover design comparing oral potassium supplements with placebo, no treatment, or usual care; 2) treatment and follow-up >= 8 weeks; 3) participants over 18 years, with raised systolic blood pressure (SBP) >= 140 mmHg or diastolic blood pressure (DBP) >=85 mmHg); 4) SBP and DBP reported at end of follow-up. We excluded trials where: participants were pregnant; received antihypertensive medication which changed during the study; or potassium supplementation was combined with other interventions. Data collection and analysis Two reviewers independently extracted data and assessed trial quality. Disagreements were resolved by discussion or a third reviewer. Random effects meta-analyses and sensitivity analyses were conducted. Main results Six RCT’s (n = 483), with eight to 16 weeks follow-up, met our inclusion criteria. Meta-analysis of five trials (n = 425) with adequate data indicated that potassium supplementation compared to control resulted in a large but statistically non-significant reductions in SBP (mean difference: - 11.2, 95% CI: - 25.2 to 2.7) and DBP (mean difference: - 5.0, 95% CI: - 12.5 to 2.4). The substantial heterogeneity between trials was not explained by potassium dose, quality of trials or baseline blood pressure. Excluding one trial in an African population with very high baseline blood pressure resulted in smaller overall reductions in blood pressure (SBP mean difference: -3.9, 95% CI: -8.6 to 0.8; DBP mean difference: - 1.5, 95% CI: - 6.2 to 3.1). Further sensitivity analysis restricted to two high quality trials (n = 138) also found non-significant reductions in blood pressure (SBP mean difference: - 7.1, 95% CI: - 19.9 to 5.7; DBP mean difference: - 5.5, 95% CI: - 14.5 to 3.5). Authors’ conclusions This systematic review found no statistically significant effect of potassium supplementation on blood pressure. Because of the small number of participants in the two high quality trials, the short duration of follow-up, and the unexplained heterogeneity between trials, the evidence about the effect of potassium supplementation on blood pressure is not conclusive. Further high quality RCTs of longer duration are required to clarify whether potassium supplementation can reduce blood pressure and improve health outcomes.

Keywords: Antihypertensive Medication, Arterial-Hypertension, Blood-Pressure Response, Citation, Clinical-Trials, Control, Double-Blind, Embase, Health Outcomes, Interventions, Medline, Meta-Analysis, Mild Essential-Hypertension, Moderate Sodium Restriction, Normotensive Women, Oral Potassium, Outcomes, Placebo-Controlled Trial, Pressure, Primary, Review, Science, Science Citation Index, Search Strategy, Strategy, Systematic Review, Systematic Reviews

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Full Text: [2006\Coc Dat Sys Rev2006, CD005555.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD005555.pdf)

Abstract: Background Angle-closure glaucoma is characterized by obstruction to the outflow of aqueous humor and consequent rise in intraocular pressure. The obstruction may result from an anatomical predisposition of the eye or may be due to pathophysiologic processes in any part of the eye. The former is considered the primary form and the latter a secondary form of angle closure. Relative pupillary block obstructing free flow of aqueous from the posterior chamber of the eye to the anterior chamber is considered to be the most common mechanism of angle closure. Crowding of the angle is another mechanism, which of ten coexists with pupillary block. This can result from ananterior placement of the lens due to an increase in the thickness of the lens (as occurs with aging), anterior displacement by a posterior force (for example choroidal effusion), or laxity of the zonules. Objectives The objective of this review was to assess the effectiveness of lens extraction for chronic primary angle-closure glaucoma compared with other interventions for the condition in people without past history of acute-angle closure attacks. Search strategy We searched CENTRAL (2005, Issue 3), MEDLINE (1950 to April 2006), EMBASE (1980 to April 2006), and LILACS (to August 2005). We searched the reference lists of included studies and used the Science Citation Index database. Selection criteria In the absence of any randomized trials we included non-randomized studies comparing lens extraction with other treatment modalities for chronic primary angle-closure glaucoma including, but not limited to, laser iridotomy, medications, and laser iridoplasty. We excluded studies with a case-series design. Data collection and analysis Two authors independently extracted data on methodological quality of the included studies, outcomes for the review, and study characteristics including participant characteristics, interventions, and sources of funding. Differences were resolved through discussion. Main results We found no randomized trials evaluating the effects of lens extraction as a treatment for chronic primary angle-closure glaucoma. Two non-randomized comparative studies included in the review have several methodological flaws including selection bias. While these studies and other non-comparative studies provide information on biological plausibility and treatment effect they do not provide proof of effectiveness. Also, they do not address the question of how primary lens extraction compares with other treatments for chronic primary angle-closure glaucoma. Authors’ conclusions There is no evidence from good quality randomized trials or non-randomized studies of the effectiveness of lens extraction for chronic primary angle-closure glaucoma.

Keywords: Aging, Aqueous, Authors, Bias, Case Series, Characteristics, Chronic, Citation, Configuration, Criteria, Database, Disease, Effectiveness, Extracapsular Cataract-Extraction, Eyes, Funding, History, Implantation, Intraocular-Pressure, Mechanism, Medline, Outcomes, Phacoemulsification, Placement, Population, Primary, Review, Science, Science Citation Index, Selection, Singapore, Surgery, Treatment

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Full Text: [2006\Coc Dat Sys Rev2006, CD001865.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD001865.pdf)

Abstract: Background There is a trend towards greater patient involvement in healthcare decisions. Adequate discussion of the risks and benefits associated with different choices is often required if involvement is to be genuine and effective. Achieving both the adequate involvement of consumers and informed decision making are now seen as important goals for any screening programme. Personalised risk estimates have been shown to be effective methods of risk communication in general, but the effectiveness of different strategies has not previously been examined. Objectives To assess the effects of different types of personalised risk communication for consumers making decisions about taking screening tests. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 4, 2004), MEDLINE (1985 to December 2005), EMBASE (1985 to December 2005), CINAHL (1985 to December 2005), and PsycINFO (1989 to December 2005). Follow-up searches involved hand searching Preventive Medicine, citation searches on seven authors, and searching reference lists of articles. For the original version of this review (Edwards 2003c) we also searched CancerLit (1985 to 2001) and Science Citation Index Expanded (searched March 2002). Selection criteria Randomised controlled trials addressing the decision by consumers of whether or not to undergo screening, incorporating an intervention with a ‘personalised risk communication element’ and reporting cognitive, affective, or behavioural outcomes. A ‘personalised risk communication element’ is based on the individual’s own risk factors for a condition (such as age or family history). It may be calculated from an individual’s risk factors using formulae derived from epidemiological data, and presented as an absolute or relative risk or as a risk score, or it may be categorised into, for example, high, medium or low risk groups. It may be less detailed still, involving a listing, for example, of a consumer’s risk factors as a focus for discussion and intervention. Data collection and analysis Two authors independently assessed each trial for quality and extracted data. We extracted data about the nature and setting of the intervention, and relevant outcome data, along with items relating to methodological quality. We then used standard statistical methods of the Consumers and Communication Review Group to combine data using MetaView, including analysis according to different levels of detail of personalised risk communication, different condition for screening, and studies based only on high risk participants rather than people at ‘average’ risk. Main results Twenty-two studies were included, nine of which were added in the 2006 update of this review. There was weak evidence, consistent with a small effect, that personalised risk communication (whether written, spoken or visually presented) increases uptake of screening tests (odds ratio (OR) 1.31 (random effects, 95% confidence interval (CI) 0.98 to 1.77). In three studies the interventions showed a trend towards more accurate risk perception (OR 1.65 (95% CI 0.96 to 2.81), and three other trials with heterogenous outcome measures showed improvements in knowledge with personalised risk interventions. There was little other evidence from these studies that the interventions promoted or achieved informed decision making by consumers about participation in screening. More detailed personalised risk communication may be associated with a smaller increase in uptake of tests. That is, for personalised risk communication which used and presented numerical calculations of risk, the OR for test uptake was 0.82 (95% CI 0.65 to 1.03). For risk estimates or calculations which were categorised into high, medium or low strata of risk, the OR was 1.42 (95% CI 1.07 to 1.89). For risk communication that simply listed personal risk factors the OR was 1.42 (95% CI 0.95 to 2.12). Over half of the included studies assessed interventions in the context of mammography. These studies showed similar effects to the overall dataset. The five studies examining risk communication in high risk individuals (individuals at higher risk due to, for example, a family history of breast cancer or other conditions) showed larger odds ratios for uptake of tests than the other studies (random effects OR 1.74; 95% CI 1.05 to 2.88). There were insufficient data from the included studies to report odds ratios on other key outcomes such as: intention to take tests, anxiety, satisfaction with decisions, decisional conflict, knowledge and resource use. Authors’ conclusions Personalised risk communication (as currently implemented in the included studies) may have a small effect on increasing uptake of screening tests, and there is only limited evidence that the interventions have promoted or achieved informed decision making by consumers.

Keywords: African-American Women, Authors, Breast Cancer, Breast-Cancer Risk, Cancer, Cervical-Cancer, Citation, Colorectal-Cancer, Communication, Decision Making, Decision-Making, Embase, Health-Care, History, Intervention, Interventions, Involvement, Low-Income, Mammography Use, Medline, Outcomes, Perception, Public-Health, Randomized-Trial, Review, Risk Factors, Risk Groups, Science, Science Citation Index, Screening, Search Strategy, Statistical, Statistical Methods, Strategy, Tailored Interventions, Trend

? Rathbone, J. and Soares-Weiser, K. (2006), Anticholinergics for neuroleptic-induced acute akathisia. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD003727.

Full Text: [2006\Coc Dat Sys Rev2006, CD003727.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD003727.pdf)

Abstract: Background Neuroleptic-induced akathisia is one of the most common and distressing early-onset adverse effects of first generation ‘typical’ antipsychotic drugs. It is associated with poor compliance with treatment, and thus, ultimately, with an increased risk of relapse. We assessed the role of anticholinergic drugs as an adjunct therapy to standard antipsychotic medication in the pharmacological treatment of this adverse effect. Objectives To review anticholinergic drugs for neuroleptic-induced acute akathisia. Search strategy We searched the Cochrane Schizophrenia Group’s Register (October 1999), Biological Abstracts (1982-1999), CINAHL (1982-1999), Cochrane Library (Issue 4 1999), EMBASE (1980-1999), LILACS (1982-1999), MEDLINE (1966-1999) and PsycLIT (1974-1999). References of all identified studies were inspected for more trials and we contacted first authors. Each included study was sought as a citation on the Science Citation Index database. For this 2005-6 update, we searched the Cochrane Schizophrenia Group’s Register (July 2005). Selection criteria We included all randomised clinical trials of adjunctive anticholinergic drugs in addition to antipsychotic medication compared with placebo, for people with neuroleptic-induced acute akathisia. Data collection and analysis We quality assessed and extracted data independently. We calculated the fixed effects relative risk (RR), the 95% confidence intervals (CI) and, where appropriate, the number needed to treat (NNT) for homogeneous dichotomous data on an intention-to-treat basis. For continuous data, we calculated weighted mean differences (WMD). Main results We identified no relevant randomised controlled trials. Authors’ conclusions At present, there is no reliable evidence to support or refute the use of anticholinergics for people suffering from neuroleptic-induced acute akathisia. Akathisia is a distressing movement disorder that remains highly prevalent in people with schizophrenia, both in the developed and developing world. This review highlights the need for well designed, conducted and reported clinical trials to address the claims of open studies as regards the effects of the anticholinergic group of drugs for akathisia.

Keywords: Authors, Benztropine, Bias, Citation, Database, Disorder, Drugs, Medline, Metaanalysis, Propranolol, Quality, Randomized Trials, Review, Schizophrenia, Science Citation Index, Statistics Notes, Treatment

? Kumar, S., Shelley, M., Harrison, C., Coles, B., Wilt, T.J. and Mason, M.D. (2006), Neo-adjuvant and adjuvant hormone therapy for localised and locally advanced prostate cancer. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD006019.

Full Text: [2006\Coc Dat Sys Rev2006, CD006019.pdf](2006/Coc%20Dat%20Sys%20Rev2006,%20CD006019.pdf)

Abstract: Background Hormone therapy for early prostate cancer has demonstrated an improvement in clinical and pathological variables, but not always an improvement in overall survival. We performed a systematic review of both adjuvant and neo-adjuvant hormone therapy combined with surgery or radiotherapy in localised or locally advanced prostate cancer. Objectives The objective of this review was to undertake a systematic review and, if possible, a meta-analysis of neo-adjuvant and adjuvant hormone therapy in localised or locally advanced prostate cancer. Search strategy We searched MEDLINE (1966-2006), EMBASE, The Cochrane Library, Science Citation Index, LILACS, and SIGLE for relevant randomised trials. Handsearching of appropriate publications was also undertaken. Selection criteria Randomised or quasi-randomised controlled trials of patients with localised or locally advanced prostate cancer, that is, stages T1-T4, any N, M0, comparing neo-adjuvant or adjuvant hormonal deprivation in combination with primary therapy (radical radiotherapy or radical prostatectomy) versus primary therapy alone were included in this review. Data collection and analysis Data were extracted from eligible studies and assessed for quality, and included information on study design, participants, interventions, and outcomes. Comparable data were pooled together for meta-analysis with intention-to treat principle. Main results Men with prostate cancer have different clinical outcomes based on their risk (T1 - T2, T3 - T4, PSA levels and Gleason score). However, the majority of studies included in this review did not report results by risk groups; therefore, it was not possible to perform sub-group analysis. Neo-adjuvant hormonal therapy prior to prostatectomy did not improve overall survival (OR 1.11, 95% CI 0.67 to 1.85, P = 0.69). However, there was a significant reduction in the positive surgical margin rate (OR 0.34, 95% CI 0.27 to 0.42, P < 0.00001) and a significant improvement in other pathological variables such as lymph node involvement, pathological staging and organ confined rates. There was a borderline significant reduction of disease recurrence rates (OR 0.74, 95% CI 0.55 to 1.0, P = 0.05), in favour of treatment. The use of longer duration of neo-adjuvant hormones, that is either 6 or 8 months prior to prostatectomy, was associated with a significant reduction in positive surgical margins (OR 0.56, 95% CI 0.39 to 0.80, P = 0.002). In one study, neo-adjuvant hormones prior to radiotherapy significantly improved overall survival for Gleason 2 to 6 patients; although, in two studies, there was no improvement in disease-specific survival (OR 0.99, 95% CI 0.75 to 1.32, P = 0.97). However, there was a significant improvement in both clinical disease-free survival (OR 1.86, 95% CI 1.93 to 2.40, P < 0.00001) and biochemical disease-free survival (OR 1.93, 95% CI 1.45 to 2.56, P < 0.00001). Adjuvant androgen deprivation following prostatectomy did not significantly improve overall survival at 5 years (OR 1.50, 95% CI 0.79 to 2.85, P = 0.2); although one study reported a significant disease-specific survival advantage with adjuvant therapy (P = 0.001). In addition, there was a significant improvement in disease-free survival at both 5 years (OR 3.73, 95% CI 2.30 to 6.03, P < 0.00001) and 10 years (OR 2.06, 95% CI 1.34 to 3.15, P = 0.0009). Adjuvant therapy following radiotherapy resulted in a significant overall survival gain apparent at 5 (OR 1.46, 95% CI 1.17 to 1.83, P = 0.0009) and 10 years (OR 1.44, 95% CI 1.13 to 1.84, P = 0.003); although there was significant heterogeneity (P = 0.09 and P = 0.07, respectively). There was also a significant improvement in disease-specific survival (OR 2.10, 95% CI 1.53 to 2.88, P = 0.00001) and disease-free survival (OR 2.53, 95% CI 2.05 to 3.12, P < 0.00001) at 5 years. Authors’ conclusions Hormone therapy combined with either prostatectomy or radiotherapy is associated with significant clinical benefits in patients with local or locally advanced prostate cancer. Significant local control may be achieved when given prior to prostatectomy or radiotherapy, which may improve patient’s quality of life. When given adjuvant to these primary therapies, hormone therapy, not only provides a method for local control, but there is also evidence for a significant survival advantage. However, hormone therapy is associated with significant side effects, such as hot flushes and gynaecomastia, as well as cost implications. The decision to use hormone therapy should, therefore, be taken at a local level, between the patient, clinician and policy maker, taking into account the clinical benefits, toxicity and cost. More research is needed to guide the choice, the duration, and the schedule of hormonal deprivation therapy, and the impact of long-term hormone therapy with regard to toxicity and the patient’s quality of life.

Keywords: Adjuvant, Authors, Beam Radiation-Therapy, Bicalutamide 150 Mg, Cancer, Citation, Combined Androgen Blockade, Comparing Radical Prostatectomy, Criteria, Groups, Heterogeneity, Hormones, Impact, Local, Median Follow-up, Medline, Meta-Analysis, Outcomes, Phase-III Trial, Positive, Primary, Prospective Randomized-Trial, Publications, Reduction, Research, Resection Margin Status, Review, Risk, Science, Science Citation Index, Study Design, Suppression Plus Radiation, Surgery, Systematic Review, Therapy, Toxicity, Treatment, Unfavorable-Prognosis Carcinoma

? Zachos, M., Tondeur, M. and Griffiths, A.M. (2007), Enteral nutritional therapy for induction of remission in Crohn’s disease. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD000542.

Full Text: [2007\Coc Dat Sys Rev2007, CD000542.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD000542.pdf)

Abstract: Background The role of enteral nutrition in Crohn’s disease is controversial. Increasing research on the mechanisms by which nutritional therapy improves the clinical well being of patients with Crohn’s disease has led to novel formula design and trials comparing two different forms of enteral nutrition. This meta-analysis aims to provide an update on the existing effectiveness data for both corticosteroids versus enteral nutrition and for one form of enteral nutrition versus another for inducing remission of active Crohn’s disease.

Objectives To evaluate the effectiveness of exclusive enteral nutrition (EN) as primary therapy to induce remission in Crohn’s disease and to examine the importance of formula composition on effectiveness.

Search strategy Studies were selected using a computer-assisted search of the on-line bibliographic databases MEDLINE (1966-2006) and EMBASE (1984-2006), as well as the Science Citation Index on Web of Science. Additional citations were sought by manual search of references of articles retrieved from the computerized search, abstracts submitted to major gastroenterologic meetings and published in the journals: American Journal of Gastroenterology, Gut, Gastroenterology, Journal of Pediatric Gastroenterology and Nutrition, and Journal of Parenteral and Enteral Nutrition, and from the reviewers’ personal files or contact with leaders in the field.

Selection criteria All randomized and quasi-randomized controlled trials involving patients with active Crohn’s disease defined by a clinical disease activity index were considered for review. Studies evaluating the administration of one type of enteral nutrition to one group of patients and another type of enteral nutrition or conventional corticosteroids to the other group were selected for review.

Data collection and analysis Data were extracted independently by two authors and any discrepancies were resolved by rereading and discussion. For the dichotomous variable, achievement of remission, individual and pooled trial statistics were calculated as odds ratios (OR) with 95% confidence intervals (CI); both fixed and random effect models were used. The results for each analysis were tested for heterogeneity using the chi square statistic. The studies were separated into two groups: A. one form of enteral nutrition compared with another form of enteral nutrition and B. one form of enteral nutrition compared with corticosteroids. Subgroup analyses were conducted on the basis of clinical or disease criteria and formula composition. Sensitivity analyses were conducted on the basis of the inclusion of abstract publications, methodologic quality and by random or fixed effects models.

Main results In part A, of the 15 included eligible trials (one abstract) comparing different formulations of EN for the treatment of active CD, 11 compared one (or more) elemental formula to a non-elemental one, three compared enteral diets of similar protein composition but different fat composition, and one compared non-elemental diets differing only in glutamine enrichment. Meta-analysis of ten trials comprising 334 patients demonstrated no difference in the efficacy of elemental versus non-elemental formulas (OR 1.10; 95% CI 0.69 to 1.75). Subgroup analyses performed to evaluate the different types of elemental and non-elemental diets (elemental, semi-elemental and polymeric) showed no statistically significant differences. Further analysis of seven trials including 209 patients treated with EN formulas of differing fat content (low fat: < 20 g/ 1000 kCal versus high fat: > 20 g/ 1000 kCal) demonstrated no statistically significant difference in efficacy (OR 1.13; 95% CI 0.63 to 2.01). Similarly, the effect of very low fat content (< 3 g/ 1000 kCal) or type of fat (long chain triglycerides) were investigated, but did not demonstrate a difference in efficacy in the treatment of active CD, although a non significant trend was demonstrated favoring very low fat and very low long chain triglyceride content. This result should be interpreted with caution due to statistically significant heterogeneity and small sample size. Sensitivity analyses had no significant effects on the results. The role of specific fatty acids or disease characteristics on response to therapy could not be evaluated. In part B, eight trials (including two abstracts) comparing enteral nutrition to steroid therapy met the inclusion criteria for review. Meta-analysis of six trials that included 192 patients treated with enteral nutrition and 160 treated with steroids yielded a pooled OR of 0.33 favouring steroid therapy (95% CI 0.21 to 0.53). A sensitivity analysis including the abstracts resulted in an increase in the number of participants to 212 in the enteral nutrition group and 179 in the steroid group but the meta-analysis yielded a similar result (OR 0.36; 95% CI 0.23 to 0.56). There were inadequate data from full publications to perform further subgroup analyses by age, disease duration and disease location.

Authors’ conclusions Corticosteroid therapy is more effective than enteral nutrition for inducing remission of active Crohn’s disease as was found in previous systematic reviews. Protein composition does not influence the effectiveness of EN in the treatment of active CD. A non significant trend favouring very low fat and/or very low long chain triglyceride content exists but larger trials are required to explore the significance of this finding.

Keywords: Randomized Controlled-Trial, Inflammatory-Bowel-Disease, Defined-Formula Diet, Elemental Diet, Polymeric Diet, Clinical-Trials, Prednisolone, Children, Corticosteroids, Metaanalysis

? Jeffery, M., Hickey, B.E. and Hider, P.N. (2007), Follow-up strategies for patients treated for non-metastatic colorectal cancer. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD002200.

Full Text: [2007\Coc Dat Sys Rev2007, CD002200.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD002200.pdf)

Abstract: Background It is common clinical practice to follow patients with colorectal cancer (CRC) for several years following their definitive surgery and/or adjuvant therapy. Despite this widespread practice there is considerable controversy about how often patients should be seen, what tests should be performed and whether these varying strategies have any significant impact on patient outcomes. Objectives To review the available evidence concerning the benefits of intensive follow up of colorectal cancer patients with respect to survival. Secondary endpoints include time to diagnosis of recurrence, quality of life and the harms and costs of surveillance and investigations. Search strategy Relevant trials were identified by electronic searches of MEDLINE, EMBASE, CINAHL, CANCERLIT, Cochrane Controlled Trials Register, Science Citation Index, conference proceedings, trial registers, reference lists and contact with experts in the field. Selection criteria Only randomised controlled trials comparing different follow-up strategies for patients with non-metastatic CRC treated with curative intent were included. Data collection and analysis Trial eligibility and methodological quality were assessed independently by the three authors. Main results Eight studies were included in this update of the review. There was evidence that an overall survival benefit at five years exists for patients undergoing more intensive follow up OR was 0.73 (95% CI 0.59 to 0.91); and RD -0.06 (95% CI -0.11 to -0.02). The absolute number of recurrences was similar; OR was 0.91 (95% CI 0.75 to 1.10); and RD -0.02 (95% CI -0.06 to 0.02) and although the weighted mean difference for the time to recurrence was significantly reduced by -6.75 (95% CI -11.06 to -2.44) there was significant heterogeneity between the studies. Analyses demonstrated a mortality benefit for performing more tests versus fewer tests OR was 0.64 (95% CI 0.49 to 0.85), and RD -0.09 (95% CI -0.14 to -0.03) and liver imaging versus no liver imaging OR was 0.64 (95% CI 0.49 to 0.85), and RD -0.09 (95% CI -0.14 to -0.03). There were significantly more curative surgical procedures attempted in the intensively followed arm: OR 2.41(95%CI 1.63 to 3.54), RD 0.06 (95% CI 0.04 to 0.09). No useful data on quality of life, harms or cost-effectiveness were available for further analysis. Authors’ conclusions The results of our review suggest that there is an overall survival benefit for intensifying the follow up of patients after curative surgery for colorectal cancer. Because of the wide variation in the follow-up programmes used in the included studies it is not possible to infer from the data the best combination and frequency of clinic (or family practice) visits, blood tests, endoscopic procedures and radiological investigations to maximise the outcomes for these patients. Nor is it possible to estimate the potential harms or costs of intensifying follow up for these patients in order to adopt a cost-effective approach in this clinical area. Large clinical trials underway or about to commence are likely to contribute valuable further information to clarify these areas of clinical uncertainty.

Keywords: Authors, Cancer, Carcinoembryonic Antigen, Carcinoma, Citation, Clinical Trials, Colon-Cancer, Cost Effectiveness, Costs, Criteria, Curative Resection, Diagnosis, Heterogeneity, Impact, Medline, Outcomes, Quality-of-Life, Radical Surgery, Randomized Controlled-Trial, Rectal-Surgeons, Review, Science, Science Citation Index, Surgery, Surveillance Program, Survival, Therapy, Uncertainty

? Colli, A., Fraquelli, M., Massironi, S., Colucci, A., Paggi, S. and Conte, D. (2007), Elective surgery for benign liver tumours. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD005164.

Full Text: [2007\Coc Dat Sys Rev2007, CD005164.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD005164.pdf)

Abstract: Backgound Benign liver tumours (haemangioma, focal nodular hyperplasia, and hepatic adenoma) have different prevalence and prognosis. Spontaneous rupture and malignant transformation can complicate hepatic adenoma. Elective surgery is controversial, and indications are represented by uncertain diagnosis, presence of symptoms, and prevention of major complications. Objectives To assess the beneficial and harmful effects of elective surgery of benign liver tumours. We identified 31 cases series. These were small (with less than 60 participants) and the types of tumours mixed. These studies reported no significant mortality, but in the six studies with mortality it ranged from 1% to 17%. Search strategy The Cochrane Hepato-Biliary Group Controlled Trials Register and the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (searches in Issue 1, 2006), MEDLINE, EMBASE, Cancer Lit, and Science Citation Index Expanded (SCI-EXPANDED) (searched December 2005). A further search included the proceedings of major hepatological and surgical congresses (Annual Meetings of the American Association for the Study of the Liver (AASLD) and European Association for the Study of the Liver (EASL)), and examination of the references of relevant papers and reference lists of the identified studies. Selection criteria Randomised clinical trials in adult patients with benign liver tumours without indications for emergency surgery in which elective surgery (resection) versus no intervention or sham operation are compared. Data collection and analysis All trials identified through searches were evaluated for eligibility for inclusion. We intended to extract relevant data in order to analyse the outcomes as per our published protocol using intention-to-treat analysis. Main results We could not identify any randomised clinical trials. Authors’ conclusions We were unable to find evidence supporting or refuting elective surgery for patients with benign liver tumours. We need large, longterm randomised clinical trials with adequate methodology to assess the bene fi ts and harms of elective surgery.

Keywords: Authors, Cancer, Cavernous Hemangiomas, Citation, Clinical Trials, Clinical-Trials, Criteria, Diagnosis, Differential-Diagnosis, Focal Nodular Hyperplasia, Hepatic Hemangioma, Hepatocellular Adenoma, Intervention, Management, Medline, Methodology, Oral-Contraceptive Use, Outcomes, Prevalence, Prognosis, Randomized-Trials, Science, Science Citation Index, Surgery, Surgical-Treatment

? Gurusamy, K.S. and Samraj, K. (2007), Wound drains after incisional hernia repair. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD005570.

Full Text: [2007\Coc Dat Sys Rev2007, CD005570.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD005570.pdf)

Abstract: Incisional hernias are caused by the failure of the wall of the abdomen to close after abdominal surgery, leaving a hole through which the viscera protrude. Incisional hernias are repaired by further surgery. Surgical drains are frequently inserted during hernia repair with the aim of facilitating fluid drainage and preventing complications. Traditional teaching has recommended the use of drains after incisional hernia repair other than for laparoscopic ventral hernia repair. More than 50% of open mesh repairs of ventral hernias have drains inserted. However, there is uncertainty as to whether drains are associated with benefits or harms to the patient. To determine the effects on wound infection and other outcomes, of inserting a wound drain during surgery to repair incisional hernias, and, if possible, to determine the comparative effects of different types of wound drain after incisional hernia repair. We searched the Cochrane Wounds Group Specialised Register (last searched March 2006), the Cochrane Central Register of Controlled Trials (CENTRAL)(The Cochrane Library Issue 1, 2006), EMBASE (1974 to March 2006), PUBMED (1951 to March 2006), and Science Citation Index Expanded (1974 to March 2006). We also searched the meta-register of controlled trials. We considered all randomised trials performed in adult patients who underwent incisional hernia repair and that compared using a drain with no drain. We also considered trials that compared different types of drain. We extracted data on the characteristics of the trial, methodological quality of the trials, outcomes (e.g. infection and other wound complications) from each trial. For each outcome we calculated the risk ratio (RR) with 95% confidence intervals (CI) and based on intention-to-treat analysis. Only one trial was eligible for inclusion in the review with a total of 24 patients randomised to an electrified drain (12 patients) compared with a corrugated drain (12 patients). There were no statistically significant differences between the groups for any of the outcomes (a variety of measures of infection). There is insufficient evidence to determine whether wound drains after incisional hernia repair are associated with better or worse outcomes than no drains.

Keywords: Characteristics, Citation, Complications, Drainage, Groups, Mesh, Outcomes, Prevention, Review, Risk, Risk-Factors, Science, Science Citation Index, Selective Use, Seromas, Surgery, Surgical Site Infection, Thyroid-Surgery, Trials, Uncertainty, Ventral Hernias

? Gurusamy, K.S. and Samraj, K. (2007), Primary closure versus T-tube drainage after open common bile duct exploration. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD005640.

Full Text: [2007\Coc Dat Sys Rev2007, CD005640.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD005640.pdf)

Abstract: Between 5% and 11% of people undergoing cholecystectomy have common bile duct stones. Open common bile duct exploration is an important operation when endoscopic retrograde cholangio-pancreatography fails or when expertise for laparoscopic common bile duct exploration is not available. The optimal method for performing open common bile duct exploration is unclear. The aim is to assess the benefits and harms of primary closure versus routine T-tube drainage in open common bile duct exploration for common bile duct stones. We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until January 2006. We considered for inclusion all randomised clinical trials comparing primary closure (with or without biliary stent) versus T-tube drainage after open common bile duct exploration. We collected the data on the characteristics, methodological quality, mortality, morbidity, operating time, and hospital stay from each trial. We analysed the data with both the fixed-effect and the random-effects model using RevMan Analysis. For each outcome we calculated the odds ratio (OR) with 95% confidence intervals (CI) based on intention-to-treat analysis. We included five trials with 324 patients randomised: 165 to primary closure without stent and 159 to T-tube. Three of the five trials were considered to have adequate methodological quality, but all lacked blinded outcome assessment. The primary closure group had significantly lower positive bile culture (3 trials, OR 0.22, 95% CI 0.10 to 0.45) and wound infection (5 trials, OR 0.29, 95% CI 0.15 to 0.56). When only trials with high methodological quality were included, there was no statistically significant difference in any of the outcomes except positive bile culture, which became non-significant when the random- effects model was used. The deaths of the three patients in the T-tube group were directly related to surgery and sepsis. Bile peritonitis was higher in the T-tube group (2.9%) than in the primary closure group (1%) (not statistically significant). Hospital stay was significantly longer in the T-tube group compared with the primary closure group in three of the four trials, which reported on the hospital stay. The only trial comparing primary closure with stent (37 patients) versus T-tube drainage (44 patients) did not reveal any statistically significant difference in any of the reported outcomes (mortality, re-operations, wound infection, and hospital stay). There was one case of stent migration, which could not be retrieved after two attempts of ERCP. Primary closure after common bile duct exploration seems at least as safe as T-tube drainage. We need randomised trials that assess whether stents may offer benefits.

Keywords: Assessment, Bias, Characteristics, Choledochorrhaphy, Choledochotomy, Citation, Clinical Trials, Clinical-Trials, Culture, Drainage, Laparoscopic Cholecystectomy, Medline, Metaanalysis, Migration, Model, Outcomes, Positive, Primary, Quality, Randomized-Trials, Recurrent Choledocholithiasis, Science, Science Citation Index, Sphincterotomy, Surgery

? Gurusamy, K.S. and Samraj, K. (2007), Cholecystectomy versus no cholecystectomy in patients with silent gallstones. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD006230.

Full Text: [2007\Coc Dat Sys Rev2007, CD006230.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD006230.pdf)

Abstract: Background Cholecystectomy is currently advised only for patients with symptomatic gallstones. However, about 4% of patients with asymptomatic gallstones develop symptom including cholecystitis, obstructive jaundice, pancreatitis, and gallbladder cancer. Objectives To assess the benefits and harms of surgical removal of the gallbladder for patients with asymptomatic gallstones. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until 2006 for identifying the randomised trials using The Cochrane Hepato-Biliary Group search strategy. Selection criteria Only randomised clinical trials (irrespective of language, blinding, or publication status) comparing cholecystectomy and no cholecystectomy were considered for the review. Data collection and analysis We were unable to identify any randomised clinical trials comparing cholecystectomy versus no cholecystectomy. Main results We were unable to identify any randomised clinical trial comparing cholecystectomy versus no cholecystectomy. Authors’ conclusions There are no randomised trials comparing cholecystectomy versus no cholecystectomy in patients with silent gallstones. Further evaluation of observational studies, which measure outcomes such as obstructive jaundice, gallstone-associated pancreatitis, and/or gall-bladder cancer for sufficient duration of follow-up is necessary before randomised trials a redesigned in order to evaluate whether cholecystectomy or no cholecystectomy is better for a symptomatic gallstones.

Keywords: Acute Cholecystitis, Acute-Pancreatitis, Asymptomatic Gallstones, Authors, Bile-Duct Stones, Cancer, Citation, Clinical Trials, Criteria, Evaluation, Gallbladder Cancer, Language, Laparoscopic Transcystic Management, Medline, Outcomes, Porcelain Gallbladder, Publication, Randomized-Trials, Removal, Review, Science, Science Citation Index, Shock-Wave Therapy, Tert-Butyl Ether

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Full Text: [2007\Coc Dat Sys Rev2007, MR000002.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20MR000002.pdf)

Abstract: Background Most journals try to improve their articles by technical editing processes such as proof-reading, editing to conform to ‘house styles’ and grammatical conventions. Despite the considerable resources devoted to technical editing, we do not know whether it improves the accessibility of biomedical research findings or the utility of articles. Objectives To assess the effects of technical editing on research reports in peer-reviewed biomedical journals. Search strategy We searched the Cochrane Library Issue 1, 2001, MEDLINE (last searched February 2000), 12 other databases, handsearched 9 journals and checked relevant articles for further references. We also searched the Internet and contacted researchers and experts in the field. Selection criteria Prospective or retrospective comparative studies of technical editing processes applied to original research articles in biomedical journals. Data collection and analysis Two reviewers independently assessed each study against the selection criteria and assessed the methodological quality of each study. One reviewer extracted the data, and the second reviewer repeated this. Main results We located 18 studies addressing technical editing and 35 surveys of reference accuracy. Only two of the studies were randomized controlled trials. A ‘package’ of largely unspecified editorial processes applied between acceptance and publication was associated with improved readability in two studies and improved reporting quality in another two studies, while another study showed mixed results after stricter editorial policies were introduced. More intensive editorial processes were associated with fewer errors in abstracts and references. Providing instructions to authors was associated with improved reporting of ethics requirements in one study and fewer errors in references in two studies, but no difference was seen in the quality of abstracts in one randomized controlled trial. Structuring generally improved the quality of abstracts, but increased their length. The reference accuracy studies showed a median citation error rate of 39% and a median quotation error rate of 20%. Authors’ conclusions Surprisingly few studies have evaluated the effects of technical editing rigorously. However there is some evidence that the ‘package’ of technical editing used by biomedical journals does improve papers.

Keywords: Acceptance, Accuracy, Analysis, Biomedical, Biomedical Journals, Biomedical Research, Citation, Citation Error, Clinical-Trials, Collection, Controlled Trial, Criteria, Data, Databases, Editorial Policies, Error, Error Rate, Errors, Ethics, Evidence, Experts, Field, General Surgical Journals, Internal-Medicine, Internet, Journals, Length, Medical Journals, MEDLINE, Original Research Articles, Papers, Peer-Reviewed, Policies, Publication, Quality, Quality of, Quotation, Quotation Error, Randomized, Randomized Controlled Trial, Randomized Controlled Trials, Reference, Reference Accuracy, Reference Citations, References, Reporting, Research, Selection Criteria, Structured Abstracts, Surveys, Trial, Utility

? Gurusamy, K.S. and Samraj, K. (2007), Routine abdominal drainage for uncomplicated open cholecystectomy. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD006003.

Full Text: [2007\Coc Dat Sys Rev2007, CD006003.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD006003.pdf)

Abstract: Background Cholecystectomy is the removal of gallbladder and is performed mainly for symptomatic gallstones. Although laparoscopic cholecystectomy is currently preferred over open cholecystectomy for elective cholecystectomy, reports of randomised clinical trials comparing the choice of cholecystectomy (open or laparoscopic) in acute cholecystitis are still being conducted. Drainage in open cholecystectomy is a matter of considerable debate. Surgeons use drains primarily to prevent subhepatic abscess or bile peritonitis from an undrained bile leak. Critics of drain condemn drain use as it increases wound and chest infection. Objectives To assess the benefits and harms of routine abdominal drainage in uncomplicated open cholecystectomy. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until April 2006. Selection criteria We included randomised clinical trials comparing ‘no drain’ versus ‘drain’ in patients who had undergone uncomplicated open cholecystectomy (irrespective of language, publication status, and the type of drain). Randomised clinical trials comparing one drain with another were also included. Data collection and analysis We collected the data on the characteristics and methodological quality of each trial, number of abdominal collections requiring different treatments, bile peritonitis, wound infection, chest complications, and hospital stay from each trial. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each outcome, we calculated the odds ratio (OR) with 95% confidence intervals (CI) based on intention-to-treat analysis. Main results Twenty eight trials involving 3659 patients were included. There were 20 comparisons of ‘no drain’ versus ‘drain’ and 12 comparisons of one drain with another. There was no statistically significant difference in mortality, bile peritonitis, total abdominal collections, abdominal collections requiring different treatments, or infected abdominal collections. ‘No drain’ group had statistically significant lower wound infection (OR 0.61, 95% CI 0.43 to 0.87) and statistically significant lower chest infection (OR 0.59, 95% CI 0.42 to 0.84) than drain group. We found no significant differences between different types of drains. Authors’ conclusions Drains increase the harms to the patient without providing any additional benefit for patients undergoing open cholecystectomy and should be avoided in open cholecystectomy.

Keywords: Acute Cholecystitis, Authors, Characteristics, Citation, Clinical Trials, Closed-Suction, Criteria, Drainage, Elective Cholecystectomy, Language, Laparoscopic Cholecystectomy, Medline, Metaanalysis, Models, Peritoneal Drainage, Publication, Quality, Randomized Clinical-Trial, Removal, Science, Science Citation Index, Subhepatic Collections, Suction Drainage

? Shelley, M., Wilt, T.J., Coles, B. and Mason, M.D. (2007), Cyrotherapy for localised prostate cancer. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD005010.

Full Text: [2007\Coc Dat Sys Rev2007, CD005010.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD005010.pdf)

Abstract: Background Prostate cancer is a common cancer in elderly men and in some will prove fatal. Standard treatments for localised disease include surgery (radical prostatectomy), radiotherapy and active monitoring. New emerging therapies are being evaluated with the aim of reducing the complication rate associated with standard therapies, as well as developing an effective treatment. One such modality is cryotherapy, a procedure that introduces probes directly into the prostate tumour and kills the malignant cells by a freezing process. Objectives This review aims to evaluate the relative clinical and economic benefits of cryotherapy compared to standard therapies for the primary treatment of localised prostate cancer. Search strategy Our search strategy included an electronic search of MEDLINE from 1996 to December 2006, plus EMBASE (Exerpta Medica Database), the Cochrane library, ISI Science Citation Index, Database of Abstracts and Reviews of Effectiveness (DARE), and LILACS to identify all relevant published randomised trials of cryotherapy for localised prostate cancer. Cancerlit (R) and HealthSTAR databases were searched to their final date. Handsearching of relevant journals was undertaken. Selection criteria Only published randomised trials comparing the effectiveness of cryotherapy with radical prostatectomy, radiotherapy or active monitoring for the primary treatment of men with localised prostate cancer were eligible for inclusion in this review. Data collection and analysis Data were extracted from eligible studies, and included study design, participants, interventions and outcomes. Primary outcome measures were biochemical disease-free survival, disease-free survival and treatment-induced complications. Secondary outcomes included disease-specific survival, overall survival, quality-of-life outcome measures and economic impact measures. Main results There were no randomised trials found comparing cryotherapy with other therapies for the primary treatment of localised prostate cancer. All studies identified were case series. To indicate the level of the available evidence, studies that evaluated cryotherapy as a primary therapy, using transrectal ultrasound guidance and urethral warming in at least 50 patients with localised prostate cancer, and a minimum of one year follow up, were reviewed. Eight case series were identified that complied with these criteria; two were retrospective. The patients recruited (n = 1483) had an age range from 41 to 84 years, stages T1 = 0 to 43%, T2 = 24 to 88%, T3 = 1 to 41%, and T4 = 0 to 14%. The mean preoperative PSA level ranged from 9.7 to 39 ng/mL, with Gleason scores < 7 and ranging from 6 to 37%. One additional study that compared cryotherapy (total cryotherapy and standard cryotherapy with urethral preservation) with radical prostatectomy was also identified and reviewed. In this study the success rates, defined as a post-treatment PSA of 0.2 ng/mL or less, were reported as 96% for total cryotherapy, 49% for standard cryotherapy and 73% for radical prostatectomy. Four studies did not monitor the temperature of the cyro-procedure and reported 17 to 28% of patients had a positive biopsy following cryotherapy with a mean PSA nadir of 0.55 to 1.75 ng/mL (median 0.4 to 1.85 ng/mL). The other four studies used thermocouples to monitor the temperature of the cryo-procedure and reported progression-free survival rates of 71 to 89% with 1.4 to 13% of patients having a positive biopsy post-cryotherapy. At 5 years, overall survival was reported as 89 to 92% in two studies, and disease-specific survival as 94% in one study. The major complications observed in all studies included impotence (47 to 100%), incontinence (1.3 to 19%), and urethral sloughing (3.9 to 85%), with less common complications of fistula (0 to 2%), bladder-neck obstruction (2 to 55%), stricture (2.2 to 17%) and pain (0.4 to 3.1%). Most patients were sent home the following day (range 1 to 4 days). Authors’ conclusions Cryotherapy offers a potential alternative to standard therapies for the primary treatment of localised prostate cancer. However, the poor quality of the available studies makes it difficult to determine the relative benefits of this modality. Randomised trials are needed to fully evaluate the full potential of cryotherapy in men with this disease. Patients selecting cryotherapy as their therapeutic option should be made fully aware of the reported efficacy, complications and the low-grade evidence from which these data are derived.

Keywords: Authors, Cancer, Carcinoma, Case Series, Citation, Complications, Criteria, Cryosurgical Ablation, Database, Databases, Economic, Effectiveness, Elderly, Impact, ISI, Journals, Medline, Outcomes, Pain, Percutaneous Cryoablation, Positive, Preservation, Primary, Prostate, Radical Prostatectomy, Review, Science, Science Citation Index, Statistics, Study Design, Surgery, Temperature, Therapy, Treatment, Ultrasound

? Ezra, D.G. and Allan, B.D. (2007), Topical anaesthesia alone versus topical anaesthesia with intracameral lidocaine for phacoemulsification. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD005276.

Full Text: [2007\Coc Dat Sys Rev2007, CD005276.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD005276.pdf)

Abstract: Background Cataract is defined as loss of transparency of the natural lens and is usually an age-related phenomenon. The only recognized treatment available for cataract involves surgery. An ideal anaesthetic should allow for pain-free surgery with no systemic or local complications. It should be cost effective and should facilitate a stress-free procedure for surgeon and patient alike. Topical anaesthesia involves applying anaesthetic eye drops to the surface of the eye prior to and during surgery. This has found large acceptance especially in the USA where it is used by 61% of cataract surgeons. Many surgeons who perform cataract surgery under topical anaesthesia also use intraoperative supplementary intracameral lidocaine (injected directly into the anterior chamber of the eye). The benefits and possible risks of intracameral lidocaine have been assessed by a number of randomized controlled trials, but the results have been conflicting and many of the endpoints have been heterogeneous. Objectives The primary objective of this systematic review was to assess pain during surgery and patient satisfaction with topical anaesthesia alone compared to topical anaesthesia with intracameral anaesthesia for phacoemulsification. The secondary objectives were to assess adverse effects and complications attributable to choice of anaesthesia and the need for additional anaesthesia during surgery. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (T h e Cochrane Library 2006, Issue 2), MEDLINE (1966 to May 2006), EMBASE (1980 to May 2006) and LILACs (1982 to 3May 2006). We also searched the reference lists of the identified studies and the Science Citation Index. We did not have any language restriction. Selection criteria We included only randomized controlled trials (RCTs) comparing topical anaesthesia alone to topical anaesthesia with intracameral lidocaine. Data collection and analysis Two authors independently assessed trial quality and extracted data. For dichotomous outcomes data were presented as odds ratios. For continuous outcomes the weighted mean difference was employed. A random-effects model was used unless there were fewer than three trials in a comparison, where a fixed-effect model was used. We explored heterogeneity between trial results using a chi-squared test. Main results A total of eight trials comprising of 1281 patients were identified for analysis. Our data comparison showed a significantly lower intraoperative pain perception in patient groups using supplementary intracameral lidocaine, although the difference was small. No significant difference was demonstrated between the groups receiving topical anaesthesia alone and topical combined with intracameral anaesthesia in terms of the need for supplemental anaesthesia, intraoperative adverse events or corneal toxicity. Authors’ conclusions The use of intracameral unpreserved 1% lidocaine is an effective and safe adjunct to topical anaesthesia for phacoemulsification cataract surgery.

Keywords: 1-Percent, Anaesthesia, Anterior-Chamber Irrigation, Authors, Cataract, Cataract-Surgery Survey, Citation, Comparison, Corneal Endothelium, Criteria, Efficacy, Extraction, Groups, Heterogeneity, Language, Local, Medline, Model, Outcomes, Pain, Primary, Randomized Controlled Trials, Review, Safety, Science, Science Citation Index, Surgery, Systematic Review, Toxicity, Treatment, Trial, Unpreserved Lidocaine, USA

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Full Text: [2007\Coc Dat Sys Rev2007, CD006001.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD006001.pdf)

Abstract: Background Postoperative morbidity and mortality are high in patients undergoing pancreatico-duodenectomy for malignant pancreatico-biliary stricture. Different approaches have been tried to improve the outcomes, including pre-surgical biliary stenting with endoscopic retrograde cholangiopancreaticography (ERCP). Objectives To assess the beneficial and harmful effects of biliary stenting via ERCP for pancreatico-biliary stricture confirmed or suspected to be malignant, prior to surgery. Search strategy We identified trials through The Cochrane Hepato-Biliary Group Controlled Trials Register (October 2006), the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (Issue 2, 2006), MEDLINE (1950 to October 2006), EMBASE (1980 to October 2006), and Science Citation Index Expanded (1945 to October 2006). We also searched the references in the published papers and wrote to stent producers. Selection criteria Randomised trials comparing ERCP with biliary stenting versus ERCP without biliary stenting for pancreatico-biliary malignancy prior to surgery. Data collection and analysis Two authors independently selected trials for inclusion and extracted data. The primary pre-surgical, post-surgical, and final outcome measures were mortality. The secondary outcomes were complications such as cholangitis, pancreatitis, bleeding, pancreatic fistula, intra-abdominal abscess, improvement in bilirubin, and quality of life. Dichotomous outcomes were reported as odds ratio (OR) with 95% confidence interval (CI) based on fixed- and random-effect models. Main results We identified two randomised trials with 125 patients undergoing pancreatico-duodenectomy; 62 patients underwent ERCP with biliary stenting and 63 had ERCP without biliary stenting prior to surgery. Pre-surgical mortality was not significantly affected by stenting (OR 3.14, 95% CI 0.12 to 79.26), while there were significantly more complications in the stented group (OR 43.75, 95% CI 2.51 to 761.8). Stenting had no significant effect on the post-surgical mortality (OR 0.75, 95% CI 0.25 to 2.24). However, post-surgical complications were significantly less in the stented group (OR 0.45, 95% CI 0.22 to 0.91). Overall mortality (OR 0.81, 95% CI 0.17 to 3.89) and complications (OR 0.50, 95% CI 0.01 to 23.68) were not significantly different in the two groups. Authors’ conclusions We could not find convincing evidence to support or refute endoscopic biliary stenting on the mortality in patients with pancreatico-biliary malignancy. Large randomised trials are needed to settle the question of pre-surgical biliary stenting.

Keywords: Authors, Bile-Ducts, Citation, Clinical-Trials, Criteria, Decompression, Groups, Hilar Cholangiocarcinoma, Management, Medline, Models, Obstructive-Jaundice, Outcome Following Pancreaticoduodenectomy, Outcomes, Postoperative Complications, Preoperative Biliary Drainage, Primary, Randomized-Trials, Science, Science Citation Index, Surgery

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Full Text: [2007\Coc Dat Sys Rev2007, CD000515.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD000515.pdf)

Abstract: Background Endovascular treatment by transluminal balloon angioplasty or stent insertion may be a useful alternative to carotid endarterectomy. Objectives To assess the benefits and risks of endovascular treatment compared with carotid endarterectomy or medical therapy. Search strategy We searched the Cochrane Stroke Group trials register (last searched 14 March 2007) and the following bibliographic databases: Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, Issue 1, 2007), MEDLINE (1950 to March 2007), EMBASE (1980 to March 2007) and Science Citation Index (1945 to March 2007). We also contacted researchers in the field. Selection criteria We selected randomised trials of endovascular treatment compared with endarterectomy or medical therapy for carotid artery stenosis. Data collection and analysis One review author independently applied the inclusion criteria, extracted data and assessed trial quality. Search results were validated by a second review author. Main results Data were available from 12 trials (3227 patients) but not all contributed to each analysis. The primary outcome comparison of any stroke or death within 30 days of treatment favoured surgery (odds ratio (OR) 1.39, P = 0.02, not significant (NS) in the random-effects model). The following outcome comparisons favoured endovascular treatment over surgery: cranial neuropathy (OR 0.07, P < 0.01); 30 day neurological complication or death (OR 0.62, P = 0.004, NS in the random-effects model, with significant heterogeneity). The following outcome comparisons showed little difference between endovascular treatment and surgery: 30 day stroke, myocardial infarction or death (OR 1.11, P = 0.57 with significant heterogeneity); stroke during long-term follow up (OR 1.00). Comparison between endovascular treatment with or without protection device showed no significant difference in 30 day stroke or death (OR 0.77, P = 0.42 with significant heterogeneity). Analysis of stroke or death within 30 days of the procedure in asymptomatic carotid stenosis showed no difference (OR 1.06, P = 0.96). In patients not suitable for surgery, there was no significant difference in 30 day stroke or death (OR 0.39, P = 0.09 with significant heterogeneity). Authors’ conclusions The data are difficult to interpret because the trials are heterogeneous (different patients, endovascular procedures, and duration of follow up) and five trials were stopped early, perhaps leading to an over-estimate of the risks of endovascular treatment. The pattern of effects on different outcomes does not support a change in clinical practice away from recommending carotid endarterectomy as the treatment of choice for suitable carotid artery stenosis.

Keywords: \*Angioplasty,Balloon, \*Carotid Artery,Internal, \*Stents, Authors, Balloon Angioplasty, Carotid Stenosis [\*Therapy], Cerebral Protection, Change, Citation, Clinical-Trial, Comparison, Criteria, Databases, Disease, Endarterectomy, EVA-3S Trial, Follow-up, Heterogeneity, High-Risk Patients, Humans, Medical, Medline, Model, Neurological, Outcomes, Primary, Randomized Controlled Trials, Randomized-Trial, Researchers, Review, Science, Science Citation Index, Stroke, Surgery, Therapy, Trans-Luminal Angioplasty, Treatment

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Full Text: [2007\Coc Dat Sys Rev2007, CD004003.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD004003.pdf)

Abstract: Background Trachoma is a major cause of avoidable blindness. It is responsible for about six million blind people worldwide, mostly in the poor communities of developing countries. One of the major strategies advocated for the control of the disease is the application of various environmental sanitary measures to such communities.

Objectives To assess the evidence for the effectiveness of environmental sanitary measures on the prevalence of active trachoma in endemic areas.

Search strategy We searched the Cochrane Central Register of Controlled Trials - CENTRAL in The Cochrane Library (Issue 2, 2007), MEDLINE (1966 to July 2007), EMBASE (1980 to July 2007), LILACS (July 2007), reference list of trials and the Science Citation Index. We also contacted agencies, experts and researchers in trachoma control.

Selection criteria We included randomised and quasi-randomised controlled trials comparing any form of environmental hygiene measures with no measure. These hygiene measures included fly control, provision of water and health education. Participants in the trials were people normally resident in the trachoma endemic areas.

Data collection and analysis Two authors independently extracted data and assessed the quality of trials. Study authors were contacted for additional information. Four trials met the inclusion criteria but meta-analysis was not conducted due to heterogeneity of the studies.

Main results Two studies that assessed insecticide spray as a fly control measure found that trachoma is reduced by at least 55% to 61% with this measure compared to no intervention. However, another study did not find insecticide spray to be effective in reducing trachoma. One study found that another fly control measure, latrine provision, reduced trachoma by 29.5% compared to no intervention; this was, however, not statistically significantly different. Another study revealed that health education on personal and household hygiene reduced the incidence of trachoma such that the odds of reducing trachoma in the health education village was about twice that of the no intervention village. However, all the studies have some methodological concerns relating to concealment of allocation and non-consideration of clustering effect in data analysis.

Authors’ conclusions The role of insecticide spray as a fly control measure in reducing trachoma remains unclear. Latrine provision as a fly control measure has not demonstrated significant trachoma reduction. Health education may be effective in reducing trachoma. There is a dearth of data to determine the effectiveness of all aspects of environmental sanitation in the control of trachoma.

Keywords: Diptera, Health Education [Methods], Insect Control, Insecticides, Randomized Controlled Trials, Sanitation [\* Methods], Toilet Facilities, Trachoma [\* Prevention & Control, Transmission], Safe Strategy, Evidence Base, Fly Control, Diarrhea, Trial

? Suwan-apichon, O., Reyes, J.M., Herretes, S., Vedula, S.S. and Chuck, R.S. (2007), Topical corticosteroids as adjunctive therapy for bacterial keratitis. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD05430.

Full Text: [2007\Coc Dat Sys Rev2007, CD05430.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD05430.pdf)

Abstract: Background Bacterial keratitis is a serious ocular infectious disease that can lead to severe visual disability. Risk factors for bacterial corneal infection include contact lens wear, ocular surface disease, corneal trauma and previous ocular or eyelid surgery. Topical antibiotics constitute the mainstay of treatment in cases of bacterial keratitis where as the use of topical corticosteroids remains controversial. Topical corticosteroids are usually used to control inflammation using the smallest amount of the drug. Their use requires optimal timing, concomitant antibiotics and careful follow up. Objectives The objective of the review was to assess the clinical effectiveness and adverse effects of corticosteroids as adjunctive therapy for bacterial keratitis. Search strategy We searched CENTRAL, MEDLINE, EMBASE, and LILACS up to 15 January 2007. We also searched the Science Citation Index to identify additional studies that had cited the included trial, an online database of ongoing trials (www.clinicaltrials.gov), reference lists of included trials, earlier reviews and the American Academy of Ophthalmology guidelines. We also contacted experts to identify any unpublished and ongoing randomized trials. Selection criteria We included randomized controlled trials evaluating adjunctive therapy with topical corticosteroids in people with bacterial keratitis. Data collection and analysis Two review authors independently screened all the retrieved articles. Methodological quality of the one included trial was assessed using forms developed using pre-specified criteria by at least two review authors. We planned to extract data on outcomes using forms developed for the purpose. We planned to report risk ratios for dichotomous outcomes and mean differences for continuous outcomes. Main results A single trial was eligible for inclusion in the review. Participants in the trial were randomized using a random numbers table. Allocation concealment was not attempted. Masking of participants, and care-providers was also not attempted. Outcome assessment was conducted independently by two physicians. Neither was masked to the treatment allocation. The trial reported the healing rate of epithelial defects and improvement in visual acuity. Authors’ conclusions There are no good quality randomized trials evaluating the effects of adjunct use of topical corticosteroids in bacterial keratitis. The only randomized trial we identified in the literature suffered from major methodological inadequacies.

Keywords: Antibiotics, Articles, Assessment, Authors, Ciprofloxacin, Citation, Contact-Lenses, Corneal Ulcers, Criteria, Database, Diffuse Lamellar Keratitis, Effectiveness, In-Situ Keratomileusis, Lead, Literature, Medline, Microbial Keratitis, Ofloxacin, Online Database, Outcomes, Predisposing Factors, Review, Risk, Risk-Factors, Science, Science Citation Index, Surgery, Therapy, Trauma, Treatment, Ulcerative Keratitis

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Full Text: [2007\Coc Dat Sys Rev2007, CD006032.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD006032.pdf)

Abstract: Background Traumatic optic neuropathy (TON) is an important cause of severe visual loss following blunt or penetrating head trauma. Following the initial injury, optic nerve swelling within the optic nerve canal can result in secondary retinal ganglion cell loss. Optic nerve decompression with steroids or surgical interventions or both has therefore been advocated as a means of improving visual prognosis in TON. Objectives The aim of this review was to examine the effectiveness and safety of using steroids in TON. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (Issue 1, 2007), MEDLINE (1966 to February 2007), EMBASE (1980 to February 2007), LILACS (March 2007) and NRR (Issue 1, 2007). We also searched the reference lists of included studies, other reviews and book chapters on TON to find references to additional trials. The Science Citation Index was used to look for papers that cited the studies included in this review. We did not manually search any journals or conference proceedings. Trial investigators and experts in the field were contacted to identify additional published and unpublished studies. There were no date or language restrictions in the electronic searches for trials. Selection criteria We planned to include only randomised controlled trials (RCTs) of TON in which any steroid regime, either on its own or in combination with surgical optic nerve decompression, was compared to surgery alone or no treatment. Data collection and analysis Two review authors independently assessed the titles and abstracts identified from the electronic searches. Main results No studies were found that met our selection criteria and therefore none were included for analysis. Authors’ conclusions There is a relatively high rate of spontaneous visual recovery in TON and no convincing data that steroids provide any additional benefit over observation alone. Recent evidence also suggests a possible detrimental effect of steroids in TON and further studies are urgently needed to clarify this important issue. Based on the current literature, TON cases presenting more than eight hours after the initial injury should not be treated with steroids. The decision to initiate treatment for patients seen within the eight-hour window remains controversial and the supporting evidence is weak. Each case therefore needs to be assessed on an individual basis and proper informed consent is paramount. An adequately powered RCT of steroids in TON poses difficult challenges and is probably not feasible.

Keywords: Authors, Blindness, Citation, Consent, Controlled Trial, Corticosteroids, Criteria, Decompression, Effectiveness, Head-Injury, Journals, Language, Literature, Management, Medline, Methylprednisolone, Nerve Trauma, Nonsurgical Treatment, Prognosis, Recovery, Review, Science, Science Citation Index, Selection, Spinal-Cord-Injury, Surgery, Swelling, Trauma, Treatment

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Full Text: [2007\Coc Dat Sys Rev2007, CD006233.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD006233.pdf)

Abstract: Back ground Cholecystectomy is not required in up to 64% of patients who adopt a wait-and-see policy after endoscopic clearance of common bile duct stones. Although reports of retrospective cohort series have shown a higher mortality among patients who defer cholecystectomy, it is not known if this is due to the patients’ premorbid health status or due to the deferral of cholecystectomy. Randomised clinical trials of prophylactic cholecystectomy versus wait-and-see have not had sufficient power to demonstrate differences in survival. Objectives To evaluate the beneficial and harmful effects of cholecystectomy deferral (wait-and-see) versus elective (prophylactic) cholecystectomy in patients who have had an endoscopic biliary sphincterotomy. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Controlled Trials Register (CENTRAL) in The Cochrane Library, MEDLINE (1966 to 2007), EMBASE (1980 to 2007), and Science Citation Index Expanded without language restrictions until April 2007. Selection criteria Randomised clinical trials comparing patients whose gallbladder was left in-situ after endoscopic sphincterotomy (wait-and-see group) versus patients who had cholecystectomy with either endoscopic sphincterotomy or common bile duct exploration (prophylactic cholecystectomy group), irrespective of blinding, language, or publication status. Data collection and analysis We assessed the impact of a wait-and-see policy on mortality. Secondary outcomes assessed were the incidence of biliary pain, cholangitis, pancreatitis, need for cholangiography, need for cholecystectomy, and the rate of difficult cholecystectomy. We pooled data using relative risk with fixed-effect and random-effects models. Main results We included 5 randomised trials with 662 participants out of 93 publications identified through the literature searches. The number of deaths was 47 in the wait-and- see group (334 patients) compared to 26 in the prophylactic cholecystectomy group (328 patients) for a 78% increased risk of mortality (RR 1.78, 95% CI 1.15 to 2.75, P = 0.010). The survival benefit of prophylactic cholecystectomy was independent of trial design, inclusion of high risk patients or inclusion of any one of the five trials. Patients in the wait-and- see group had higher rates of recurrent biliary pain (RR 14.56, 95% CI 4.95 to 42.78, P < 00001), jaundice or cholangitis (RR 2.53, 95% CI 1.09 to 5.87, P = 0.03), and of repeat ERCP or other forms of cholangiography (RR 2.36, 95% CI 1.29 to 4.32, P = 0.005). Cholecystectomy was eventually performed in 35% (115 patients) of the wait-and- see group. Authors’ conclusions Prophylactic cholecystectomy should be offered to patients whose gallbladders remain in-situ after endoscopic sphincterotomy and common bile duct clearance.

Keywords: Authors, Bile-Duct Stones, Calculi, Citation, Clinical Trials, Cohort, Criteria, Health, Health Status, High Risk, High-Risk, Impact, In-Situ, Language, Laparoscopic Cholecystectomy, Literature, Management, Medline, Models, Outcomes, Pain, Publication, Publications, Randomized-Trial, Risk, Science, Science Citation Index, Surgery

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Full Text: [2007\Coc Dat Sys Rev2007, CD006409.pdf](2007/Coc%20Dat%20Sys%20Rev2007,%20CD006409.pdf)

Abstract: Background Vascular occlusion is used to reduce blood loss during liver resection surgery. There is considerable controversy regarding whether vascular occlusion should be used or not during elective liver resections. The method of vascular occlusion employed is also controversial. There is also considerable debate on the role of ischaemic preconditioning before vascular occlusion. Objectives To assess the advantages (decreased blood loss and peri-operative morbidity) and disadvantages (liver dysfunction from ischaemia) of vascular occlusion during liver resections. To compare the advantages (in decreasing blood loss or decreasing ischaemia-reperfusion injury) and disadvantages of different types of vascular occlusion versus total, continuous portal triad clamping. Search strategy We searched TheCochraneHepato-BiliaryGroupControlledTrialsRegister,the Cochrane Central Register of Controlled Trials(CENTRAL)in The Cochrane Library,MEDLINE,EMBASE,and Science Citation Index Expanded until March 2007. Selection criteria We included randomised clinical trials comparing vascular occlusion versus no vascular occlusion during elective liver resections (irrespective of language or publication status). We also included randomised clinical trials comparing the different methods of vascular occlusion and those investigating the role of ischaemic preconditioning in liver resection. Data collection and analysis We collected the data on the characteristics of the trial, methodological quality of the trials, mortality, morbidity, blood loss, blood transfusion requirements, liver function tests, markers of neutrophil activation, operating time, and hospital stay. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each binary outcome we calculated the odds ratio (OR) with 95% confidence intervals (CI) based on intention-to-treat analysis. For continuous outcomes, we calculated the weighted mean difference (WMD) with 95% confidence intervals. Main results We identified a total of 16 randomised trials. Five trials including 331 patients compared vascular occlusion (n= 166) versus no vascular occlusion (n=165). Six trials including 521 patients compared different methods of vascular occlusion. Three trials including 210 patients compared ischaemic preconditioning before continuous portal triad clamping (n= 105) versus no ischaemic preconditioning (n= 105). Two trials including 127 patients compared ischaemic preconditioning before continuous portal triad clamping (n= 63) versus intermittent portal triad clamping (n= 64). The blood loss was significantly lower in vascular occlusion compared with no vascular occlusion. The liver enzymes were significantly elevated in the vascular occlusion group compared with no vascular occlusion. There was no difference in the mortality, liver failure, or other morbidities. Four of the five trials comparing vascular occlusion and no vascular occlusion used intermittent vascular occlusion. Trials comparing complete inflow and outflow occlusion to the liver, ie, hepatic vascular exclusion and portal triad clamping demonstrate significant detrimental haemodynamic changes in hepatic vascular exclusion compared to portal triad clamping. There was no significant difference in the number of units transfused and the number of patients needing transfusion. There was no difference in mortality, liver failure, or morbidity between total and selective methods of portal triad clamping. All four cases of mortality and liver failure in the comparison between the intermittent and continuous portal triad clamping occurred in the continuous portal triad clamping (statistically not significant). Intermittent portal triad clamping does not increase the total blood loss or operating time compared to continuous portal triad clamping. There was no statistically significant difference in the mortality, liver failure, morbidity, blood loss, or haemodynamic changes between ischaemic preconditioning versus no ischaemic preconditioning before continuous portal triad clamping. Liver enzymes used as markers of liver injury were significantly lower in the early post-operative period in the ischaemic preconditioning group. The intensive therapy unit stay and hospital stay were statistically significantly lower in the ischaemic preconditioning group than in the no ischaemic preconditioning group. There was no statistically significant difference in the mortality, liver failure, morbidity, intensive therapy unit stay, or hospital stay between ischaemic preconditioning before continuous portal triad clamping and intermittent portal triad clamping. The blood loss and transfusion requirements were lower in the ischaemic preconditioning group. Aspartate aminotransferase level was lower in the intermittent portal triad clamping group than the ischaemic preconditioning group on the third post-operative day. There was no difference in the peak aspartate aminotransferase levels or in the aspartate aminotransferase levels on first or sixth post-operative days of aspartate aminotransferase. Authors’ conclusions Intermittent vascular occlusion seems safe in liver resection. However, it does not seem to decrease morbidity. Among the different methods of vascular occlusion, intermittent portal triad clamping has most evidence to support the clinical application. Hepatic vascular exclusion cannot be recommended routinely. Ischaemic preconditioning before continuous portal triad clamping may be of clinical benefit in reducing intensive therapy unit and hospital stay.

Keywords: 100 Consecutive Patients, Activation, Authors, Blood-Loss, Characteristics, Citation, Clinical Trials, Comparison, Criteria, Donor Procurement, Hepatic Gene-Expression, Hepatocellular-Carcinoma, Intermittent Pringle Maneuver, Ischemia-Reperfusion Injury, Language, Methods, Models, Noncirrhotic Patients, Outcomes, Portal Triad, Publication, Randomized Clinical-Trial, Science, Science Citation Index, Surgery, Therapy

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Full Text: [2008\Coc Dat Sys Rev2008, CD004265.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD004265.pdf)

Abstract: Background Diarrhoea is a common cause of morbidity and a leading cause of death among children aged less than five years, particularly in low- and middle-income countries. It is transmitted by ingesting contaminated food or drink, by direct person-to-person contact, or from contaminated hands. Hand washing is one of a range of hygiene promotion interventions that can interrupt the transmission of diarrhoea-causing pathogens.

Objectives To evaluate the effects of interventions to promote hand washing on diarrhoeal episodes in children and adults.

Search strategy InMay 2007, we searched the Cochrane Infectious Diseases Group Specialized Register, CENTRAL (The Cochrane Library 2007, Issue 2), MEDLINE, EMBASE, LILACS, PsycINFO, Science Citation Index and Social Science Citation Index, ERIC (1966 toMay 2007), SPECTR, Bibliomap, RoRe, The Grey Literature, and reference lists of articles. We also contacted researchers and organizations in the field.

Data collection and analysis Two authors independently assessed trial eligibility and methodological quality. Where appropriate, incidence rate ratios (IRR) were pooled using the generic inverse variance method and random-effects model with 95% confidence intervals (CI).

Main results Fourteen randomized controlled trials met the inclusion criteria. Eight trials were institution-based, five were community-based, and one was in a high-risk group (AIDS patients). Interventions promoting hand washing resulted in a 29% reduction in diarrhoea episodes in institutions in high-income countries (IRR 0.71, 95% CI 0.60 to 0.84; 7 trials) and a 31% reduction in such episodes in communities in low- or middle-income countries (IRR 0.69, 95% CI 0.55 to 0.87; 5 trials).

Authors’ conclusion Hand washing can reduce diarrhoea episodes by about 30%. This significant reduction is comparable to the effect of providing clean water in low-income areas. However, trials with longer follow up and that test different methods of promoting hand washing are needed.

Keywords: Randomized Controlled-Trial, Day-Care-Centers, Water-Sanitation Behaviors, Reduce Childhood Diarrhea, Critical Control Points, Peruvian Shanty-Town, Burkina-Faso, Hygiene Behavior, Educational Intervention, Handwashing-Promotion

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Full Text: [2008\Coc Dat Sys Rev2008, CD004935.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD004935.pdf)

Abstract: Background Lifestyle interventions are often recommended as initial treatment for mild hypertension, but the efficacy of relaxation therapies is unclear. Objectives To evaluate the effects of relaxation therapies on cardiovascular outcomes and blood pressure in people with elevated blood pressure. Search strategy We searched the Cochrane Library, MEDLINE, EMBASE, Science Citation Index, ISI Proceedings, ClinicalTrials. gov, Current Controlled Trials and reference lists of systematic reviews, meta-analyses and randomised controlled trials (RCTs) included in the review. Selection criteria Inclusion criteria: RCTs of a parallel design comparing relaxation therapies with no active treatment, or sham therapy; follow-up >= 8 weeks; participants over 18 years, with raised systolic blood pressure (SBP) >= 140mmHg or diastolic blood pressure (DBP) >= 85mmHg); SBP and DBP reported at end of follow-up. Exclusion criteria: participants were pregnant; participants received antihypertensive medication which changed during the trial. Data collection and analysis Two reviewers independently extracted data and assessed trial quality. Disagreements were resolved by discussion or a third reviewer. Random effects meta-analyses and sensitivity analyses were conducted. Main results 29 RCTs, with eight weeks to five years follow-up, met our inclusion criteria; four were excluded from the primary meta-analysis because of inadequate outcome data. The remaining 25 trials assessed 1,198 participants, but adequate randomisation was confirmed in only seven trials and concealment of allocation in only one. Only one trial reported deaths, heart attacks and strokes (one of each). Metaanalysis indicated that relaxation resulted in small, statistically significant reductions in SBP (mean difference: -5.5 mmHg, 95% CI: -8.2 to -2.8, I2 = 72%) and DBP (mean difference: -3.5 mmHg, 95% CI: -5.3 to -1.6, I2 = 75%) compared to control. The substantial heterogeneity between trials was not explained by duration of follow-up, type of control, type of relaxation therapy or baseline blood pressure. The nine trials that reported blinding of outcome assessors found a non-significant net reduction in blood pressure (SBP mean difference: -3.2 mmHg, 95% CI: -7.7 to 1.4, I(2) = 69%) associated with relaxation. The 15 trials comparing relaxation with sham therapy likewise found a non-significant reduction in blood pressure (SBP mean difference: -3.5 mmHg, 95% CI: -7.1 to 0.2, I(2) = 63%). Authors’ conclusions In view of the poor quality of included trials and unexplained variation between trials, the evidence in favour of causal association between relaxation and blood pressure reduction is weak. Some of the apparent benefit of relaxation was probably due to aspects of treatment unrelated to relaxation.

Keywords: Biofeedback-Assisted Relaxation, Blood-Pressure Biofeedback, Borderline Essential Hypertension, Citation, Control, Coronary-Heart-Disease, Density-Lipoprotein-Cholesterol, Efficacy, Embase, Individualized Stress Management, Interventions, Medline, Meta-Analysis, Mild Essential-Hypertension, Older African-Americans, Outcomes, Pressure, Primary, Progressive Muscle-Relaxation, Randomized Controlled-Trial, Review, Science, Science Citation Index, Search Strategy, Strategy, Systematic Reviews

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Full Text: [2008\Coc Dat Sys Rev2008, CD005619.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD005619.pdf)

Abstract: Background This review is one in a series of Cochrane reviews of interventions for shoulder disorders. Objectives To determine the effectiveness and safety of surgery for rotator cuff disease. Search strategy We searched the Cochrane Controlled Trials Register, (The Cochrane Library Issue 1, 2006), MEDLINE, EMBASE, CINAHL, Sports Discus, Science Citation Index (Web of Science) in March 2006 unrestricted by date or language. Selection criteria Only studies described as randomised or quasi-randomised clinical trials (RCTs) studying participants with rotator cuff disease and surgical interventions compared to placebo, no treatment, or any other treatment were included. Data collection and analysis Two independent review authors assessed methodological quality of each included trial and extracted data. Main results We included 14 RCTs involving 829 participants. Eleven trials included participants with impingement, two trials included participants with rotator cuff tear and one trial included participants with calcific tendinitis. No study met all methodological quality criteria and minimal pooling could be performed. Three trials compared either open or arthroscopic subacromial decompression with active non operative treatment (exercise programme, physiotherapy regimen of exercise and education, or graded physiotherapy strengthening program). No differences in outcome between these treatment groups were reported in any of these trials. One trial which also included a placebo arm (12 sessions detuned soft laser) reported that the Neer score of participants in both active treatment arms improved significantly more than those who received placebo at six months. Six trials that compared arthroscopic with open subacromial decompression reported no significant differences in outcome between groups at any time point although four trials reported a quicker recovery and/or return to work with arthroscopic decompression. Adverse events, which occurred in three trials and included infection, capsulitis, pain, deltoid atrophy, and reoperation, did not differ between surgical groups. Authors’ conclusions Based upon our review of 14 trials examining heterogeneous interventions and all susceptible to bias, we cannot draw firm conclusions about the effectiveness or safety of surgery for rotator cuff disease. There is “Silver” (www.cochranemsk.org) level evidence from three trials that there are no significant differences in outcome between open or arthroscopic subacromial decompression and active non-operative treatment for impingement. There is also “Silver” level evidence from six trials that there are no significant differences in outcome between arthroscopic and open subacromial decompression although four trials reported earlier recovery with arthroscopic decompression.

Keywords: Arthroscopic Subacromial Decompression, Authors, Bias, Calcifying Tendinitis, Citation, Clinical Trials, Criteria, Double-Blind, Education, Effectiveness, Follow-up, General-Practice, Groups, Language, Medline, Mini-Open Repair, Pain, Placebo, Randomized Controlled-Trial, Recovery, Review, Science, Science Citation Index, Shock-Wave Therapy, Shoulder Pain, Stage-Ii Impingement, Surgery, Treatment, Web Of Science

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Full Text: [2008\Coc Dat Sys Rev2008, CD005656.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD005656.pdf)

Abstract: Background Macular edema is secondary to leakage from diseased retinal capillaries and is an important cause of poor central visual acuity in patients with diabetic retinopathy. Objectives This review evaluated the effectiveness and safety of intraocular steroids in treating diabetic macular edema (DME). Search strategy We searched CENTRAL, MEDLINE, EMBASE in June 2007, reference lists, Science Citation Index and conference proceedings. Selection criteria We included randomized clinical trials (RCTs) evaluating any form of intravitreal steroids for treating DME. Data collection and analysis Two authors independently assessed eligibility, methodological quality and extracted data. We performed meta-analyses when appropriate. Main results Seven studies, involving 632 DME eyes were included. Four examined the effectiveness of intravitreal triamcinolone acetate injection (IVTA), three examined intravitreal steroids implantation (fluocinolone acetonide implant (FAI) or dexamethasone drug delivery system (DDS)). Two trials were at low risk of bias, one was at median risk of bias, two were at high risk of bias and the remaining two were at unclear risk of bias. The preponderance of data suggest a beneficial effect from IVTA. Comparing IVTA with controls, the mean difference in visual acuity was -0.15 LogMAR (95% CI -0.21 to -0.09) at 3 months (based on three trials), -0.23 LogMAR (95% CI -0.33 to -0.13) at 6 months (two trials), -0.29 LogMAR (95% CI -0.47 to -0.11) at 9months (one trial), and -0.11 LogMAR (95% CI -0.20 to -0.03) at 24 months (one trial), all in favor of IVTA. The relative risk (RR) for one or more lines improvement in visual acuity was 2.85 (95% CI 1.59 to 5.10) at 3 months (two trials), 1.25 (95% CI 0.66 to 2.38) at 6 months (one trial), and 2.17 (95% CI 1.15 to 4.11) at 24 months (one trial), all in favor of IVTA. We did not find evidence for three or more lines improvement in visual acuity. The mean difference in retinal thickness was -131.97 um (95% CI -169.08 to -94.86) at 3 months (two trials), -135.00 um (95% CI -194.50 to -75.50) at 6 months (one trial), -133.00 um (95% CI -199.86 to -66.14) at 9 months (one trial), and -59.00 um (95% CI -103.50 to -14.50) at 24 months (one trial), all in favor of IVTA. The RR for at least one grade macular edema resolution was 5.15 (95% CI 2.23 to 11.88) at 3 months in favor of IVTA (one trial). Two trials reported improved clinical outcome when FAI was compared to standard of care. Beneficial effect was also observed in one dexamethasone DDS trial. Increased intraocular pressure and cataract formation were side effects requiring monitoring and management. Authors’ conclusions RCTs included in this review suggest that steroids placed inside the eye by either intravitreal injection or surgical implantation may improve visual outcomes in eyes with persistent or refractory DME. Since the studies in our report focused on chronic or refractory DME, the question arises whether intravitreal steroids therapy could be of value in other stages of DME, especially the earlier stages either as standalone therapy or in combination with other therapies, such as laser photocoagulation.

Keywords: Authors, Bias, Cataract, Chronic, Citation, Clinical Trials, Complications, Criteria, Diffuse, Effectiveness, High Risk, High-Risk, Injection, Management, Medline, Outcomes, Prospective Controlled-Trial, Randomized Clinical Trials, Randomized Clinical-Trial, Resolution, Retinopathy, Review, Risk, Science, Science Citation Index, System, Therapy, Triamcinolone Acetonide

? Gurusamy, K.S., Junnarkar, S., Farouk, M. and Davidson, B.R. (2008), Day-case versus overnight stay in laparoscopic cholecystectomy. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD006798.

Full Text: [2008\Coc Dat Sys Rev2008, CD006798.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD006798.pdf)

Abstract: Background Although day-case elective laparoscopic cholecystectomy can save bed costs, its safety remains to be established. Objectives To assess the safety and benefits of day-case surgery compared to overnight stay in patients undergoing elective laparoscopic cholecystectomy. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until February 2007 for identifying randomised trials using search strategies. Selection criteria Only randomised clinical trials, irrespective of language, blinding, or publication status, comparing day-case and overnight stay in elective laparoscopic cholecystectomy were considered for the review. Data collection and analysis We collected the data on the characteristics of the trial, methodological quality of the trials, morbidity, prolonged hospitalisation, re-admissions, pain and quality of life from each trial. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each outcome we calculated the relative risk, weighted mean difference, or standardised mean difference with 95% confidence intervals (CI) based on available case-analysis. Main results Five trials with 429 patients randomised to the day-case group (215) and overnight stay group (214) were included in the review. Four of the five trials were of low risk of bias regarding randomisation and follow up, but all lacked blinding. The trials recruited 49% of patients undergoing cholecystectomy. The selection criteria varied, but most included only patients without other diseases. The patients were living in easy reach of the hospital and with a responsible adult to take care of them. On the day of surgery, 81% of day-case patients were discharged. The drop-out rate after randomisation varied from 6.5% to 12.7%. There was no significant difference between day-case and overnight stay group as regards to morbidity, prolongation of hospital stay, re-admission rates, pain, quality of life, patient satisfaction and return to normal activity and work. Authors’ conclusions Day-case elective laparoscopic cholecystectomy seems to be a safe and effective intervention in selected patients (with no or minimal systemic disease and within easy reach of the hospital) with symptomatic gallstones. Because of the decreased hospital stay, it is likely to save costs.

Keywords: Authors, Bias, Characteristics, Citation, Clinical Trials, Clinical-Trial, Complications, Costs, Criteria, Day-Care, Intervention, Language, Medline, Metaanalysis, Models, Outpatient, Pain, Population, Prevalence, Prospective Randomized-Trial, Publication, Quality, Review, Risk, Science, Science Citation Index, Selection, Surgery

? Hackett, M.L., Anderson, C.S., House, A. and Halteh, C. (2008), Interventions for preventing depression after stroke. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD003689.

Full Text: [2008\Coc Dat Sys Rev2008, CD003689.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD003689.pdf)

Abstract: Background Depression is an important consequence of stroke that impacts on recovery yet often is not detected or is inadequately treated. Objectives To determine if pharmaceutical or psychological interventions can prevent depression and improve physical and psychological outcomes in patients with stroke. Search strategy We searched the Trials Registers of the Cochrane Stroke Group (October 2007) and the Cochrane Depression Anxiety and Neurosis Group (February 2008). In addition, we searched the Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 1, 2008), MEDLINE (1966 to May 2006), EMBASE (1980 to May 2006), CINAHL (1982 to May 2006), PsycINFO (1967 to May 2006), Applied Science and Technology Plus (1986 to May 2006), Arts and Humanities Index (1991 to September 2002), Biological Abstracts (1969 to September 2002), BIOSIS Previews (2002 to May 2006), General Science Plus (1994 to September 2002), Science Citation Index (1992 to May 2006), Social Sciences Citation Index (1991 to May 2006), SocioFile (1974 to May 2006) ISI Web of Science (2002 to February 2008), reference lists, trial registers, conference proceedings and dissertation abstracts, and contacted authors, researchers and pharmaceutical companies. Selection criteria Randomised controlled trials comparing pharmaceutical agents with placebo, or psychotherapy against standard care (or attention control) to prevent depression in patients with stroke. Data collection and analysis Two review authors independently selected trials, extracted data and assessed trial quality. Primary analyses were the proportion of patients who met the standard diagnostic criteria for depression applied in the trials at the end of follow up. Secondary outcomes included depression scores on standard scales, physical function, death, recurrent stroke and adverse effects. Main results Fourteen trials involving 1515 participants were included. Data were available for 10 pharmaceutical trials (12 comparisons) and four psychotherapy trials. The time from stroke to entry ranged from a few hours to seven months, but most patients were recruited within one month of acute stroke. The duration of treatment ranged from two weeks to one year. There was no clear effect of pharmacological therapy on the prevention of depression or other endpoints. A significant improvement in mood and the prevention of depression was evident for psychotherapy, but the treatment effects were small. Authors’ conclusions A small but significant effect of psychotherapy on improving mood and preventing depression was identified. More evidence is required before recommendations can be made about the routine use of such treatments after stroke.

Keywords: Adverse Effects, Analyses, Analysis, Care, Collection, Control, Criteria, Data, Death, Depression, Diagnostic Criteria, Duration, Evidence, Follow-Up, Function, Impacts, Improvement, Interventions, ISI, ISI Web of Science, MEDLINE, Outcomes, Patients, Pharmaceutical Agents, Physical, Placebo, Prevention, Psychotherapy, Psycinfo, Quality, Recommendations, Recovery, Recurrent, Review, Scales, Science Citation Index, Small, Standard, Stroke, Therapy, Treatment, Trial, Web of Science

? Hart, M.G., Grant, R., Garside, R., Rogers, G., Somerville, M. and Stein, K. (2008), Chemotherapeutic wafers for high grade glioma. *Cochrane Database of Systematic Reviews*, **3**, Article Number: CD007294.

Full Text: [2008\Coc Dat Sys Rev2008, CD007294.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD007294.pdf)

Abstract: Background Standard treatment for high grade glioma (HGG) usually entails biopsy or surgical resection where possible followed by radiotherapy. Systemic chemotherapy is usually only given in selected cases and its use is often limited by side effects. Implanting wafers impregnated with chemotherapy agents into the resection cavity represents a novel means of delivering drugs to the central nervous system (CNS) with fewer side effects. It is not clear how effective this modality is or whether it should be recommended as part of standard care for HGG. Objectives To assess whether chemotherapeutic wafers have any advantage over conventional therapy for HGG. Search strategy The following databases were searched: The Cochrane Central Register of Controlled Trials (CENTRAL), Issue 2, 2007, MEDLINE, EMBASE, SCIENCE CITATION INDEX, Physician Data Query and the meta-Register of Controlled Trials. Reference lists of all identified studies were searched. The Journal of Neuro-Oncology was hand searched from 1999 to 2007, including all conference abstracts. Neuro-oncologists were contacted regarding ongoing and unpublished trials. Selection criteria Patients included those of all ages with a presumed diagnosis of malignant glioma from clinical examination and radiology. Interventions included insertion of chemotherapeutic wafers to the resection cavity at either primary surgery or for recurrent disease. Included studies had to be randomised controlled trials (RCTs). Data collection and analysis Quality assessment and data extraction were undertaken by two review authors. Outcome measures included survival, time to progression, quality of life (QOL) and adverse events. Main results In primary disease two RCTs assessing the effect of carmustine impregnated wafers (Gliadel) and enrolling a total of 272 participants were identified. Survival was increased (hazard ratio (HR) 0.65 confidence interval (CI) 0.48 to 0.86 p = 0.003). In recurrent disease a single RCT was included assessing the effect of Gliadel and enrolling 222 participants. It did not demonstrate a significant survival increase (HR 0.83 CI 0.62 to 1.10 p = 0.2). There was no suitable data for time to progression or QOL. Adverse events were not more common in either arm, and were presented in a descriptive fashion. Authors’ conclusions Gliadel results in a prolongation of survival without an increased incidence of adverse events when used as primary therapy. There is no evidence of enhanced progression free survival (PFS) or QOL. In recurrent disease, Gliadel does not appear to confer any added benefit. These findings are based on the results of three RCTs with approximately 500 patients in total.

Keywords: Assessment, Authors, Brain-Tumors, Citation, Citation Indexes, Citation-Index, Clinical-Trials, Controlled-Trial, Criteria, Databases, Diagnosis, Glioblastoma-Multiforme, Index, Indexes, Interstitial Chemotherapy, Local Chemotherapy, Malignant Glioma, Management, Medline, Primary, Progression, Quality Assessment, Radiotherapy, Review, Science, Science Citation, Science Citation Index, Science-Citation-Index, Surgery, System, Therapy, Treatment

? Wager, E. and Middleton, P. (2008), Technical editing of research reports in biomedical journals. *Cochrane Database of Systematic Reviews*, **4**, Article Number: MR000002.

Full Text: [2008\Coc Dat Sys Rev2008, MR000002.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20MR000002.pdf)

Abstract: Background Most journals try to improve their articles by technical editing processes such as proof-reading, editing to conform to ‘house styles’, grammatical conventions and checking accuracy of cited references. Despite the considerable resources devoted to technical editing, we do not know whether it improves the accessibility of biomedical research findings or the utility of articles. This is an update of a Cochrane methodology review first published in 2003. Objectives To assess the effects of technical editing on research reports in peer-reviewed biomedical journals, and to assess the level of accuracy of references to these reports. Search strategy. We searched The Cochrane Library Issue 2, 2007; MEDLINE (last searched July 2006); EMBASE (last searched June 2007) and checked relevant articles for further references. We also searched the Internet and contacted researchers and experts in the field. Selection criteria Prospective or retrospective comparative studies of technical editing processes applied to original research articles in biomedical journals, as well as studies of reference accuracy. Data collection and analysis Two review authors independently assessed each study against the selection criteria and assessed the methodological quality of each study. One review author extracted the data, and the second review author repeated this. Main results We located 32 studies addressing technical editing and 66 surveys of reference accuracy. Only three of the studies were randomised controlled trials. A ‘package’ of largely unspecified editorial processes applied between acceptance and publication was associated with improved readability in two studies and improved reporting quality in another two studies, while another study showed mixed results after stricter editorial policies were introduced. More intensive editorial processes were associated with fewer errors in abstracts and references. Providing instructions to authors was associated with improved reporting of ethics requirements in one study and fewer errors in references in two studies, but no difference was seen in the quality of abstracts in one randomised controlled trial. Structuring generally improved the quality of abstracts, but increased their length. The reference accuracy studies showed a median citation error rate of 38% and a median quotation error rate of 20%. Authors’ conclusions Surprisingly few studies have evaluated the effects of technical editing rigorously. However there is some evidence that the ‘package’ of technical editing used by biomedical journals does improve papers. A substantial number of references in biomedical articles are cited or quoted inaccurately.

Keywords: Acceptance, Accuracy, Accuracy Of References, American-Medical-Association, Analysis, Authors, Biomedical, Biomedical Journals, Biomedical Research, Citation, Citation Error, Clinical-Trials, Collection, Controlled Trial, Criteria, Data, Editorial Policies, Effects, Error, Error Rate, Errors, Ethics, Evidence, Experts, Field, First, General Surgical Journals, Internet, Journals, Length, Medline, Methodology, Original Research Articles, Papers, Peer-Reviewed, Policies, Publication, Quality, Quality Assessment, Quality of, Quotation, Quotation Accuracy, Quotation Error, Randomised, Randomised Controlled Trial, Randomised Controlled Trials, Reference, Reference Accuracy, Reference Citations, References, Reporting, Research, Resources, Review, Selection, Selection Criteria, Strategy, Structured Abstracts, Surveys, Trial, Utility, Vascular-Anesthesia

? Gurusamy, K.S., Samraj, K., Fusai, G. and Davidson, B.R. (2008), Early versus delayed laparoscopic cholecystectomy for biliary colic. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD007196.

Full Text: [2008\Coc Dat Sys Rev2008, CD007196.pdf](2008/Coc%20Dat%20Sys%20Rev2008,%20CD007196.pdf)

Abstract: Background Biliary colic is one of the commonest indications for laparoscopic cholecystectomy. Laparoscopic cholecystectomy involves several months of waiting if performed electively. However, patients can develop life-threatening complications during this waiting period. Objectives To assess the benefits and harms of early versus delayed laparoscopic cholecystectomy for patients with biliary colic due to gallstones. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Control led Trials in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until March 2008. Selection criteria We included only randomised clinical trials irrespective of language and publication status. Data collection and analysis Two authors independently extracted the data. We intended to calculate the risk ratio, risk difference with 95% confidence intervals (CI) for dichotomous outcomes, and weighted mean difference (WMD) with 95% CI for continuous outcomes using RevMan 4.2 based on intention-to-treat analysis. Main results Only one trial including 75 patients, randomised to early laparoscopic cholecystectomy (less than 24 hours of diagnosis) (n = 35) and delayed laparoscopic cholecystectomy (mean waiting period of 4.2 months) (n = 40), qualified for this review. This trial was of high risk of bias. During the waiting period in the delayed group (mean 4.2 months), the complications that the patients suffered included severe acute pancreatitis resulting in mortality (1), empyema of gallbladder (1), gallbladder perforation (1), acute cholecystitis (2), cholangitis (2), obstructive jaundice (2), and recurrent biliary colic requiring hospital visits (5). The rate of conversion to open cholecystectomy was lower in the early group (0%) than the delayed group (8/ 40 or 20%) (p = 0.0172). There was a statistically significant shorter operating time and hospital stay in the early group than the delayed group (WMD - 14.80 minutes, 95% CI -18.02 to -11.58 and -1.25 days, 95% CI -2.05 to - 0.45 respectively). Fourteen patients (35%) required 18 hospital admissions for symptoms related to gallstones during the mean waiting period of 4.2 months in the delayed group. This is equivalent to 11 admissions per 100 persons per month. Authors’ conclusions Based on evidence fromonly one high- bias risk trial, it appears that early laparoscopic cholecystectomy (< 24 hours of diagnosis of biliary colic) decreases the morbidity during the waiting period for elective laparoscopic cholecystectomy, decreases the rate of conversion to open cholecystectomy, decreases operating time, and decreases hospital stay. Further randomised clinical trials are necessary to confirm or refute this finding.

Keywords: Acute Cholecystitis, Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Criteria, Diagnosis, Gallstone Disease, High Risk, High-Risk, Language, Medline, Metaanalysis, Outcomes, Population, Prevalence, Publication, Quality, Randomized-Trials, Review, Risk, Science, Science Citation Index, Surgery

? Samuel, M., Chow, P.K.H., Shih-Yen, E.C., Machin, D. and Soo, K.C. (2009), Neoadjuvant and adjuvant therapy for surgical resection of hepatocellular carcinoma. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD001199.

Full Text: [2009\Coc Dat Sys Rev2009, CD001199.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD001199.pdf)

Abstract: Background Hepatocellular carcinoma is a disease of great concern. Surgery is the treatment of choice, but there is still a high recurrence rate after resection. Objectives To determine the benefits and harms of neoadjuvant and adjuvant therapies compared to surgery alone or surgery and placebo/supportive therapy after curative resection for operable hepatocellular carcinoma. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, Chinese Biomedical Database, and US National Cancer Institute’s Physician’s Data Query Trials Database until 2005. References of the identified trials were also searched for identifying further trials. Selection criteria Randomised and quasi-randomised trials that compared hepatocellular carcinoma patients who were given and not given neoadjuvant/adjuvant therapy as a supplement to curative liver resection. Data collection and analysis Data were extracted independently by two authors and discrepancies resolved by consensus. The survival and disease-free survival curves were compared using their one, two, three, four, and five-year survival rates, median survival times, and the result of the significance tests (P-values). Main results A total of 12 randomised trials were identified, totaling 843 patients. The size of the randomised clinical trials ranged from 30 to 155 patients. Both preoperative (neoadjuvant) and postoperative (adjuvant), systemic and locoregional (+/-embolisation), chemo-and immunotherapy interventions were tested. Treatment regimens and patients selected were not comparable, so no pooling was done. Only one regimen using preoperative transcatheter arterial chemoembolisation with doxorubicin was similar in two trials. Four of the twelve trials reported survival benefit at five years when given adjuvant or neoadjuvant therapy. Disease-free survival was reported in nine trials, and the estimated hazard ratios show that disease-free survival was significant in two trials at five years. These two trials had not shown a survival advantage, but the recurrence was significantly lower in patients given adjuvant or neoadjuvant therapy. The highest toxicity rate was in a trial using oral 1-hexylcarbamoyl 5-fluorouracil which resulted in 12 out of 38 patients being withdrawn from the trial because of adverse events. Authors’ conclusions There is no clear evidence for efficacy of any of the adjuvant and neo-adjuvant protocols reviewed, but there is some evidence to suggest that adjuvant therapy may be beneficial offering prolonged disease-free survival. In order to detect a realistic treatment advantage, larger trials with lower risk of systematic error will have to be conducted.

Keywords: 5-Fluorouracil, Authors, Cancer, Chemotherapy, Citation, Clinical Trials, Clinical-Trials, Controlled-Trials, Criteria, Curative Resection, Database, Empirical-Evidence, End-Points, Intrahepatic Recurrence, Medline, Postoperative Interferon Therapy, Quality, Randomized-Trials, Risk, Science, Science Citation Index, Surgery, Therapy, Toxicity, Treatment, US

? Chavez-Tapia, N.C., Soares-Weiser, K., Brezis, M. and Leibovici, L. (2009), Antibiotics for spontaneous bacterial peritonitis in cirrhotic patients. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD002232.

Full Text: [2009\Coc Dat Sys Rev2009, CD002232.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD002232.pdf)

Abstract: Background Spontaneous bacterial peritonitis is a complication of cirrhotic ascites that occurs in the absence of any intra-abdominal, surgically treatable source of infection. Antibiotic therapy is indicated and should be initiated as soon as possible to avoid severe complications that may lead to death. It has been proposed that empirical treatment should cover gram-negative enteric bacteria and gram-positive cocci, responsible for up to 90% of spontaneous bacterial peritonitis cases. Objectives This review aims to evaluate the beneficial and harmful effects of different types and modes of antibiotic therapy in the treatment of spontaneous bacterial peritonitis in cirrhotic patients. Search strategy We performed electronic searches in The Cochrane Hepato-Biliary Group Controlled Trials Register (July 2008), the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (Issue 3, 2008), MEDLINE (1950 to July 2008), EMBASE (1980 to July 2008), and Science Citation Index EXPANDED (1945 to July 2008). In addition, we handsearched the references of all identified studies and contacted the first author of each included trial. Selection criteria Randomised studies comparing different types of antibiotics for spontaneous bacterial peritonitis in cirrhotic patients. Data collection and analysis Data were independently extracted from the trials by at least two authors. Peto odds ratios or average differences, with their 95% confidence intervals, were estimated. Main results This systematic review attempted to summarise evidence from randomised clinical trials on the treatment of spontaneous bacterial peritonitis. Thirteen studies were included; each one of them compared different antibiotics in their experimental and control groups. No meta-analyses could be performed, though data on the main outcomes were collected and analysed separately for each included trial. Currently, the evidence showing that lower dosage or short-term treatment with third generation cephalosporins is as effective as higher dosage or long-term treatment is weak. Oral quinolones could be considered an option for those with less severe manifestations of the disease. Authors’ conclusions This review provides no clear evidence for the treatment of cirrhotic patients with spontaneous bacterial peritonitis. In practice, third generation cephalosporins have already been established as the standard treatment of spontaneous bacterial peritonitis, and it is clear, that empirical antibiotic therapy should be provided in any case. However, until large, well-conducted trials provide more information, practice will remain based on impression, not evidence.

Keywords: Authors, Cefotaxime, Ceftriaxone, Citation, Efficacy, Groups, Infections, Intravenous Ciprofloxacin, Lead, Liver-Cirrhosis, Medline, Oral Ciprofloxacin, Prophylaxis, Randomized Controlled-Trials, Review, Science Citation Index, Systematic Review, Therapy, Treatment

? Duijvestijn, Y.C.M., Mourdi, N., Smucny, J., Pons, G. and Chalumeau, M. (2009), Acetylcysteine and carbocysteine for acute upper and lower respiratory tract infections in paediatric patients without chronic broncho-pulmonary disease. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD003124.

Full Text: [2009\Coc Dat Sys Rev2009, CD003124.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD003124.pdf)

Abstract: Background

Acetylcysteine and carbocysteine are the most commonly prescribed mucolytic drugs in many European countries. To our knowledge, no systematic review has been published on their efficacy and safety for acute upper and lower respiratory tract infections (ARTIs) in children without chronic broncho-pulmonary disease.

Objectives

The objective was to assess the efficacy and safety and to establish a benefit-risk ratio of acetylcysteine and carbocysteine as symptomatic treatments for ARTIs in children without chronic broncho-pulmonary disease.

Search strategy

We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2007, issue 4) which contains the Acute Respiratory Infections (ARI) Group’s Specialized Register, MEDLINE (1966 to 2008), EMBASE (1980 to 2008); Micromedex (2008), Pascal (1987 to 2004), and Science Citation Index (1974 to 2008).

Selection criteria

To study efficacy, we used randomised controlled trials (RCTs) comparing the use of acetylcysteine or carbocysteine versus placebo either alone or as an add-on therapy. To study safety, we also used trials comparing the use of acetylcysteine or carbocysteine versus active treatment or no treatment and case reports.

Data collection and analysis

At least two review authors extracted data and assessed trial quality. We performed a subgroup analysis of children younger than two years of age.

Main results

Six trials involving 497 participants were included to study efficacy. They showed some benefit from mucolytic agents, although differences were of little clinical relevance. No conclusion was drawn about the subgroup of infants younger than two years because the data were unavailable. Thirty-four studies including the previous six trials involving 2064 children were eligible to study safety. Overall safety was good but very few data were available to evaluate safety in infants younger than two years. However, 48 cases of paradoxically increased bronchorrhoea observed in infants were reported to the French pharmacovigilance system.

Authors’ conclusions

The results of this review have to be interpreted with caution because it was based on a limited number of participants included in studies whose methodological quality is questionable. Acetylcysteine and carbocysteine seem to have a limited efficacy and appear to be safe in children older than two years. These results should take into consideration the fact that acetylcysteine and carbocysteine are prescribed for self-limiting diseases (for example, acute cough, bronchitis). Regarding children younger than two years, given concerns about safety, these drugs should only be used for ARTIs in the context of an RCT.

Keywords: Plus Mucolytic Treatment, Adverse Drug-Reactions, Oral Acetylcysteine, Bronchial Diseases, N-Acetylcysteine, Children, Infants, Cefuroxime, Secretion, France

? Gurusamy, K.S., Aggarwal, R., Palanivelu, L. and Davidson, B.R. (2009), Virtual reality training for surgical trainees in laparoscopic surgery. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD006575.

Full Text: [2009\Coc Dat Sys Rev2009, CD006575.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD006575.pdf)

Abstract: Background Surgical training has traditionally been one of apprenticeship, where the surgical trainee learns to perform surgery under the supervision of a trained surgeon. This is time consuming, costly, and of variable effectiveness. Training using a virtual reality simulator is an option to supplement standard training. Objectives To determine whether virtual reality training can supplement or replace conventional laparoscopic surgical training (apprenticeship) in surgical trainees with limited or no prior laparoscopic experience. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and grey literature until March 2008. Selection criteria We included all randomised clinical trials comparing virtual reality training versus other forms of training including video trainer training, no training, or standard laparoscopic training in surgical trainees with little or no prior laparoscopic experience. We also included trials comparing different methods of virtual reality training. Data collection and analysis We collected the data on the characteristics of the trial, methodological quality of the trials, mortality, morbidity, conversion rate, operating time, and hospital stay. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each outcome we calculated the standardised mean difference with 95% confidence intervals based on intention-to-treat analysis. Main results We included 23 trials with 612 participants. Four trials compared virtual reality versus video trainer training. Twelve trials compared virtual reality versus no training or standard laparoscopic training. Four trials compared virtual reality, video trainer training and no training, or standard laparoscopic training. Three trials compared different methods of virtual reality training. Most of the trials were of high risk of bias. In trainees without prior surgical experience, virtual reality training decreased the time taken to complete a task, increased accuracy, and decreased errors compared with no training; virtual reality group was more accurate than video trainer training group. In the participants with limited laparoscopic experience, virtual reality training reduces operating time and error better than standard in the laparoscopic training group; composite operative performance score was better in the virtual reality group than in the video trainer group. Authors’ conclusions Virtual reality training can supplement standard laparoscopic surgical training of apprenticeship and is at least as effective as video trainer training in supplementing standard laparoscopic training. Further research of better methodological quality and more patient-relevant outcomes are needed.

Keywords: Accuracy, Acquisition, Authors, Bias, Characteristics, Citation, Clinical Trials, Clinical-Trials, Composite, Criteria, Effectiveness, Empirical-Evidence, High Risk, High-Risk, Laparoscopic Surgery, Learning-Curve, Literature, Medline, Metaanalysis, Methods, Mist-VR, Models, Operating-Room Performance, Outcomes, Psychomotor-Skills, Randomized Controlled-Trial, Research, Risk, Science, Science Citation Index, Simulator, Surgery, Task, Training

? Gurusamy, K.S., Samraj, K., Fusai, G. and Davidson, B.R. (2009), Robot assistant for laparoscopic cholecystectomy. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD006578.

Full Text: [2009\Coc Dat Sys Rev2009, CD006578.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD006578.pdf)

Abstract: Background The role of a robotic assistant in laparoscopic cholecystectomy is controversial. While some trials have shown distinct advantages of robotic assistant over a human assistant, others have not, and it is unclear which robotic assistant is best. Objectives The aims of this review are to compare the safety of robot assistant versus human assistant in laparoscopic cholecystectomy and to assess whether the robot can substitute for the human assistant. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation In de x Expanded until May 2008 for identifying the randomised trials using The Cochrane Hepato-Biliary Group search strategy. Selection criteria Only randomised clinical trials (irrespective of language, blinding, or publication status) comparing robot assistants versus human assistants in laparoscopic cholecystectomy were considered for the review. Randomised clinical trials comparing different types of robot assistants were also considered for the review. Data collection and analysis Two authors independently identified the trials for exclusion and independently extracted the data. We calculated the risk ratio, mean difference, or standardised mean difference with 95% confidence intervals using the fixed-effect and the random-effects models based on available case-analysis using RevMan 5. Main results We included five trials (all of high risk of bias) with 453 patients randomised: 159 to the robot-assistant group and 165 to the human assistant group (one trial report of 129 patients was a conference abstract, not reporting on the number of patients in each group). There was no statistically significant difference between the two groups for morbidity, conversion to open cholecystectomy, total operating time, or hospital stay when fixed-effect or random-effects model were used. The instrument set-up time was significantly lower in the human assistant group. In one trial, about one sixth of the laparoscopic cholecystectomies in which robot assistant was used, required temporary use of a human assistant. It appears that there was little or no requirement for human assistants in the other three published trials. In two of the three trials, which reported surgeons’ preference, the surgeons preferred a robot assistant to a human assistant. There was no statistically significant difference in the accuracy when the random-effects model was used. There was no difference in the errors. Authors’ conclusions Although robot-assisted laparoscopic cholecystectomy appears safe, there seems to be no significant advantages over human-assisted laparoscopic cholecystectomy. We were unable to identify trials comparing one type of robot assistant versus another. Further randomised trials with low bias-risk and random errors are needed.

Keywords: Abstract, Accuracy, Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Controlled-Trials, Criteria, Empirical-Evidence, Gallstones, Groups, High Risk, High-Risk, Language, Medline, Metaanalysis, Model, Models, Population, Prevalence, Publication, Quality, Randomized-Trials, Review, Risk, Science

? Gurusamy, K.S., Pamecha, V., Sharma, D. and Davidson, B.R. (2009), Techniques for liver parenchymal transection in liver resection. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD006880.

Full Text: [2009\Coc Dat Sys Rev2009, CD006880.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD006880.pdf)

Abstract: Background Blood loss during elective liver resection is one of the main factors affecting the surgical outcome. Different parenchymal transection techniques have been suggested to decrease blood loss. Objectives To assess the benefits and risks of the different techniques of parenchymal transection during liver resections. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded (March 2008). Selection criteria We considered for inclusion all randomised clinical trials comparing different methods of parenchymal dissection irrespective of the method of vascular occlusion or any other measures used for lowering blood loss. Data collection and analysis Two authors identified the trials and extracted the data on the population characteristics, bias risk, mortality, morbidity, blood loss, transection speed, and hospital stay independently of each other. We calculated the odds ratio (OR), mean difference (MD), or standardised mean difference (SMD) with 95% confidence intervals based on ‘interntion-to-treat analysis’ or ‘available case analysis’ using RevMan 5. Main results We included seven trials randomising 556 patients. The comparisons include CUSA (cavitron ultrasound surgical aspirator) versus clamp-crush (two trials); radiofrequency dissecting sealer (RFDS) versus clamp-crush (two trials); sharp dissection versus clamp-crush technique (one trial); and hydrojet versus CUSA (one trial). One trial compared CUSA, RFDS, hydrojet, and clamp-crush technique. The infective complications and transection blood loss were greater in the RFDS than clamp-crush. There was no difference in the blood transfusion requirements, intensive therapy unit (ITU) stay, or hospital stay in this comparison. There was no significant differences in the mortality, morbidity, markers of liver parenchymal injury or liver dysfunction, ITU, or hospital stay in the other comparisons. The blood transfusion requirements were lower in the clamp-crush technique than CUSA and hydrojet. There was no difference in the transfusion requirements of clamp-crush technique and sharp dissection. Clamp-crush technique is quicker than CUSA, hydrojet, and RFDS. The transection speed of sharp dissection and clamp-crush technique was not compared. There was no clinically or statistically significant difference in the operating time between sharp dissection and clamp-crush techniques. Clamp-crush technique is two to six times cheaper than the other methods depending upon the number of surgeries performed each year. Authors’ conclusions Clamp-crush technique is advocated as the method of choice in liver parenchymal transection because it avoids special equipment, whereas the newer methods do not seem to offer any benefit in decreasing the morbidity or transfusion requirement.

Keywords: Authors, Bias, Blood-Loss, Characteristics, Citation, Clinical Trials, Comparison, Criteria, Drainage, Empirical-Evidence, Hepatic Vascular Exclusion, Hepatocellular-Carcinoma, Medline, Metaanalysis, Methods, Quality, Randomized Clinical-Trial, Risk, Risk-Factors, Science, Science Citation Index, Techniques, Therapy, Ultrasound

? Gurusamy, K.S., Abu-Amara, M., Farouk, M. and Davidson, B.R. (2009), Cholecystectomy for gallbladder polyp. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD007052.

Full Text: [2009\Coc Dat Sys Rev2009, CD007052.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007052.pdf)

Abstract: Background The management of gallbladder polyps is controversial. Cholecystectomy has been recommended for gallbladder polyps larger than 10 mm because of the association with gallbladder cancer. Cholecystectomy has also been suggested for gallbladder polyps smaller than 10 mm in patients with biliary type of symptoms. Objectives The aim of this review is to compare the benefits (relief of symptoms, decreased incidence of gallbladder cancer) and harms (surgical morbidity) of cholecystectomy in patients with gallbladder polyp(s). Search strategy We searched The Cochrane Hepato- Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until July 2008 to identify the randomised trials. Selection criteria Only randomised clinical trials (irrespective of language, blinding, or publication status) comparing cholecystectomy and no cholecystectomy were considered for the review. Data collection and analysis We planned to collect the data on the characteristics, methodological quality, mortality, number of patients in whom symptoms were improved or cured from the one identified trial. We planned to analyse the data using the fixed-effect and the random-effects models using RevMan Analysis. For each outcome we planned to calculate the risk ratio (RR) with 95% confidence intervals based on intention-to-treat analysis. Main results We were unable to identify any randomised clinical trials comparing cholecystectomy versus no cholecystectomy in patients with a gallbladder polyp. Authors’ conclusions There are no randomised trials comparing cholecystectomy versus no cholecystectomy in patients with gallbladder polyps. Randomised clinical trials with low bias-risk are necessary to address the question of whether cholecystectomy is indicated in gallbladder polyps smaller than 10 mm.

Keywords: Authors, Cancer, Characteristics, Citation, Clinical Trials, Clinical-Trials, Controlled-Trials, Criteria, Empirical-Evidence, Injuries, Language, Laparoscopic Cholecystectomy, Lesions, Management, Medline, Metaanalysis, Models, Publication, Randomized-Trials, Review, Risk, Risk-Factors, Science, Science Citation Index, Surgical-Management

? Gurusamy, K.S., Pamecha, V., Sharma, D. and Davidson, B.R. (2009), Palliative cytoreductive surgery versus other palliative treatments in patients with unresectable liver metastases from gastro-entero-pancreatic neuroendocrine tumours. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD007118.

Full Text: [2009\Coc Dat Sys Rev2009, CD007118.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007118.pdf)

Abstract: Background Neuroendocrine tumours are tumours of cells which possess secretory granules and originate from the neuroectoderm. While liver resection is generally advocated in patients with resectable liver alone metastases, the management of patients with liver metastases, which cannot be completely resected, is controversial. Objectives To determine if cytoreductive surgery is better than other palliative treatments in patients with liver metastases from gastro-enteropancreatic neuroendocrine tumours, which cannot be completely resected. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and LILACS until July 2008 for identifying the randomised trials. Selection criteria Only randomised clinical trials (irrespective of language, blinding, or publication status) comparing liver resection (alone or in combination with radiofrequency ablation or cryoablation) versus other palliative treatments (chemotherapy or hormone-therapy or immunotherapy) or no treatment in patients with liver metastases from neuroendocrine tumours, which cannot be completely resected, were considered for the review. Data collection and analysis Two authors independently identified trials for inclusion. Main results We were unable to identify any randomised clinical trial suitable for inclusion in this review. Authors’ conclusions The literature provides no evidence from randomised clinical trials in order to assess the role of cytoreductive surgery in non-resectable liver metastases from gastro-entero-pancreatic neuroendocrine tumours. High-quality randomised clinical trials may become feasible to perform if their conduct and study design is thoroughly considered in all their practical and methodological aspects. Pilot randomised clinical trials, which can guide the study design of definitive randomised clinical trials, are necessary.

Keywords: Authors, Carcinoid-Tumors, Citation, Clinical Trials, Clinical-Trials, Controlled-Trials, Criteria, Empirical-Evidence, Hepatic Metastases, Interferon-Alpha, Language, Literature, Management, Medline, Publication, Radiofrequency Ablation, Radionuclide Therapy, Randomized-Trials, Review, Science, Science Citation Index, Study Design, Surgery, Surgical-Treatment, Treatment

? Gurusamy, K.S., Kumar, Y., Pamecha, V., Sharma, D. and Davidson, B.R. (2009), Ischaemic pre-conditioning for elective liver resections performed under vascular occlusion. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD007629.

Full Text: [2009\Coc Dat Sys Rev2009, CD007629.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007629.pdf)

Abstract: Background Vascular occlusion is used to reduce blood loss during liver resection surgery. The enzyme markers of liver injury are elevated if vascular occlusion is employed during liver resection. It is not clear whether ischaemic preconditioning prior to vascular occlusion has a protective effect during elective liver resections. Objectives To assess the advantages (decreased ischaemia-reperfusion injury) and any potential disadvantages of ischaemic preconditioning prior to vascular occlusion during liver resections. Search strategy Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until August 2008. Selection criteria We included randomised clinical trials comparing ischaemic preconditioning versus no ischaemic preconditioning prior to vascular occlusion (irrespective of the method of vascular occlusion) during elective liver resections (irrespective of language or publication status). Data collection and analysis Two authors independently assessed trials for inclusion and independently extracted the data. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. We calculated the risk ratio, mean difference, or standardised mean difference with 95% confidence intervals based on intention-to-treat or available data analysis. Main results We included four trials with 271 patients undergoing open liver resections. The patients were randomised to ischaemic preconditioning (n = 135) and no ischaemic preconditioning (n = 136) prior to continuous vascular occlusion (portal triad clamping in three trials and hepatic vascular exclusion in one trial). All the trials excluded cirrhotic patients. We assessed all the four trials as having high risk of bias. There was no difference in mortality, liver failure, other peri-operative morbidity, hospital stay, intensive therapy unit stay, and operating time between the two groups. The proportion of patients requiring blood transfusion was lower in the ischaemic preconditioning group. There was also a trend towards a lower amount of red cell transfusion favouring ischaemic preconditioning group. There was no difference in the haemodynamic changes, blood loss, bilirubin, or prothrombin activity between the two groups. The enzyme markers of liver injury were lower in the ischaemic preconditioning group on the first post-operative day. Authors’ conclusions Currently, there is no evidence to suggest a protective effect of ischaemic preconditioning in non-cirrhotic patients undergoing liver resection under continuous vascular occlusion. Ischaemic preconditioning reduces the blood transfusion requirements in patients undergoing liver resection.

Keywords: 100 Consecutive Patients, Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Controlled-Trials, Criteria, Data Analysis, Empirical-Evidence, Groups, Hepatectomy, Hepatic Resection, Hepatocellular-Carcinoma, High Risk, High-Risk, Language, Medline, Metaanalysis, Models, Publication, Randomized-Trials, Risk, Risk-Factors, Science, Science Citation Index, Surgery, Therapy

? Gurusamy, K.S., Sheth, H., Kumar, Y., Sharma, D. and Davidson, B.R. (2009), Methods of vascular occlusion for elective liver resections. *Cochrane Database of Systematic Reviews*, **1**, Article Number: CD007632.

Full Text: [2009\Coc Dat Sys Rev2009, CD007632.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007632.pdf)

Abstract: Background Vascular occlusion is used to reduce blood loss during liver resection surgery. Various methods of vascular occlusion have been suggested. Objectives To compare the benefits and harms of different methods of vascular occlusion during elective liver resection. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until August 2008. Selection criteria We included randomised clinical trials comparing different methods of vascular occlusion during elective liver resections (irrespective of language or publication status). Data collection and analysis Two authors independently assessed trials for inclusion and independently extracted the data. We calculated the risk ratio or mean difference with 95% confidence intervals using fixed-effect and random-effects models based on intention-to-treat or available data analysis. Main results Ten trials including 657 patients compared different methods of vascular occlusion. All trials were of high risk of bias. Only one or two trials were included under each comparison. There was no statistically significant differences in mortality, liver failure, or other morbidity between any of the comparisons. Hepatic vascular occlusion does not decrease the blood transfusion requirements. It decreases the cardiac output and increases the systemic vascular resistance. In the comparison between continuous portal triad clamping and intermittent portal triad clamping, four of the five liver failures occurred in patients with chronic liver diseases undergoing the liver resections using continuous portal triad clamping. In the comparison between selective inflow occlusion and portal triad clamping, all four patients with liver failure occurred in the selective inflow occlusion group. There was no difference in any of the other important outcomes in any of the comparisons. Authors’ conclusions In elective liver resection, hepatic vascular occlusion cannot be recommended over portal triad clamping. Intermittent portal triad clamping seems to be better than continuous portal triad clamping at least in patients with chronic liver disease. There is no evidence to support selective inflow occlusion over portal triad clamping. The optimal method of intermittent portal triad clamping is not clear. There is no evidence for any difference between the ischaemic preconditioning followed by vascular occlusion and intermittent vascular occlusion for liver resection in patients with non-cirrhotic livers. Further randomised trials of low risk of bias are needed to determine the optimal technique of vascular occlusion.

Keywords: Authors, Bias, Blood-Loss, Chronic, Citation, Clinical Trials, Comparison, Criteria, Data Analysis, Empirical-Evidence, Hepatic Resection, Hepatocellular-Carcinoma, High Risk, High-Risk, Inferior Vena-Cava, Language, Medline, Methods, Models, Noncirrhotic Patients, Outcomes, Portal Triad, Pringle Maneuver, Publication, Randomized Clinical-Trial, Risk, Risk-Factors, Science, Science Citation Index, Surgery

? Duperrex, O., Blackhall, K., Burri, M. and Jeannot, E. (2009), Education of children and adolescents for the prevention of dog bite injuries. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD004726.

Full Text: [2009\Coc Dat Sys Rev2009, CD004726.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD004726.pdf)

Abstract: Background Dog bites can have dramatic consequences for children and adolescents. Educating young people on how to interact with dogs could contribute to reducing dog bite injuries. Objectives To determine the effectiveness of educational interventions that target children and adolescents in reducing dog bite injuries and their consequences. Search strategy We searched the following databases: The Cochrane Injuries Group’s Specialised Register, CENTRAL (The Cochrane Library Issue 3, 2008), CAB Abstracts, Zetoc, SIGLE, MEDLINE, EMBASE, ERIC, PsycInfo, SPECTR, CINAHL, National Research Register, LILACs, African Healthline, Science Citation Index, Social Science Citation Index, CurrentClinicalTrials. Gov, Centrewatch, Controlledtrials. com, Vetgate and the WHO database. We checked the bibliographies of relevant reviews and trials and also contacted experts in the field. The searches were carried out to 18 July 2008. Selection criteria We included randomised controlled trials and controlled before-after studies that evaluated the effectiveness of educational interventions, in populations under 20 years old, for preventing dog bites. Data collection analysis Two review authors selected eligible studies based on information from the title and abstract. Two review authors decided on the inclusion of eligible trials and extracted data from the trial reports. We contacted authors of eligible studies to obtain more information. Main results Two studies met the inclusion criteria. No study looked at our main outcome: dog bite rates. The included studies were randomised controlled trials conducted in kindergarten and primary schools. Their methodology was of moderate quality. One study showed that the intervention group showed less ‘inappropriate behaviour’ when observed in the presence of a dog after a 30-minute educational intervention. Another study showed an increase in knowledge and in caution after an information programme. Authors’ conclusions There is no direct evidence that educational programmes can reduce dog bite rates in children and adolescents. Educating children who are less than 10 years old in school settings could improve their knowledge, attitude and behaviour towards dogs. Educating children and adolescents in settings other than schools should also be evaluated. There is a need for high quality studies that measure dog bite rates as an outcome. To date, evidence does not suggest that educating children and adolescents is effective as a unique public health strategy to reduce dog bite injuries and their consequences.

Keywords: Accident, Adolescents, Attitude, Authors, Bias, Children, Citation, Databases, Education, Embase, Emergency-Departments, Epidemiology, Information, Intervention, Interventions, Medline, Methodology, Posttraumatic-Stress-Disorder, Prevention, Primary, Program, Public Health, Randomized Controlled-Trial, Research, Review, Risk, Schools, Science, Science Citation Index, Search Strategy, Strategy, WHO

? Bradt, J. and Dileo, C. (2009), Music for stress and anxiety reduction in coronary heart disease patients. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD006577.

Full Text: [2009\Coc Dat Sys Rev2009, CD006577.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD006577.pdf)

Abstract: Background Individuals with coronary heart disease (CHD) often suffer from severe distress putting them at greater risk for complications. Music interventions have been used to reduce anxiety and distress and improve physiological functioning in medical patients, however its efficacy for CHD patients needs to be evaluated. Objectives To examine the effects of music interventions with standard care versus standard care alone on psychological and physiological responses in persons with CHD. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, CINAHL, EMBASE, PSYCINFO, LILACS, Science Citation Index, www.musictherapyworld.net, CAIRSS for Music, Proquest Digital Dissertations, ClinicalTrials.gov, Current Controlled Trials, and the National Research Register (all to May 2008). We handsearched music therapy journals and reference lists, and contacted relevant experts to identify unpublished manuscripts. There was no language restriction. Selection criteria We included all randomized controlled trials that compared music interventions and standard care with standard care alone for persons with CHD. Data collection and analysis Data were extracted, and methodological quality was assessed, independently by the two reviewers. Additional information was sought from the trial researchers when necessary. Results are presented using weighted mean differences for outcomes measured by the same scale and standardized mean differences for outcomes measured by different scales. Posttest scores were used. In cases of significant baseline difference, we used change scores. Main results Twenty-three trials (1461 participants) were included. Music listening was the main intervention used, and 21 of the studies did not include a trained music therapist. Results indicated that music listening has a moderate effect on anxiety in patients with CHD, however results were inconsistent across studies. This review did not find strong evidence for reduction of psychological distress. Findings indicated that listening to music reduces heart rate, respiratory rate and blood pressure. Studies that included two or more music sessions led to a small and consistent pain-reducing effect. No strong evidence was found for peripheral skin temperature. None of the studies considered hormone levels and only one study considered quality of life as an outcome variable. Authors’ conclusions Music listening may have a beneficial effect on blood pressure, heart rate, respiratory rate, anxiety, and pain in persons with CHD. However, the quality of the evidence is not strong and the clinical significance unclear. Most studies examined the effects of listening to pre-recorded music. More research is needed on the effects of music offered by a trained music therapist.

Keywords: Anxiety, Authors, Care Unit, Change, Citation, Criteria, Intervention, Interventions, Journals, Language, Manuscripts, Medical, Medline, Metaanalysis, Outcomes, Pain, Reduction, Relaxation, Research, Researchers, Respiratory, Review, Risk, Scale, Science, Science Citation Index, Stress, Surgery, Temperature, Therapy

? Gurusamy, K.S., Samraj, K. and Davidson, B.R. (2009), Low pressure versus standard pressure pneumoperitoneum in laparoscopic cholecystectomy. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD006930.

Full Text: [2009\Coc Dat Sys Rev2009, CD006930.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD006930.pdf)

Abstract: Background A pneumoperitoneum of 12 to 16 mmHg is used for laparoscopic cholecystectomy. Lower pressures are claimed to be safe and effective in decreasing cardiopulmonary complications and pain. Objectives To assess the benefits and harms of low pressure pneumoperitoneum compared with standard pressure pneumoperitoneum in patients undergoing laparoscopic cholecystectomy. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until November 2008 for identifying randomised trials using search strategies. Selection criteria Only randomised clinical trials, irrespective of language, blinding, or publication status were considered for the review. Data collection and analysis Two authors independently identified trials and independently extracted data on mortality, morbidity, conversion to open cholecystectomy, pain, analgesic requirement, operating time, hospital stay, patient satisfaction, additional measures to increase vision, and cardiopulmonary parameters. We calculated the risk ratio (RR), mean difference (MD), or standardised mean difference (SMD) with 95% confidence intervals (CI) using both the fixed-effect and the random-effects models with RevMan 5 based on available case-analysis. Main results Fifteen trials randomised 690 patients to low pressure (n = 336) and standard pressure (n = 354). All the trials were of high risk of bias. There was no difference in the mortality, morbidity, or conversion to open cholecystectomy between the groups. The intensity of pain was lower in the low pressure group at various time points. The incidence of shoulder pain was lower in the low pressure group (RR 0.53; 95% CI 0.31 to 0.90). The analgesic consumption was also lower. The operating time was similar between the groups (MD 2.30 minutes; 95% CI 0.42 to 4.18). Because of the high risk of bias due to incomplete outcome data in seven trials, it was not possible to conclude about the safety of low pressure pneumoperitoneum. Authors’ conclusions Low pressure pneumoperitoneum appears effective in decreasing pain after laparoscopic cholecystectomy. The safety of low pressure pneumoperitoneum has to be established.

Keywords: Abdominal-Wall Lift, Authors, Base-Balance Alterations, Bias, Carbon-Dioxide Pneumoperitoneum, Citation, Clinical Trials, Clinical-Trials, Consumption, Criteria, Different Insufflation Pressures, Different Intraabdominal Pressures, Empirical-Evidence, Groups, Hepatic-Function, High Risk, High-Risk, Language, Medline, Models, Pain, Pressures, Prospective Randomized-Trial, Publication, Review, Risk, Science, Science Citation Index, Surgery

? Gurusamy, K.S., Ramamoorthy, R., Sharma, D. and Davidson, B.R. (2009), Liver resection versus other treatments for neuroendocrine tumours in patients with resectable liver metastases. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD007060.

Full Text: [2009\Coc Dat Sys Rev2009, CD007060.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007060.pdf)

Abstract: Background Neuroendocrine tumours are tumours of cells, which possess secretory granules and originate from the neuroectoderm. While liver resection is generally advocated in patients with resectable liver metastases, recent studies have shown good survival in patients with disseminated neuroendocrine tumours who underwent thermal ablation using radiofrequency. Objectives To determine the benefits and harms of liver resection versus other treatments in patients with resectable liver metastases from gastroentero-pancreatic neuroendocrine tumours. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded and LILACS until July 2008 for identifying the randomised trials. Selection criteria We considered only randomised clinical trials (irrespective of language, blinding, or publication status) comparing liver resection (alone or in combination with radiofrequency ablation or cryoablation) versus other interventions (chemotherapy, hormonotherapy, or immunotherapy) and those comparing liver resection and thermal ablation (radiofrequency ablation or cryoablation) in patients with resectable liver metastases from neuroendocrine tumours for the review. Data collection and analysis Two authors independently identified trials for inclusion. Main results We were unable to identify any randomised clinical trial suitable for inclusion in this review. We were also unable to identify any quasi-randomised studies, cohort studies, or case-control studies that could inform meaningfully. Authors’ conclusions There is no evidence from randomised clinical trials comparing liver resection versus other treatments in patients with resectable liver metastases from gastro-entero-pancreatic neuroendocrine tumours. Liver resection appears to be the main stay curative treatment for neuroendocrine liver metastases based on non-randomised studies. Further randomised clinical trials comparing liver resection alone or in combination with chemoembolisation or radionuclide therapy are needed. Further randomised clinical trials comparing surgical resection and radiofrequency ablation in selected patients may also be appropriate.

Keywords: Authors, Case-Control, Citation, Clinical Trials, Clinical-Trials, Cohort, Controlled-Trials, Criteria, Empirical-Evidence, Hepatic-Tumors, Interferon-Alpha, Language, Medline, Midgut Carcinoid-Tumors, Publication, Radiofrequency Ablation, Radionuclide, Randomized-Trials, Review, Science, Science Citation Index, Surgical-Treatment, Survival, Therapy, Treatment

? Settas, G., Settas, C., Minos, E. and Yeung, I.Y.L. (2009), Photorefractive keratectomy (PRK) versus laser assisted in situ keratomileusis (LASIK) for hyperopia correction. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD007112.

Full Text: [2009\Coc Dat Sys Rev2009, CD007112.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007112.pdf)

Abstract: Background Hyperopia, or hypermetropia (also known as long-sightedness or far-sightedness), is the condition where the unaccommodating eye brings parallel light to a focus behind the retina instead of on it. Hyperopia can be corrected with both non-surgical and surgical methods, among them photorefractive keratectomy (PRK) and laser assisted In situ keratomileusis (LASIK). There is uncertainty as to whether hyperopic-PRK or hyperopic-LASIK is the better method. Objectives The objectives of this review were to determine whether PRK or LASIK leads to more reliable, stable and safe results when correcting a hyperopic refractive error. Search strategy We searched the Cochrane Central Register of Controlled Trials (The Cochrane Library Issue 4, 2008), MEDLINE (January 1950 to January 2009), EMBASE (January 1980 to January 2009) and LILACS (January 1982 to January 2009). There were no language or date restrictions in the search for trials. The electronic databases were last searched on 13 January 2009. We also searched the reference lists of the studies included in the review for information about further trials and used the Science Citation Index to search for papers that cite any studies included in this review. We did not handsearch journals or conference proceedings specifically for this review. Selection criteria We planned to include only randomised controlled trials (RCTs) comparing PRK against LASIK for correction of hyperopia and then perform a sensitivity analysis of pre-and post-millennial trials since this is the mid-point in the history of both PRK and LASIK. Data collection analysis We did not identify any studies that met the inclusion criteria for this review. Main results As no studies met the inclusion criteria for this review, we discussed the results of non- randomised trials comparing hyperopic-PRK with hyperopic-LASIK. Authors’ conclusions No robust, reliable conclusions could be reached, but the non-randomised trials reviewed appear to be in agreement that hyperopic-PRK and hyperopic-LASIK are of comparable efficacy. High quality, well-planned open RCTs are needed in order to obtain a robust clinical evidence base.

Keywords: Astigmatism, Authors, Children, Citation, Criteria, Databases, History, Journals, Language, Lasik, Medline, Methods, Refractive Errors, Review, Science, Science Citation Index, Sensitivity Analysis, Uncertainty

? Keay, L., Lindsley, K., Tielsch, J., Katz, J. and Schein, O. (2009), Routine preoperative medical testing for cataract surgery. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD007293.

Full Text: [2009\Coc Dat Sys Rev2009, CD007293.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007293.pdf)

Abstract: Background Cataract surgery is practiced widely and substantial resources are committed to an increasing cataract surgical rate in developing countries. With the current volume of cataract surgery and the increases in the future, it is critical to optimize the safety and costeffectiveness of this procedure. Most cataracts are performed on older individuals with correspondingly high systemic and ocular comorbidities. It is likely that routine preoperative medical testing will detect medical conditions, but it is questionable whether these conditions should preclude individuals from cataract surgery or change their perioperative management. Objectives (1) To investigate the evidence for reductions in adverse events through preoperative medical testing, and (2) to estimate the average cost of performing routine medical testing. Search strategy We searched CENTRAL, MEDLINE, EMBASE and LILACS using no date or language restrictions. We used reference lists and the Science Citation Index to search for additional studies. Selection criteria We included randomized clinical trials in which routine preoperative medical testing was compared to no preoperative or selective preoperative testing prior to age-related cataract surgery. Data collection and analysis Two review authors independently assessed abstracts to identify possible trials for inclusion. For each included study, two review authors independently documented study characteristics, extracted data, and assessed methodological quality. Main results The three randomized clinical trials included in this review reported results for 21,531 total cataract surgeries with 707 total surgery-associated medical adverse events, including 61 hospitalizations and three deaths. Of the 707 medical adverse events reported, 353 occurred in the pretesting group and 354 occurred in the no testing group. Most events were cardiovascular and occurred during the intraoperative period. Routine preoperative medical testing did not reduce the risk of intraoperative (OR 1.02, 95% CI 0.85 to 1.22) or postoperative medical adverse events (OR 0.96, 95% CI 0.74 to 1.24) when compared to selective or no testing. Cost savings were evaluated in one study which estimated the costs to be 2.55 times higher in those with preoperative medical testing compared to those without preoperative medical testing. There was no difference in cancellation of surgery between those with preoperative medical testing and those with no or limited preoperative testing, reported by two studies. Authors’ conclusions This review has shown that routine pre- operative testing does not increase the safety of cataract surgery. Alternatives to routine preoperative medical testing have been proposed, including self-administered health questionnaires, which could substitute for health provider histories and physical examinations. Such avenues may lead to cost-effective means of identifying those at increased risk of medical adverse events due to cataract surgery. However, despite the rare occurrence, adverse medical events precipitated by cataract surgery remain a concern because of the large number of elderly patients with multiple medical comorbidities who have cataract surgery in various settings. The studies summarized in this review should assist recommendations for the standard of care of cataract surgery, at least in developed settings. Unfortunately, in developing country settings, medical history questionnaires would be useless to screen for risk since few people have ever been to a physician, let alone been diagnosed with any chronic disease.

Keywords: Anesthesiologists, Authors, Cataract, Change, Characteristics, Chronic, Citation, Clinical Trials, Cost, Costs, Criteria, Developing Countries, Developing Country, Elderly, Health, History, Impact, Language, Lead, Management, Medical, Medline, Occurrence, Outcomes, Questionnaires, Randomized Clinical Trials, Review, Risk, Science, Science Citation Index, Surgery

? Wijeysundera, D.N., Bender, J.S. and Beattie, W.S. (2009), Alpha-2 adrenergic agonists for the prevention of cardiac complications among patients undergoing surgery. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD004126.

Full Text: [2009\Coc Dat Sys Rev2009, CD004126.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD004126.pdf)

Abstract: Background The surgical stress response plays an important role on the pathogenesis of perioperative cardiac complications. Alpha-2 adrenergic agonists attenuate this response and may thereby prevent cardiac complications. Objectives This review assessed the efficacy and safety of preoperative (within 24 hours), intraoperative, and postoperative (first 48 hours) alpha-2 adrenergic agonists for preventing mortality and cardiac complications after surgery performed under either general or neuraxial anaesthesia, or both. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2008, Issue 3), MEDLINE (1950 to August week 4 2008), EMBASE (1980 to week 36 2008), the Science Citation Index, and reference lists of articles. Selection criteria We included randomized controlled trials that compared alpha-2 adrenergic agonists (clonidine, dexmedetomidine, or mivazerol) against placebo or non-alpha-2 adrenergic agonists. Included studies had to report on mortality, myocardial infarction, myocardial ischaemia, or supraventricular tachyarrhythmia. Data collection and analysis Three authors independently assessed trial quality and extracted data. Two authors independently performed computer entry of abstracted data. We contacted study authors for additional information. Adverse event data were gathered from the trials. Main results We included 31 studies (4578 participants). Study quality was generally inadequate, with only six studies clearly reporting methods for blinding and allocation concealment. Overall, alpha-2 adrenergic agonists reduced mortality (relative risk (RR) 0.66; 95% CI 0.44 to 0.98; P = 0.04) and myocardial ischaemia (RR 0.68; 95% CI 0.57 to 0.81; P < 0.0001). However, their effects appeared to vary with the surgical procedure. The most encouraging data pertained to vascular surgery, where they reduced mortality (RR 0.47; 95% CI 0.25 to 0.90; P = 0.02), cardiac mortality (RR 0.36; 95% CI 0.16 to 0.79; P = 0.01), and myocardial infarction (RR 0.66; 95% CI 0.46 to 0.94; P = 0.02). With regard to adverse effects, alpha-2 adrenergic agonists significantly increased perioperative hypotension (RR 1.32; 95% CI 1.07 to 1.62; P = 0.009) and bradycardia (RR 1.66; 95% CI 1.14 to 2.41; P = 0.008). Authors’ conclusions Our study provides encouraging evidence that alpha-2 adrenergic agonists may reduce cardiac risk, especially during vascular surgery. Nonetheless, these data remain insufficient to make firm conclusions about their efficacy and safety. A large randomized trial of alpha-2 adrenergic agonists is therefore warranted. Additionally, future research must determine which specific alpha-2 adrenergic agonist should be used, and whether it is safe to combine them with other perioperative interventions (for example beta-adrenergic blockade).

Keywords: Anaesthesia, Artery Bypass-Surgery, Articles, Authors, Citation, Computer, Criteria, Double-Blind, Elective Abdominal Hysterectomy, Hemodynamic-Responses, Intensive-Care-Unit, Intravenously Administered Dexmedetomidine, Medline, Methods, Noncardiac Surgery, Oral Clonidine Premedication, Perioperative Myocardial-Ischemia, Placebo, Postoperative Analgesia, Research, Review, Risk, Science, Science Citation Index, Stress, Surgery, Vascular Surgery

? Gurusamy, K.S., Li, J., Sharma, D. and Davidson, B.R. (2009), Cardiopulmonary interventions to decrease blood loss and blood transfusion requirements for liver resection. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD007338.

Full Text: [2009\Coc Dat Sys Rev2009, CD007338.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007338.pdf)

Abstract: Background Blood loss during liver resection is one of the most important factors affecting the peri-operative outcomes of patients undergoing liver resection. Objectives To determine the benefits and harms of cardiopulmonary interventions to decrease blood loss and to decrease allogeneic blood transfusion requirements in patients undergoing liver resections. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until November 2008 for identifying the randomised trials. Selection criteria We included all randomised clinical trials comparing various cardiopulmonary interventions aimed at decreasing blood loss and allogeneic blood transfusion requirements in liver resection. Trials were included irrespective of whether they included major or minor liver resections, normal or cirrhotic livers, vascular occlusion was used or not, and irrespective of the reason for liver resection. Data collection and analysis Two authors independently identified trials for inclusion and independently extracted data. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each outcome we calculated the risk ratio (RR), mean difference (MD), or standardised mean difference (SMD) with 95% confidence intervals (CI) based on intention-to-treat analysis or available case-analysis. For dichotomous outcomes with only one trial included under the outcome, we performed the Fisher’s exact test. Main results Nine trials involving 587 patients satisfied the inclusion criteria. The interventions included low central venous pressure (CVP), autologous blood donation, haemodilution, haemodilution with controlled hypotension, and hypoventilation. Only one or two trials were included under most comparisons. All trials had a high risk of bias. There was no significant difference in the peri-operative mortality or other peri-operative morbidity. None of the trials reported long-term survival or liver failure. The risk ratio of requiring allogeneic blood transfusion was significantly lower in the haemodilution and haemodilution with controlled hypotension groups than the respective control groups. Other interventions did not show significant decreases of allogeneic transfusion requirements. Authors’ conclusions None of the interventions seem to decrease peri-operative morbidity or offer any long-term survival benefit. Haemodilution shows promise in the reduction of blood transfusion requirements in liver resection surgery. However, there is a high risk of type I (erroneously concluding that an intervention is beneficial when it is actually not beneficial) and type II errors (erroneously concluding that an intervention is not beneficial when it is actually beneficial) because of the few trials included, the small sample size in each trial, and the high risk of bias. Further randomised clinical trials with low risk of bias and random errors assessing clinically important outcomes such as peri-operative mortality are necessary to assess any cardiopulmonary interventions aimed at decreasing blood loss and blood transfusion requirements in liver resections. Trials need to be designed to assess the effect of a combination of different interventions in liver resections.

Keywords: Acute Normovolemic Hemodilution, Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Criteria, Empirical-Evidence, Groups, Hepatectomy, Hepatic Resection, Hepatocellular-Carcinoma, High Risk, High-Risk, Intervention, Medline, Metaanalysis, Models, Outcomes, Quality, Randomized Controlled-Trial, Reduction, Risk, Risk-Factors, Science, Science Citation Index, Surgery

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Full Text: [2009\Coc Dat Sys Rev2009, CD007370.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007370.pdf)

Abstract: Background Penetrating abdominal trauma occurs when the peritoneal cavity is breached. Routine laparotomy for penetrating abdominal injuries began in the 1800s, with antibiotics first being used in World War II to combat septic complications associated with these injuries. This practice was marked with a reduction in sepsis-related mortality and morbidity. Whether prophylactic antibiotics are required in the prevention of infective complications following penetrating abdominal trauma is controversial, however, as no randomised placebo controlled trials have been published to date. There has also been debate about the timing of antibiotic prophylaxis. In 1972 Fullen noted a 7% to 11% post-surgical infection rate with pre-operative antibiotics, a 33% to 57% infection rate with intra-operative antibiotic administration and 30% to 70% infection rate with only post-operative antibiotic administration. Current guidelines state there is sufficient class I evidence to support the use of a single pre-operative broad spectrum antibiotic dose, with aerobic and anaerobic cover, and continuation (up to 24 hours) only in the event of a hollow viscus perforation found at exploratory laparotomy. Objectives To assess the benefits and harms of prophylactic antibiotics administered for penetrating abdominal injuries for the reduction of the incidence of septic complications, such as septicaemia, intra-abdominal abscesses and wound infections. Search strategy Searches were not restricted by date, language or publication status. We searched the following electronic databases: the Cochrane Injuries Group Specialised Register, CENTRAL (The Cochrane Library 2008 Issue 3), MEDLINE (Ovid), EMBASE (Ovid), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S), PUBMED. Searches were last conducted in September 2008. Selection criteria All randomised controlled trials of antibiotic prophylaxis or treatment in patients with penetrating abdominal trauma versus no antibiotics or placebo. Data collection and analysis The authors performed the literature search independently, and screened all resulting abstracts for inclusion.We identified no trials meeting the inclusion criteria. Author’s conclusions There is currently no information from randomised controlled trials to support or refute the use of antibiotics for patients with penetrating abdominal trauma.

Keywords: Antibiotics, Bias, Citation, Criteria, Databases, Isi, Isi Web, Isi Web Of Science, Language, Literature, Medline, Metaanalysis, Placebo, Publication, Quality, Randomized-Trials, Reduction, Science, Science Citation Index, Spectrum, State, Trauma, Treatment, Web of Science

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Full Text: [2009\Coc Dat Sys Rev2009, CD007472.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD007472.pdf)

Abstract: Background Vascular occlusion to reduce blood loss is used during elective liver resection but results in significant ischaemia reperfusion injury. This, in turn, might lead to significant postoperative liver dysfunction and morbidity. Various pharmacological drugs have been used with an intention to ameliorate the ischaemia reperfusion injury in liver resections. Objectives To assess the benefits and harms of different pharmacological agents versus no pharmacological interventions to decrease ischaemia reperfusion injury during liver resections where vascular occlusion was performed during the surgery. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until January 2009. Selection criteria We included randomised clinical trials, irrespective of language or publication status, comparing any pharmacological agent versus placebo or no pharmacological agent during elective liver resections with vascular occlusion. Data collection and analysis Two authors independently identified trials for inclusion and independently extracted the data. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. We calculated the risk ratio (RR) or mean difference (MD) with 95% confidence intervals (CI) based on intention-to-treat analysis or available case analysis. Main results We identified a total of 15 randomised trials evaluating 11 different pharmacological interventions (methylprednisolone, multivitamin antioxidant infusion, vitamin E infusion, amrinone, prostaglandin E1, pentoxifylline, mannitol, trimetazidine, dextrose, allopurinol, and OKY 046 (a thromboxane A2 synthetase inhibitor)). All trials had high risk of bias. There were no significant differences between the groups in mortality, liver failure, or perioperative morbidity. The trimetazidine group had a significantly shorter hospital stay than control (MD -3.00 days; 95% CI -3.57 to -2.43). There were no significant differences in any of the clinically relevant outcomes in the remaining comparisons. Methylprednisolone improved the enzyme markers of liver function and trimetazidine, methylprednisolone, and dextrose reduced the enzyme markers of liver injury compared with controls. However, there is a high risk of type I and type II errors because of the few trials included, the small sample size in each trial, and the risk of bias. Authors’ conclusions Trimetazidine, methylprednisolone, and dextrose may protect against ischaemia reperfusion injury in elective liver resections performed under vascular occlusion, but this is shown in trials with small sample sizes and high risk of bias. The use of these drugs should be restricted to well-designed randomised clinical trials before implementing them in clinical practice.

Keywords: Authors, Bias, Cirrhotic-Patients, Citation, Clinical Trials, Criteria, Groups, Hepatic Resection, Hepatocellular-Carcinoma, High Risk, High-Risk, Intervention, Intraoperative Blood-Loss, Ischemia, Reperfusion Injury, Language, Lead, Medline, Models, Outcomes, Placebo, Prostaglandin E-1, Protease Inhibitor, Publication, Randomized Clinical-Trials, Risk, Science, Science Citation Index, Surgery, Surgical Stress, Type I and Type Ii Errors, Warm Ischemia

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Full Text: [2009\Coc Dat Sys Rev2009, CD008085.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD008085.pdf)

Abstract: Background Blood loss during liver resection is one of the most important factors affecting the peri-operative outcomes of patients undergoing liver resection. Objectives To determine the benefits and harms of pharmacological interventions to decrease blood loss and to decrease allogeneic blood transfusion requirements in patients undergoing liver resections. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until November 2008 for identifying the randomised trials. Selection criteria We included all randomised clinical trials comparing various pharmacological interventions aimed at decreasing blood loss and allogeneic blood transfusion requirements in liver resection. Trials were included irrespective of whether they included major or minor liver resections, normal or cirrhotic livers, vascular occlusion was used or not, and irrespective of the reason for liver resection. Data collection and analysis Two authors independently identified trials for inclusion and independently extracted data. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each outcome we calculated the risk ratio (RR), mean difference (MD), or standardised mean difference with 95% confidence intervals (CI) based on intention-to-treat analysis or available case-analysis. For dichotomous outcomes with only one trial included under the outcome, we performed the Fisher’s exact test. Main results Six trials involving 849 patients satisfied the inclusion criteria. Pharmacological interventions included aprotinin, desmopressin, recombinant factor VIIa, antithrombin III, and tranexamic acid. One or two trials could be included under most comparisons. All trials had a high risk of bias. There was no significant difference in the peri-operative mortality, survival at maximal follow-up, liver failure, or other peri-operative morbidity. The risk ratio of requiring allogeneic blood transfusion was significantly lower in the aprotinin and tranexamic acid groups than the respective control groups. Other interventions did not show significant decreases of allogeneic transfusion requirements. Authors’ conclusions None of the interventions seem to decrease peri-operative morbidity or offer any long-term survival benefit. Aprotinin and tranexamic acid show promise in the reduction of blood transfusion requirements in liver resection surgery. However, there is a high risk of type I (erroneously concluding that an intervention is beneficial when it is actually not beneficial) and type II errors (erroneously concluding that an intervention is not beneficial when it is actually beneficial) because of the few trials included, the small sample size in each trial, and the high risk of bias. Further randomised clinical trials with low risk of bias and random errors assessing clinically important outcomes such as peri-operative mortality are necessary to assess any pharmacological interventions aimed at decreasing blood loss and blood transfusion requirements in liver resections. Trials need to be designed to assess the effect of a combination of different interventions in liver resections.

Keywords: Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Criteria, Double-Blind, Empirical-Evidence, Groups, Hepatectomy, Hepatic Resection, Hepatocellular-Carcinoma, High Risk, High-Risk, Intervention, Medline, Metaanalysis, Models, Outcomes, Quality, Randomized-Trials, Reduction, Risk, Risk-Factors, Science, Science Citation Index, Surgery

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Full Text: [2009\Coc Dat Sys Rev2009, CD008154.pdf](2009/Coc%20Dat%20Sys%20Rev2009,%20CD008154.pdf)

Abstract: Background Vascular occlusion used during elective liver resection to reduce blood loss results in significant ischaemia reperfusion (IR) injury. This in turn leads to significant postoperative liver dysfunction and morbidity. Various pharmacological drugs have been used in experimental settings to ameliorate the ischaemia reperfusion injury in liver resections. Objectives To assess the relative benefits and harms of using one pharmacological intervention versus another pharmacological intervention to decrease ischaemia reperfusion injury during liver resections where vascular occlusion was performed during the surgery. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until January 2009. Selection criteria We included randomised clinical trials, irrespective of language or publication status, comparing one pharmacological agent versus another pharmacological agent during elective liver resections with vascular occlusion. Data collection and analysis Two authors independently identified trials for inclusion and independently extracted data. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. We planned to calculate the risk ratio (RR) or mean difference (MD) with 95% confidence intervals (CI) based on intention-to-treat analysis or available case analysis. However, all outcomes were only reported on by single trials, and meta-analysis could not be performed. Therefore, we performed Fisher’s exact test on dichotomous outcomes. Main results We identified a total of five randomised trials evaluating nine different pharmacological interventions (amrinone, prostaglandin E1, pentoxifylline, dopexamine, dopamine, ulinastatin, gantaile, sevoflurane, and propofol). All trials had high risk of bias. There was no significant difference between the groups in mortality, liver failure, or perioperative morbidity. The ulinastatin group had significantly lower postoperative enzyme markers of liver injury compared with the gantaile group. None of the other comparisons showed any difference in any of the other outcomes. However, there is a high risk of type I and type II errors because of the few trials included, the small sample size in each trial, and the risk of bias. Authors’ conclusions Ulinastatin may have a protective effect against ischaemia reperfusion injury relative to gantaile in elective liver resections performed under vascular occlusion. The absolute benefit of this drug agent remains unknown. None of the drugs can be recommended for routine clinical practice. Considering that none of the drugs have proven to be useful to decrease ischaemia reperfusion injury, such trials should include a group of patients who do not receive any active intervention whenever possible to determine the pharmacological drug’s absolute effects on ischaemia reperfusion injury in liver resections.

Keywords: Authors, Bias, Cirrhotic-Patients, Citation, Clinical Trials, Criteria, Groups, Hepatic Resection, Hepatocellular-Carcinoma, High Risk, High-Risk, Intervention, Intraoperative Blood-Loss, IR, Ischemia, Reperfusion Injury, Language, Medline, Meta-Analysis, Models, Outcomes, Postoperative Morbidity, Prostaglandin E-1, Protease Inhibitor, Publication, Randomized Clinical-Trials, Risk, Science, Science Citation Index, Surgery, Surgical Stress, Type I and Type Ii Errors

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Full Text: [2010\Coc Dat Sys Rev2010, MR000013.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20MR000013.pdf)

Abstract: Background Recruiting participants to trials can be extremely difficult. Identifying strategies that improve trial recruitment would benefit both trialists and health research. Objectives To quantify the effects of strategies to improve recruitment of participants to randomised controlled trials. Search strategy We searched the Cochrane Methodology Review Group Specialised Register - CMR (The Cochrane Library (online) Issue 1 2008) (searched 20 February 2008); MEDLINE, Ovid (1950 to date of search) (searched 06 May 2008); EMBASE, Ovid (1980 to date of search) (searched 16 May 2008); ERIC, CSA (1966 to date of search) (searched 19 March 2008); Science Citation Index Expanded, ISI Web of Science (1975 to date of search) (searched 19 March 2008); Social Sciences Citation Index, ISI Web of Science (1975 to date of search) (searched 19 March 2008); and National Research Register (online) (Issue 3 2007) (searched 03 September 2007); C2-SPECTR (searched 09 April 2008). We also searched PUBMED (25 March 2008) to retrieve “related articles” for 15 studies included in a previous version of this review. Selection criteria Randomised and quasi-randomised controlled trials of methods to increase recruitment to randomised controlled trials. This includes non-healthcare studies and studies recruiting to hypothetical trials. Studies aiming to increase response rates to questionnaires or trial retention, or which evaluated incentives and disincentives for clinicians to recruit patients were excluded. Data collection and analysis Data were extracted on the method evaluated; country in which the study was carried out; nature of the population; nature of the study setting; nature of the study to be recruited into; randomisation or quasi-randomisation method; and numbers and proportions in each intervention group. We used risk ratios and their 95% confidence intervals to describe the effects in individual trials, and assessed heterogeneity of these ratios between trials. Main results We identified 27 eligible trials with more than 26,604 participants. There were 24 studies involving interventions aimed directly at trial participants, while three evaluated interventions aimed at people recruiting participants. All studies were in health care. Some interventions were effective in increasing recruitment: telephone reminders to non-respondents (RR 2.66, 95% CI 1.37 to 5.18), use of opt-out, rather than opt-in, procedures for contacting potential trial participants (RR 1.39, 95% CI 1.06 to 1.84) and open designs where participants know which treatment they are receiving in the trial (RR 1.25, 95% CI 1.18 to 1.34). However, some of these strategies have disadvantages, which may limit their widespread use. For example, opt-out procedures are controversial and open designs are by definition unblinded. The effects of many other recruitment strategies are unclear; examples include the use of video to provide trial information to potential participants and modifying the training of recruiters. Many studies looked at recruitment to hypothetical trials and it is unclear how applicable these results are to real trials. Authors’ conclusions Trialists can increase recruitment to their trials by using the strategies shown to be effective in this review: telephone reminders; use of opt-out, rather than opt-in; procedures for contacting potential trial participants and open designs. Some strategies (e. g. open trial designs) need to be considered carefully before use because they also have disadvantages. For example, opt-out procedures are controversial and open designs are by definition unblinded.

Keywords: Authors, Breast-Cancer, Cancer-Patients, Citation, Clinical Trials As Topic, Clinical-Trials, Decision-Making, Hazardous Drinking, Health, Health Care, Heterogeneity, Humans, Informed-Consent Process, Injured Patients, ISI, ISI Web, ISI Web of Science, Medical-Research, Medline, Patient Education As Topic, Patient Recruitment, Patient Selection, Prevention Trial, Randomized Controlled Trials As Topic, Research, Retention, Review, Risk, Sample Size, Science, Science Citation Index, Training, Treatment, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD000313.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD000313.pdf)

Abstract: Background Discharge planning is a routine feature of health systems in many countries. The aim of discharge planning is to reduce hospital length of stay and unplanned readmission to hospital, and improve the co-ordination of services following discharge from hospital. Objectives To determine the effectiveness of planning the discharge of patients moving from hospital. Search strategy We updated the review using the Cochrane EPOC Group Trials Register, MEDLINE, EMBASE and the Social Science Citation Index (last searched in March 2009). Selection criteria Randomised controlled trials (RCTs) that compared an individualised discharge plan with routine discharge care that was not tailored to the individual patient. Participants were hospital inpatients. Data collection and analysis Two authors independently undertook data analysis and quality assessment using a predesigned data extraction sheet. Studies are grouped according to patient group (elderly medical patients, surgical patients and those with a mix of conditions) and by outcome. Main results Twenty-one RCTs (7234 patients) are included; ten of these were identified in this update. Fourteen trials recruited patients with a medical condition (4509 patients), four recruited patients with a mix of medical and surgical conditions (2225 patients), one recruited patients from a psychiatric hospital (343 patients), one from both a psychiatric hospital and from a general hospital (97 patients), and the final trial recruited patients admitted to hospital following a fall (60 patients). Hospital length of stay and readmissions to hospital were significantly reduced for patients allocated to discharge planning (mean difference length of stay -0.91, 95% CI -1.55 to -0.27, 10 trials; readmission rates RR 0.85, 95% CI 0.74 to 0.97, 11 trials). For elderly patients with a medical condition (usually heart failure) there was insufficient evidence for a difference in mortality (RR 1.04, 95% CI 0.74 to 1.46, four trials) or being discharged from hospital to home (RR 1.03, 95% CI 0.93 to 1.14, two trials). This was also the case for trials recruiting patients recovering from surgery and a mix of medical and surgical conditions. In three trials patients allocated to discharge planning reported increased satisfaction. There was little evidence on overall healthcare costs. Authors’ conclusions The evidence suggests that a structured discharge plan tailored to the individual patient probably brings about small reductions in hospital length of stay and readmission rates for older people admitted to hospital with a medical condition. The impact of discharge planning on mortality, health outcomes and cost remains uncertain.

Keywords: Acute-Care, Assessment, Authors, Citation, Clinical-Trial, Congestive-Heart-Failure, Controlled Clinical Trials As Topic, Data Analysis, Discharge, Elderly, Follow-Up, Frail Elderly-Patients, Geriatric Consultation Team, Health, Health Care Costs, Humans, Impact, Intervention Team, Length of Stay, Medical, Medicare Population, Medline, Older People, Outcome Assessment (Health Care), Patient Discharge, Patient Readmission, Quality-of-Life, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Review, Science, Science Citation Index, Social Science Citation Index, Surgery

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Full Text: [2010\Coc Dat Sys Rev2010, CD004888.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD004888.pdf)

Abstract: Background Antiviral treatment for chronic hepatitis C may be less effective if patients are co-infected with human immunodeficiency virus (HIV). Objectives To assess the benefits and harms of antiviral treatment for chronic hepatitis C in patients with HIV. Search strategy Trials were identified through manual and electronic searches in The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded. The last search was May 2009. Selection criteria Randomised trials comparing at least 12 weeks of any anti-HCV treatment versus another treatment regimen or no treatment. Included patients had chronic hepatitis C and stable HIV irrespective of previous antiviral therapy. Data collection and analysis Data extraction and assessment of risk of bias were done in duplicate. Analysis was by intention-to-treat. Main results Fourteen trials were included. None of the included 2269 patients were previously treated for chronic hepatitis C. Peginterferon (either 2a, 180 microgram, or 2b, 1.5 microgram/kg, once weekly) plus ribavirin was more effective in achieving end of treatment and sustained virological response compared with interferon plus ribavirin (5 trials, 1340 patients) or peginterferon (2 trials, 714 patients). The benefit of peginterferon plus ribavirin was seen irrespective of HCV genotype although patients with genotype 1 or 4 had lower response rates (27%) than patients with genotype 2 or 3 (56%). The remaining trials compared different treatment regimens in patients who were treatment naive or had no virological response after three months of treatment, but overall they had not enough power to show any effect of increasing the dose of interferon or adding both amantadine or ribavirin. The overall mortality was 23/2111 patients with no significant differences between treatment regimens. Treatment increased the risk of adverse events including anaemia and flu-like symptoms, and several serious adverse events occurred including fatal lactic acidosis, liver failure, and suicide due to depression. Authors’ conclusions Peginterferon plus ribavirin may be considered a treatment for patients with chronic hepatitis C and stable HIV who have not received treatment for hepatitis C as the intervention may clear the blood of HCV RNA. Supporting evidence comes mainly from the analysis of this non-validated surrogate outcome assessed in comparisons against other antiviral treatments. There is no evidence on treatment of patients who have relapsed or did not respond to previous therapy. Careful monitoring of adverse events is warranted.

Keywords: Antiretroviral Therapy, Assessment, Authors, Citation, Disease Progression, Early Virological Response, HIV-Infected Patients, Hiv, Hcv-Coinfected Patients, Interferon Plus Ribavirin, Medline, Natural-History, Pegylated Interferon-Alpha-2b, Randomized Controlled-Trial, Risk, Risk-Factors, Science, Science Citation Index, Treatment

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Full Text: [2010\Coc Dat Sys Rev2010, CD005956.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD005956.pdf)

Abstract: Background Chronic musculoskeletal pain (CMP) is a major health problem, accounting for approximately one-quarter of general practice (GP) consultations in the United Kingdom (UK). Exercise and physical activity is beneficial for the most common types of CMP, such as back and knee pain. However, poor adherence to exercise and physical activity may limit long-term effectiveness. Objectives To assess the effects of interventions to improve adherence to exercise and physical activity for people with chronic musculoskeletal pain. Search strategy We searched the trials registers of relevant Cochrane Review Groups. In addition, we searched the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL, AMED, PsycINFO, Science Citation Index and Social Science Citation Index and reference lists of articles to October 2007. We consulted experts for unpublished trials. Selection criteria Randomised or quasi-randomised trials evaluating interventions that aimed to improve adherence to exercise and physical activity in adults with pain for three months and over in the axial skeleton or large peripheral joints. Data collection and analysis Two of the four authors independently assessed the quality of each included trial and extracted data. We contacted study authors for missing information. Main results We included 42 trials with 8243 participants, mainly with osteoarthritis and spinal pain. Methods used for improving and measuring adherence in the included trials were inconsistent. Two of the 17 trials that compared different types of exercise showed positive effects, suggesting that the type of exercise is not an important factor in improving exercise adherence. Six trials studied different methods of delivering exercise, such as supervising exercise sessions, refresher sessions and audio or videotapes of the exercises to take home. Of these, five trials found interventions improved exercise adherence. Four trials evaluated specific interventions targeting exercise adherence; three of these showed a positive effect on exercise adherence. In eight trials studying self-management programmes, six improved adherence measures. One trial found graded activity was more effective than usual care for improving exercise adherence. Cognitive behavioural therapy was effective in a trial in people with whiplash-associated disorder, but not in trials of people with other CMP. In the trials that showed a positive effect on adherence, association between clinical outcomes and exercise adherence was conflicting. Authors’ conclusions Interventions such as supervised or individualised exercise therapy and self-management techniques may enhance exercise adherence. However, high-quality, randomised trials with long-term follow up that explicitly address adherence to exercises and physical activity are needed. A standard validated measure of exercise adherence should be used consistently in future studies.

Keywords: Articles, Authors, Chronic Neck Pain, Chronic Spinal Pain, Citation, Clinical-Practice Guidelines, Cognitive-Behavioral Treatment, Disorder, Exercises, Health, Low-Back-Pain, Medline, Physical-Activity Intervention, Positive, Randomized Controlled-Trial, Review, Science, Science Citation Index, Self-Management Program, Social Science Citation Index, Techniques, UK, United Kingdom, Upper-Limb Symptoms, Work Style Intervention

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Full Text: [2010\Coc Dat Sys Rev2010, CD006797.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006797.pdf)

Abstract: Background Involvement of hepatic lymph node in patients with colorectal liver metastases is associated with poor prognosis. Objectives To determine the benefits and harms of curative liver resection with lymphadenectomy versus other treatments for colorectal liver metastases with hepatic node involvement. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and LILACS until September 2009 for identifying the randomised trials. Selection criteria We considered only randomised clinical trials (irrespective of language, blinding, or publication status) comparing liver resection (alone or in combination with radiofrequency ablation or cryoablation) versus other treatments (neo-adjuvant chemotherapy, chemotherapy, or radiofrequency ablation) in patients with colorectal liver metastases with hepatic node involvement. Data collection and analysis Two authors independently identified trials for inclusion. Main results We were unable to identify any randomised clinical trial fulfilling the inclusion criteria of this review. We were also unable to identify any quasi-randomised or cohort studies, which could meaningfully answer this important issue. Authors’ conclusions There is no evidence in the literature to assess the role of surgery versus other treatments for patients with colorectal liver metastases with hepatic node involvement. High quality randomised clinical trials are feasible and are necessary to determine the optimal management of patients with colorectal liver metastases with hepatic node involvement.

Keywords: Arterial Infusion, Authors, Citation, Clinical-Trials, Cohort, Controlled-Trials, Empirical-Evidence, Literature, Medline, Natural-History, Positive, Preoperative Chemotherapy, Prognosis, Prognostic-Factors, Publication, Radiofrequency Ablation, Randomized-Trial, Review, Science, Science Citation Index, Squamous-Cell Carcinoma, Surgery, Treatment

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Full Text: [2010\Coc Dat Sys Rev2010, CD006803.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006803.pdf)

Abstract: Background Antiviral therapy to treat recurrent hepatitis C infection after liver transplantation is controversial due to unresolved balance between benefits and harms. Objectives To compare the therapeutic benefits and harms of different antiviral regimens in patients with hepatitis C re-infected grafts after liver transplantation. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until March 2009. Selection criteria Only randomised clinical trials (irrespective of language, blinding, or publication status) comparing various antiviral therapies (alone or in combination) in the treatment of hepatitis C virus recurrence in liver transplantation were considered for the review. Data collection and analysis Two authors collected the data independently. We calculated the risk ratio (RR) or mean difference (MD) with 95% confidence intervals (CI) using the fixed-effect and the random-effects models based on available case-analysis. In the presence of only trial for a dichotomous outcome, we performed the Fisher’s exact test. Main results A total of 425 liver transplant recipients with proven hepatitis C recurrence were randomised in twelve trials to various interventions and controls. The mean proportion of genotype I was 79.9% in the nine trials that reported the genotype. All the trials were of high risk of bias. One to two trials were included under each comparison including single drug or multidrug regimens of interferon, ribavirin, and amantadine. There was no significant difference in the mortality, graft rejection, or in re-transplantation between intervention and control in any of the comparisons that reported these outcomes. None of the trials reported liver decompensation or quality of life. Life-threatening adverse effects were not reported in either group in any of the comparisons. Up to 87.5% of patients required reduction in dose and up to 42.9% of patients required cessation of treatment in the various comparisons because of adverse effects or because of patient’s choice to stop treatment. Authors’ conclusions Considering the lack of clinical benefit and the frequent adverse effects, there is currently no evidence to recommend antiviral treatment for recurrent liver graft infection with HCV. Further randomised clinical trials with adequate trial methodology and adequate duration of follow-up are necessary.

Keywords: Antiviral Agents [Adverse Effects, Authors, Citation, Clinical-Trials, Combination Therapy, Comparison, Genotype, Graft Rejection [Epidemiology], HCV Treatment, Hepacivirus [Genetics], Hepatitis C [Drug Therapy, Humans, Interferon-Alpha, Liver Transplantation [Adverse Effects, Medline, Models, Mortality], Multicenter Randomized-Trial, Peginterferon Alpha-2a Pegasys(R), Plus Ribavirin, Publication, Randomized Controlled Trials As Topic, Recurrence, Rejection, Review, Risk, Science, Science Citation Index, Sustained Virological Response, Therapeutic Use], Transplant Recipients, Transplantation, Treatment, Viral Response

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Full Text: [2010\Coc Dat Sys Rev2010, CD007169.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007169.pdf)

Abstract: Background Music therapy in end-of-life care aims to improve a person’s quality of life by helping relieve symptoms, addressing psychological needs, offering support, facilitating communication, and meeting spiritual needs. In addition, music therapists assist family and caregivers with coping, communication, and grief/bereavement. Objectives To examine effects of music therapy with standard care versus standard care alone or standard care combined with other therapies on psychological, physiological, and social responses in end-of-life care. Search strategy We searched CENTRAL, MEDLINE, CINAHL, EMBASE, PSYCINFO, LILACS, CancerLit, Science Citation Index, www. musictherapyworld. de, CAIRSS for Music, Proquest Digital Dissertations, ClinicalTrials. gov, Current Controlled Trials, and the National Research Register to September 2009. We handsearched music therapy journals and reference lists, and contacted experts to identify unpublished manuscripts. There was no language restriction. Selection criteria We included all randomized and quasi-randomized controlled trials that compared music interventions and standard care with standard care alone or combined with other therapies in any care setting with a diagnosis of advanced life-limiting illness being treated with palliative intent and with a life expectancy of less than two years. Data collection and analysis Data were extracted, and methodological quality was assessed, independently by review authors. Additional information was sought fromstudy authors when necessary. Results are presented using weightedmean differences for outcomes measured by the same scale and standardized mean differences for outcomes measured by different scales. Posttest scores were used. In cases of statistically significant baseline difference, we used change scores. Main results Five studies (175 participants) were included. There is insufficient evidence of high quality to support the effect of music therapy on quality of life of people in end-of-life care. Given the limited number of studies and small sample sizes, more research is needed. No strong evidence was found for the effect of music therapy on pain or anxiety. These results were based on two small studies. There were insufficient data to examine the effect of music therapy on other physical, psychological, or social outcomes. Authors’ conclusions A limited number of studies suggest there may be a benefit of music therapy on the quality of life of people in end-of-life care. However, the results stem from studies with a high risk of bias. More research is needed.

Keywords: Authors, Cancer, Citation, Diagnosis, Hospice, Journals, Manuscripts, Medline, Palliative Care, Research, Review, Risk, Scale, Science, Science Citation Index, Terminally-Ill

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Full Text: [2010\Coc Dat Sys Rev2010, CD007340.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007340.pdf)

Abstract: Background Nonalcoholic fatty liver disease (NAFLD) is increasingly recognised as a condition associated with overweight or obesity that may progress to end-stage liver disease. NAFLD histology resembles alcohol-induced liver injury, but occurs in patients with no history of alcohol abuse. NAFLD has a broad spectrum of clinical and histological manifestations, ranging from simple fatty liver to hepatic steatosis with inflammation, advanced fibrosis, and cirrhosis. The inflammatory stage is known as non-alcoholic steatohepatitis (NASH). Recent reports indicate that weight loss induced by bariatric procedures could be beneficial for NASH treatment. Objectives To assess the benefits and harms of bariatric surgery for NASH in obese patients. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded to October 2009. Selection criteria All randomised clinical trials evaluating any bariatric procedure versus no intervention, placebo (sham procedure), or other interventions in patients with NASH regardless of publication status, number of patients randomised, language, or blinding. Quasi-randomised clinical studies were to be considered for the review if no randomised clinical trials were identified. If included, their bias towards positive findings was to be considered. Data collection and analysis We extracted data in duplicate, and we planned to analyse the data by intention-to-treat. Main results We could not find any randomised clinical trials or quasi-randomised clinical studies that fulfilled the inclusion criteria. Our search resulted in twenty-one prospective or retrospective cohort studies, in which improvement on steatosis or inflammation scores was reported. However, four studies also described some deterioration in the degree of fibrosis. Authors’ conclusions LThe lack of randomised clinical trials and quasi-randomised clinical studies precludes us to assess the benefits and harms of bariatric surgery as a therapeutic approach for patients with NASH. Limitations of all other studies with inferior design did not allow us to draw any unbiased conclusion on bariatric surgery for treatment of NASH.

Keywords: Authors, Citation, Clinical-Trials, Cohort, Empirical-Evidence, Fatty Liver-Disease, Gastric Bypass-Surgery, History, Insulin-Resistance, Medline, Metabolic Syndrome, Morbid-Obesity, Natural-History, Placebo-Controlled Trial, Positive, Publication, Review, Science, Science Citation Index, Surgery, Treatment, Weight-Loss

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Full Text: [2010\Coc Dat Sys Rev2010, CD007438.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007438.pdf)

Abstract: Background Trauma is one of the leading causes of death in any age group. The ‘lethal triad’ of acidosis, hypothermia, and coagulopathy has been recognized as a significant cause of death in patients with traumatic injuries. In order to prevent the lethal triad two factors are essential, early control of bleeding and prevention of further heat loss. In patients with major abdominal trauma, damage control surgery (DCS) avoids extensive procedures on unstable patients, stabilizes potentially fatal problems at initial operation, and applies staged surgery after successful initial resuscitation. It is not currently known whether DCS is superior to immediate surgery for patients with major abdominal trauma. Objectives To assess the effectiveness of DCS compared to traditional immediate definitive surgical treatment for patients with major abdominal trauma. Search strategy We searched the Cochrane Injuries Group Specialised Register, CENTRAL (The Cochrane Library 2008, Issue 3), MEDLINE, EMBASE, Web of Science: Science Citation Index & ISI Proceedings, Current Controlled Trials MetaRegister, Clinicaltrials. gov, Zetoc, and CINAHL for all published and unpublished randomised controlled trials. We did not restrict the searches by language, date, or publication status. Searches were conducted in August 2008. Selection criteria Randomised controlled trials of DCS versus immediate traditional surgical repair were included in this review. We included patients with major abdominal trauma (Abbreviated Injury Scale > 3) who were undergoing surgery. Patient selection was crucial as patients with relatively simple abdominal injuries should not undergo unnecessary procedures. Data collection and analysis Two authors independently evaluated the search results. Main results A total of 1523 studies were identified by our search. No randomised controlled trials comparing DCS with immediate and definitive repair in patients with major abdominal trauma were found. A total of 1521 studies were excluded because they were not relevant to the review topic and two studies were excluded because they were case-control studies. Authors’ conclusion Evidence that supports the efficacy of DCS with respect to traditional laparotomy in patients with major abdominal trauma is limited.

Keywords: Authors, Case-Control, Citation, Coagulopathy, Consecutive Patients, Experience, Hemorrhage, Hepatic-Trauma, Injury, ISI, Laparotomy, Management, Medline, Publication, Review, Science, Science Citation Index, Surgery, Survival, Topic, Treatment, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD007502.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007502.pdf)

Abstract: Background Infection with human immunodeficency virus (HIV) and acquired immunodeficency syndrome (AIDS) is a pandemic that has affected millions of people globally. Although major research and clinical initiatives are addressing prevention and cure strategies, issues of quality of life for survivors have received less attention. Massage therapy is proposed to have a positive effect on quality of life and may also have a positive effect on immune function through stress mediation. Objectives The objective of this systematic review was to examine the safety and effectiveness of massage therapy on quality of life, pain and immune system parameters in people living with HIV/AIDS. Search strategy A comprehensive search strategy was devised incorporating appropriate terms for HIV/AIDS, randomised controlled trials (RCTs), massage therapy and the pertinent measures of benefit. All electronic databases identified were searched in November 2008, including Cochrane Group Trials Register, Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, SCIENCE CITATION INDEX, AIDSLINE, AIDSearch, CINAHL, HEALTHSTAR, PsycLIT, AMED, Current Contents, AMI, NLM GATEWAY, LILACS, IndMed, SOCIOFILE, SCI, SSCI, ERIC and DAI. We also reviewed relevant published and unpublished conference abstracts and proceedings and scrutinised reference lists from pertinent journals. There were no language or date restrictions. Selection criteria Studies were identified by two reviewers based on trial design (RCTs) and participants (ie, people of any age with HIV/AIDS, at any stage of the disease) who had undergone an intervention that included massage therapy for the identified aims of improving quality of life and activity and participation levels, improving immune function, reducing pain and improving other physiological or psychological impairments. Datacollection and analysis Two reviewers independently identified included studies and extracted relevant data. Two other reviewers independently reviewed the included studies for risk of bias. All data and risk of bias judgements were entered into Revman (v5) and meta-analyses were conducted where appropriate. Main results Twelve papers were identified, from which four were included. The remaining eight papers were excluded predominantly due to inappropriate methodology. The four included studies were highly clinically heterogenous, investigating a range of age groups (ie, children, adolescents and adults) across the disease spectrum from early HIV through late-stage AIDS. The settings were either community or palliative care, and the outcome measures were a combination of quality of life and immunological function. The trials were judged to be at moderate risk of bias mostly because of incomplete reporting. For quality of life measures, the studies reported that massage therapy in combination with other modalities, such as meditation and stress reduction, are superior to massage therapy alone or to the other modalities alone. The quality of life domains with significant effect sizes included self-reported reduced use of health care resources, improvement in self-perceived spiritual quality of life and improvement in total quality of life scores. One study also reported positive changes in immune function, in particular CD4+ cell count and natural killer cell counts, due to massage therapy, and one study reported no difference between people given massage therapy and controls in immune parameters. Adverse or harmful effects were not well reported. Authors’ conclusions There is some evidence to support the use of massage therapy to improve quality of life for people living with HIV/AIDS (PLWHA), particularly in combination with other stress-management modalities, and that massage therapymay have a positive effect on immunological function. The trials are small, however, and at moderate risk of bias. Further studies are needed using larger sample sizes and rigorous design/reporting before massage therapy can be strongly recommended for PLWHA.

Keywords: Aids, Authors, Citation, Citation Indexes, Citation-Index, Complementary Therapies, Databases, Dominican Children, Efficacy, Groups, Health, Health Care, HIV, Human-Immunodeficiency-Virus, Improved Immune, Index, Indexes, Journals, Medline, Palliative Care, Positive, Quality, Research, Review, Risk, SCI, Science, Science Citation, Science-Citation-Index, System, Systematic Review

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Full Text: [2010\Coc Dat Sys Rev2010, CD007877.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007877.pdf)

Abstract: Back ground Traumatic brain injury (TBI) is a leading cause of death and disability. Intracranial bleeding is a common complication of TBI, and intracranial bleeding can develop or worsen after hospital admission. Haemostatic drugsmay reduce the occurrence or size of intracranial bleeds and consequently lower the morbidity and mortality associated with TBI. Objectives To assess the effects of haemostatic drugs on mortality, disability and thrombotic complications in patients with traumatic brain injury. Search strategy We searched the electronic databases: Cochrane Injuries Group Specialised Register (3 February 2009), CENTRAL (The Cochrane Library 2009, Issue 1), MEDLINE (1950 to Week 3 2009), PUBMED (searched 3 February 2009 (last 180 days)), EMBASE (1980 to Week 4 2009), CINAHL (1982 to January 2009), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to January 2009), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) (1990 to January 2009). Selection criteria We included published and unpublished randomised controlled trials comparing haemostatic drugs (antifibrinolytics: aprotinin, tranexamic acid (TXA), aminocaproic acid or recombined activated factor VIIa (rFVIIa)) with placebo, no treatment, or other treatment in patients with acute traumatic brain injury. Data collection and analysis Two review authors independently examined all electronic records, and extracted the data. We judged that there was clinical heterogeneity between trials so we did not attempt to pool the results of the included trials. The results are reported separately. Main results We included two trials. One was a post-hoc analysis of 30 TBI patients from a randomised controlled trial of rFVIIa in blunt trauma patients. The risk ratio for mortality at 30 days was 0.64 (95% CI 0.25 to 1.63) for rFVIIa compared to placebo. This result should be considered with caution as the subgroup analysis was not pre-specified for the trial. The other trial evaluated the effect of rFVIIa in 97 TBI patients with evidence of intracerebral bleeding in a computed tomography (CT) scan. The corresponding risk ratio for mortality at the last follow up was 1.08 (95% CI 0.44 to 2.68). The quality of the reporting of both trials was poor so it was difficult to assess the risk of bias. Authors’ conclusions There is no reliable evidence from randomised controlled trials to support the effectiveness of haemostatic drugs in reducing mortality or disability in patients with TBI. New randomised controlled trials assessing the effects of haemostatic drugs in TBI patients should be conducted. These trials should be large enough to detect clinically plausible treatment effects.

Keywords: Activated Factor-Vii, Authors, Citation, Clinical-Trial, Databases, Head-Injury, Heterogeneity, Impact, Intracerebral Hemorrhage, ISI, ISI Web, ISI Web of Science, Medline, Occurrence, Review, Risk, Safety, Science, Science Citation Index, Therapy, Treatment, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD007916.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007916.pdf)

Abstract: Background Early surfactant reduces mortality and pulmonary complications in preterm infants with respiratory distress syndrome. However, current surfactant administration strategies require endotracheal intubation with or without continued mechanical ventilation. Bronchopulmonary dysplasia and chronic lung disease (CLD) are associated with mechanical ventilation and potentially life-long effects. Noninvasive methods of surfactant administration including intra-amniotic surfactant may avoid endotracheal intubation and mechanical ventilation, potentially preventing development of CLD. Objectives To determine if intra-amniotic instillation of surfactant for women at risk of preterm birth, compared to placebo or no treatment or post-delivery tracheal surfactant instillation, reduces morbidity or mortality, or both, in preterm infants. If intra-amniotic instillation is effective, in subgroup analysis to determine the effect of 1) gestational age; 2) type of surfactant; 3) dose; 4) timing; 5) indication; and 6) multiple pregnancy. Search strategy We searched the Cochrane Pregnancy and Childbirth Group’s Trials Register (August 2009), MEDLINE (1950-August 2009), hand-searched the Proceedings of Pediatric Academic Societies (American Pediatric Society, Society for Pediatric Research and European Society for Pediatric Research) from 1990-2009 in Pediatric Research Journal and Abstracts online and the Proceedings of Perinatal Society of Australia and New Zealand (PSANZ) (1996-2009). We also searched the Science Citation Index (Web of Science) (August 2009) and checked reference lists of identified studies. We contacted Abbott Laboratories, Inc for unpublished studies. Selection criteria Published, unpublished and ongoing randomised controlled, cluster-randomised or quasi-randomised trials of intra-amniotic instillation of surfactant for women at risk of preterm birth, compared to placebo or no treatment or post-delivery tracheal surfactant instillation. Data collection and analysis Three review authors independently assessed study eligibility and quality. Main results We found no trials were found met the inclusion criteria for this review. Authors’ conclusions We identified no randomised trials that evaluated the effect of intra-amniotic instillation of surfactant for women at risk of preterm birth. Evidence from animal and observational human studies suggest that intra-amniotic surfactant administration is potentially safe, feasible and effective. Well designed trials of intra-amniotic instillation of surfactant for women at risk of preterm birth are needed.

Keywords: Age, Australia, Authors, Bronchopulmonary Dysplasia, Chronic Lung-Disease, Citation, In-Utero, Indication, Medline, Positive Airway Pressure, Pregnancy, Premature-Infants, Replacement, Research, Respiratory, Review, Risk, Science, Science Citation Index, Surfactant, Syndrome Rds, Treatment, Ventilation, Web of Science, Weight Infants

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Full Text: [2010\Coc Dat Sys Rev2010, CD008341.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008341.pdf)

Abstract: Background Golimumab is a humanized inhibitor of Tumor necrosis factor-alpha, recently approved by the Food and Drug Administration (FDA) for the treatment of Rheumatoid arthritis (RA). Objectives The objective of this systematic review was to compare the efficacy and safety of golimumab (alone or in combination with DMARDs or biologics) to placebo (alone or in combination with DMARDs or biologics) in randomized or quasi-randomized clinical trials in adults with RA. Search strategy An expert librarian searched six databases for any clinical trials of golimumab in RA, including the Cochrane Central Register of Controlled Trials (CENTRAL), OVID MEDLINE, CINAHL, EMBASE, Science Citation Index (Web of Science) and Current Controlled Trials databases. Selection criteria Studies were included if they used golimumab in adults with RA, were randomized or quasi-randomized and provided clinical outcomes. Data collection and analysis Two review authors (JS, SN) independently reviewed all titles and abstracts, selected appropriate studies for full review and reviewed the full-text articles for the final selection of included studies. For each study, they independently abstracted study characteristics, safety and efficacy data and performed risk of bias assessment. Disagreements were resolved by consensus. For continuous measures, we calculated mean differences or standardized mean differences and for categorical measures, relative risks. 95% confidence intervals were calculated. Main results Four RCTs with 1,231 patients treated with golimumab and 483 patients treated with placebo were included. Of these, 436 were treated with the FDA-approved dose of golimumab 50 mg every four weeks. Compared to patients treated with placebo+ methotrexate, patients treated with the FDA-approved dose of golimumab+ methotrexate were 2.6 times more likely to reach ACR50 (95% confidence interval (CI) 1.3 to 4.9; P=0.005 and NNT=5,95% confidence interval 2 to 20), no more likely to have any adverse event (relative risk 1.1, 95% Cl 0.9 to 1.2; P = 0.44), and 0.5 times as likely to have overall withdrawals (95% Cl 0.3 to 0.8; P = 0.005). Golimumab-treated patients were significantly more likely to achieve remission, low disease activity and improvement in functional ability compared to placebo (all statistically significant). No significant differences were noted between golimumab and placebo regarding serious adverse events, infections, serious infections, lung infections, tuberculosis, cancer, withdrawals due to adverse events and inefficacy and deaths. No radiographic data were reported. Authors’ conclusions With an overall high grade of evidence, at the FDA-approved dose, golimumab is significantly more efficacious than placebo in treatment of patients with active RA, when used in combination with methotrexate. The short-term safety profile, based on short-term RCTs, is reasonable with no differences in total adverse events, serious infections, cancer, tuberculosis or deaths. Long-term surveillance studies are needed for safety assessment.

Keywords: Articles, Assessment, Authors, Cancer, Characteristics, Citation, Databases, Disease, Factor-Alpha, Medline, Metaanalysis, Methotrexate, Necrosis-Factor Inhibitors, Preliminary Definition, Progression, Response Criteria, Review, Rheumatoid Arthritis, Risk, Science, Science Citation Index, Systematic Review, Therapy, Treatment, Web of Science, Work Disability

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Full Text: [2010\Coc Dat Sys Rev2010, CD002043.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD002043.pdf)

Abstract: Background Studies in traumatic encephalopathy first led to the insight that the damage seen was not just due to direct consequences of the primary injury. A significant, and potentially preventable, contribution to the overall morbidity arose from secondary hypoxic-ischaemic damage. Brain swelling accompanied by raised intracranial pressure (ICP) resulted in inadequate cerebral perfusion with well-oxygenated blood. Detection of raised ICP could be useful in alerting clinicians to the need to improve cerebral perfusion, with consequent reductions in brain injury. Objectives To determine whether routine ICP monitoring in all acute cases of severe coma reduces the risk of all-cause mortality or severe disability at final follow-up. Search strategy We searched the Cochrane Injuries Group’s Specialised Register (searched 7 April 2009), CENTRAL (The Cochrane Library 2009, Issue 1), MEDLINE 1950 to March week 4 2009, EMBASE 1980 to week 14 March 2009, CINAHL 1982 to March 2009, ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) 1970 to March 2009, Conference Proceedings Citation Index-Science (CPCI-S) 1990 to March 2009, PUBMED (searched 7 April 2009, limit; added in last 6 months). The searches were last updated in April 2009. Selection criteria All randomised controlled studies of real-time ICP monitoring by invasive or semi-invasive means in acute coma (traumatic or non-traumatic aetiology) versus no ICP monitoring (that is, clinical assessment of ICP). Data collection and analysis Primary outcome measures were all-cause mortality and severe disability at the end of the follow-up period. Main results No studies meeting the selection criteria have been identified to date. Authors’ conclusions There are no data from randomised controlled trials that can clarify the role of ICP monitoring in acute coma.

Keywords: Acute Disease, Aggressive Treatment, Assessment, Authors, Brain Injuries [Complications], Cerebrovascular Circulation, Citation, Coma [Physiopathology], Contribution, Experience, Failure, Humans, Insults, Intensive-Care, Intra-Cranical Pressure, Intracranial Hypertension [Physiopathology], Intracranial Pressure [Physiology], ISI, ISI Web, ISI Web of Science, Management, Medline, Monitoring,Physiologic, Primary, Risk, Science, Science Citation Index, Severe Head-Injury, Survival, Swelling, Traumatic Brain-Injury, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD003690.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD003690.pdf)

Abstract: Background Antidepressants may be useful in the treatment of abnormal crying associated with stroke. This is an update of a Cochrane Review first published in 2004. Objectives To determine whether pharmaceutical treatment reduces the frequency of emotional displays in people with emotionalism after stroke. Search strategy We searched the trials registers of the Cochrane Stroke Group and the Cochrane Depression Anxiety and Neurosis Group (last searched August 2009). In addition, we searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 3, 2009), MEDLINE (1966 to May 2008), EMBASE (1980 to May 2008), CINAHL (1982 to May 2008), PsycINFO (1967 to May 2008), Arts and Humanities Index (1991 to May 2008), BIOSIS Previews (2002 to May 2008), Science Citation Index (1992 to May 2008), Social Sciences Citation Index (1991 to May 2008), Sociological Abstract/Sociofile (1974 to May 2008), ISI Web of Science (2002 to May 2008), reference lists, clinical trials registers, conference proceedings and dissertation abstracts. We also contacted authors, researchers and pharmaceutical companies. Selection criteria Randomised and quasi-randomised controlled trials comparing psychotropic medication to placebo in people with stroke and emotionalism (also known as emotional lability or pathological crying and laughing). Data collection and analysis We obtained data for people who no longer met the criteria for emotionalism, and on reduction in frequency of crying. Primary analyses were the proportion of patients who met the criteria for emotionalism at the end of treatment. Secondary outcomes included emotionalism and depression scores, cognitive function, death, activities of daily living and adverse effects. Main results We included seven trials involving 239 participants. Data were available for five trials with 213 participants. Five trials showed large effects of treatment: 50% reduction in emotionalism, diminished tearfulness, improvements (reduction) in lability, tearfulness and scores on the Pathological Laughter and Crying Scale. However, confidence intervals were wide indicating that treatment may have had only a small positive effect, or even a small negative effect (in one trial). Only two studies systematically reported adverse events; no discernible differences were seen between groups. Authors’ conclusions Antidepressants can reduce the frequency and severity of crying or laughing episodes. The effect does not seem specific to one drug or class of drugs. Our conclusions must be qualified by several methodological deficiencies in the studies. More reliable data are required before recommendations can be made about the treatment of post-stroke emotionalism.

Keywords: Antidepressants, Antidepressive Agents [Therapeutic Use], Authors, Brain-Damage, Citalopram Treatment, Citation, Crying [Psychology], Double-Blind, Fluoxetine Improves, Groups, Humans, Incontinence, ISI, ISI Web, ISI Web of Science, Lability, Laughter [Psychology], Medline, Pharmaceutical, Positive, Poststroke Depression, Pseudobulbar Affect, Quality-of-Life, Randomized Controlled Trials as Topic, Researchers, Review, Science, Science Citation Index, Sertraline, Stroke [Psychology], Treatment, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD005187.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD005187.pdf)

Abstract: Background Healthcare workers’ (HCWs) influenza rates are unknown, but may be similar to the general public and they may transmit influenza to patients. Objectives To identify studies of vaccinating HCWs and the incidence of influenza, its complications and influenza-like illness (ILI) in individuals >= 60 in long-term care facilities (LTCFs). Search strategy We searched CENTRAL (The Cochrane Library 2009, issue 3), which contains the Cochrane Acute Respiratory Infections Group’s Specialised Register, MEDLINE (1966 to 2009), EMBASE (1974 to 2009) and Biological Abstracts and Science Citation Index-Expanded. Selection criteria Randomised controlled trials (RCTs) and non-RCTs of influenza vaccination of HCWs caring for individuals >= 60 in LTCFs and the incidence of laboratory-proven influenza, its complications or ILI. Data collection and analysis Two authors independently extracted data and assessed risk of bias. Main results We identified four cluster-RCTs (C-RCTs) (n = 7558) and one cohort (n = 12742) of influenza vaccination for HCWs caring for individuals >= 60 in LTCFs. Pooled data from three C-RCTs showed no effect on specific outcomes: laboratory-proven influenza, pneumonia or deaths from pneumonia. For non-specific outcomes pooled data from three C-RCTs showed HCW vaccination reduced ILI; data from one C-RCT that HCW vaccination reduced GP consultations for ILI; and pooled data from three C-RCTs showed reduced all-cause mortality in individuals >= 60. Authors’ conclusions No effect was shown for specific outcomes: laboratory-proven influenza, pneumonia and death from pneumonia. An effect was shown for the non-specific outcomes of ILI, GP consultations for ILI and all-cause mortality in individuals >= 60. These non-specific outcomes are difficult to interpret because ILI includes many pathogens, and winter influenza contributes < 10% to all-cause mortality in individuals >= 60. The key interest is preventing laboratory-proven influenza in individuals >= 60, pneumonia and deaths from pneumonia, and we cannot draw such conclusions. The identified studies are at high risk of bias. Some HCWs remain unvaccinated because they do not perceive risk, doubt vaccine efficacy and are concerned about side effects. This review did not find information on co-interventions with HCW vaccination: hand washing, face masks, early detection of laboratory-proven influenza, quarantine, avoiding admissions, anti-virals, and asking HCWs with ILI not to work. We conclude there is no evidence that vaccinating HCWs prevents influenza in elderly residents in LTCFs. High quality RCTs are required to avoid risks of bias in methodology and conduct, and to test these interventions in combination.

Keywords: A H3N2, Adult, Aged, Authors, Citation, Cohort, Efficacy, Elderly, Facilities, Health Personnel, Homes for the Aged, Humans, Infections, Infectious Disease Transmission,Professional-To-Patient [Prevention & Control], Influenza Vaccines [Administration & Dosage], Influenza,Human [Prevention & Control, Long-Term-Care, Medline, Middle Aged, Mortality, Nursing-Home Residents, Pathogens, People, Prevention, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Residents, Review, Risk, Science, Transmission], Vaccines,Inactivated [Administration & Dosage]

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Full Text: [2010\Coc Dat Sys Rev2010, CD007219.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007219.pdf)

Abstract: Background Cardiovascular disease is a major cause of death in developed and developing countries. Refractory stable angina pectoris is, in general, inadequately responsive to conventional medical therapy. Enhanced external counterpulsation is a non-invasive treatment for patients with refractory angina and involves the placing of compressible cuffs around the calves and lower and upper thighs. These are inflated sequentially so that during early diastole they help propel blood back to the heart and when deflated at end of diastole allow the blood vessels to return to their normal state. It is claimed that enhanced external counterpulsation can help reduce aortic impedance and thereby alleviate some of the symptoms of angina. Objectives To assess the effects of enhanced external counterpulsation therapy in improving health outcomes for patients with chronic stable or refractory stable angina pectoris. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) on The Cochrane Library (2008, Issue 1), MEDLINE (1966 to February 2008), EMBASE (1980 to February 2008), LILACS via BIREME (to February 2008) and ISI Science Citation Index on Web of Science (to February 2008). No language restrictions were applied. Selection criteria Randomized controlled trials and cluster-randomized trials comparing enhanced external counterpulsation therapy to sham treatment in adults, aged over 18 years, with chronic stable and stable refractory angina pectoris graded Canadian Cardiovascular Society Class III to IV at baseline. Data collection and analysis Two authors independently screened papers, extracted trial details and assessed risk of bias. Main results One trial (139 participants) was included in this review. Poormethodological quality, in terms of trial design and conduct, incompleteness in reporting of the review’s primary outcome, limited follow up for the secondary outcomes and subsequent flawed statistical analysis, compromised the reliability of the reported data. Authors’ conclusions We found one relevant trial which failed to address the characteristics of interest satisfactorily, in terms of severity of angina, for the participants in this review. Participants with the most severe symptoms of angina were excluded, therefore the results of this study represent only a subsection of the broader population with the disorder, are not generalizable and provide inconclusive evidence for the effectiveness of enhanced external counterpulsation therapy for chronic angina pectoris.

Keywords: Authors, Cardiovascular Disease, Characteristics, Citation, Developing Countries, Disease, Disorder, Health, ISI, Medical, Medline, Multicenter, Primary, Randomized Controlled Trials, Refractory Angina, Reliability, Review, Risk, Science, Science Citation Index, Stable Angina, State, Term, Treatment, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD008009.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008009.pdf)

Abstract: Background Flexible working conditions are increasingly popular in developed countries but the effects on employee health and wellbeing are largely unknown. Objectives To evaluate the effects (benefits and harms) of flexible working interventions on the physical, mental and general health and wellbeing of employees and their families. Search strategy Our searches (July 2009) covered 12 databases including the Cochrane Public Health Group Specialised Register, CENTRAL; MEDLINE; EMBASE; CINAHL; PsycINFO; Social Science Citation Index; ASSIA; IBSS; Sociological Abstracts; and ABI/Inform. We also searched relevant websites, handsearched key journals, searched bibliographies and contacted study authors and key experts. Selection criteria Randomised controlled trials (RCT), interrupted time series and controlled before and after studies (CBA), which examined the effects of flexible working interventions on employee health and wellbeing. We excluded studies assessing outcomes for less than six months and extracted outcomes relating to physical, mental and general health/ill health measured using a validated instrument. We also extracted secondary outcomes (including sickness absence, health service usage, behavioural changes, accidents, work-life balance, quality of life, health and wellbeing of children, family members and co-workers) if reported alongside at least one primary outcome. Data collection and analysis Two experienced review authors conducted data extraction and quality appraisal. We undertook a narrative synthesis as there was substantial heterogeneity between studies. Main results Ten studies fulfilled the inclusion criteria. Six CBA studies reported on interventions relating to temporal flexibility: self-scheduling of shift work (n = 4), flexitime (n = 1) and overtime (n = 1). The remaining four CBA studies evaluated a form of contractual flexibility: partial/gradual retirement (n = 2), involuntary part-time work (n = 1) and fixed-term contract (n = 1). The studies retrieved had a number of methodological limitations including short follow-up periods, risk of selection bias and reliance on largely self-reported outcome data. Four CBA studies on self-scheduling of shifts and one CBA study on gradual/partial retirement reported statistically significant improvements in either primary outcomes (including systolic blood pressure and heart rate; tiredness; mental health, sleep duration, sleep quality and alertness; self-rated health status) or secondary health outcomes (co-workers social support and sense of community) and no ill health effects were reported. Flexitime was shown not to have significant effects on self-reported physiological and psychological health outcomes. Similarly, when comparing individuals working overtime with those who did not the odds of ill health effects were not significantly higher in the intervention group at follow up. The effects of contractual flexibility on self-reported health (with the exception of gradual/partial retirement, which when controlled by employees improved health outcomes) were either equivocal or negative. No studies differentiated results by socio-economic status, although one study did compare findings by gender but found no differential effect on self-reported health outcomes. Authors’ conclusions The findings of this review tentatively suggest that flexible working interventions that increase worker control and choice (such as self-scheduling or gradual/partial retirement) are likely to have a positive effect on health outcomes. In contrast, interventions that were motivated or dictated by organisational interests, such as fixed-term contract and involuntary part-time employment, found equivocal or negative health effects. Given the partial and methodologically limited evidence base these findings should be interpreted with caution. Moreover, there is a clear need for well-designed intervention studies to delineate the impact of flexible working conditions on health, wellbeing and health inequalities.

Keywords: Authors, Bibliographies, British Civil-Servants, Citation, Coronary-Heart-Disease, Databases, Decision Latitude, Gradual Retirement, Health, Heterogeneity, Impact, Journals, Medline, Mental Health, Positive, Primary, Prospective Cohort, Review, Risk, Science, Science Citation Index, Self-Rated Health, Social Interventions, Social Science Citation Index, Systematic Reviews, Whitehall-II, Workplace Reorganization

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Full Text: [2010\Coc Dat Sys Rev2010, CD008370.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008370.pdf)

Abstract: Background Pancreatic resections are associated with high morbidity (30% to 60%) and mortality (5%). Synthetic analogues of somatostatin are advocated by some surgeons to reduce complications following pancreatic surgery, however their use is controversial. Objectives To determine whether prophylactic somatostatin analogues should be used routinely in pancreatic surgery. Search strategy We searched the Cochrane Upper Gastrointestinal and Pancreatic Diseases Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2009, issue 4), MEDLINE, EMBASE and Science Citation Index Expanded to November 2009. Selection criteria We included randomised controlled trials comparing prophylactic somatostatin or one of its analogues versus no drug or placebo during pancreatic surgery (irrespective of language or publication status). Data collection and analysis Two authors independently assessed trials for inclusion and independently extracted data. We analysed data with both the fixed-effect and the random-effects models using Review Manager (RevMan). We calculated the risk ratio (RR), mean difference (MD) or standardised mean difference (SMD) with 95% confidence intervals (CI) based on an intention-to-treat or available case analysis. When it was not possible to perform either of the above, we performed per protocol analysis. Main results We identified 17 trials (of high risk of bias) involving 2143 patients. The overall number of patients with postoperative complications was lower in the somatostatin analogue group (RR 0.71; 95% CI 0.62 to 0.82) but there was no difference in the perioperative mortality, re-operation rate or hospital stay between the groups. The incidence of pancreatic fistula was lower in the somatostatin analogue group (RR 0.64; 95% CI 0.53 to 0.78). The proportion of these fistulas that were clinically significant was not mentioned in most trials. On inclusion of trials that clearly distinguished clinically significant fistulas, there was no difference between the two groups (RR 0.69; 95% CI 0.34 to 1.41). Subgroup analysis revealed a shorter hospital stay in the somatostatin analogue group than the controls for patients with malignant aetiology (MD -7.57; 95% CI -11.29 to -3.84). Authors’ conclusions Somatostatin analogues reduce perioperative complications but do not reduce perioperative mortality. In those undergoing pancreatic surgery for malignancy, they shorten hospital stay. Further adequately powered trials with low risk of bias are necessary. Based on the current available evidence, somatostatin and its analogues are recommended for routine use in patients undergoing pancreatic resection for malignancy. There is currently no evidence to support their routine use in pancreatic surgeries performed for other indications.

Keywords: Authors, Citation, Clinical-Trials, Elective Pancreatectomy, Empirical-Evidence, General Complications, Groups, Low-Dose Octreotide, Medline, Models, Pancreaticoduodenectomy, Placebo-Controlled Trial, Prevention, Prophylactic Octreotide, Publication, Randomized Controlled Multicenter, Review, Risk, Science, Science Citation Index, Surgery

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Full Text: [2010\Coc Dat Sys Rev2010, CD002233.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD002233.pdf)

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Full Text: [2010\Coc Dat Sys Rev2010, CD003680.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD003680.pdf)

Keywords: Children

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Full Text: [2010\Coc Dat Sys Rev2010, CD004015.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD004015.pdf)

Abstract: Background Lay health workers (LHWs) are widely used to provide care for a broad range of health issues. Little is known, however, about the effectiveness of LHW interventions.

Objectives To assess the effects of LHW interventions in primary and community health care on maternal and child health and the management of infectious diseases.

Search strategy For the current version of this review we searched The Cochrane Central Register of Controlled Trials (including citations uploaded from the EPOC and the CCRG registers) (The Cochrane Library 2009, Issue 1 Online) (searched 18 February 2009); MEDLINE, Ovid (1950 to February Week 1 2009) (searched 17 February 2009); MEDLINE In-Process & Other Non-Indexed Citations, Ovid (February 13 2009) (searched 17 February 2009); EMBASE, Ovid (1980 to 2009 Week 05) (searched 18 February 2009); AMED, Ovid (1985 to February 2009) (searched 19 February 2009); British Nursing Index and Archive, Ovid (1985 to February 2009) (searched 17 February 2009); CINAHL, Ebsco 1981 to present (searched 07 February 2010); POPLINE (searched 25 February 2009); WHOLIS (searched 16 April 2009); Science Citation Index and Social Sciences Citation Index (ISI Web of Science) (1975 to present) (searched 10 August 2006 and 10 February 2010). We also searched the reference lists of all included papers and relevant reviews, and contacted study authors and researchers in the field for additional papers.

Selection criteria Randomised controlled trials of any intervention delivered by LHWs (paid or voluntary) in primary or community health care and intended to improve maternal or child health or the management of infectious diseases. A ‘lay health worker’ was defined as any health worker carrying out functions related to healthcare delivery, trained in some way in the context of the intervention, and having no formal professional or paraprofessional certificate or tertiary education degree. There were no restrictions on care recipients.

Data collection and analysis Two review authors independently extracted data using a standard form and assessed risk of bias. Studies that compared broadly similar types of interventions were grouped together. Where feasible, the study results were combined and an overall estimate of effect obtained.

Main results Eighty-two studies met the inclusion criteria. These showed considerable diversity in the targeted health issue and the aims, content, and outcomes of interventions. The majority were conducted in high income countries (n = 55) but many of these focused on low income and minority populations. The diversity of included studies limited meta-analysis to outcomes for four study groups. These analyses found evidence of moderate quality of the effectiveness of LHWs in promoting immunisation childhood uptake (RR 1.22, 95% CI 1.10 to 1.37; P = 0.0004); promoting initiation of breastfeeding (RR = 1.36, 95% CI 1.14 to 1.61; P < 0.00001), any breastfeeding (RR 1.24, 95% CI 1.10 to 1.39; P = 0.0004), and exclusive breastfeeding (RR 2.78, 95% CI 1.74 to 4.44; P < 0.0001); and improving pulmonary TB cure rates (RR 1.22 (95% CI 1.13 to 1.31) P < 0.0001), when compared to usual care. There was moderate quality evidence that LHW support had little or no effect on TB preventive treatment completion (RR 1.00, 95% CI 0.92 to 1.09; P = 0.99). There was also low quality evidence that LHWs may reduce child morbidity (RR 0.86, 95% CI 0.75 to 0.99; P = 0.03) and child (RR 0.75, 95% CI 0.55 to 1.03; P = 0.07) and neonatal (RR 0.76, 95% CI 0.57 to 1.02; P = 0.07) mortality, and increase the likelihood of seeking care for childhood illness (RR 1.33, 95% CI 0.86 to 2.05; P = 0.20). For other health issues, the evidence is insufficient to draw conclusions regarding effectiveness, or to enable the identification of specific LHW training or intervention strategies likely to be most effective.

Authors’ conclusions LHWs provide promising benefits in promoting immunisation uptake and breastfeeding, improving TB treatment outcomes, and reducing child morbidity and mortality when compared to usual care. For other health issues, evidence is insufficient to draw conclusions about the effects of LHWs.

Keywords: Allied Health Personnel, Community Health Services, Health Promotion, Primary Health Care, Community Health Aides, Home Health Aides, Randomized Controlled Trials As Topic, Humans, Randomized Controlled-Trial, Traditional Birth Attendants, Cost-Effective Interventions, Social Support Intervention, Mother-Infant Interaction, Breast-Feeding Duration, Home Visiting Program, Failure-To-Thrive, Low-Income, Peer Support

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Full Text: [2010\Coc Dat Sys Rev2010, CD005442.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD005442.pdf)

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Full Text: [2010\Coc Dat Sys Rev2010, CD005575.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD005575.pdf)

Keywords: Health

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Full Text: [2010\Coc Dat Sys Rev2010, CD006804.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006804.pdf)

Abstract: Background In conventional (standard) laparoscopic cholecystectomy, four abdominal ports (two of 10 mm diameter and two of 5 mm diameter) are used. Recently, use of smaller ports have been reported. Objectives To assess the benefits and harms of miniport (defined as ports smaller than conventional ports) laparoscopic cholecystectomy versus standard laparoscopic cholecystectomy. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until September 2009 for identifying the randomised trials. Selection criteria Only randomised clinical trials (irrespective of language, blinding, or publication status) comparing miniport versus standard ports laparoscopic cholecystectomy were considered for the review. Data collection and analysis Two authors collected the data independently. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For each outcome we calculated the risk ratio (RR), mean difference (MD), or standardised mean difference (SMD) with 95% confidence intervals (CI). Main results We included thirteen trials with 803 patients randomised to miniport (n = 416) versus standard ports laparoscopic cholecystectomy (n = 387). In twelve trials, four ports were used. In one trial, three ports were used. The bias risk of all trials was high. Miniport laparoscopic cholecystectomy could be completed successfully in 87% of patients. The remaining patients were mostly converted to standard laparoscopic cholecystectomy but some were also converted to open cholecystectomy. Further information about these patients who underwent conversion to open cholecystectomy was not available in most trials. In the patients on whom information was available, there was no mortality reported; and there was no significant difference in the surgery-related morbidity or conversion to open cholecystectomy. Most trials excluded the patients who were converted to standard laparoscopic cholecystectomy. In patients who underwent successful miniport laparoscopic cholecystectomy, the pain was significantly lower in the miniport group than in the standard port at various time points. Authors’ conclusions Miniport laparoscopic cholecystectomy can be completed successfully in more than 85% of patients. Patients, in whom elective miniport laparoscopic cholecystectomy was completed successfully, had lower pain than those who underwent standard laparoscopic cholecystectomy. However, because of the lack of information on its safety, miniport laparoscopic cholecystectomy cannot be recommended outside well-designed, randomised clinical trials.

Keywords: Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Criteria, Empirical-Evidence, Language, Medline, Metaanalysis, Microlaparoscopic Cholecystectomy, Models, Pain, Population, Prevalence, Publication, Quality, Randomized Controlled-Trials, Review, Risk, Science, Science Citation Index

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Full Text: [2010\Coc Dat Sys Rev2010, CD006932.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006932.pdf)

Keywords: Primary, Treatment

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Full Text: [2010\Coc Dat Sys Rev2010, CD007596.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007596.pdf)

Keywords: Treatment

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Full Text: [2010\Coc Dat Sys Rev2010, CD008335.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008335.pdf)

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Full Text: [2010\Coc Dat Sys Rev2010, MR000013-1.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20MR000013-1.pdf)

Abstract: Background Recruiting participants to trials can be extremely difficult. Identifying strategies that improve trial recruitment would benefit both trialists and health research. Objectives To quantify the effects of strategies to improve recruitment of participants to randomised controlled trials. Search strategy We searched the Cochrane Methodology Review Group Specialised Register - CMR (The Cochrane Library (online) Issue 1 2008) (searched 20 February 2008); MEDLINE, Ovid (1950 to date of search) (searched 06 May 2008); EMBASE, Ovid (1980 to date of search) (searched 16 May 2008); ERIC, CSA (1966 to date of search) (searched 19 March 2008); Science Citation Index Expanded, ISI Web of Science (1975 to date of search) (searched 19 March 2008); Social Sciences Citation Index, ISI Web of Science (1975 to date of search) (searched 19 March 2008); and National Research Register (online) (Issue 3 2007) (searched 03 September 2007); C2-SPECTR (searched 09 April 2008). We also searched PUBMED (25 March 2008) to retrieve “related articles” for 15 studies included in a previous version of this review. Selection criteria Randomised and quasi-randomised controlled trials of methods to increase recruitment to randomised controlled trials. This includes non-healthcare studies and studies recruiting to hypothetical trials. Studies aiming to increase response rates to questionnaires or trial retention, or which evaluated incentives and disincentives for clinicians to recruit patients were excluded. Data collection and analysis Data were extracted on the method evaluated; country in which the study was carried out; nature of the population; nature of the study setting; nature of the study to be recruited into; randomisation or quasi-randomisation method; and numbers and proportions in each intervention group. We used risk ratios and their 95% confidence intervals to describe the effects in individual trials, and assessed heterogeneity of these ratios between trials. Main results We identified 27 eligible trials with more than 26,604 participants. There were 24 studies involving interventions aimed directly at trial participants, while three evaluated interventions aimed at people recruiting participants. All studies were in health care. Some interventions were effective in increasing recruitment: telephone reminders to non-respondents (RR 2.66, 95% CI 1.37 to 5.18), use of opt-out, rather than opt-in, procedures for contacting potential trial participants (RR 1.39, 95% CI 1.06 to 1.84) and open designs where participants know which treatment they are receiving in the trial (RR 1.25, 95% CI 1.18 to 1.34). However, some of these strategies have disadvantages, which may limit their widespread use. For example, opt-out procedures are controversial and open designs are by definition unblinded. The effects of many other recruitment strategies are unclear; examples include the use of video to provide trial information to potential participants and modifying the training of recruiters. Many studies looked at recruitment to hypothetical trials and it is unclear how applicable these results are to real trials. Authors’ conclusions Trialists can increase recruitment to their trials by using the strategies shown to be effective in this review: telephone reminders; use of opt-out, rather than opt-in; procedures for contacting potential trial participants and open designs. Some strategies (e. g. open trial designs) need to be considered carefully before use because they also have disadvantages. For example, opt-out procedures are controversial and open designs are by definition unblinded.

Keywords: Authors, Breast-Cancer, Cancer-Patients, Citation, Clinical Trials as Topic, Clinical-Trials, Decision-Making, Hazardous Drinking, Health, Health Care, Heterogeneity, Humans, Informed-Consent Process, Injured Patients, ISI, ISI Web, ISI Web of Science, Medical-Research, Medline, Methodology, Methods, Patient Education as Topic, Patient Recruitment, Patient Selection, Prevention Trial, Questionnaires, Randomized Controlled Trials As Topic, Research, Retention, Review, Risk, Sample Size, Science, Science Citation Index, Training, Treatment, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD002300.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD002300.pdf)

Abstract: Background Gastro-oesophageal reflux (GOR) is common and usually self-limiting in infants. Cisapride, a pro-kinetic agent, was commonly prescribed until reports of possible serious adverse events were associated with its use. Objectives To determine the effectiveness of cisapride versus placebo or non-surgical treatments for symptoms of GOR. Search strategy We searched the Cochrane Upper Gastrointestinal and Pancreatic Diseases Group Specialised Register and Central Register of Controlled Trials (CENTRAL), MEDLINE and EMBASE, reference lists of relevant review articles and searched in the Science Citation Index for all the trials identified. All searches were updated in February 2009. Selection criteria Randomised controlled trials comparing oral cisapride therapy with placebo or other non-surgical treatments for children diagnosed with GOR were included. We excluded trials with a majority of participants less than 28 days of age. Data collection and analysis Primary outcomes were a change in symptoms at the end of treatment, presence of adverse events, occurrence of clinical complications and weight gain. Secondary outcomes included physiological measures of GOR or histological evidence of oesophagitis. We dichotomised symptoms into ‘same or worse’ versus ‘improved’ and calculated summary odds ratios (OR). Continuous measures of GOR (for example reflux index) were summarised as a weighted mean difference. All outcomes were analysed using a random-effects method. Main results Ten trials in total met the inclusion criteria. Nine trials compared cisapride with placebo or no treatment, of which eight (262 participants) reported data on symptoms of gastro-oesophageal reflux. There was no statistically significant difference between the two interventions (OR 0.34; 95% CI 0.10 to 1.19) for ‘same or worse’ versus ‘improved symptoms’ at the end of treatment. There was significant heterogeneity between the studies, suggesting publication bias. Four studies reported adverse events (mainly diarrhoea); this difference was not statistically significant (OR 1.80; 95% CI 0.87 to 3.70). Another trial found no difference in the electrocardiographic QTc interval after three to eight weeks of treatment. Cisapride significantly reduced the reflux index (weighted mean difference 6.49; 95% CI -10.13 to -2.85; P = 0.0005). Other measures of oesophageal pH monitoring did not reach significance. One included study compared cisapride with Gaviscon (with no statistically significant difference). One small study found no evidence of benefit on frequency of regurgitation or weight gain after treatment with cisapride versus no treatment, carob bean or corn syrup thickeners. Authors’ conclusions We found no clear evidence that cisapride reduces symptoms of GOR. Due to reports of fatal cardiac arrhythmias or sudden death, from July 2000 in the USA and Europe cisapride was restricted to a limited access programme supervised by a paediatric gastrologist.

Keywords: 100 Babies, Anti-Ulcer Agents [Therapeutic Use], Articles, Authors, Bias, Children, Cisapride [Therapeutic Use], Citation, Disease, Double-Blind, Esophageal PH, Europe, Feed Intolerance, Gastroesophageal Reflux [Drug Therapy], Gastrointestinal Agents [Therapeutic Use], Heterogeneity, Humans, Infant, Medline, Newborn, Occurrence, pH, Placebo, Placebo-Controlled Therapy, Predictive-Value, Preterm Infants, Publication, Publication Bias, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Review, Science, Science Citation Index, Symptoms, Treatment, USA

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Full Text: [2010\Coc Dat Sys Rev2010, CD007026.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007026.pdf)

Abstract: Background Cerebrolysin is a mixture of low-molecular-weight peptides and amino acids derived from pigs’ brain tissue which has proposed neuroprotective and neurotrophic properties. It is widely used in the treatment of acute ischaemic stroke in Russia and China. Objectives To assess the benefits and risks of cerebrolysin for treating acute ischaemic stroke. Search strategy We searched the Cochrane Stroke Group Trials Register (February 2009), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 1, 2009), MEDLINE (1966 to February 2009), EMBASE (1974 to February 2009), LILACS (1982 to February 2009), Science Citation Index (1940 to February 2009), SIGLE Archive (1980 to March 2005), and a number of relevant Russian Databases (1988 to February 2009). We also searched reference lists, ongoing trials registers and conference proceedings. Selection criteria Randomised controlled trials comparing cerebrolysin with placebo or no treatment in patients with acute ischaemic stroke. Data collection and analysis Three review authors independently applied the inclusion criteria, assessed trial quality and extracted the data. Main results We included one trial involving 146 participants. There was no difference in death (6/78 in the cerebrolysin group versus 6/68 in the placebo group; risk ratio (RR) 0.87, 95% confidence interval (CI) 0.29 to 2.58) or in the total number of adverse events (16.4% versus 10.3%; RR 1.62, 95% CI 0.69 to 3.82) between the treatment and control groups. Authors’ conclusions There is not enough evidence to evaluate the effect of cerebrolysin on survival and dependency in people with acute ischaemic stroke. High-quality and large-scale randomised controlled trials may help to gain a better understanding of the potential value of cerebrolysin in acute ischaemic stroke.

Keywords: Authors, China, Citation, Databases, Groups, Medline, Neuroprotection, Placebo, Review, Risk, Science, Science Citation Index, Treatment

? Opiyo, N. and English, M. (2010), In-service training for health professionals to improve care of the seriously ill newborn or child in low and middle-income countries (Review). *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD007071.

Full Text: [2010\Coc Dat Sys Rev2010, CD007071.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007071.pdf)

Abstract: Background A variety of emergency care training courses based on developed country models are being promoted as a strategy to improve the quality of care of the seriously ill newborn or child in developing countries. Clear evidence of their effectiveness is lacking. Objectives To investigate the effectiveness of in-service training of health professionals on their management and care of the seriously ill newborn or child in low and middle-income settings. Search strategy We searched The Cochrane Register of Controlled Trials (CENTRAL), the Specialised Register of the Cochrane EPOC group (both up to May 2009), MEDLINE (1950 to May 2009), EMBASE (1980 to May 2009), CINAHL (1982 to March 2008), ERIC / LILACS / WHOLIS (all up to October 2008), and ISI Science Citation Index Expanded and ISI Social Sciences Citation Index (both from 1975 to March 2009). We checked references of retrieved articles and reviews and contacted authors to identify additional studies. Selection criteria Randomised controlled trials (RCTs), cluster-randomised trials (CRTs), controlled clinical trials (CCTs), controlled before-after studies (CBAs) and interrupted time series studies (ITSs) that reported objectively measured professional practice, patient outcomes, health resource / services utilization, or training costs in healthcare settings (not restricted to studies in low-income settings). Data collection and analysis We independently selected studies for inclusion, abstracted data using a standardised form, and assessed study quality. Meta-analysis was not appropriate. Study results were summarised and appraised. Main results Two studies of varied designs were included. In one RCT of moderate quality, Newborn Resuscitation Training (NRT) was associated with a significant improvement in performance of adequate initial resuscitation steps (risk ratio 2.45, 95% confidence interval (CI) 1.75 to 3.42, P < 0.001, adjusted for clustering) and a reduction in the frequency of inappropriate and potentially harmful practices (mean difference 0.40, 95% CI 0.13 to 0.66, P = 0.004). In the second RCT, available limited data suggested that there was improvement in assessment of breathing and newborn care practices in the delivery room following implementation of Essential Newborn Care (ENC) training. Authors’ conclusions There is limited evidence that in-service neonatal emergency care courses improve health-workers’ practices when caring for a seriously ill newborn although there is some evidence of benefit. Rigorous trials evaluating the impact of refresher emergency care training on long-term professional practices are needed. To optimise appropriate policy decisions, studies should aim to collect data on resource use and costs of training implementation.

Keywords: Articles, Assessment, Authors, Case-Management, Citation, Clustering, Design, Developing Countries, Guidelines, Health, Illness, Impact, Integrated Management, ISI, Medline, Meta-Analysis, Models, Mortality, Pneumonia, Professional, Quality, Reduction, Resuscitation, Review, Risk, Science, Science Citation Index, Training, Triage

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Full Text: [2011\Coc Dat Sys Rev2011, CD001035.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001035.pdf)

Abstract: Background Human papillomavirus (HPV) is the key risk factor for cervical cancer. Continuing high rates of HPV and other sexually transmitted infections (STIs) in young people demonstrate the need for effective behavioural interventions. Objectives To assess the effectiveness of behavioural interventions for young women to encourage safer sexual behaviours to prevent transmission of STIs (including HPV) and cervical cancer. Search strategy Systematic literature searches were performed on the following databases: Cochrane Central Register of Controlled Trials (CENTRAL Issue 4, 2009) Cochrane Gynaecological Cancer Review Group (CGCRG) Specialised Register, MEDLINE, EMBASE, CINAHL, PsychINFO, Social Science Citation Index and Trials Register of Promoting Health Interventions (TRoPHI) up to the end of 2009. All references were screened for inclusion against selection criteria. Selection criteria Randomised controlled trials (RCTs) of behavioural interventions for young women up to the age of 25 years that included, amongst other things, information provision about the transmission and prevention of STIs. Trials had to measure behavioural outcomes (e. g. condom use) and/or biological outcomes (e. g. incidence of STIs, cervical cancer). Data collection and analysis A narrative synthesis was conducted. Meta-analysis was not considered appropriate due to heterogeneity between the interventions and trial populations. Main results A total of 5271 references were screened and of these 23 RCTs met the inclusion criteria. Most were conducted in the USA and in health-care clinics (e. g. family planning). The majority of interventions provided information about STIs and taught safer sex skills (e. g. communication), occasionally supplemented with provision of resources (e. g. free sexual health services). They were heterogeneous in duration, contact time, provider, behavioural aims and outcomes. A variety of STIs were addressed including HIV and chlamydia. None of the trials explicitly mentioned HPV or cervical cancer prevention. Statistically significant effects for behavioural outcomes (e. g. increasing condom use) were common, though not universal and varied according to the type of outcome. There were no statistically significant effects of abstaining from or reducing sexual activity. There were few statistically significant effects on biological (STI) outcomes. Considerable uncertainty exists in the risk of bias due to incomplete or ambiguous reporting. Authors’ conclusions Behavioural interventions for young women which aim to promote sexual behaviours protective of STI transmission can be effective, primarily at encouraging condom use. Future evaluations should include a greater focus on HPV and its link to cervical cancer, with long-term follow-up to assess impact on behaviour change, rates of HPV infection and progression to cervical cancer. Studies should use an RCT design where possible with integral process evaluation and cost-effectiveness analysis where appropriate. Given the predominance of USA studies in this systematic review evaluations conducted in other countries would be particularly useful.

Keywords: African-American Women, Bias, Cancer, Citation, Cost-Effectiveness, Databases, Embase, Evaluation, Female, Female-Condom Use, Health Care, Health Services, Hiv-Risk-Reduction, HPV, Human, Human-Immunodeficiency-Virus, Human-Papillomavirus Infection, Humans, Impact, Impoverished Minority Women, Information, Inner-City Women, Interventions, Literature, Medline, Meta-Analysis, Outcomes, Peer Education-Program, Prevention, Randomized-Controlled-Trial, Review, Science, Science Citation Index, Search Strategy, Sexual Behavior, Strategy, Systematic Review, Transmitted-Disease Prevention, Uterine Cervical Neoplasms [Prevention & Control]

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Full Text: [2011\Coc Dat Sys Rev2011, CD002800.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD002800.pdf)

Abstract: Background Randomised clinical trials have addressed the question whether propylthiouracil has any beneficial effects in patients with alcoholic liver disease. Objectives To assess the beneficial and harmful effects of propylthiouracil for patients with alcoholic liver disease. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register (April 2011), The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (April 2011), MEDLINE (1948 to April 2011), EMBASE (1980 to April 2011), and Science Citation Index Expanded (1900 to April 2011). These electronic searches were combined with full text searches. Manufacturers and researchers in the field were also contacted. Selection criteria Randomised clinical trials studying patients with alcoholic steatosis, alcoholic fibrosis, alcoholic hepatitis, and/or alcoholic cirrhosis were included irrespective of blinding, publication status, or language. Interventions encompassed propylthiouracil at any dose versus placebo or no intervention. Data collection and analysis All analyses were performed according to the intention-to-treat method in RevMan Analyses. The risk of bias of the randomised clinical trials was evaluated by bias risk domains such as generation of allocation sequence, allocation concealment, blinding, incomplete outcome data, selective outcome reporting, academic bias, and source of funding. Main results Combining the results of six randomised clinical trials with high risk of bias which included 710 patients demonstrated no significant effects of propylthiouracil versus placebo on all-cause mortality (risk ratio (RR) 0.93, 95% confidence interval (CI) 0.66 to 1.30), liver-related mortality (RR 0.90, 95% CI 0.58 to 1.40), or complications of the liver disease. Although propylthiouracil was not associated with a significant increased risk of non-serious adverse events, there were occasional instances of serious adverse events such as leukopenia and generalised bullous eruption. Authors’ conclusions We could not demonstrate any significant beneficial effect of propylthiouracil on all-cause mortality, liver-related mortality, liver complications, or liver histology of patients with alcoholic liver disease. Propylthiouracil was associated with adverse events. Confidence intervals were wide. Thus, the risk of random errors and systematic errors was high. Accordingly, there is no evidence for using propylthiouracil for alcoholic liver disease outside randomised clinical trials.

Keywords: Alcoholic [\*Drug Therapy], Antimetabolites [\*Therapeutic Use], Antithyroid Drugs, Bias, Citation, Clinical Trials, Double-Blind, Embase, Empirical-Evidence, Hepatitis, Humans, Liver Diseases, Long-Term Treatment, Medline, Of-The-Literature, Propylthiouracil [\*Therapeutic Use], Publication, Radical Formation, Randomized Clinical-Trials, Randomized Controlled Trials As Topic, Science, Science Citation Index, Search Strategy, Sequential-Analysis, Simulated Controls, Treatment Outcome

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Full Text: [2011\Coc Dat Sys Rev2011, CD003619.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003619.pdf)

Abstract: Background Non-alcoholic fatty liver disease (NAFLD) is becoming a wide spread liver disease. The present recommendations for treatment are not evidence-based. Some of them are various weight reduction measures with diet, exercise, drug, or surgical therapy. Objectives To assess the benefits and harms of intended weight reduction for patients with NAFLD. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, PUBMED, EMBASE, Science Citation Index Expanded, Chinese Biomedicine Database, and ClinicalTrials.gov until February 2011. Selection criteria We included randomised clinical trials evaluating weight reduction with different measures versus no intervention or placebo in NAFLD patients. Data collection and analysis We extracted data independently. We calculated the odds ratio (OR) for dichotomous data and calculated the mean difference (MD) for continuous data, both with 95% confidence intervals (CI). Main results The review includes seven trials; five on aspects of lifestyle changes (eg, diet, physical exercise) and two on treatment with a weight reduction drug ‘orlistat’. In total, 373 participants were enrolled, and the duration of the trials ranged from 1 month to 1 year. Only one trial on lifestyle programme was judged to be of low risk of bias. We could not perform meta-analyses for the main outcomes as they were either not reported or there were insufficient number of trials for each outcome to be meta-analysed. We could meta-analyse the available data for body weight and body mass index only. Adverse events were poorly reported. Authors’ conclusions The sparse data and high risk of bias preclude us from drawing any definite conclusion on lifestyle programme or orlistat for treatment of NAFLD. Further randomised clinical trials with low risk of bias are needed to test the beneficial and harmful effects of weight reduction for NAFLD patients. The long-term prognosis of development of fibrosis, mortality, and quality of life should be studied.

Keywords: Aminotransferase Levels, Bariatric Surgery, Bias, Citation, Clinical Trials, Development, Embase, Follow-Up, Hepatic Steatosis, Impaired Glucose-Tolerance, Life-Style Intervention, Obese Children, Outcomes, Placebo-Controlled Trial, PUBMED, Randomized Controlled-Trial, Review, Risk-Factors, Science, Science Citation Index, Search Strategy

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Full Text: [2011\Coc Dat Sys Rev2011, CD005958.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005958.pdf)

Abstract: Background Training and the provision of assistive devices are considered major interventions to prevent back pain and its related disability among workers exposed to manual material handling (MMH). Objectives To determine the effectiveness of MMH advice and training and the provision of assistive devices in preventing and treating back pain. Search strategy We searched CENTRAL (The Cochrane Library 2011, issue 1), MEDLINE, EMBASE, CINAHL, Nioshtic, CISdoc, Science Citation Index, and PsychLIT to February 2011. Selection criteria We included randomised controlled trials (RCT) and cohort studies with a concurrent control group that were aimed at changing human behaviour in MMH and measured back pain, back pain-related disability or sickness absence. Data collection and analysis Two authors independently extracted the data and assessed the risk of bias using the criteria recommended by the Cochrane Back Review Group for RCTs and MINORS for the cohort studies. We based the results and conclusions on the analysis of RCTs only. We compared these with the results from cohort studies. Main results We included nine RCTs (20,101 employees) and nine cohort studies (1280 employees) on the prevention of back pain in this updated review. Studies compared training to no intervention (4), professional education (2), a video (3), use of a back belt (3) or exercise (2). Other studies compared training plus lifting aids to no intervention (3) and to training only (1). The intensity of training ranged from a single educational session to very extensive personal biofeedback. Six RCTs had a high risk of bias. None of the included studies showed evidence of a preventive effect of training on back pain. There was moderate quality evidence from seven RCTs (19,317 employees) that those who received training reported levels of back pain similar to those who received no intervention, with an odds ratio of 1.17 (95% confidence intervals (CI) 0.68 to 2.02) or minor advice (video), with a relative risk of 0.93 (95% CI 0.69 to 1.25). Confidence intervals around the effect estimates were still wide due to the adjustment for the design effect of clustered studies. The results of the cohort studies were similar to those of the randomised studies. Authors’ conclusions There is moderate quality evidence that MMH advice and training with or without assistive devices does not prevent back pain or back pain-related disability when compared to no intervention or alternative interventions. There is no evidence available from RCTs for the effectiveness of MMH advice and training or MMH assistive devices for treating back pain. More high quality studies could further reduce the remaining uncertainty.

Keywords: \*Health Education, \*Self-Help Devices, \*Therapy], Authors, Back Pain [Prevention & Control, Bias, Care Facilities, Citation, Cohort Studies, Education, Embase, Human, Humans, Intervention Program, Interventions, Lifting, Lumbar Supports, Medline, Musculoskeletal Disorders, No Lifting Policy, Nurses, Occupational Diseases [Prevention & Control, Participatory Ergonomics, Prevention, Professional, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Review, Science, Science Citation Index, Search Strategy, Systematic Reviews, Training, Updated Method Guidelines

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Full Text: [2011\Coc Dat Sys Rev2011, CD008399.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008399.pdf)

Abstract: Background Routine use of abdominal drainage in patients undergoing liver transplantation is controversial. Objectives To assess the benefits and harms of routine abdominal drainage after orthotopic liver transplantation versus no drainage and to address different drain types. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and the MetaRegister of Controlled Trials until March 2011 to identify the randomised trials. Selection criteria We planned to include only randomised clinical trials (irrespective of language, blinding, or publication status) addressing this issue. Data collection and analysis Two authors identified the trials for inclusion independently. Two authors planned to collect the data independently. We planned to analyse the data with both the fixed-effect and the random-effects model using RevMan Analysis. For each outcome we planned to calculate the risk ratio (RR) or mean difference (MD) with 95% confidence intervals (CI) based on intention-to-treat analysis whenever possible. Main results We did not identify any randomised clinical trials addressing this issue. Authors’ conclusions There is currently no evidence to conclude whether routine abdominal drainage is useful or harmful in patients undergoing orthotopic liver transplantation. Evidence from non-randomised studies of high risk of bias showed conflicting results on the impact of routine drainage in orthotopic liver transplantation on serious adverse events, showing that this question is an important clinical research question. Well-designed randomised clinical trials with adequate sample size to decrease systematic errors and to decrease random errors are necessary.

Keywords: Authors, Bias, Citation, Clinical Research, Clinical Trials, Efficacy, Embase, Empirical-Evidence, Impact, Medline, Metaanalysis, Model, Publication, Quality, Randomized Clinical-Trials, Research, Science, Science Citation Index, Search Strategy, Survival

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Full Text: [2010\Coc Dat Sys Rev2010, CD007539.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007539.pdf)

Abstract: Background Allergic and febrile non-haemolytic transfusion reactions (NHTRs) are the two most common forms of transfusion reaction. Pretransfusion medication with anti-inflammatory drugs is used in NHTR prevention, however its efficacy and safety remains unclear. Objectives To assess the clinical effects and safety of pharmacological interventions for preventing NHTR in patients with and without a history of transfusion reactions. Search strategy The search strategy included The Cochrane Central Register of Controlled Trials (CENTRAL) on The Cochrane Library (Issue 4, 2008), Cochrane Injuries Group’s Specialised Register (December 17, 2008), MEDLINE (1950 to November (week 3) 2008), EMBASE (1988 to November (week 3) 2008), LILACS (1982 to January 12, 2009), CINAHL (1982 to December 2008), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED): 1970 to December 2008). There was no language restriction. Selection criteria Randomised controlled trials (RCTs) assessing the effectiveness of interventions for the prevention of NHTR. Data collection and analysis Authors independently selected studies, assessed the risks of bias and extracted data. Relative risks (RR) were estimated in RCTs with parallel design (PD). Odds ratio (OR) was estimated for one RCT with crossover design (CD). No meta-analysis was attempted due to differences in the pharmacotherapy of pre-transfusion medication and methodology between the studies; a per-protocol analysis was used. Main results This review includes three RCTs (two PD and one CD). The PD-RCTs employed disparate units of randomisation (UofR); patient or transfusion, while the CD-RCT applied the patient as the UofR. The PD-RCTs administered leukodepleted blood products. Both PD-RCTs compared acetaminophen plus diphenhydramine (ApD) at different regimens with placebo, while the CD-RCT contrasted hydrocortisone pharmacotherapy with diphenhydramine. Both PD-RCTs found no statistically significant difference in allergic reactions (RR 0.13, 95% confidence interval (CI) 0.01 to 2.39, RR 1.46, 95% CI 0.78 to 2.73) and febrile reactions (RR 0.52, 95% CI 0.22 to 1.26). The CD-RCT found a statistically significant difference in the odds of febrile reactions (OR 2.38, 95% CI 1.07 to 5.27). The trials did not report anaphylactic reactions, deaths related to transfusion reactions or other adverse events. Authors’ conclusions None of the three studies found that medication prior to transfusion reduces NHTR. This applied regardless of the patient’s history of NHTR and the use of leukodepleted blood products in the transfusion. However, this conclusion is based on three trials of moderate to low quality. A better-powered RCT is necessary to evaluate the role of pretransfusion medication in the prevention of NHTR. Inclusion criteria should be restricted to patients at high risk of developing NHTR, with no restriction by age, history of transfusion reactions and type of blood products (leukodepleted or not).

Keywords: Acetaminophen, Authors, Bias, Blood, Cd, Citation, Controlled-Trial, Criteria, Diphenhydramine, Effectiveness, Effects, High Risk, High-Risk, History, ISI, ISI Web, ISI Web of Science, Language, Leukoreduction, Medline, Meta-Analysis, Metaanalyses, Methodology, PD, Placebo, Premedication, Reduction, Review, Risk, Science, Science Citation Index, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD008084.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008084.pdf)

Abstract: Background Paraquat is an effective and widely used herbicide but is also a lethal poison. In many developing countries paraquat is widely available and inexpensive, making poisoning prevention difficult. However most of the people who become poisoned from paraquat have taken it as a means of suicide. Standard treatment for paraquat poisoning both prevents further absorption and reduces the load of paraquat in the blood through haemoperfusion or haemodialysis. The effectiveness of standard treatments is extremely limited. The immune system plays an important role in exacerbating paraquat-induced lung fibrosis. Immunosuppressive treatment using glucocorticoid and cyclophosphamide in combination is being developed and studied. Objectives To assess the effects of glucocorticoid with cyclophosphamide on mortality in patients with paraquat-induced lung fibrosis. Search strategy To identify randomised controlled trials on this topic, we searched the Cochrane Injuries Group’s Specialised Register (searched 15 Sept 2009), CENTRAL (The Cochrane Library 2009, Issue 3), MEDLINE (Ovid SP) (1950 September Week 1 2009), EMBASE (Ovid SP) (1980 to 2009 Week 37), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to Sept 2009), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) (1990 to Sept 2009), Chinese bio-medical literature & retrieval system (CBM) (1978 to Sept 2009), Chinese medical current contents (CMCC) (1995 to Sept 2009), and Chinese medical academic conference (CMAC) (1994-Sept 2009). The searches were completed in September 2009. Selection criteria Randomised controlled trials (RCTs) were included in this review. All patients were to receive standard care, plus the intervention or control. The intervention was glucocorticoid with cyclophosphamide in combination versus a control of a placebo, standard care alone, or any other therapy in addition to standard care. Data collection and analysis The mortality risk ratio (RR) and 95% confidence interval (CI) was calculated for each study on an intention-to-treat basis. Data for all-cause mortality at final follow-up were summarised in a meta-analysis using a fixed-effects model. Main results This systematic review includes three trials with a combined total of 164 participants who had moderate to severe paraquat poisoning. Patients who received glucocorticoid with cyclophosphamide in addition to standard care had a lower risk of death at final follow-up than those receiving standard care only (RR 0.72 (95% CI 0.59 to 0.89)). Authors’ conclusions Based on the findings of three small RCTs of moderate to severely poisoned patients, glucocorticoid with cyclophosphamide in addition to standard care may be a beneficial treatment for patients with paraquat-induced lung fibrosis. To enable further study of the effects of glucocorticoid with cyclophosphamide for patients with moderate to severe paraquat poisoning, hospitals may provide this treatment as part of an RCT with allocation concealment.

Keywords: Absorption, Authors, Biomedical, Citation, Criteria, Cyclophosphamide, Developing Countries, Dexamethasone, Effectiveness, Effects, Intervention, ISI, ISI Web, ISI Web of Science, Literature, Medical, Medline, Meta-Analysis, Methylprednisolone, Model, Mortality, Placebo, Poisoning, Pulse, Randomised Controlled Trials, Review, Risk, Science, Science Citation Index, System, Systematic Review, Therapy, Topic, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD008143.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008143.pdf)

Abstract: Background Patients with type 2 diabetes mellitus (T2D) exhibit an increased risk of cardiovascular disease and mortality compared to the background population. Observational studies report a relationship between reduced blood glucose and reduced risk of both micro-and macrovascular complications in patients with T2D. Objectives To assess the effects of targeting intensive versus conventional glycaemic control in T2D patients. Search strategy Trials were obtained from searches of CENTRAL (The Cochrane Library), MEDLINE, EMBASE, Science Citation Index Expanded, LILACS, and CINAHL (until December 2010). Selection criteria We included randomised clinical trials that prespecified different targets of glycaemic control in adults with T2D. Data collection and analysis Two authors independently assessed the risk of bias and extracted data. Dichotomous outcomes were assessed by risk ratios (RR) and 95% confidence intervals (CI). Main results Twenty trials randomised 16,106T2D participants to intensive control and 13,880 T2D participants to conventional glycaemic control. The mean age of the participants was 62.1 years. The duration of the intervention ranged from three days to 12.5 years. The number of participants in the included trials ranged from 20 to 11,140. There was no significant difference between targeting intensive andconventional glycaemic control for all-cause mortality (RR 1.01, 95% CI 0.90 to 1.13; 29,731 participants, 18 trials) or cardiovascular mortality (RR 1.06, 95% CI 0.90 to 1.26; 29,731 participants, 18 trials). Trial sequential analysis (TSA) showed that a 10% RR reduction could be refuted for all-cause mortality. Targeting intensive glycaemic control did not show a significant effect on the risk of non-fatal myocardial infarction in the random-effects model but decreased the risk in the fixed-effect model (RR 0.86, 95% CI 0.78 to 0.96; P = 0.006; 29,174 participants, 12 trials). Targeting intensive glycaemic control reduced the risk of amputation (RR 0.64, 95% CI 0.43 to 0.95; P = 0.03; 6960 participants, 8 trials), the composite risk of microvascular disease (RR 0.89, 95% CI 0.83 to 0.95; P = 0.0006; 25,760 participants, 4 trials), retinopathy (RR 0.79, 95% CI 0.68 to 0.92; P = 0.002; 10,986 participants, 8 trials), retinal photocoagulation (RR 0.77, 95% CI 0.61 to 0.97; P = 0.03; 11,142 participants, 7 trials), and nephropathy (RR 0.78, 95% CI 0.61 to 0.99; P = 0.04; 27,929 participants, 9 trials). The risks of both mild and severe hypoglycaemia were increased with targeting intensive glycaemic control but substantial heterogeneity was present. The definition of severe hypoglycaemia varied among the included trials; severe hypoglycaemia was reported in 12 trials that included 28,127 participants. TSA showed that firm evidence was reached for a 30% RR increase in severe hypoglycaemic when targeting intensive glycaemic control. Subgroup analysis of trials exclusively dealing with glycaemic control in usual care settings showed a significant effect in favour of targeting intensive glycaemic control for non-fatal myocardial infarction. However, TSA showed more trials are needed before firm evidence is established. Authors’ conclusions The included trials did not show significant differences for all-cause mortality and cardiovascular mortality when targeting intensive glycaemic control compared with conventional glycaemic control. Targeting intensive glycaemic control reduced the risk of microvascular complications while increasing the risk of hypoglycaemia. Furthermore, intensive glycaemic control might reduce the risk of non-fatal myocardial infarction in trials exclusively dealing with glycaemic control in usual care settings.

Keywords: 10-Year Follow-Up, Acute Myocardial-Infarction, Authors, Bias, Blood-Glucose Control, Cardiac Surgical-Procedures, Citation, Clinical Trials, Cost-Effectiveness, Embase, Insulin-Treatment, Medline, Metabolic-Control, Model, Multifactorial Intervention, Outcomes, Randomized Controlled-Trials, Science, Science Citation Index, Search Strategy, Sternal Wound-Infection

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Full Text: [2011\Coc Dat Sys Rev2011, CD001800.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001800.pdf)

Abstract: Background The burden of coronary heart disease (CHD) worldwide is one of great concern to patients and healthcare agencies alike. Exercise-based cardiac rehabilitation aims to restore patients with heart disease to health. Objectives To determine the effectiveness of exercise-based cardiac rehabilitation (exercise training alone or in combination with psychosocial or educational interventions) on mortality, morbidity and health-related quality of life of patients with CHD. Search strategy RCTs have been identified by searching CENTRAL, HTA, and DARE (using The Cochrane Library Issue 4, 2009), as well as MEDLINE (1950 to December 2009), EMBASE (1980 to December 2009), CINAHL (1982 to December 2009), and Science Citation Index Expanded (1900 to December 2009). Selection criteria Men and women of all ages who have hadmyocardial infarction (MI), coronary artery bypass graft (CABG) or percutaneous transluminal coronary angioplasty (PTCA), or who have angina pectoris or coronary artery disease defined by angiography. Data collection and analysis Studies were selected and data extracted independently by two reviewers. Authors were contacted where possible to obtain missing information. Main results This systematic review has allowed analysis of 47 studies randomising 10,794 patients to exercise-based cardiac rehabilitation or usual care. In medium to longer term (i.e. 12 or more months follow-up) exercise-based cardiac rehabilitation reduced overall and cardiovascular mortality [RR 0.87 (95% CI 0.75, 0.99) and 0.74 (95% CI 0.63, 0.87), respectively], and hospital admissions [RR 0.69 (95% CI 0.51, 0.93)] in the shorter term (< 12 months follow-up) with no evidence of heterogeneity of effect across trials. Cardiac rehabilitation did not reduce the risk of total MI, CABG or PTCA. Given both the heterogeneity in outcome measures and methods of reporting findings, a meta-analysis was not undertaken for health-related quality of life. In seven out of 10 trials reporting health-related quality of life using validated measures was there evidence of a significantly higher level of quality of life with exercise-based cardiac rehabilitation than usual care. Authors’ conclusions Exercise-based cardiac rehabilitation is effective in reducing total and cardiovascular mortality (in medium to longer term studies) and hospital admissions (in shorter term studies) but not total MI or revascularisation (CABG or PTCA). Despite inclusion of more recent trials, the population studied in this review is still predominantly male, middle aged and low risk. Therefore, well-designed, and adequately reported RCTs in groups of CHD patients more representative of usual clinical practice are still needed. These trials should include validated health-related quality of life outcome measures, need to explicitly report clinical events including hospital admission, and assess costs and cost-effectiveness.

Keywords: Acute Myocardial-Infarction, Artery-Bypass-Surgery, Citation, Comprehensive Rehabilitation, Coronary Disease [Mortality, Costs, Elderly-Patients, Embase, Exercise Therapy, Information, Interventions, Low-Fat Diet, Medline, Meta-Analysis, Myocardial Infarction [Mortality, Outcome Assessment (Health Care), Physical-Exercise, Program J-Carp, Quality Of Life, Quality-of-Life, Randomized Clinical-Trial, Randomized Controlled Trials As Topic, Rehabilitation], Review, Risk-Factors, Science, Science Citation Index, Search Strategy, Systematic Review, Training

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Full Text: [2010\Coc Dat Sys Rev2010, CD002787.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD002787.pdf)

Abstract: Background Acute hypoxaemic respiratory failure (AHRF), defined as acute lung injury (ALI) and acute respiratory distress syndrome (ARDS), are critical conditions. AHRF results from a number of systemic conditions and is associated with high mortality and morbidity in all ages. Inhaled nitric oxide (INO) has been used to improve oxygenation but its role remains controversial. Objectives To systematically assess the benefits and harms of INO in critically ill patients with AHRF. Search strategy Randomized clinical trials (RCTs) were identified from electronic databases: the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 1); MEDLINE; EMBASE; Science Citation Index Expanded; International Web of Science; CINAHL; LILACS; and the Chinese Biomedical Literature Database (up to 31st January 2010). We contacted trial authors, authors of previous reviews, and manufacturers in the field. Selection criteria We included all RCTs, irrespective of blinding or language, that compared INO with no intervention or placebo in children or adults with AHRF. Data collection and analysis Two authors independently abstracted data and resolved any disagreements by discussion. We presented pooled estimates of the intervention effects on dichotomous outcomes as relative risks (RR) with 95% confidence intervals (CI). Our primary outcome measure was all cause mortality. We performed subgroup and sensitivity analyses to assess the effect of INO in adults and children and on various clinical and physiological outcomes. We assessed the risk of bias through assessment of trial methodological components and the risk of random error through trial sequential analysis. Main results We included 14 RCTs with a total of 1303 participants; 10 of these trials had a high risk of bias. INO showed no statistically significant effect on overallmortality (40.2% versus 38.6%) (RR 1.06, 95% CI 0.93 to 1.22; I-2 = 0) and in several subgroup and sensitivity analyses, indicating robust results. Limited data demonstrated a statistically insignificant effect of INO on duration of ventilation, ventilator-free days, and length of stay in the intensive care unit and hospital. We found a statistically significant but transient improvement in oxygenation in the first 24 hours, expressed as the ratio of partial pressure of oxygen to fraction of inspired oxygen and the oxygenation index (MD 15.91, 95% CI 8.25 to 23.56; I-2 = 25%). However, INO appears to increase the risk of renal impairment among adults (RR 1.59, 95% CI 1.17 to 2.16; I-2 = 0) but not the risk of bleeding or methaemoglobin or nitrogen dioxide formation. Authors’ conclusions INO cannot be recommended for patients with AHRF. INO results in a transient improvement in oxygenation but does not reduce mortality and may be harmful.

Keywords: Acute Disease, Administration, Adult [Drug Therapy], Anoxia [Complications, Bias, Bronchodilator Agents [Administration & Dosage], Cumulative Metaanalysis, Failure, Inhalation, Monitoring Boundaries, Mortality], Nitric Oxide [Administration & Dosage], Outcomes, Oxygen Consumption, Randomized Controlled Trials as Topic, Randomized Controlled-Trial, Respiratory Distress Syndrome, Respiratory Insufficiency [Drug Therapy, Right-Ventricular Function, Risk-Factors, Therapy, Trial Sequential-Analysis, Web

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Full Text: [2010\Coc Dat Sys Rev2010, CD002839.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD002839.pdf)

Abstract: Background It is unclear whether blood pressure (BP) should be altered actively during the acute phase of stroke. Objectives To assess the effect of lowering or elevating BP in people with acute stroke, and the effect of different vasoactive drugs on BP in acute stroke. Search strategy We searched the Cochrane Stroke Group Trials Register (last searched June 2009), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 4, 2009), MEDLINE (1966 to October 2009), EMBASE (1980 to October 2009), and Science Citation Index (1981 to October 2009). Selection criteria Randomised trials of interventions that would be expected, on pharmacological grounds, to alter BP in patients within one week of the onset of acute stroke. Data collection and analysis Two review authors independently applied the trial inclusion criteria, assessed trial quality, and extracted data. Main results We identified 131 trials involving in excess of 18,000 patients; a further 13 trials are ongoing. We obtained data for 43 trials (7649 patients). Among BP-lowering trials, beta receptor antagonists lowered BP (early systolic BP (SBP) mean difference (MD) -6.1 mmHg, 95% CI -11.4 to -0.9; late SBP MD -4.9 mmHg, 95% CI -10.2 to 0.4; late diastolic BP (DBP) MD -4.5 mmHg, 95% CI -7.8 to 1.2). Oral calcium channel blockers (CCB) lowered BP (late SBP MD -3.2 mmHg, 95% CI -5.4 to -1.1; early DBP MD -2.5, 95% CI -5.6 to 0.7; late DBP MD -2.1, 95% CI -3.5 to -0.7). Nitric oxide donors lowered BP (early SBP MD -10.3 mmHg, 95% CI 17.6 to -3.0). Prostacyclin lowered BP (late SBP MD, -7.7 mmHg, 95% CI -15.6 to 0.2; late DBP MD -3.9 mmHg, 95% CI -8.1 to 0.4). Among BP-increasing trials, diaspirin cross-linked haemoglobin (DCLHb) increased BP (early SBP MD 15.3 mmHg, 95% CI 4.0 to 26.6; late SBP MD 15.9 mmHg, 95% CI 1.8 to 30.0). None of the drug classes significantly altered outcome apart from DCLHb which increased combined death or dependency (odds ratio (OR) 5.41, 95% CI 1.87 to 15.64). Authors’ conclusions There is not enough evidence to evaluate reliably the effect of altering BP on outcome after acute stroke. However, treatment with DCLHb was associated with poor clinical outcomes. Beta receptor antagonists, CCBs, nitric oxide, and prostacyclin each lowered BP during the acute phase of stroke. In contrast, DCLHb increased BP.

Keywords: Acute Cerebral Infarction, Acute Ischemic-Stroke, Acute Nonhemorrhagic Stroke, Administration, Adrenergic Alpha-Antagonists [Therapeutic Use], Adrenergic Beta-Antagonists [Therapeutic Use], Angiotensin Converting Enzyme Inhibitors [Therapeutic Use], Antihypertensive Agents [Therapeutic Use], Blind Controlled Trial, Blood Pressure [Drug Effects, Calcium Channel Blockers [Therapeutic Use], Epoprostenol [Therapeutic Use], Injections, Intravenous, Intravenous Magnesium-Sulfate, Oral, Physiology], Physiopathology], Placebo-Controlled Trial, Quality-of-Care, Randomized Controlled Trials as Topic, Randomized Controlled-Trial, Reduces Blood-Pressure, Stroke [Drug Therapy, Transdermal Glyceryl Trinitrate, Vasodilator Agents [Therapeutic Use]

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Full Text: [2010\Coc Dat Sys Rev2010, CD006005.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006005.pdf)

Abstract: Background Recurrence of hepatitis B virus (HBV) infection in the liver graft is a grave complication following liver transplantation for HBV cirrhosis. Hepatitis B immunoglobulin (HBIg) seems effective in increasing survival after liver transplantation. HBIg and anti-viral drugs are given alone or in combination for its prevention. Objectives To assess the benefits and harms of different regimens for preventing HBV reactivation following liver transplantation. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until February 2010. We attempted to identify further trials by reviewing the reference lists and contacting the principal authors of identified trials. Selection criteria Randomised clinical trials addressing benefits and harms of lamivudine or adefovir dipivoxil alone or in combination with hepatitis B immunoglobulins (HBIg) for preventing recurrent HBV infection in patients who are liver transplanted due to HBV infection with or without hepatocellular carcinoma. Data collection and analysis Two authors independently assessed the trials for risk of bias and extracted data. We contacted study authors whenever information was lacking. We collected information on adverse events. The primary outcomes were all-cause mortality and reappearance of hepatitis B surface antigen in serum after liver transplantation. Relative risks were calculated from individual trials. Main results Four trials, recruiting 136 participants, were included. Two trials compared lamivudine alone versus HBIg alone. Randomisation was performed one week after transplantation in one of the trials and after six months after transplantation in another; from transplantation until randomisation, HBIg alone was given to all patients in the two trials. A third trial compared combination treatment with lamivudine and HBIg versus lamivudine alone after one month of combination treatment, and a fourth trial compared the combination of lamivudine and HBIg versus a combination of lamivudine and adefovir dipivoxil after at least 12-month of lamivudine and HBIg combination treatment. Statistically significant differences were not detected in any of the comparisons and outcomes. All trials were open-labelled, and none of the trials were adequately powered to show a difference in HBV recurrence. No meta-analyses were performed since the identified trials assessed different comparisons. Authors’ conclusions This review could not derive clear evidence from randomised clinical trials for the treatment of patients with chronic HBV following liver transplantation for preventing recurrence of HBV infection. Large randomised clinical trials comparing long-term combination treatment to each of the monotherapy alone, including the newer antiviral drugs, are needed.

Keywords: Combination, Controlled-Trials, Empirical-Evidence, HBIG, Immune Globulin Monotherapy, Infection, Prophylaxis, Randomized-Trials, Surface-Antigen, Virus Recurrence

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Full Text: [2010\Coc Dat Sys Rev2010, CD006787.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006787.pdf)

Abstract: Background Acquired brain injury (ABI)can result in impairments in motor function, language, cognition, sensory processing and emotional disturbances. This may severely reduce a survivor’s quality of life. Music therapy has been used in rehabilitation to stimulate brain functions involved in movement, cognition, speech, emotions and sensory perceptions. A systematic review is needed to gauge the efficacy of music therapy as a rehabilitation intervention for people with ABI. Objectives To examine the effects of music therapy with standard care versus standard care alone or standard care combined with other therapies on gait, upper extremity function, communication, mood and emotions, social skills, pain, behavioral outcomes, activities of daily living and adverse events. Search strategy We searched the Cochrane Stroke Group Trials Register (February 2010), the Cochrane Central Register of Controlled Trials (The Cochrane Library Issue 2, 2009), MEDLINE (July 2009), EMBASE (August 2009), CINAHL (March 2010), PsycINFO (July 2009), LILACS (August 2009), AMED (August 2009) and Science Citation Index (August 2009). We handsearched music therapy journals and conference proceedings, searched dissertation and specialist music databases, trials and research registers, reference lists, and contacted experts and music therapy associations. There was no language restriction. Selection criteria Randomized and quasi-randomized controlled trials that compared music therapy interventions and standard care with standard care alone or combined with other therapies for people older than 16 years of age who had acquired brain damage of a non-degenerative nature and were participating in treatment programs offered in hospital, outpatient or community settings. Data collection and analysis Two review authors independently assessed methodological quality and extracted data. We present results using mean differences (using post-test scores) as all outcomes were measured with the same scale. Main results We included seven studies (184 participants). The results suggest that rhythmic auditory stimulation (RAS) may be beneficial for improving gait parameters in stroke patients, including gait velocity, cadence, stride length and gait symmetry. These results were based on two studies that received a low risk of bias score. There were insufficient data to examine the effect of music therapy on other outcomes. Authors’ conclusions RAS may be beneficial for gait improvement in people with stroke. These results are encouraging, but more RCTs are needed before recommendations can be made for clinical practice. More research is needed to examine the effects of music therapy on other outcomes in people with ABI.

Keywords: Depression, Individuals, Instruction, Low, Mood, Patterns, People, Recovery, Research, Speech, States, Stroke Patients

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Full Text: [2011\Coc Dat Sys Rev2011, CD007470.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007470.pdf)

Abstract: Background The available evidence on vitamin D and mortality is inconclusive. Objectives To assess the beneficial and harmful effects of vitamin D for prevention of mortality in adults. Search strategy We searched The Cochrane Library, MEDLINE, EMBASE, LILACS, the Science Citation Index Expanded, and Conference Proceedings Citation Index-Science (to January 2011). We scanned bibliographies of relevant publications and asked experts and pharmaceutical companies for additional trials. Selection criteria We included randomised trials that compared vitamin D at any dose, duration, and route of administration versus placebo or no intervention. Vitamin D could have been administered as supplemental vitamin D (vitamin D(3) (cholecalciferol) or vitamin D(2) (ergocalciferol)) or an active form of vitamin D (1 alpha-hydroxyvitamin D (alfacalcidol) or 1,25-dihydroxyvitamin D (calcitriol)). Data collection and analysis Six authors extracted data independently. Random-effects and fixed-effect model meta-analyses were conducted. For dichotomous outcomes, we calculated the risk ratios (RR). To account for trials with zero events, meta-analyses of dichotomous data were repeated using risk differences (RD) and empirical continuity corrections. Risk of bias was considered in order to minimise risk of systematic errors. Trial sequential analyses were conducted to minimise the risk of random errors. Main results Fifty randomised trials with 94,148 participants provided data for the mortality analyses. Most trials included elderly women (older than 70 years). Vitamin D was administered for a median of two years. More than one half of the trials had a low risk of bias. Overall, vitamin D decreased mortality (RR 0.97, 95% confidence interval (CI) 0.94 to 1.00, I(2) = 0%). When the different forms of vitamin D were assessed separately, only vitamin D(3) decreasedmortality significantly (RR 0.94, 95% CI 0.91 to 0.98, I(2) = 0%; 74,789 participants, 32 trials) whereas vitamin D(2), alfacalcidol, or calcitriol did not. Trial sequential analysis supported our finding regarding vitamin D(3), corresponding to 161 individuals treated to prevent one additional death. Vitamin D3 combined with calcium increased the risk of nephrolithiasis (RR 1.17, 95% CI 1.02 to 1.34, I(2) = 0%). Alfacalcidol and calcitriol increased the risk of hypercalcaemia (RR 3.18, 95% CI 1.17 to 8.68, I(2) = 17%). Data on health-related quality of life and health economics were inconclusive. Authors’ conclusions Vitamin D in the form of vitamin D(3) seems to decrease mortality in predominantly elderly women who are mainly in institutions and dependent care. Vitamin D(2), alfacalcidol, and calcitriol had no statistically significant effect on mortality. Vitamin D(3) combined with calcium significantly increased nephrolithiasis. Both alfacalcidol and calcitriol significantly increased hypercalcaemia.

Keywords: African-American Women, Authors, Bias, Bone-Mineral Density, Citation, Conference, Congestive-Heart-Failure, Early Postmenopausal Women, Economics, Embase, Hormone-Replacement Therapy, Long-Term Treatment, Medline, Model, Nursing-Home Residents, Outcomes, Pharmaceutical Companies, Placebo-Controlled Trial, Prevention, Publications, Randomized-Controlled-Trial, Science, Science Citation Index, Search Strategy, Serum 25-Hydroxyvitamin D

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Full Text: [2011\Coc Dat Sys Rev2011, CD008122.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008122.pdf)

Abstract: Background Rapid diagnostic tests (RDTs) for Plasmodium falciparum malaria use antibodies to detect either HRP-2 antigen or pLDH antigen, and can improve access to diagnostics in developing countries. Objectives To assess the diagnostic accuracy of RDTs for detecting P. falciparum parasitaemia in persons living in endemic areas who present to ambulatory healthcare facilities with symptoms suggestive of malaria by type and brand. Search strategy We undertook a comprehensive search of the following databases: Cochrane Infectious Diseases Group Specialized Register; MEDLINE; EMBASE; MEDION; Science Citation Index; Web of Knowledge; African Index Medicus; LILACS; IndMED; to January 14, 2010. Selection criteria Studies comparing RDTs with a reference standard (microscopy or polymerase chain reaction) in blood samples from a random or consecutive series of patients attending ambulatory health facilities with symptoms suggestive of malaria in P. falciparum endemic areas. Data collection and analysis For each study, a standard set of data was extracted independently by two authors, using a tailored data extraction form. Comparisons were grouped hierarchically by target antigen, and type and brand of RDT, and combined in meta-analysis where appropriate. Main results We identified 74 unique studies as eligible for this review and categorized them according to the antigens they detected. Types 1 to 3 include HRP-2 (from P. falciparum) either by itself or with other antigens. Types 4 and 5 included pLDH (from P. falciparum) either by itself or with other antigens. In comparisons with microscopy, we identified 71 evaluations of Type 1 tests, eight evaluations of Type 2 tests and five evaluations of Type 3 tests. In meta-analyses, average sensitivities and specificities (95% CI) were 94.8% (93.1% to 96.1%) and 95.2% (93.2% to 96.7%) for Type 1 tests, 96.0% (94.0% to 97.3%) and 95.3% (87.3% to 98.3%) for Type 2 tests, and 99.5% (71.0% to 100.0%) and 90.6% (80.5% to 95.7%) for Type 3 tests, respectively. Overall for HRP-2, the meta-analytical average sensitivity and specificity (95% CI) were 95.0% (93.5% to 96.2%) and 95.2% (93.4% to 99.4%), respectively. For pLDH antibody-based RDTs verified with microscopy, we identified 17 evaluations of Type 4 RDTs and three evaluations of Type 5 RDTs. In meta-analyses, average sensitivity for Type 4 tests was 91.5% (84.7% to 95.3%) and average specificity was 98.7% (96.9% to 99.5%). For Type 5 tests, average sensitivity was 98.4% (95.1% to 99.5%) and average specificity was 97.5% (93.5% to 99.1%). Overall for pLDH, the meta-analytical average sensitivity and specificity (95% CI) were 93.2% (88.0% to 96.2%) and 98.5% (96.7% to 99.4%), respectively. For both categories of test, there was substantial heterogeneity in study results. Quality of the microscopy reference standard could only be assessed in 40% of studies due to inadequate reporting, but results did not seem to be influenced by the reporting quality. Overall, HRP-2 antibody-based tests (such as the Type 1 tests) tended to be more sensitive and were significantly less specific than pLDH-based tests (such as the Type 4 tests). If the point estimates for Type 1 and Type 4 tests are applied to a hypothetical cohort of 1000 patients where 30% of those presenting with symptoms have P. falciparum, Type 1 tests will miss 16 cases, and Type 4 tests will miss 26 cases. The number of people wrongly diagnosed with P. falciparum would be 34 with Type 1 tests, and nine with Type 4 tests. Authors’ conclusions The sensitivity and specificity of all RDTs is such that they can replace or extend the access of diagnostic services for uncomplicated P. falciparum malaria. HRP-2 antibody types may be more sensitive but are less specific than pLDH antibody-based tests, but the differences are small. The HRP-2 antigen persists even after effective treatment and so is not useful for detecting treatment failures.

Keywords: Accuracy, Antigen-Capture Assay, Authors, Citation, Databases, Developing Countries, Embase, Febrile Returned Travelers, Histidine-Rich Protein-2, Home-Based Management, Knowledge, Medline, Meta-Analysis, P.F, P.V Immunochromatographic Test, Parasight-F Test, Plasmodium Lactate-Dehydrogenase, Polymerase-Chain-Reaction, Primary-Health-Care, Quality, Review, Science, Science Citation Index, Search Strategy, Strategy, Sub-Saharan Africa

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Full Text: [2010\Coc Dat Sys Rev2010, CD008331.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008331.pdf)

Abstract: Background Tocilizumab, a new biologic that inhibits interleukin-6, is approved for treatment of rheumatoid arthritis (RA) in Europe, Japan and the US. Objectives To assess the efficacy and safety of tocilizumab in patients with RA using the data from published randomized or quasi-randomized controlled trials (RCTs). Search strategy We performed a search of the following databases: the Cochrane Central Register of Controlled Trials (CENTRAL) up to issue 3, 2009; OVID MEDLINE(1966 to 1 October 2009); CINAHL(1982 to 2009); EMBASE (1980 to week 39, 2009); Science Citation Index (Web of Science) (1945 to 2009) and Current Controlled Trials. Selection criteria Tocilizumab alone or in combination with disease-modifying anti-rheumatic drugs (DMARDs) or biologics compared to placebo or other DMARDs or biologics. Data collection and analysis Two review authors independently extracted all data including major (ACR50, adverse events, serious adverse events, withdrawals, specific adverse events) and secondary outcomes. We calculated the risk ratio for dichotomous outcomes and mean difference for continuous outcomes. Main results Eight RCTs were included in this systematic review with 3334 participants; 2233 treated with tocilizumab and 1101 controls. Of the 2233, 1561 were treated with tocilizumab 8 mg/kg every four weeks, which is the approved dose. In patients taking concomitant methotrexate, compared to placebo, tocilizumab-treated patients were four times more likely to achieve ACR50 (absolute %, 38.8% versus 9.6%), 11 times more likely to achieve Disease Activity Score (DAS) remission (absolute %, 30.5% versus 2.7%), 1.8 times more likely to achieve clinically meaningful decrease in Health Assessment Questionnaire (HAQ/mHAQ) scores (absolute %, 60.5% versus 34%), 1.2 times more likely to have any adverse event (absolute %, 74% versus 65%) and 0.6 times less likely to withdraw from therapy for any reason (absolute %, 8.1% versus 14.9%). With the limitation that none of the studies were powered for safety as primary outcome, there were no statistically significant differences in serious adverse effects, or withdrawals due to adverse events. A significant increase in total, HDL and LDL cholesterol and triglyceride level was seen in the tocilizumab treated patients. Authors’ conclusions Tocilizumab is beneficial in decreasingRA disease activity and improving function. Tocilizumab treatment was associated with significant increase in cholesterol levels and in total adverse events. Larger safety studies are needed to address these safety concerns.

Keywords: Anti-Interleukin-6 Receptor Antibody, Criteria, Disease-Activity Score, Double-Blind, IL-6 Receptor, Inadequate Response, Inhibition, Placebo-Controlled Trial, Preliminary Definition, Therapy, Web

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Full Text: 2011\Coc Dat Sys Rev2011, CD008405.pdf

Abstract: Background Dual practice, whereby health workers hold two or more jobs, is a common phenomenon globally. In resource constrained low-and middle-income countries dual practice poses an ongoing threat to the efficiency, quality and equity of health services, especially in the public sector. Identifying effective interventions to manage dual practice is important. Objectives To assess the effects of regulations implemented to manage dual practice. Search strategy Databases searched included: The Cochrane Central Register of Controlled Trials (CENTRAL) 2011, Issue 4, part of The Cochrane Library. www.thecochranelibrary.com, including the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (searched 26 May 2011); MEDLINE In-Process & Other Non-Indexed Citations May 24, 2011 (searched 26 May 2011); MEDLINE, Ovid (1948 to May week 2 2011) (searched 26 May 2011); EMBASE, Ovid (1980 to 2011 week 20) (searched 26 May 2011); Science Citation Index and Social Sciences Citation Index, ISIWeb of Science (1975 to present) (searched 04 December 2009); LILACS (searched January 2010); and AIM (December 2009) (searched 18 December 2009). Selection criteria Randomized controlled trials, non-randomized controlled trials, controlled before-and-after studies and interrupted-time-series studies. Dual practice was defined as holding more than one job. Studies for inclusion were those focusing on interventions to manage dual practice among health professionals employed in the public health sector. Data collection and analysis Two review authors independently applied the criteria for inclusion and exclusion of studies when scanning the identified titles and abstracts. The same two review authors independently Main results No studies were found which were eligible for inclusion in this review. Authors’ conclusions There is a need to rigorously evaluate the effects of interventions implemented to manage dual practice among health workers. However, there is still much that is unknown about dual practice itself. The designing of studies to evaluate the effects of interventions to manage dual practice could benefit from prior studies to assess the various manifestations of dual practice, their prevalence and their likely impacts on health services delivery. These findings would then inform the design of studies to evaluate interventions to manage dual practice.

Keywords: Authors, Care, Citation, Citations, Embase, Exploration, Interventions, Medline, Private-Practice, Public Health, Review, Science, Science Citation Index, Search Strategy, Service, Social Sciences

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Full Text: 2011\Coc Dat Sys Rev2011, CD009255.pdf

Abstract: Background There is considerable interest in the effectiveness of financial incentives in the delivery of health care. Incentives may be used in an attempt to increase the use of evidence-based treatments among healthcare professionals or to stimulate health professionals to change their clinical behaviour with respect to preventive, diagnostic and treatment decisions, or both. Financial incentives are an extrinsic source of motivation and exist when an individual can expect a monetary transfer which is made conditional on acting in a particular way. Since there are numerous reviews performed within the healthcare area describing the effects of various types of financial incentives, it is important to summarise the effectiveness of these in an overview to discern which are most effective in changing health professionals’ behaviour and patient outcomes. Objectives To conduct an overview of systematic reviews that evaluates the impact of financial incentives on healthcare professional behaviour and patient outcomes. Methods We searched the Cochrane Database of Systematic Reviews (CDSR) (The Cochrane Library); Database of Abstracts of Reviews of Effectiveness (DARE); TRIP; MEDLINE; EMBASE; Science Citation Index; Social Science Citation Index; NHS EED; HEED; EconLit; and Program in Policy Decision-Making (PPd) (from their inception dates up to January 2010). We searched the reference lists of all included reviews and carried out a citation search of those papers which cited studies included in the review. We included both Cochrane and non-Cochrane reviews of randomised controlled trials (RCTs), controlled clinical trials (CCTs), interrupted time series (ITSs) and controlled before and after studies (CBAs) that evaluated the effects of financial incentives on professional practice and patient outcomes, and that reported numerical results of the included individual studies. Two review authors independently extracted data and assessed the methodological quality of each review according to the AMSTAR criteria. We included systematic reviews of studies evaluating the effectiveness of any type of financial incentive. We grouped financial incentives into five groups: payment for working for a specified time period; payment for each service, episode or visit; payment for providing care for a patient or specific population; payment for providing a pre-specified level or providing a change in activity or quality of care; and mixed or other systems. We summarised data using vote counting. Mainresults We identified four reviews reporting on 32 studies. Two reviews scored 7 on the AMSTAR criteria (moderate, score 5 to 7, quality) and two scored 9 (high, score 8 to 11, quality). The reported quality of the included studies was, by a variety of methods, low to moderate. Payment for working for a specified time period was generally ineffective, improving 3/11 outcomes from one study reported in one review. Payment for each service, episode or visit was generally effective, improving 7/10 outcomes from five studies reported in three reviews; payment for providing care for a patient or specific population was generally effective, improving 48/69 outcomes from 13 studies reported in two reviews; payment for providing a pre-specified level or providing a change in activity or quality of care was generally effective, improving 17/20 reported outcomes from 10 studies reported in two reviews; and mixed and other systems were of mixed effectiveness, improving 20/31 reported outcomes from seven studies reported in three reviews. When looking at the effect of financial incentives overall across categories of outcomes, they were of mixed effectiveness on consultation or visit rates (improving 10/17 outcomes from three studies in two reviews); generally effective in improving processes of care (improving 41/57 outcomes from 19 studies in three reviews); generally effective in improving referrals and admissions (improving 11/16 outcomes from 11 studies in four reviews); generally ineffective in improving compliance with guidelines outcomes (improving 5/17 outcomes from five studies in two reviews); and generally effective in improving prescribing costs outcomes (improving 28/34 outcomes from 10 studies in one review). Authors’ conclusions Financial incentives may be effective in changing healthcare professional practice. The evidence has serious methodological limitations and is also very limited in its completeness and generalisability. We found no evidence from reviews that examined the effect of financial incentives on patient outcomes.

Keywords: Authors, Citation, Clinical Trials, Compliance, Costs, Delivery Of Health Care, Effectiveness, Embase, Fundholders, General-Practice, Health Care, Immunization Rates, Impact, Incentives, Medicaid Managed Care, Medline, Outcomes, Overview, Papers, Pay-For-Performance, Physician Reimbursement, Prescribing Patterns, Preventive Care, Professional, Quality-of-Care, Review, Science, Science Citation Index, Systematic Reviews

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Full Text: [2010\Coc Dat Sys Rev2010, CD001796.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD001796.pdf)

Abstract: Background Access to combination antiretroviral therapy has turnedHIV into a chronic and manageable disease for many. This increased chronicity has been mirrored by increased prevalence of health-related challenges experienced by people living with HIV (Rusch 2004). Exercise is a key strategy for people living with HIV and by rehabilitation professionals to address these disablements; however, knowledge about the effects of exercise among adults living with HIV still is emerging. Objectives To examine the safety and effectiveness of aerobic exercise interventions on immunologic and virologic, cardiopulmonary, psychologic outcomes and strength, weight, and body composition in adults living with HIV. Search strategy Searches of MEDLINE, EMBASE, SCIENCE CITATION INDEX, CINAHL, HEALTHSTAR, PsycINFO, SPORTDISCUS and Cochrane Review Group Databases were conducted between 1980 and June 2009. Searches of published and unpublished abstracts and proceedings from major international and national HIV/AIDS conferences were conducted, as well as a handsearch of reference lists and tables of contents of relevant journals and books. Selection criteria We included studies of randomised controlled trials (RCTs) comparing aerobic exercise interventions with no aerobic exercise interventions or another exercise or treatment modality, performed at least three times per week for at least four weeks among adults (18 years of age or older) living with HIV. Data collection and analysis Data on study design, participants, interventions, outcomes, and methodological quality were abstracted from included studies by two reviewers. Meta-analyses, using RevMan 5 computer software, were performed on outcomes when possible. Main results A total of 14 studies met inclusion criteria for this review and 30 meta-analyses over several updates were performed. Main results indicated that performing constant or interval aerobic exercise, or a combination of constant aerobic exercise and progressive resistive exercise for at least 20 minutes at least three times per week for at least five weeks appears to be safe and may lead to significant improvements in selected outcomes of cardiopulmonary fitness (maximum oxygen consumption), body composition (leg muscle area, percent body fat), and psychological status (depression-dejection symptoms). These findings are limited to participants who continued to exercise and for whom there were adequate follow-up data. Authors’ conclusions Aerobic exercise appears to be safe and may be beneficial for adults living with HIV. These findings are limited by the small sample sizes and large withdrawal rates described in the studies. Future research would benefit from participant follow-up and intention-totreat analysis. Further research is required to determine the optimal parameters in which aerobic exercise may be most beneficial for adults living with HIV.

Keywords: \*Exercise, \*Rehabilitation], Active Antiretroviral Therapy, Adult, Body-Composition, Cardiovascular Physiological Phenomena, CD4 Lymphocyte Count, Citation, Citation Indexes, Clinical-Trial, Fat Redistribution, Female, HIV Infections [Physiopathology, HIV-Infected Patients, Human-Immunodeficiency-Virus, Humans, Index, Lead, Male, Metabolic Indexes, Psychology, Quality-of-Life, Randomized Controlled Trials as Topic, Randomized-Trial, Research, Resistance Exercise, Respiratory Physiological Phenomena, Review, Science, Science-Citation-Index, Time Factors

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Full Text: [2010\Coc Dat Sys Rev2010, CD007228.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007228.pdf)

Abstract: Background Specialised disease management programmes for chronic heart failure (CHF) improve survival, quality of life and reduce healthcare utilisation. The overall efficacy of structured telephone support or telemonitoring as an individual component of a CHF disease management strategy remains inconclusive. Objectives To review randomised controlled trials (RCTs) of structured telephone support or telemonitoring compared to standard practice for patients with CHF in order to quantify the effects of these interventions over and above usual care for these patients. Search strategy Databases (the Cochrane Central Register of Controlled Trials (CENTRAL), Database of Abstracts of Reviews of Effects (DARE) and Health Technology Assessment Database (HTA) on The Cochrane Library, MEDLINE, EMBASE, CINAHL, AMED and Science Citation Index Expanded and Conference Citation Index on ISI Web of Knowledge) and various search engines were searched from 2006 to November 2008 to update a previously published non-Cochrane review. Bibliographies of relevant studies and systematic reviews and abstract conference proceedings were handsearched. No language limits were applied. Selection criteria Only peer reviewed, published RCTs comparing structured telephone support or telemonitoring to usual care of CHF patients were included. Unpublished abstract data was included in sensitivity analyses. The intervention or usual care could not include a home visit or more than the usual (four to six weeks) clinic follow-up. Data collection and analysis Data were presented as risk ratio (RR) with 95% confidence intervals (CI). Primary outcomes included all-cause mortality, all-cause and CHF-related hospitalisations which were meta-analysed using fixed effectsmodels. Other outcomes included length of stay, quality of life, acceptability and cost and these were described and tabulated. Main results Twenty-five studies and five published abstracts were included. Of the 25 full peer-reviewed studies meta-analysed, 16 evaluated structured telephone support (5613 participants), 11 evaluated telemonitoring (2710 participants), and two tested both interventions (included in counts). Telemonitoring reduced all-cause mortality (RR 0.66, 95% CI 0.54 to 0.81, P < 0.0001) with structured telephone support demonstrating a non-significant positive effect (RR 0.88, 95% CI 0.76 to 1.01, P = 0.08). Both structured telephone support (RR 0.77, 95% CI 0.68 to 0.87, P < 0.0001) and telemonitoring (RR 0.79, 95% CI 0.67 to 0.94, P = 0.008) reduced CHF-related hospitalisations. For both interventions, several studies improved quality of life, reduced healthcare costs and were acceptable to patients. Improvements in prescribing, patient knowledge and self-care, and New York Heart Association (NYHA) functional class were observed. Authors’ conclusions Structured telephone support and telemonitoring are effective in reducing the risk of all-cause mortality and CHF-related hospitalisations in patients with CHF; they improve quality of life, reduce costs, and evidence-based prescribing.

Keywords: Citation, Disease-Management Program, Home Health-Care, Improves Clinical-Outcomes, ISI, Long-Term Benefits, Preserved Ejection Fraction, Quality-of-Life, Randomized Controlled-Trial, Science, Science Citation Index, Self-Management, Span-Chf Trial, Technology, Trans-European Network, Web

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Full Text: [2010\Coc Dat Sys Rev2010, CD007667.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007667.pdf)

Abstract: Background Antisocial personality disorder (AsPD) is associated with a wide range of disturbance including persistent rule-breaking, criminality, substance misuse, unemployment, homelessness and relationship difficulties. Objectives To evaluate the potential beneficial and adverse effects of pharmacological interventions for people with AsPD. Search strategy We searched the Cochrane Central Register of Controlled Trials (The Cochrane Library 2009, Issue 3), MEDLINE (1950 to September 2009), EMBASE (1980 to 2009, week 37), CINAHL (1982 to September 2009), PsycINFO (1872 to September 2009), ASSIA (1987 to September 2009), BIOSIS (1985 to September 2009), COPAC (September 2009), National Criminal Justice Reference Service Abstracts (1970 to July 2008), Sociological Abstracts (1963 to September 2009), ISI-Proceedings (1981 to September 2009), Science Citation Index (1981 to September 2009), Social Science Citation Index (1981 to September 2009), SIGLE (1980 to April 2006), Dissertation Abstracts (September 2009), ZETOC (September 2009) and the metaRegister of Controlled Trials (September 2009). Selection criteria Controlled trials in which participants with AsPD were randomly allocated to a pharmacological intervention and a placebo control condition. Two trials comparing one drug against another without a placebo control are reported separately. Data collection and analysis Three review authors independently selected studies. Two review authors independently extracted data. We calculated mean differences, with odds ratios for dichotomous data. Main results Eight studies met the inclusion criteria involving 394 participants with AsPD. Data were available from four studies involving 274 participants with AsPD. No study set out to recruit participants solely on the basis of having AsPD, and in only one study was the sample entirely of AsPD participants. Eight different drugs were examined in eight studies. Study quality was relatively poor. Inadequate reporting meant the data available were generally insufficient to allow any independent statistical analysis. The findings are limited to descriptive summaries based on analyses carried out and reported by the trial investigators. All the available data were derived from unreplicated single reports. Only three drugs (nortriptyline, bromocriptine, phenytoin) were effective compared to placebo in terms of improvement in at least one outcome. Nortriptyline was reported in one study as superior for men with alcohol dependency on mean number of drinking days and on alcohol dependence, but not for severity of alcohol misuse or on the patient’s or clinician’s rating of drinking. In the same study, both nortriptyline and bromocriptine were reported as superior to placebo on anxiety on one scale but not on another. In one study, phenytoin was reported as superior to placebo on the frequency and intensity of aggressive acts in male prisoners with impulsive (but not premeditated) aggression. In the remaining two studies, both amantadine and desipramine were not superior to placebo for adults with opioid and cocaine dependence, and desipramine was not superior to placebo for men with cocaine dependence. Authors’ conclusions The body of evidence summarised in this review is insufficient to allow any conclusion to be drawn about the use of pharmacological interventions in the treatment of antisocial personality disorder.

Keywords: Alcohol Dependence, Citation, Cocaine Dependence, Comorbid Psychiatric-Disorders, Conduct Disorder, Desipramine Treatment, Double-Blind, Impulsive Aggressive-Behavior, Major Depression, Placebo-Controlled Trial, Science, Science Citation Index, Substance-Abuse

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Full Text: [2010\Coc Dat Sys Rev2010, CD007733.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007733.pdf)

Abstract: Background Acute lung injury (ALI) and acute respiratory distress syndrome (ARDS) are critical conditions that are associated with high mortality and morbidity. Aerosolized prostacyclin has been used to improve oxygenation despite the limited evidence available so far. Objectives To systematically assess the benefits and harms of aerosolized prostacyclin in critically ill patients with ALI and ARDS. Search strategy We identified randomized clinical trials (RCTs) from electronic databases: the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 1); MEDLINE; EMBASE; Science Citation Index Expanded; International Web of Science; CINAHL; LILACS; and the Chinese Biomedical Literature Database (to 31st January 2010). We contacted trial authors and manufacturers in the field. Selection criteria We included all RCTs, irrespective of blinding or language, that compared aerosolized prostacyclin with no intervention or placebo in either children or adults with ALI or ARDS. Data collection and analysis Two authors independently abstracted data and resolved any disagreements by discussion. We presented pooled estimates of the intervention effects as relative risks (RR) with 95% confidence intervals (CI) for dichotomous outcomes. Our primary outcome measure was all cause mortality. We planned to perform subgroup and sensitivity analyses to assess the effect of aerosolized prostacyclin in adults and children, and on various clinical and physiological outcomes. We assessed the risk of bias through assessment of methodological trial components and the risk of random error through trial sequential analysis. Main results We included one paediatric RCT with low risk of bias and involving a total of 14 critically ill children with ALI or ARDS. Aersosolized prostacyclin over less than 24 hours did not reduce overall mortality at 28 days (RR 1.50, 95% CI 0.17 to 12.94) compared with aerosolized saline (a total of three deaths). The authors did not encounter any adverse events such as bleeding or organ dysfunction. We were unable to perform the prespecified subgroups and sensitivity analyses or trial sequential analysis due to the limited number of RCTs. We were also not able to assess the safety and efficacy of aerosolized prostacyclin for ALI and ARDS. We found two ongoing trials, one involving adults and the other paediatric participants. The adult trial has been finalized but the data are not yet available. Authors’ conclusions There is no current evidence to support or refute the routine use of aerosolized prostacyclin for patients with ALI and ARDS. There is an urgent need for more randomized clinical trials.

Keywords: Assessment, Citation, Cumulative Metaanalysis, Failure, Inhaled Nitric-Oxide, Low, Multicenter Clinical-Trial, Prostaglandin E-1, Pulmonary-Hypertension, Randomized Double-Blind, RCT, Risk-Factors, Science, Science Citation Index, Sequential-Analysis, TLC C-53, Web, Web of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD002907.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD002907.pdf)

Abstract: Background Bacterial infections are a frequent complication in patients with cirrhosis and upper gastrointestinal bleeding. Antibiotic prophylaxis seems to decrease the incidence of bacterial infections. Oral antibiotics, active against enteric bacteria, have been commonly used as antibiotic prophylaxis in patients with cirrhosis and upper gastrointestinal bleeding. This is an update of a Cochrane review first published in 2002. Objectives To assess the benefits and harms of antibiotic prophylaxis in cirrhotic patients with upper gastrointestinal bleeding. Search strategy We searched TheCochraneHepato- Biliary Group Controlled Trials Register, TheCochrane Central Register of Controlled Trials ( CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index EXPANDED until June 2010. In addition, we handsearched the references of all identified studies. Selection criteria Randomised clinical trials comparing different types of antibiotic prophylaxis with no intervention, placebo, or another antibiotic to prevent bacterial infections in cirrhotic patients with upper gastrointestinal bleeding. Data collection and analysis Three authors independently assessed trial quality, risk of bias, and extracted data. We contacted study authors for additional information. Association measures were relative risk (RR) for dichotomous outcomes and mean difference (MD) for continuous outcomes. Main results Twelve trials (1241 patients) evaluated antibiotic prophylaxis compared with placebo or no antibiotic prophylaxis. All trials were at risk of bias. Antibiotic prophylaxis compared with no intervention or placebo was associated with beneficial effects on mortality (RR 0.79, 95% CI 0.63 to 0.98), mortality from bacterial infections (RR 0.43, 95% CI 0.19 to 0.97), bacterial infections (RR 0.36, 95% CI 0.27 to 0.49), rebleeding (RR 0.53, 95% CI 0.38 to 0.74), days of hospitalisation (MD -1.91, 95% CI -3.80 to -0.02), bacteraemia (RR 0.25, 95% CI 0.15 to 0.40), pneumonia (RR 0.45, 95% CI 0.27 to 0.75), spontaneous bacterial peritonitis (RR 0.29, 95% CI 0.15 to 0.57), and urinary tract infections (RR 0.23, 95% CI 0.12 to 0.41). No serious adverse events were reported. The trials showed no significant heterogeneity of effects. Another five trials (650 patients) compared different antibiotic regimens. Data could not be combined as each trial used different antibiotic regimen. None of the examined antibiotic regimen was superior to the control regimen regarding mortality or bacterial infections.

Keywords: Acute Variceal Hemorrhage, Antibiotic Prophylaxis, Bacteria, Bacterial Infections [Mortality, Citation, Empirical-Evidence, Endoscopic Sclerotherapy, Esophageal-Varices, Liver Cirrhosis [Complications, Liver-Cirrhosis, Mortality], Placebo-Controlled Trial, Portal-Hypertension, Prevention & Control] Gastrointestinal Hemorrhage [Complications, Prognosis, Randomized Controlled Trials as Topic, Randomized-Trial, Science Citation Index, Spontaneous Bacterial Peritonitis, Trial Sequential-Analysis

? Hoffmann, T., Bennett, S., Koh, C.L. and McKenna, K.T. (2010), Occupational therapy for cognitive impairment in stroke patients. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD006430.

Full Text: [2010\Coc Dat Sys Rev2010, CD006430.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006430.pdf)

Abstract: Background Cognitive impairment is a frequent consequence of stroke and can impact on a person’s ability to perform everyday activities. There are a number of different intervention strategies that occupational therapists may use when working with people who have cognitive impairment post-stroke. Objectives To determine whether occupational therapy improves functional performance of basic activities of daily living (ADL) and specific cognitive abilities in people who have cognitive impairment following a stroke. Search strategy We searched the Cochrane Stroke Group Trials Register (last searchedMay 2009), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library Issue 1, 2009), MEDLINE (1966 to April 2009), EMBASE (1980 to April 2009), CINAHL (1982 to April 2009), PsycINFO (1840 to April 2009), PsycBITE, OTseeker and Dissertation Abstracts (the latest three were searched up to April 2009). In an effort to identify further published, unpublished, and ongoing trials, we also tracked relevant references through the cited reference search in Science Citation Index (SCI) and Social Science Citation Index (SSCI), reviewed the reference lists of relevant studies and reviews, handsearched relevant occupational therapy journals, and contacted key researchers in the area. Selection criteria Randomised and quasi-randomised controlled trials that evaluated an intervention focused on providing cognitive retraining to adults with clinically defined stroke and confirmed cognitive impairment. The intervention needed either to be provided by an occupational therapist or given under the supervision of an occupational therapist. Data collection and analysis Two review authors independently examined the abstracts that might meet the inclusion criteria, assessed the quality and extracted data. We have presented results using mean differences. Main results We included one trial with 33 participants in this review. We found no difference between groups for the two relevant outcomes that were measured: improvement in time judgement skills and improvement in basic ADLs on the Barthel Index. Authors’ conclusions The effectiveness of occupational therapy for cognitive impairment post- stroke remains unclear. The potential benefits of cognitive retraining delivered as part of occupational therapy on improving basic daily activity function or specific cognitive abilities, or both, of people who have had a stroke cannot be supported or refuted by the evidence included in this review. More research is required.

Keywords: Adults, Brain-Injury, Citation, Health, Journals, Performance, Program, Quality, Randomized Clinical-Trial, Recovery, Rehabilitation, Remediation, Research, Researchers, SCI, Science Citation Index

? Ervin, A.M., Wojciechowski, R. and Schein, O. (2010), Punctal occlusion for dry eye syndrome. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD006775.

Full Text: [2010\Coc Dat Sys Rev2010, CD006775.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006775.pdf)

Abstract: Background Dry eye syndrome is a disorder of the tear film and is associated with symptoms of ocular discomfort. Punctal occlusion is a mechanical treatment in which the tear drainage system is blocked in order to aid in the preservation of natural tears on the ocular surface. Objectives The objective of this review was to assess the safety and efficacy of punctal plugs for the management of dry eye. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (which contains the Cochrane Eyes and Vision Group Trials Register) (The Cochrane Library 2010, Issue 6), MEDLINE (January 1950 to June 2010), EMBASE (January 1980 to June 2010), Latin American and Caribbean Literature on Health Sciences (LILACS) (January 1982 to June 2010), the metaRegister of Controlled Trials (mRCT) (www. controlled-trials. com) and ClinicalTrials. gov (http://clinicaltrials. gov). We also searched the Science Citation Index-Expanded database and reference lists of included studies. There were no language or date restrictions in the search for trials. The electronic databases were last searched on 21 June 2010. Selection criteria We included randomized and quasi-randomized controlled trials of collagen or silicone punctal plugs in symptomatic participants diagnosed with aqueous tear deficiency or dry eye syndrome. Data collection and analysis Two review authors independently assessed trial quality and extracted data. We contacted study investigators for additional information. Main results Seven randomized controlled trials including 305 participants (601 eyes) met the inclusion criteria and are summarized in this review. We did not perform meta-analysis due to appreciable variability in interventions and follow-up intervals. Although punctal plugs provided symptomatic improvement and clinical outcomes also improved frombaseline measures, few studies demonstrated a benefit of punctal plugs over the comparison intervention. Reported adverse effects included epiphora (overflow of tears), foreign body sensation, eye irritation, and spontaneous plug loss. Authors’ conclusions This systematic review shows a relative scarcity of controlled clinical trials assessing the efficacy of punctal occlusion therapy in dry eye. Although the evidence is very limited, the data suggest that silicone plugs can provide symptomatic relief in severe dry eye. Moreover, temporary collagen plugs appear similarly effective to silicone plugs on a short-term basis.

Keywords: Citation, Efficacy, Epidemiology, Keratoconjunctivitis Sicca, Management, Prevalence, Prospective Randomized-Trial, Risk-Factors, Science Citation Index Expanded, Silicone Plugs, Symptoms, Therapy

? Boncoraglio, G.B., Bersano, A., Candelise, L., Reynolds, B.A. and Parati, E.A. (2010), Stem cell transplantation for ischemic stroke. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD007231.

Full Text: [2010\Coc Dat Sys Rev2010, CD007231.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007231.pdf)

Abstract: Background Studies in animal models of ischemic stroke have shown that stem cells transplanted into the brain can lead to functional improvement. However, to date, evidence for the benefits of stem cell transplantation in ischemic stroke patients is lacking. Objectives To assess the efficacy and safety of stem cell transplantation compared with conventional treatments in patients with ischemic stroke. Search strategy We searched the Cochrane Stroke Group Trials Register (last searched February 2010), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2009, Issue 3), MEDLINE (1966 to August 2008), EMBASE (1980 to August 2008), Science Citation Index (1900 to August 2008), and BIOSIS (1926 to August 2008). We handsearched potentially relevant conference proceedings, screened reference lists, and searched ongoing trials and research registers (last searchedNovember 2008). We also contacted individuals active in the field and stem cell manufacturers (last contacted December 2008). Selection criteria We included randomized controlled trials (RCTs) recruiting patients with ischemic stroke, in any phase of the disease, and an ischemic lesion confirmed by computerized tomography or magnetic resonance imaging scan. We included all types of stem cell transplantation regardless of cell source (autograft, allograft, or xenograft; embryonic, fetal, or adult; from brain or other tissues), route of cell administration (systemic or local), and dosage. The primary outcome was efficacy (assessed as combined functional outcome or disability and dependency) at longer follow-up (minimum six months). Secondary outcomes included post-procedure safety outcomes (death, worsening of neurological deficit, infections and neoplastic transformation). Data collection and analysis Two review authors independently extracted data and assessed trial quality. We contacted study authors for additional information. Main results We identified three very small RCTs. Two are still awaiting classification because only subgroups of patients could be included in this meta-analysis and additional unpublished data are needed. The third trial randomized 30 patients to intravenous transplantation of autologous mesenchymal stem cell (10 participants) or reference group (20 participants) (five participants, initially randomized to the intervention group, refused the treatment and were allocated to the reference group) and found a statistically non-significant functional improvement in treated patients at longer follow-up. No adverse cell-related events were reported. Authors’s conclusions No large trials of stem cell transplantation have been performed in ischemic stroke patients and it is too early to know whether this intervention can improve functional outcome. Large, well-designed trials are needed.

Keywords: Citation, Implantation, Neurological Disorders, Neurotransplantation, Research, Science Citation Index, Therapy, Trial

? Singh, J.A. and Fitzgerald, P.M. (2010), Botulinum toxin for shoulder pain. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD008271.

Full Text: [2010\Coc Dat Sys Rev2010, CD008271.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008271.pdf)

Abstract: Background Recent evidence suggests an anti-nociceptive effect of botulinum toxin. Objectives To compare the efficacy and safety of botulinum toxin in comparison to placebo or other treatment options for shoulder pain. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (T h e Cochrane Library), Ovid MEDLINE, CINAHL (via EBSCOhost), Ovid SPORTDiscus, EMBASE and Science Citation Index. Selection criteria Randomized controlled trials (RCTs) comparing botulinum toxin with placebo or active treatment in people with shoulder pain were included. Data collection and analysis For continuous measures we calculated mean difference (MD), and for categorical measures risk ratio (RR) (with 95% confidence interval (CI)). Main results Six RCTs with 164 patients were included. Five RCTs in participants with post-stroke shoulder pain indicated that compared with placebo, a single intramuscular injection of botulinum toxin A significantly reduced pain at three to six months post-injection (MD -1.2 points, 95% CI -2.4 to -0.07; 0 to 10 point scale) but not at one month (MD -1.1 points, 95% CI -2.9 to 0.7). Shoulder external rotation was increased at one month (MD 9.8, 95% CI 0.2 to 19.4) but not at three to six months. Shoulder abduction, external rotation or spasticity did not differ between groups, nor did the number of adverse events (RR 1.46, 95% CI 0.6 to 24.3). One RCT in arthritis-related shoulder pain indicated that botulinum toxin reduced pain severity (MD -2.0, 95% CI -3.7 to -0.3; 10 point scale) and shoulder disability with a reduction in Shoulder Pain and Disability Index score (MD -13.4, 95% CI -24.9 to -1.9; 100 point scale) when compared with placebo. Shoulder abduction was improved (MD 13.8 degrees, 95% CI 3.2 to 44.0). Serious adverse events did not differ between groups (RR 0.35, 95% CI: 0.11, 1.12). Authors’ conclusions The results should be interpreted with caution due to few studies with small sample sizes and high risk of bias. Botulinum toxin A injections seem to reduce pain severity and improve shoulder function and range of motion when compared with placebo in patients with shoulder pain due to spastic hemiplegia or arthritis. It is unclear if the benefit of pain relief in post-stroke shoulder pain at three to six months but not at one month is due to limitations of the evidence, which includes small sample sizes with imprecise estimates, or a delayed onset of action. More studies with safety data are needed.

Keywords: Barthel Index, Chronic Myofascial Pain, Citation, Controlled-Trial, Double-Blind, Modified Rankin Scale, Primary-Care, Rheumatoid-Arthritis, Science Citation Index, Spastic Hemiplegia, Subscapular Muscle, Tennis Elbow

? Wilson, C., Willis, C., Hendrikz, J.K., Le Brocque, R. and Bellamy, N. (2010), Speed cameras for the prevention of road traffic injuries and deaths. *Cochrane Database of Systematic Reviews*, **10**, Article Number: CD004607.

Full Text: [2010\Coc Dat Sys Rev2010, CD004607.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD004607.pdf)

Abstract: Background It is estimated that by 2020, road traffic crashes will have moved from ninth to third in the world ranking of burden of disease, as measured in disability adjusted life years. The prevention of road traffic injuries is of global public health importance. Measures aimed at reducing traffic speed are considered essential to preventing road injuries; the use of speed cameras is one such measure. Objectives To assess whether the use of speed cameras reduces the incidence of speeding, road traffic crashes, injuries and deaths. Search strategy We searched the following electronic databases covering all available years up to March 2010; the Cochrane Library, MEDLINE (WebSPIRS), EMBASE (WebSPIRS), TRANSPORT, IRRD(International Road Research Documentation), TRANSDOC (European Conference of Ministers of Transport databases), Web of Science (Science and Social Science Citation Index), PsycINFO, CINAHL, EconLit, WHO database, Sociological Abstracts, Dissertation Abstracts, Index to Theses. Selection criteria Randomised controlled trials, interrupted time series and controlled before-after studies that assessed the impact of speed cameras on speeding, road crashes, crashes causing injury and fatalities were eligible for inclusion. Data collection and analysis We independently screened studies for inclusion, extracted data, assessed methodological quality, reported study authors’ outcomes and where possible, calculated standardised results based on the information available in each study. Due to considerable heterogeneity between and within included studies, a meta-analysis was not appropriate. Main results Thirty five studies met the inclusion criteria. Compared with controls, the relative reduction in average speed ranged from 1% to 15% and the reduction in proportion of vehicles speeding ranged from 14% to 65%. In the vicinity of camera sites, the pre/post reductions ranged from 8% to 49% for all crashes and 11% to 44% for fatal and serious injury crashes. Compared with controls, the relative improvement in pre/post injury crash proportions ranged from 8% to 50%. Authors’ conclusions Despite the methodological limitations and the variability in degree of signal to noise effect, the consistency of reported reductions in speed and crash outcomes across all studies show that speed cameras are a worthwhile intervention for reducing the number of road traffic injuries and deaths. However, whilst the the evidence base clearly demonstrates a positive direction in the effect, an overall magnitude of this effect is currently not deducible due to heterogeneity and lack of methodological rigour. More studies of a scientifically rigorous and homogenous nature are necessary, to provide the answer to the magnitude of effect.

Keywords: Accident Prevention [\*Instrumentation, Accidents, Accidents,Traffic [\*Prevention & Control, British-Columbia, Casualties, Citation, Conference, Controlled Clinical Trials As Topic, Crashes, Disease, Enforcement Cameras, Hidden, Humans, Management Measures, Medline, Meta-Analysis, Methods], Photography [Instrumentation], Program, Radar, Radar [Instrumentation], Research, Safety, Science Citation Index, Statistics & Numerical Data], Transport, Web of Science

? Kardamanidis, K., Martiniuk, A., Ivers, R.Q., Stevenson, M.R. and Thistlethwaite, K. (2010), Motorcycle rider training for the prevention of road traffic crashes. *Cochrane Database of Systematic Reviews*, **10**, Article Number: CD005240.

Full Text: [2010\Coc Dat Sys Rev2010, CD005240.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD005240.pdf)

Abstract: Background Riding a motorcycle (a two-wheeled vehicle that is powered by a motor and has no pedals) is associated with a high risk of fatal crashes, particularly in new riders. Motorcycle rider training has therefore been suggested as an important means of reducing the number of crashes, and the severity of injuries. Objectives To quantify the effectiveness of pre- and post-licence motorcycle rider training on the reduction of traffic offences, traffic crash involvement, injuries and deaths of motorcycle riders. Search strategy We searched the Cochrane Injuries Group Specialised Register, CENTRAL (T h e Cochrane Library 2008, Issue 3), TRANSPORT, MEDLINE, EMBASE, CINAHL, WHOLIS (World Health Organization Library Information System), PsycInfo, LILACS (Latin American and Caribbean Health Sciences), ISI Web of Science: Social Sciences Citation Index (S S C I), ERIC, ZETOC and SIGLE. Database searches covered all available dates up to October 2008. We also checked reference lists of relevant papers and contacted study authors in an effort to identify published, unpublished and ongoing trials related to motorcycle rider training. Selection criteria We included all relevant intervention studies such as randomised and non-randomised controlled trials, interrupted time-series and observational studies such as cohort and case-control studies. Data collection and analysis Two review authors independently analysed data about the study population, study design and methods, interventions and outcome measures as well as data quality from each included study, and compared the findings. We resolved differences by discussion with a third review author. Main results We reviewed 23 studies: three randomised trials, two non-randomised trials, 14 cohort studies and four case-control studies. Five examined mandatory pre-licence training, 14 assessed non-mandatory training, three of the case-control studies assessed `any’ type of rider training, and one case-control study assessed mandatory pre-licence training and non-mandatory training. The types of assessed rider training varied in duration and content. Most studies suffered from serious methodological weaknesses. Most studies were non-randomised and controlled poorly for confounders. Most studies also suffered from detection bias due to the poor use of outcome measurement tools such as the sole reliance upon police records or self-reported data. Small sample sizes and short follow-up time after training were also common. Authors’ conclusions Due to the poor quality of studies identified, we were unable to draw any conclusions about the effectiveness of rider training on crash, injury, or offence rates. The findings suggest that mandatory pre-licence training may be an impediment to completing a motorcycle licensing process, possibly indirectly reducing crashes through a reduction in exposure. It is not clear if training (or what type) reduces the risk of crashes, injuries or offences in motorcyclists, and a best rider training practice can therefore not be recommended. As some type of rider training is likely to be necessary to teach motorcyclists to ride a motorcycle safely, rigorous research is needed.

Keywords: Accidents, Author, Citation, Education, Injuries, Isi, Medline, Operator Skill Test, Quality, Research, Safety, Transport, Trials, Web of Science

? Gurusamy, K.S., Bong, J.J., Fusai, G. and Davidson, B.R. (2010), Methods of cystic duct occlusion during laparoscopic cholecystectomy. *Cochrane Database of Systematic Reviews*, **10**, Article Number: CD006807.

Full Text: [2010\Coc Dat Sys Rev2010, CD006807.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006807.pdf)

Abstract: Background During laparoscopic cholecystectomy, it is necessary to occlude the cystic duct permanently. Traditionally, this has been performed through the application of non-absorbable metal clips. Use of absorbable materials to occlude the cystic duct has been suggested as an alternative for metal clips for various reasons. Objectives To assess the benefits and harms of the different methods of occlusion of cystic duct in patients undergoing laparoscopic cholecystectomy. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Controlled Trials in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until August 2010. Selection criteria We included all randomised clinical trials comparing different methods of occlusion of cystic duct. Data collection and analysis We collected the data on the characteristics, methodological quality, bile duct injury, bile leaks, operating time, and incidence of recurrent common bile duct stone from each trial. We analysed the data with both the fixed-effect and the random-effects model using RevMan Analysis. For each outcome we calculated the risk ratio (RR) in the presence of more than one trial for the outcome or mean difference (MD) with 95% confidence intervals (CI) based on intention-to-treat analysis. In the presence of only one trial under a dichotomous outcome, we performed the Fisher’s exact test. Main results Three trials including 255 patients qualified for this review. In two of the trial, a total of 150 patients were randomised to absorbable clips (n = 75) and non-absorbable clips (n = 75). In the third trial, a total of 105 patients were randomised to absorbable ligatures (n = 53) and non-absorbable clips (n = 52). All three trials were of high risk of bias. There was no difference in the morbidity between the groups. There was statistically significant longer operating time (MD 12.00 minutes, 95% CI 1.59 to 22.41) in the absorbable ligature group than non-absorbable clips. The duration and method of follow-up were not adequate to determine the incidence of long-term complications. Authors’ conclusions We are unable to determine the benefits and harms of different methods of cystic duct occlusion because of the small sample size, short period of follow-up, and lack of reporting of important outcomes in the included trials. Adequately powered randomised trials with low risk of bias and with long periods of follow-up and assessing all of the important outcomes for patients and professionals are necessary.

Keywords: Audit, Bias, Cautionary Note, Citation, Clinical-Trials, Empirical-Evidence, Group Randomized-Trials, Medline, Metaanalysis, Metallic Clips, Occlusion, Prevalence, Quality, Science Citation Index, Science Citation Index Expanded

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Full Text: [2010\Coc Dat Sys Rev2010, CD007345.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD007345.pdf)

Abstract: Background The use of prophylactic antibiotics before endoscopic retrograde cholangiopancreatography (ERCP) is recommended by all major international gastroenterological societies, especially in the presence of an obstructed biliary system. Their use is intended to decrease or eliminate the incidence of complications following the procedure, namely cholangitis, cholecystitis, septicaemia, and pancreatitis. Objectives To assess the benefits and harms of antibiotics before elective ERCP in patients without evidence of acute or chronic cholecystitis, or acute or chronic cholangitis, or severe acute pancreatitis. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and LILACS until March 2010. Relevant medical and surgical international conference proceedings were also searched. Selection criteria Only randomised clinical trials were included in the analyses, irrespective of blinding, language, or publication status. Participants were patients that underwent elective ERCP that were not on antibiotics, without evidence of acute or chronic cholecystitis, cholangitis, or severe acute pancreatitis before the procedure. We compared patients that received prophylactic antibiotics before the procedure with patients that were given placebo or no intervention before the procedure. Data collection and analysis The review was conducted according to the recommendations of The Cochrane Collaboration as well as the Cochrane Hepato-Biliary Group. Review Manager 5 was used employing fixed-effect and random-effects models meta-analyses. Main results Nine randomised clinical trials (1573 patients) were included in the analyses. The majority of the trials had risks of bias. When all patients providing data for a certain outcome were included, the fixed-effect meta-analyses significantly favoured the use of prophylactic antibiotics in preventing cholangitis (relative risk (RR) 0.54, 95% CI 0.33 to 0.91), septicaemia (RR 0.35, 95% CI 0.11 to 1.11), bacteriaemia (RR 0.50, 95% CI 0.33 to 0.78), and pancreatitis (RR 0.54, 95% CI 0.29 to 1.00). In random-effects meta-analyses, only the effect on bacteriaemia remained significant. Overall mortality was not reduced (RR 1.33, 95% CI 0.32 to 5.44). If one selects patients in whom the ERCP resolved the biliary obstruction at the first procedure, there seem to be no significant benefit in using prophylactic antibiotics to prevent cholangitis (RR 0.98, 95% CI 0.35 to 2.69, only three trials). Authors’ conclusions Prophylactic antibiotics reduce bacteriaemia and seem to prevent cholangitis and septicaemia in patients undergoing elective ERCP. In the subgroup of patients with uncomplicated ERCP, the effect of antibiotics may be less evident. Further research is required to determine whether antibiotics can be given during or after an ERCP if it becomes apparent that biliary obstruction cannot be relieved during that procedure.

Keywords: Cholangitis, Citation, Collaboration, Empirical-Evidence, Ercp, Infectious Complications, Information Size, Medline, Metaanalyses, Piperacillin, Publication, Quality, Randomized-Trials, Research, Science Citation Index, Science Citation Index Expanded, Trial Sequential-Analysis

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Full Text: [2010\Coc Dat Sys Rev2010, CD008089.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008089.pdf)

Abstract: Background Surgical treatment including shoulder arthroplasty is a treatment option for patients with advanced osteoarthritis of the shoulder who have failed conservative treatment. Objectives To determine the benefit and harm of surgery in patients with osteoarthritis of the shoulder confirmed on X-ray who do not respond to analgesics and NSAIDs. Search strategy We searched: The Cochrane Central Register of Controlled Trials (CENTRAL), via The Cochrane Library; OVIDMEDLINE; CINAHL (via EBSCOHost); OVID SPORTdiscus; EMBASE; and Science Citation Index (Web of Science). Selection criteria All randomized clinical trials (RCTs) or quasi-randomized trials including adults with osteoarthritis of the shoulder joint (PICO-patients) comparing surgical techniques (total shoulder arthroplasty, hemiarthroplasty, implant types and fixation-intervention) versus placebo or sham surgery, non-surgical modalities, no treatment, or comparison of one type of surgical technique to another (comparison) with patient-reported outcomes (pain, function, quality of life etc.) or revision rates (outcomes). Data collection and analysis We reviewed titles and abstracts for inclusion, extracted study and outcomes data and assessed the risk of bias of included studies. For categorical outcomes, we calculated the risk ratio (with 95% confidence interval (CI)) and for continuous outcomes, the mean difference (95% CI). Main results Seven studies (238 patients) were included for analyses. None of the studies compared shoulder surgery to sham surgery, non-surgical modalities or placebo. Two studies compared hemiarthroplasty to total shoulder arthroplasty; three compared keeled and pegged humeral components; and one each compared navigation surgery to conventional and all-polyethylene to metal-backed implant. Two studies (88 patients) compared hemiarthroplasty to total shoulder arthroplasty. Patients who underwent hemiarthroplasty had statistically significantly worse functional scores on American Shoulder and Elbow Surgeons Shoulder Scale (100 point scale; higher = better) at 24 to 34 month follow-up compared to those who underwent total shoulder arthroplasty (mean difference, -10.05; 95% CI, -18.97 to -1.13; 2 studies, 88 patients), but no statistically significant differences between hemiarthroplasty and TSA were noted for pain scores (mean difference, 7.8; 95% CI, -5.33 to 20.93; 1 study, 41 patients), quality of life on short-form 36 physical component summary (mean difference, 0.80; 95% CI, -6.63 to 8.23; 1 study, 41 patients) and adverse events (Risk ratio, 1.19; 95% CI, 0.37 to 3.81; 1 study, 41 patients), respectively. A non-statistically significant trend towards higher revision rate in hemiarthroplasty compared to total shoulder arthroplasty was noted (Risk ratio, 6.18; 95% CI, 0.77 to 49.52; 2 studies, 88 patients; P = 0.09). Authors’ conclusions Total shoulder arthroplasty seems to offer an advantage in terms of shoulder function, with no other clinical benefits over hemiarthroplasty. More studies are needed to compare clinical outcomes of surgery using different components and techniques in patients with osteoarthritis of the shoulder. There is a need for studies comparing shoulder surgery to sham, placebo and other non-surgical treatment options.

Keywords: Arthroplasty, Citation, Disability, Hemiarthroplasty, Instability, Keeled Glenoid Components, Life, Pain, Prevalence, Primary-Care, Quality of Life, Randomized-Trial, Risk, Science Citation Index, Surgical Techniques, Treatment, Trend, Web Of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD008533.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008533.pdf)

Abstract: Background The role of prophylactic gastrojejunostomy in patients with unresectable periampullary cancer is controversial. Objectives To determine whether prophylactic gastrojejunostomy should be performed routinely in patients with unresectable periampullary cancer. Search strategy We searched the Cochrane Upper Gastrointestinal and Pancreatic Diseases Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, issue 3), MEDLINE, EMBASE and Science Citation Index Expanded until April 2010. Selection criteria We included randomised controlled trials comparing prophylactic gastrojejunostomy versus no gastrojejunostomy in patients with unresectable periampullary cancer (irrespective of language or publication status). Data collection and analysis Two authors independently assessed trials for inclusion and independently extracted data. We analysed data with both the fixed-effect and the random-effects models using Review Manager (RevMan). We calculated the hazard ratio (HR), risk ratio (RR), or mean difference (MD) with 95% confidence intervals (CI) based on an intention-to-treat or available case analysis. Main results We identified two trials (of high risk of bias) involving 152 patients randomised to gastrojejunostomy (80 patients) and no gastrojejunostomy (72 patients). In both trials, patients were found to be unresectable during exploratory laparotomy. Most of the patients also underwent biliary-enteric drainage. There was no evidence of difference in the overall survival (HR 1.02; 95% CI 0.84 to 1.25), perioperative mortality or morbidity, quality of life, or hospital stay (MD 0.97 days; 95% CI -0.18 to 2.12) between the two groups. The proportion of patients who developed long term gastric outlet obstruction was significantly lower in the prophylactic gastrojejunostomy group (2/80; 2.5%) compared with no gastrojejunostomy group (20/72; 27.8%) (RR 0.10; 95% CI 0.03 to 0.37). The operating time was significantly longer in the gastrojejunostomy group compared with no gastrojejunostomy group (MD 45.00 minutes; 95% CI 21.39 to 68.61). Authors’ conclusions Routine prophylactic gastrojejunostomy is indicated in patients with unresectable periampullary cancer undergoing exploratory laparotomy (with or without hepaticojejunostomy).

Keywords: Bias, Cancer, Citation, Clinical-Trials, Empirical-Evidence, Gastric Outlet Obstruction, Medline, Metaanalysis, Palliation, Pancreatic-Cancer, Prospective Randomized-Trial, Publication, Quality of Life, Quality-of-Life, Science Citation Index, Science Citation Index Expanded, Surgical Complications

? Wilson, C., Willis, C., Hendrikz, J.K., Le Brocque, R. and Bellamy, N. (2010), Speed cameras for the prevention of road traffic injuries and deaths. *Cochrane Database of Systematic Reviews*, **11**, Article Number: CD004607.

Full Text: [2010\Coc Dat Sys Rev2010, CD004607.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD004607.pdf)

Abstract: Background It is estimated that by 2020, road traffic crashes will have moved from ninth to third in the world ranking of burden of disease, as measured in disability adjusted life years. The prevention of road traffic injuries is of global public health importance. Measures aimed at reducing traffic speed are considered essential to preventing road injuries; the use of speed cameras is one such measure. Objectives To assess whether the use of speed cameras reduces the incidence of speeding, road traffic crashes, injuries and deaths. Search strategy We searched the following electronic databases covering all available years up to March 2010; the Cochrane Library, MEDLINE (WebSPIRS), EMBASE (WebSPIRS), TRANSPORT, IRRD(International Road Research Documentation), TRANSDOC (European Conference of Ministers of Transport databases), Web of Science (Science and Social Science Citation Index), PsycINFO, CINAHL, EconLit, WHO database, Sociological Abstracts, Dissertation Abstracts, Index to Theses. Selection criteria Randomised controlled trials, interrupted time series and controlled before-after studies that assessed the impact of speed cameras on speeding, road crashes, crashes causing injury and fatalities were eligible for inclusion. Data collection and analysis We independently screened studies for inclusion, extracted data, assessed methodological quality, reported study authors’ outcomes and where possible, calculated standardised results based on the information available in each study. Due to considerable heterogeneity between and within included studies, a meta-analysis was not appropriate. Main results Thirty five studies met the inclusion criteria. Compared with controls, the relative reduction in average speed ranged from 1% to 15% and the reduction in proportion of vehicles speeding ranged from 14% to 65%. In the vicinity of camera sites, the pre/post reductions ranged from 8% to 49% for all crashes and 11% to 44% for fatal and serious injury crashes. Compared with controls, the relative improvement in pre/post injury crash proportions ranged from 8% to 50%. Authors’ conclusions Despite the methodological limitations and the variability in degree of signal to noise effect, the consistency of reported reductions in speed and crash outcomes across all studies show that speed cameras are a worthwhile intervention for reducing the number of road traffic injuries and deaths. However, whilst the the evidence base clearly demonstrates a positive direction in the effect, an overall magnitude of this effect is currently not deducible due to heterogeneity and lack of methodological rigour. More studies of a scientifically rigorous and homogenous nature are necessary, to provide the answer to the magnitude of effect.

Keywords: Accident Prevention [Instrumentation, Accidents, Accidents,Traffic [Prevention & Control, Analysis, Authors, British-Columbia, Casualties, Citation, Conference, Controlled Clinical Trials As Topic, Crashes, Database, Databases, Disease, Embase, Enforcement Cameras, Hidden, Humans, Management Measures, Medline, Meta-Analysis, Methodological Quality, Methods], Photography [Instrumentation], Program, Public Health, Radar, Radar [Instrumentation], Reduction, Research, Safety, Science, Science Citation Index, Statistics & Numerical Data], Transport, Web Of Science

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Full Text: [2010\Coc Dat Sys Rev2010, CD006590.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006590.pdf)

Abstract: Background The lack of evidence regarding the effectiveness of treatment options for clinically localised prostate cancer continues to impact on clinical decision-making. Two such options are radical prostatectomy (RP) and watchful waiting (WW). WW involves providing no initial treatment and monitoring the patient with the intention of providing palliative treatment if there is evidence of disease progression. Objectives To compare the beneficial and harmful effects of RP versus WW for the treatment of localised prostate cancer. Search strategy MEDLINE, EMBASE, The Cochrane Library, ISI Science Citation Index, DARE and LILACS were searched through 30 July 2010. Selection criteria Randomised or quasi-randomised controlled trials comparing the effects of RP versus WW for clinically localised prostate cancer. Data collection and analysis Data extraction and quality assessment were carried out independently by two authors. Main results Two trials met the inclusion criteria. Both trials commenced prior to the widespread availability of prostate-specific antigen (PSA) screening; hence the results may not be applicable to men with PSA-detected disease. One trial (N = 142), conducted in the US, was judged to be of poor quality. All cause (overall) mortality was not significantly different between RP and WW groups after fifteen years of follow up (Hazard Ratio (HR) 0.9 (95% Confidence Interval (CI) 0.56 to 1.43). The second trial (N = 695), conducted in Scandinavia, was judged to be of good quality. After 12 years of follow up, the trial results were compatible with a beneficial effect of RP on the risks of overall mortality, prostate cancer mortality and distant metastases compared with WW but the precise magnitude of the effect is uncertain as indicated by the width of the confidence intervals for all estimates (risk difference (RD) -7.1% (95% CI - 14.7 to 0.5); RD -5.4% (95% CI -11.1 to 0.2); RD-6.7% (95% CI -13.2 to -0.2), respectively). Compared to WW, RP increased the absolute risks of erectile dysfunction (RD 35% (95% CI 25 to 45)) and urinary leakage (RD 27% (95% CI 17 to 37)). These estimates must be interpreted cautiously as they are derived from data obtained from a self-administered questionnaire survey of a sample of the trial participants (N = 326), no baseline quality of life data were obtained and nerve-sparing surgery was not routinely performed on trial participants undergoing RP. Authors’ conclusions The existing trials provide insufficient evidence to allow confident statements to be made about the relative beneficial and harmful effects of RP and WW for patients with localised prostate cancer. The results of ongoing trials should help to inform treatment decisions for men with screen-detected localised prostate cancer.

Keywords: Active Surveillance, Analysis, Assessment, Authors, Availability, Baseline Quality, Bicalutamide 150 Mg, Cancer, Citation, Clinical, Collection, Confidence, Confidence Intervals, Criteria, Data, Decision Making, Decision-Making, Disease, Effectiveness, Erectile Dysfunction, Estimates, Evidence, Expectant Management, Extraction, Follow-up, Impact, Intervals, ISI, Life, Long-Term Survival, Median Follow-up, Medline, Men, Metastases, Monitoring, Mortality, N, Nerve Sparing, Nerve-Sparing, Options, Patients, Population-Based Cohort, Prostate Cancer, Prostatectomy, Quality, Quality of, Quality of Life, Quality-of-Life, Questionnaire, Radiation-Therapy, Randomized Controlled-Trial, Risk, Risks, Science, Science Citation Index, Screening, Search, Selective Delayed Intervention, Self, Strategy, Surgery, Survey, Treatment, Trial, Urinary, US

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Full Text: [2010\Coc Dat Sys Rev2010, CD008256.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008256.pdf)

Abstract: Background Antibodies against hepatitis B surface antigen (HBs) wane over time after vaccination for hepatitis B (HB); hence, the duration of protection provided by the vaccine is still unknown but may be evaluated indirectly by measuring the anamnestic immune response to booster doses of vaccine. Objectives To assess the benefits and harms of booster dose hepatitis B vaccination for preventing HB infection. Search strategy We searched The Cochrane Hepato-biliary Group Control led Trials Register, the Cochrane Centra l Register of Control led Trials (CENTRAL) (Issue 4, 2010) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, conference databases, and reference lists of articles to May 2010. We also contacted authors of articles and manufacturers. Selection criteria Randomised clinical trials addressing anamnestic immune response to booster of HB vaccine five years or more after primary vaccination in apparently healthy participants, vaccinated in a 3-dose or 4-dose schedules of HB vaccine without receiving additional dose or immunoglobulin. Data collection and analysis Two authors made the decisions if the identified publications on studies met the inclusion criteria or not. Primary outcome measures included the proportion with anamnestic immune response in non-protected participants and signs of hepatitis B virus infection. Secondary outcomes were the proportion with local and systemic adverse event events developed following booster dose injection. Weighted proportion were planned to be reported with 95% confidence intervals. Main results There were no eligible randomised clinical trials fulfilling the inclusion criteria of this review. Authors’ conclusions We were unable to identify randomised clinical trials on the topic. We need randomised clinical trials to formulate future booster policies for preventing hepatitis B infection.

Keywords: 15-Year Follow-Up, Analysis, Anti-HBS, Authors, Citation, Confidence Intervals, Databases, Dna Yeast Vaccine, Duration, Embase, Health-Care Workers, Immune-Response, Immunological Memory, Long-Term Immunogenicity, Medline, Plasma-Derived Vaccine, Prospective Randomized-Trial, Publications, Science, Science Citation Index, Science Citation Index Expanded, Yupik Eskimo Population

? Wilson, C., Willis, C., Hendrikz, J.K., Le Brocque, R. and Bellamy, N. (2010), Speed cameras for the prevention of road traffic injuries and deaths. *Cochrane Database of Systematic Reviews*, **12**, Article Number: CD004607.

Full Text: [2010\Coc Dat Sys Rev2010, CD004607.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD004607.pdf)

Abstract: Background It is estimated that by 2020, road traffic crashes will have moved from ninth to third in the world ranking of burden of disease, as measured in disability adjusted life years. The prevention of road traffic injuries is of global public health importance. Measures aimed at reducing traffic speed are considered essential to preventing road injuries; the use of speed cameras is one such measure. Objectives To assess whether the use of speed cameras reduces the incidence of speeding, road traffic crashes, injuries and deaths. Search strategy We searched the following electronic databases covering all available years up to March 2010; the Cochrane Library, MEDLINE (WebSPIRS), EMBASE (WebSPIRS), TRANSPORT, IRRD(International Road Research Documentation), TRANSDOC (European Conference of Ministers of Transport databases), Web of Science (Science and Social Science Citation Index), PsycINFO, CINAHL, EconLit, WHO database, Sociological Abstracts, Dissertation Abstracts, Index to Theses. Selection criteria Randomised controlled trials, interrupted time series and controlled before-after studies that assessed the impact of speed cameras on speeding, road crashes, crashes causing injury and fatalities were eligible for inclusion. Data collection and analysis We independently screened studies for inclusion, extracted data, assessed methodological quality, reported study authors’ outcomes and where possible, calculated standardised results based on the information available in each study. Due to considerable heterogeneity between and within included studies, a meta-analysis was not appropriate. Main results Thirty five studies met the inclusion criteria. Compared with controls, the relative reduction in average speed ranged from 1% to 15% and the reduction in proportion of vehicles speeding ranged from 14% to 65%. In the vicinity of camera sites, the pre/post reductions ranged from 8% to 49% for all crashes and 11% to 44% for fatal and serious injury crashes. Compared with controls, the relative improvement in pre/post injury crash proportions ranged from 8% to 50%. Authors’ conclusions Despite the methodological limitations and the variability in degree of signal to noise effect, the consistency of reported reductions in speed and crash outcomes across all studies show that speed cameras are a worthwhile intervention for reducing the number of road traffic injuries and deaths. However, whilst the the evidence base clearly demonstrates a positive direction in the effect, an overall magnitude of this effect is currently not deducible due to heterogeneity and lack of methodological rigour. More studies of a scientifically rigorous and homogenous nature are necessary, to provide the answer to the magnitude of effect.

Keywords: Accident Prevention [Instrumentation, Accidents, Accidents,Traffic [Prevention & Control, Analysis, Authors, British-Columbia, Casualties, Citation, Conference, Controlled Clinical Trials As Topic, Crashes, Data, Database, Databases, Embase, Enforcement Cameras, Hidden, Humans, Impact, Management Measures, Medline, Meta-Analysis, Methodological Quality, Methods], Photography [Instrumentation], Program, Public Health, Radar, Radar [Instrumentation], Reduction, Research, Safety, Science, Science Citation Index, Statistics & Numerical Data], Transport, Web Of Science

? Gurusamy, K.S., Tsochatzis, E., Davidson, B.R. and Burroughs, A.K. (2010), Antiviral prophylactic intervention for chronic hepatitis C virus in patients undergoing liver transplantation. *Cochrane Database of Systematic Reviews*, **12**, Article Number: CD006573.

Full Text: [2010\Coc Dat Sys Rev2010, CD006573.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006573.pdf)

Abstract: Background It is not clear whether prophylactic antiviral therapy is indicated in patients undergoing liver transplantation for chronic decompensated hepatitis C virus (HCV) infection. Objectives To compare the benefits and harms of different prophylactic anti-viral therapies for patients undergoing liver transplantation for chronic HCV infection. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until August 2010. Selection criteria Only randomised clinical trials irrespective of language, blinding, or publication status and comparing various prophylactic antiviral therapies (alone or in combination) in the prophylactic treatment of patients undergoing liver transplantation for chronic HCV infection. Data collection and analysis Two authors collected the data independently. We calculated the risk ratio (RR) or mean difference (MD) or hazard ratio (HR) with 95% confidence intervals (CI) using the fixed-effect and the random-effects models based on available case analysis. Main results A total of 477 liver transplant recipients undergoing liver transplantation for chronic HCV infection were randomised in eleven trials to various interventions and controls. The proportion of genotype I varied between 49% to 88% in the five trials that reported the genotype. Only one or two trials were included under each comparison. All the trials were of high risk of bias. There was no significantdifferences in the patient survival, graft rejection, re-transplantation, or HCV recurrence between intervention and control groups in any of the comparisons that reported these outcomes. None of the trials reported liver decompensation, primary graft non-function, intensive therapy unit stay, hospital stay, or quality of life. Life-threatening adverse events were not reported in either group in any of the comparisons. Up to 91% of patients required reduction in dose and up to 36% of patients required cessation of treatment in the various comparisons because of adverse events or because of patient’s choice to stop treatment. Authors’ conclusions There is currently no evidence to recommend prophylactic antiviral treatment to prevent recurrence of HCV infection either in primary liver transplantation or re-transplantation. Further randomised clinical trials with adequate trial methodology and adequate duration of follow-up are necessary.

Keywords: Analysis, Authors, Chronic Hepatitis C, Citation, Clinical-Trials, Comparison, Confidence Intervals, Control, Control Groups, Data, Duration, Embase, Empirical-Evidence, Genotype, Infected Patients, Interferon-Alpha, Language, Liver, Medline, Models, Multicenter Trial, Patient, Peginterferon Alpha-2A, Ribavirin, Plus Ribavirin, Prospective Randomized-Trial, Publication, Quality of Life, Recurrence, Reduction, Ribavirin Combination, Science, Science Citation Index, Science Citation Index Expanded, Survival, Therapy, Treatment

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Full Text: [2010\Coc Dat Sys Rev2010, CD006590.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006590.pdf)

Abstract: Background The lack of evidence regarding the effectiveness of treatment options for clinically localised prostate cancer continues to impact on clinical decision-making. Two such options are radical prostatectomy (RP) and watchful waiting (WW). WW involves providing no initial treatment and monitoring the patient with the intention of providing palliative treatment if there is evidence of disease progression. Objectives To compare the beneficial and harmful effects of RP versus WW for the treatment of localised prostate cancer. Search strategy MEDLINE, EMBASE, The Cochrane Library, ISI Science Citation Index, DARE and LILACS were searched through 30 July 2010. Selection criteria Randomised or quasi-randomised controlled trials comparing the effects of RP versus WW for clinically localised prostate cancer. Data collection and analysis Data extraction and quality assessment were carried out independently by two authors. Main results Two trials met the inclusion criteria. Both trials commenced prior to the widespread availability of prostate-specific antigen (PSA) screening; hence the results may not be applicable to men with PSA-detected disease. One trial (N = 142), conducted in the US, was judged to be of poor quality. All cause (overall) mortality was not significantly different between RP and WW groups after fifteen years of follow up (Hazard Ratio (HR) 0.9 (95% Confidence Interval (CI) 0.56 to 1.43). The second trial (N = 695), conducted in Scandinavia, was judged to be of good quality. After 12 years of follow up, the trial results were compatible with a beneficial effect of RP on the risks of overall mortality, prostate cancer mortality and distant metastases compared with WW but the precise magnitude of the effect is uncertain as indicated by the width of the confidence intervals for all estimates (risk difference (RD) - 7.1% (95% CI - 14.7 to 0.5); RD -5.4% (95% CI -11.1 to 0.2); RD - 6.7% (95% CI -13.2 to -0.2), respectively). Compared to WW, RP increased the absolute risks of erectile dysfunction (RD 35% (95% CI 25 to 45)) and urinary leakage (RD 27% (95% CI 17 to 37)). These estimates must be interpreted cautiously as they are derived from data obtained from a self- administered questionnaire survey of a sample of the trial participants (N = 326), no baseline quality of life data were obtained and nerve-sparing surgery was not routinely performed on trial participants undergoing RP. Authors’ conclusions The existing trials provide insufficient evidence to allow confident statements to be made about the relative beneficial and harmful effects of RP and WW for patients with localised prostate cancer. The results of ongoing trials should help to inform treatment decisions for men with screen- detected localised prostate cancer.

Keywords: Active Surveillance, Analysis, Authors, Bicalutamide 150 Mg, Cancer, Citation, Confidence Intervals, Data, Decision Making, Embase, Expectant Management, Extraction, Hazard, Impact, ISI, Long-Term Survival, Median Follow-up, Medline, Monitoring, Mortality, Patient, Population-Based Cohort, Quality of Life, Quality-of-Life, Radiation-Therapy, Randomized Controlled-Trial, Science, Science Citation Index, Screening, Selective Delayed Intervention, Survey, Treatment, US

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Full Text: [2010\Coc Dat Sys Rev2010, CD006902.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD006902.pdf)

Abstract: Background Mechanical ventilation often causes major distress and anxiety in patients. Music interventions have been used to reduce anxiety and distress and improve physiological functioning in medical patients; however its efficacy for mechanically ventilated patients needs to be evaluated. Objectives To examine the effects of music interventions with standard care versus standard care alone on anxiety and physiological responses in mechanically ventilated patients. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 1), MEDLINE, CINAHL, AMED, EMBASE, PsycINFO, LILACS, Science Citation Index, www.musictherapyworld. net, CAIRSS for Music, Proquest Digital Dissertations, ClinicalTrials.gov, Current Controlled Trials, the National Research Register, and NIH CRISP (all to January 2010). We handsearched music therapy journals and reference lists and contacted relevant experts to identify unpublished manuscripts. There was no language restriction. Selection criteria We included all randomized and quasi-randomized controlled trials that compared music interventions and standard care with standard care alone for mechanically ventilated patients. Data collection and analysis Two authors independently extracted the data and assessed the methodological quality. Additional information was sought from the trial researchers, when necessary. Results were presented using mean differences for outcomes measured by the same scale and standardized mean differences for outcomes measured by different scales. Post-test scores were used. In cases of significant baseline difference, we used change scores. Main results We included eight trials (213 participants). Music listening was the main intervention used, and seven of the studies did not include a trained music therapist. Results indicated that music listening may be beneficial for anxiety reduction in mechanically ventilated patients; however, these results need to be interpreted with caution due to the small sample size. Findings indicated that listening to music consistently reduced heart rate and respiratory rate, suggesting a relaxation response. No strong evidence was found for blood pressure reduction. Music listening did not improve oxygen saturation level. No studies could be found that examined the effects of music interventions on quality of life, patient satisfaction, post-discharge outcomes, mortality, or cost-effectiveness. Authors’ conclusions Music listening may have a beneficial effect on heart rate, respiratory rate, and anxiety in mechanically ventilated patients. However, the quality of the evidence is not strong. Most studies examined the effects of listening to pre-recorded music. More research is needed on the effects of music offered by a trained music therapist.

Keywords: Analysis, Anxiety, Authors, Care-Unit, Citation, Data, Embase, Heart-Rate, Infarction, Journals, Language, Management, Medical, Medline, Metaanalysis, Methodological Quality, Mortality, Patient, Pressure, Quality of Life, Reduction, Research, Researchers, Respiratory, Sample Size, Science, Science Citation Index, Sedation, Stress, Therapy, Ventilation

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Full Text: [2010\Coc Dat Sys Rev2010, CD008256.pdf](2010/Coc%20Dat%20Sys%20Rev2010,%20CD008256.pdf)

Abstract: Background Antibodies against hepatitis B surface antigen (HBs) wane over time after vaccination for hepatitis B (HB); hence, the duration of protection provided by the vaccine is still unknown but may be evaluated indirectly by measuring the anamnestic immune response to booster doses of vaccine. Objectives To assess the benefits and harms of booster dose hepatitis B vaccination for preventing HB infection. Search strategy We searched The cochrane Hepato-biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (Issue 4, 2010) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, conference databases, and reference lists of articles to May 2010. We also contacted authors of articles and manufacturers. Selection criteria Randomised clinical trials addressing anamnestic immune response to booster of HB vaccine five years or more after primary vaccination in apparently healthy participants, vaccinated in a 3-dose or 4-dose schedules of HB vaccine without receiving additional dose or immunoglobulin. Data collection and analysis Two authors made the decisions if the identified publications on studies met the inclusion criteria or not. Primary outcome measures included the proportion with anamnestic immune response in non-protected participants and signs of hepatitis B virus infection. Secondary outcomes were the proportion with local and systemic adverse event events developed following booster dose injection. Weighted proportion were planned to be reported with 95% confidence intervals. Main results There were no eligible randomised clinical trials fulfilling the inclusion criteria of this review. Authors’ conclusions We were unable to identify randomised clinical trials on the topic. We need randomised clinical trials to formulate future booster policies for preventing hepatitis B infection.

Keywords: 15-Year Follow-Up, Analysis, Anti-Hbs, Authors, Citation, Confidence Intervals, Databases, DNA Yeast Vaccine, Duration, Embase, Health-Care Workers, Immune-Response, Immunological Memory, Long-Term Immunogenicity, Medline, Plasma-Derived Vaccine, Prospective Randomized-Trial, Publications, Review, Science, Science Citation Index, Science Citation Index Expanded, Yupik Eskimo Population

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Full Text: [2011\Coc Dat Sys Rev2011, CD000009.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD000009.pdf)

Abstract: Background Acupuncture and related techniques are promoted as a treatment for smoking cessation in the belief that they may reduce nicotine withdrawal symptoms. Objectives The objectives of this review are to determine the effectiveness of acupuncture and the related interventions of acupressure, laser therapy and electrostimulation in smoking cessation, in comparison with no intervention, sham treatment, or other interventions. Search strategy We searched the Cochrane Tobacco Addiction Group specialized register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, BIOSIS Previews, PsycINFO, Science Citation Index, AMED, Acubriefs in November 2010; and four Chinese databases: Chinese Biomedical Database, China National Knowledge Infrastructure, Wanfang Data and VIP in November 2010. Selection criteria Randomized trials comparing a form of acupuncture, acupressure, laser therapy or electrostimulation with either no intervention, sham treatment or another intervention for smoking cessation. Data collection and analysis We extracted data in duplicate on the type of smokers recruited, the nature of the intervention and control procedures, the outcome measures, method of randomization, and completeness of follow up. We assessed abstinence from smoking at the earliest time-point (before six weeks), and at the last measurement point between six months and one year. We used the most rigorous definition of abstinence for each trial, and biochemically validated rates if available. Those lost to follow up were counted as continuing smokers. Where appropriate, we performed meta-analysis using a fixed-effect model. Main results We included 33 reports of studies. Compared with sham acupuncture, the fixed-effect risk ratio (RR) for the short-term effect of acupuncture was 1.18 (95% confidence interval 1.03 to 1.34), and for the long-term effect was 1.05 (CI 0.82 to 1.35). The studies were not judged to be free from bias. Acupuncture was less effective than nicotine replacement therapy (NRT). There was no evidence that acupuncture is superior to waiting list, nor to psychological interventions in short-or long-term. The evidence on acupressure and laser stimulation was insufficient and could not be combined. The evidence suggested that electrostimulation is not superior to sham electrostimulation. Authors’ conclusions There is no consistent, bias-free evidence that acupuncture, acupressure, laser therapy or electrostimulation are effective for smoking cessation, but lack of evidence and methodological problems mean that no firm conclusions can be drawn. Further, well designed research into acupuncture, acupressure and laser stimulation is justified since these are popular interventions and safe when correctly applied, though these interventions alone are likely to be less effective than evidence-based interventions.

Keywords: Acupressure, Acupuncture, Acupuncture Therapy, Analysis, Auricular Acupuncture, Bias, China, Chinese, Collection, Comparison, Confidence, Control, Controlled Trial, Cranial Electrostimulation Therapy, Criteria, Data, Databases, Effectiveness, Electric Stimulation Therapy, Electroacupuncture, Evidence, Evidence Based, Evidence-Based, Follow-Up, Humans, Interval, Intervention, Interventions, Laser, Laser Therapy, Long Term, Long-Term, Measurement, Medical Acupuncture, Medline, Meta-Analysis, Metaanalysis, Model, Nicotine Gum, Outcome, Outcome Measures, Procedures, Psycinfo, Randomization, Randomized Controlled Trials As Topic, Rat Nucleus-Accumbens, Rates, Replacement Therapy, Research, Review, Risk, Science Citation Index, Sham Acupuncture, Smoking, Smoking Cessation [Methods], Smoking [Therapy], Stopping Smoking, Strategy, Symptoms, Techniques, Therapy, Tobacco Smoking, Treatment, Trial, Withdrawal

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Full Text: [2011\Coc Dat Sys Rev2011, CD003626.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003626.pdf)

Abstract: Background Primary sclerosing cholangitis is a progressive chronic cholestatic liver disease that usually leads to the development of cirrhosis. Studies evaluating bile acids in the treatment of primary sclerosing cholangitis have shown a potential benefit of their use. However, no influence on patients survival and disease outcome has yet been proven. Objectives To assess the beneficial and harmful effects of bile acids for patients with primary sclerosing cholangitis. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Library, MEDLINE, EMBASE and Science Citation Index Expanded generally from inception through to October 2010. Selection criteria Randomised clinical trials comparing any dose of bile acids or duration of treatment versus placebo, no intervention, or another intervention were included irrespective of blinding, language, or publication status. Data collection and analysis Two authors extracted data independently. We evaluated the risk of bias of the trials using prespecified domains. We performed the meta-analysis according to the intention-to-treat principle. We presented outcomes as relative risks (RR) or mean differences (MD), both with 95% confidence intervals (CI). Main results Eight trials evaluated ursodeoxycholic acid versus placebo or no intervention (592 patients). The eight randomised clinical trials have a high risk of bias. Patients were treated for three months to six years (median three years). The dosage of ursodeoxycholic acid used in the trials ranged from low (10 mg/kg body weight/day) to high (28 to 30 mg/kg body weight/day). Ursodeoxycholic acid did not significantly reduce the risk of death (RR 1.00; 95% CI 0.46 to 2.20); treatment failure including liver transplantation, varices, ascites, and encephalopathy (RR 1.22; 95% CI 0.91 to 1.64); liver histological deterioration (RR 0.89; 95% CI 0.45 to 1.74); or liver cholangiographic deterioration (RR 0.60; 95% CI 0.23 to 1.57). Ursodeoxycholic acid significantly improved serum bilirubin (MD -4.6 mu mol/litre; 95% CI -18.7 to -10.6), alkaline phosphatases (MD -506 IU/litre; 95% CI -583 to -430), aspartate aminotransferase (MD -46 IU/litre; 95% CI -77 to -16), and gamma-glutamyltranspeptidase (MD -260 IU/litre; 95% CI -315 to -205), but not albumin (MD -0.20 g/litre; 95% CI -1.91 to 1.50). Ursodeoxycholic acid was safe and well tolerated by patients with primary sclerosing cholangitis. Authors’ conclusions We did not find enough evidence to support or refute the use of bile acids in the treatment of primary sclerosing cholangitis. However, bile acids seem to lead to a significant improvement in liver biochemistry. Therefore, more randomised trials are needed before any of the bile acids can be recommended for this indication.

Keywords: Albumin, Analysis, Aspartate Aminotransferase, Authors, Bias, Bilirubin, Biochemistry, Cholagogues And Choleretics [Therapeutic Use], Cholangitis, Cholestatic Liver-Disease, Chronic, Chronic Ulcerative-Colitis, Cirrhosis, Clinical, Clinical Trials, Clinical-Trials, Collection, Confidence, Confidence Intervals, Criteria, Data, Death, Development, Disease, Dose Ursodeoxycholic Acid, Duration, Empirical-Evidence, Encephalopathy, Evidence, Failure, Humans, Improvement, Indication, Intervals, Intervention, Lead, Liver, Liver Transplantation, Medline, Meta-Analysis, Metaanalysis, Outcome, Outcomes, Patients, Placebo, Placebo-Controlled Trial, Potential, Primary, Primary Biliary-Cirrhosis, Protein-Kinase-C, Publication, Randomised, Randomized Controlled Trials As Topic, Randomized Double-Blind, Risk, Risks, Science Citation Index, Sclerosing [Drug Therapy], Serum, Strategy, Support, Survival, Taurodeoxycholic Acid [Therapeutic Use], Tauroursodeoxycholic Acid, Transplantation, Treatment, Ursodeoxycholic Acid [Therapeutic Use], Varices

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Full Text: [2011\Coc Dat Sys Rev2011, CD004896.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD004896.pdf)

Abstract: Background Uncontrolled bleeding is an important cause of death in trauma victims. Antifibrinolytic treatment has been shown to reduce blood loss following surgery and may also be effective in reducing blood loss following trauma. Objectives To quantify the effect of antifibrinolytic drugs in reducing blood loss, transfusion requirement and mortality after acute traumatic injury. Search strategy We searched the Cochrane Injuries Group’s Specialised Register, CENTRAL, MEDLINE, PUBMED, EMBASE, Science Citation Index, National Research Register, Zetoc, SIGLE, Global Health, LILACS, and Current Controlled Trials. The Cochrane Injuries Group Specialised Register, CENTRAL, MEDLINE and EMBASE searches were updated in July 2010. Selection criteria We included all randomised controlled trials of antifibrinolytic agents (aprotinin, tranexamic acid [TXA] and epsilon-aminocaproic acid) following acute traumatic injury. Data collection and analysis The titles and abstracts identified in the electronic searches were screened by two independent authors to identify studies that had the potential to meet the inclusion criteria. The full reports of all such studies were obtained. From the results of the screened electronic searches, bibliographic searches, and contacts with experts, two authors independently selected trials meeting the inclusion criteria, with any disagreements resolved by consensus. Main results Four trials met the inclusion criteria. Two trials with a combined total of 20,451 patients assessed the effects of TXA on mortality; TXA reduced the risk of death by 10% (RR=0.90, 95% CI 0.85 to 0.97; p=0.0035). Data from one trial involving 20,211 patients found that TXA reduced the risk of death due to bleeding by 15% (RR=0.85, 95% CI 0.76 to 0.96; p=0.0077). There was no evidence that TXA increased the risk of vascular occlusive events or need for surgical intervention. There was no substantial difference in the receipt of blood transfusion between the TXA and placebo groups. The two trials of aprotinin provided no reliable data. Authors’ conclusions TXA safely reduces mortality in bleeding trauma patients without increasing the risk of adverse events. Further trials are needed to determine the effects of TXA in patients with isolated traumatic brain injury.

Keywords: Analysis, Antifibrinolytic Agents [Therapeutic Use], Aprotinin, Authors, Bleeding, Blood, Blood Loss, Blood Loss,Surgical [Prevention & Control], Blood Transfusion, Blood Transfusion [Utilization], Brain, Brain Injury, Cause Of Death, Collection, Consensus, Criteria, Data, Death, Drugs, Etiology], Events, Evidence, Experts, Hemorrhage [Drug Therapy, Humans, Inhibitor, Injury, Intervention, Medline, Mortality, Patients, Placebo, Potential, PUBMED, Randomised, Randomised Controlled Trials, Randomized Controlled Trials As Topic, Requirement, Risk, Science Citation Index, Strategy, Surgery, Tranexamic Acid, Transfusion, Trauma, Traumatic, Traumatic Brain Injury, Traumatic Injury, Treatment, Trial, Wounds And Injuries [Complications]

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Full Text: [2011\Coc Dat Sys Rev2011, CD005431.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005431.pdf)

Abstract: Background Traumatic hyphema is the entry of blood into the anterior chamber (the space between the cornea and iris) subsequent to a blow or a projectile striking the eye. Hyphema uncommonly causes permanent loss of vision. Associated trauma (e. g., corneal staining, traumatic cataract, angle recession glaucoma, optic atrophy, etc.) may seriously affect vision. Such complications may lead to permanent impairment of vision. Patients with sickle cell trait/disease may be particularly susceptible to increases of elevated intraocular pressure. If rebleeding occurs, the rates and severity of complications increase. Objectives The objective of this review was to assess the effectiveness of various medical interventions in the management of traumatic hyphema. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (which contains the Cochrane Eyes and Vision Group Trials Register) (The Cochrane Library 2010, Issue 6), MEDLINE (January 1950 to June 2010), EMBASE (January 1980 to June 2010), the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com) and ClinicalTrials.gov (http://clinicaltrials.gov). We searched the reference lists of identified trial reports to find additional trials. We also searched the ISI Web of Science Social Sciences Citation Index (SSCI) to find studies that cited the identified trials. There were no language or date restrictions in the search for trials. The electronic databases were last searched on 25 June 2010. Selection criteria Two authors independently assessed the titles and abstracts of all reports identified by the electronic and manual searches. In this review, we included randomized and quasi-randomized trials that compared various medical interventions to other medical interventions or control groups for the treatment of traumatic hyphema following closed globe trauma. There were no restrictions regarding age, gender, severity of the closed globe trauma or level of visual acuity at the time of enrollment. Data collection and analysis Two authors independently extracted the data for the primary and secondary outcomes. We entered and analyzed data using Review Manager (RevMan) 5. We performed meta-analyses using a fixed-effect model and reported dichotomous outcomes as odds ratios and continuous outcomes as mean differences. Main results Nineteen randomized and seven quasi-randomized studies with 2,560 participants were included in this review. Interventions included antifibrinolytic agents (oral and systemic aminocaproic acid, tranexamic acid, and aminomethylbenzoic acid), corticosteroids (systemic and topical), cycloplegics, miotics, aspirin, conjugated estrogens, monocular versus bilateral patching, elevation of the head, and bed rest. No intervention had a significant effect on visual acuity whether measured at two weeks or less after the trauma or at longer time periods. The number of days for the primary hyphema to resolve appeared to be longer with the use of aminocaproic acid compared to no use, but was not altered by any other intervention. Systemic aminocaproic acid reduced the rate of recurrent hemorrhage (odds ratio (OR) 0.25, 95% confidence interval (CI) 0.11 to 0.5), but a sensitivity analysis omitting studies not using an intention-to-treat (ITT) analysis reduced the strength of the evidence (OR 0.41, 95% CI 0.16 to 1.09). We obtained similar results for topical aminocaproic acid (OR 0.42, 95% CI 0.16 to 1.10). We found tranexamic acid had a significant effect in reducing the rate of secondary hemorrhage (OR 0.25, 95% CI 0.13 to 0.49), as did aminomethylbenzoic acid as reported in a single study (OR 0.07, 95% CI 0.01 to 0.32). The evidence to support an associated reduction in the risk of complications from secondary hemorrhage (i.e., corneal blood staining, peripheral anterior synechiae, elevated intraocular pressure, and development of optic atrophy) by antifibrinolytics was limited by the small number of these events. Use of aminocaproic acid was associated with increased nausea, vomiting, and other adverse events compares with placebo. We found no difference in the number of adverse events with the use of systemic versus topical aminocaproic acid or with standard versus lower drug dose. The available evidence on usage of corticosteroids, cycloplegics or aspirin in traumatic hyphema was limited due to the small numbers of participants and events in the trials. We found no difference in effect between a single versus binocular patch nor ambulation versus complete bed rest on the risk of secondary hemorrhage or time to rebleed. Authors’ conclusions Traumatic hyphema in the absence of other intraocular injuries, uncommonly leads to permanent loss of vision. Complications resulting from secondary hemorrhage could lead to permanent impairment of vision, especially in patients with sickle cell trait/disease. We found no evidence to show an effect on visual acuity by any of the interventions evaluated in this review. Although evidence is limited, it appears that patients with traumatic hyphema who receive aminocaproic acid or tranexamic acid are less likely to experience secondary hemorrhaging. However, hyphema in patients on aminocaproic acid take longer to clear. Other than the possible benefits of antifibrinolytic usage to reduce the rate of secondary hemorrhage, the decision to use corticosteroids, cycloplegics, or non-drug interventions (such as binocular patching, bed rest, or head elevation) should remain individualized because no solid scientific evidence supports a benefit. As these multiple interventions are rarely used in isolation, further research to assess the additive effect of these interventions might be of value.

Keywords: Age, Analysis, Atrophy, Authors, Bed Rest, Blood, Children, Collection, Complications, Confidence, Control, Control Groups, Corticosteroids, Criteria, Data, Databases, Decision, Development, Double-Blind, Drug, Effectiveness, Events, Evidence, Experience, Gender, Hemorrhage, Interval, Intervention, Interventions, Isi, Isi Web Of Science, Lead, Management, Medical, Medline, Model, Nausea, Odds Ratio, Oral, Outcomes, Outpatient Management, Patients, Permanent, Phase-Iii, Placebo, Pressure, Primary, Randomized, Randomized Clinical-Trial, Rates, Recurrent, Reduction, Reference, Reference Lists, Research, Restrictions, Review, Risk, Scientific Evidence, Secondary Hemorrhage, Sensitivity, Sensitivity Analysis, Sickled Erythrocytes, Small, Ssci, Standard, Strategy, Strength, Support, Topical, Topical Aminocaproic Acid, Tranexamic Acid, Trauma, Traumatic, Treatment, Trial, Urokinase, Value, Vomiting, Web Of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006032.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006032.pdf)

Abstract: Background Traumatic optic neuropathy (TON) is an important cause of severe visual loss following blunt or penetrating head trauma. Following the initial injury, optic nerve swelling within the optic nerve canal can result in secondary retinal ganglion cell loss. Optic nerve decompression with steroids or surgical interventions or both has therefore been advocated as a means of improving visual prognosis in TON. Objectives The aim of this review was to examine the effectiveness and safety of using steroids in TON. Search strategy We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (The Cochrane Library 2010, Issue 11), MEDLINE (January 1950 to November 2010), EMBASE (January 1980 to November 2010), Latin American and Caribbean Literature on Health Sciences (LILACS) (January 1982 to November 2010), the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com), ClinicalTrials.gov (http://clinicaltrials.gov) and Web of Science Conference Proceedings Citation Index-Science (CPCIS). There were no language or date restrictions in the search for trials. The electronic databases were last searched on 23 November 2010. We also searched the reference lists of included studies, other reviews and book chapters on TON to find references to additional trials. The Science Citation Index was used to look for papers that cited the studies included in this review. We did not manually search any journals or conference proceedings. We contacted trial investigators and experts in the field to identify additional published and unpublished studies. Selection criteria We planned to include only randomised controlled trials (RCTs) of TON in which any steroid regime, either on its own or in combination with surgical optic nerve decompression, was compared to surgery alone or no treatment. Data collection and analysis Two review authors independently assessed the titles and abstracts identified from the electronic searches. Main results We included one study that met our selection criteria; a double-masked, placebo-controlled, randomised trial of high dose intravenous steroids in patients with indirect TON diagnosed within seven days of the initial injury. A total of 31 eligible participants were randomised to receive either high dose intravenous steroids (n = 16) or placebo (n = 15), and they were all followed-up for three months. Mean final best corrected visual acuity (BCVA) was 1.78 +/- 1.23 Logarithm of the Minimum Angle of Resolution (LogMAR) in the placebo group, and 1.11 +/- 1.14 LogMAR in the steroid group. The mean difference in BCVA between the placebo and steroid groups was 0.67 LogMAR (95% confidence interval -1.54 to 0.20), and this difference was not statistically significant (P = 0.13). At three months follow-up, an improvement in BCVA of 0.40 LogMAR occurred in eight eyes (8/15, 53.3%) in the placebo group, and in 11 eyes (11/16, 68.8%) in the treatment group. This difference was not statistically significant (P = 0.38). Authors’ conclusions There is a relatively high rate of spontaneous visual recovery in TON and there is no convincing data that steroids provide any additional visual benefit over observation alone. Recent evidence also suggests a possible detrimental effect of steroids in TON and further studies are urgently needed to clarify this important issue. Each case therefore needs to be assessed on an individual basis and proper informed consent is paramount.

Keywords: Analysis, Authors, Blindness, Collection, Confidence, Consent, Controlled-Trial, Counting Fingers, Criteria, Data, Databases, Effectiveness, Evidence, Experts, Field, Follow-Up, Hand Motion, Head Trauma, Head-Injury, High Dose, Humans, Improvement, Informed Consent, Injury, Interval, Interventions, Intravenous, Journals, Medline, Methylprednisolone, Methylprednisolone [Administration & Dosage], Needs, Nerve Trauma, Neuropathy, Nonsurgical Treatment, Observation, Optic Nerve Injuries [Drug Therapy], Optic Neuropathy, P, Papers, Patients, Placebo, Prognosis, Randomised, Randomised Controlled Trials, Randomised Trial, Recovery, Reference, Reference Lists, References, Restrictions, Review, Reviews, Safety, Science Citation Index, Selection Criteria, Spinal-Cord-Injury, Steroids, Steroids [Administration & Dosage, Strategy, Surgery, Swelling, Therapeutic Use], Trauma, Traumatic, Treatment, Trial, Visual-Acuity Test, Web of Science

? Kisely, S.R., Campbell, L.A. and Preston, N.J. (2011), Compulsory community and involuntary outpatient treatment for people with severe mental disorders. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD004408.

Full Text: [2011\Coc Dat Sys Rev2011, CD004408.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD004408.pdf)

Abstract: Backround There is controversy as to whether compulsory community treatment for people with severe mental illnesses reduces health service use, or improves clinical outcome and social functioning. Given the widespread use of such powers it is important to assess the effects of this type of legislation. Objectives To examine the clinical and cost effectiveness of compulsory community treatment for people with severe mental illness. Search strategy We undertook searches of the Cochrane Schizophrenia Group Register 2003, 2008, and Science Citation Index. We obtained all references of identified studies and contacted authors of each included study. Selection criteria All relevant randomised controlled clinical trials of compulsory community treatment compared with standard care for people with severe mental illness. Data collection and analysis We reliably selected and quality assessed studies and extracted data. For binary outcomes, we calculated a fixed effects risk ratio (RR), its 95% confidence interval (CI) and, where possible, the weighted number needed to treat/harm statistic (NNT/H). Main results We identified two randomised clinical trials (total n = 416) of court-ordered ‘Outpatient Commitment’ (OPC) from the USA. We found little evidence that compulsory community treatment was effective in any of the main outcome indices: health service use (2 RCTs, n = 416, RR for readmission to hospital by 11-12 months 0.98 CI 0.79 to 1.2); social functioning (2 RCTs, n = 416, RR for arrested at least once by 11-12 months 0.97 CI 0.62 to 1.52); mental state; quality of life (2 RCTs, n = 416, RR for homelessness 0.67 CI 0.39 to 1.15) or satisfaction with care (2 RCTs, n = 416, RR for perceived coercion 1.36 CI 0.97 to 1.89). However, risk of victimisation may decrease with OPC (1 RCT, n = 264, RR 0.5 CI 0.31 to 0.8). In terms of numbers needed to treat (NNT), it would take 85 OPC orders to prevent one readmission, 27 to prevent one episode of homelessness and 238 to prevent one arrest. The NNT for the reduction of victimisation was lower at six (CI 6 to 6.5). A new search for trials in 2008 did not find any new trials that were relevant to this review. Authors’ conclusions Compulsory community treatment results in no significant difference in service use, social functioning or quality of life compared with standard care. People receiving compulsory community treatment were, however, less likely to be victims of violent or non-violent crime. It is unclear whether this benefit is due to the intensity of treatment or its compulsory nature. Evaluation of a wide range of outcomes should be considered when this type of legislation is introduced.

Keywords: Ambulatory Care [Standards, Analysis, Authors, Care, Citation, Civil Commitment, Clinical, Clinical Trials, Coercion, Collection, Commitment Of Mentally Ill [Legislation & Jurisprudence, Community, Community Mental Health Services [Legislation & Jurisprudence, Conditional Release, Confidence, Consort Statement, Cost, Cost Effectiveness, Cost-Effectiveness, Crime, Crime Victims, Criteria, Data, Effectiveness, Evaluation, Evidence, Health, Health-Service Use, Hospital, Humans, Indices, Interval, Legislation, Length Of Stay [Statistics & Numerical Data], Life, Mental Disorders, Mental Disorders [Therapy], Mental Illness, North-Carolina, Offender Databases, Outcome, Outcomes, Outpatient, Patient Satisfaction, Psychiatric Rating-Scale, Quality, Quality Of, Quality Of Life, Randomised, Randomized Controlled Trials As Topic, Randomized Controlled-Trials, Rct, Readmission, Reduction, References, Review, Risk, Satisfaction, Science, Science Citation Index, Search, Service, Severe Mental Illness, Social, Standard, Standards, State, Statistics & Numerical Data], Strategy, Treatment, Treatment Orders, Treatment Outcome, USA, Violent, Western-Australia

? Buckley, N.A., Eddleston, M., Li, Y., Bevan, M. and Robertson, J. (2011), Oximes for acute organophosphate pesticide poisoning. *Cochrane Database of Systematic Reviews*, **2**, Article Number: CD005085.

Full Text: [2011\Coc Dat Sys Rev2011, CD005085.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005085.pdf)

Abstract: Background Acute organophosphorus pesticide poisoning causes tens of thousands of deaths each year across the developing world. Standard treatment involves administration of intravenous atropine and oxime to reactivate inhibited acetylcholinesterase. The clinical usefulness of oximes, such as pralidoxime and obidoxime, has been challenged over the past 20 years by physicians in many parts of the world. Objectives To quantify the effectiveness and safety of the administration of oximes in acute organophosphorus pesticide-poisoned patients. Search strategy We searched both English and Chinese databases: Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials (The Cochrane Library), MEDLINE (Ovid SP), EMBASE (Ovid SP), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) and the Chinese language databases CNKI and WANGFANG. All searches were run in September 2009. Selection criteria Articles that could possibly be RCTs were retrieved to determine if they were randomised. Data collection and analysis The published methodology of three RCTs was not clear. We contacted the principal authors of these, but did not obtain further information. Main results Seven pralidoxime RCTs were found. Three RCTs including 366 patients studied pralidoxime vs placebo and four RCTs including 479 patients compared two or more different doses. These trials found quite disparate results with treatment effects ranging from benefit to harm. However, many studies did not take into account several issues important for outcomes. In particular, baseline characteristics were not balanced, oxime doses varied widely, there were substantial delays to treatment, and the type of organophosphate was not taken into account. Only one RCT compared the World Health Organization (WHO) recommended doses with placebo. This trial showed no clinical benefits and a trend towards harm in all sub-groups, despite clear evidence that these doses reactivated acetylcholinesterase in the blood. Authors’ conclusions Current evidence is insufficient to indicate whether oximes are harmful or beneficial. The WHO recommended regimen (30 mg/kg pralidoxime chloride bolus followed by 8 mg/kg/hr infusion) is not supported. Further RCTs are required to examine other strategies and regimens. There are many theoretical and practical reasons why oximes may not be useful, particularly for late presentations of dimethyl OP and those with a large excess of OP that simply re-inhibits reactivated enzymes. Future studies should screen for patient sub-groups that may benefit and may need flexible dosing strategies as clinical effectiveness and doses may depend on the type of OP.

Keywords: Acetylcholinesterase, Administration, Analysis, Antidotes [Therapeutic Use], Articles, Authors, Blood, Butyrylcholinesterase Activity, Characteristics, Chinese, Chloride, Cholinesterase Reactivation, Cholinesterase Reactivators [Therapeutic Use], Citation, Clinical, Collection, Conference, Criteria, Databases, Developing, Developing World, Developing-World, Effectiveness, Enzymes, Evidence, Experience, Humans, Information, Infusion, Intensive-Care Management, Intravenous, ISI, ISI Web of Science, Medline, Methodology, Organophosphorus Compounds [Poisoning], Outcomes, Oximes [Therapeutic Use], Patients, Pesticide, Pesticides [Poisoning], Pharmacokinetics, Physicians, Placebo, Poisoning, Poisoning [Drug Therapy], Pralidoxime, Pralidoxime Compounds [Therapeutic Use], Randomised, Randomized Controlled Trials As Topic, Randomized-Trials, Rct, Safety, Science, Science Citation Index, Science Citation Index Expanded, Search, Sri-Lanka, Strategy, Therapy, Treatment, Trend, Trial, Web of Science, World, World Health Organization

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Full Text: [2011\Coc Dat Sys Rev2011, CD000567.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD000567.pdf)

Abstract: Back ground Colloid solutions are widely used in fluid resuscitation of critically ill patients. There are several choices of colloid and there is ongoing debate about the relative effectiveness of colloids compared to crystalloid fluids. Objectives To assess the effects of colloids compared to crystalloids for fluid resuscitation in critically ill patients. Search strategy We searched the Cochrane Injuries Group Specialised Register, CENTRAL (The Cochrane Library 2008, Issue 3), MEDLINE, EMBASE, ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S), and The Controlled Trials metaRegister (www.controlled-trials.com). Reference lists of relevant studies and review articles were searched for further trials. The searches were last updated in September 2008. Selection criteria Randomised controlled trials (RCTs) of colloids compared to crystalloids, in patients requiring volume replacement. We excluded crossover trials and trials in pregnant women and neonates. Data collection and analysis Two authors independently extracted data and rated quality of allocation concealment. We analysed trials with a ‘double-intervention’, such as those comparing colloid in hypertonic crystalloid to isotonic crystalloid, separately. We stratified the analysis according to colloid type and quality of allocation concealment. Main results We identified 65 eligible trials; 56 of these presented mortality data. Colloids compared to crystalloids Albumin or plasma protein fraction - 23 trials reported data on mortality, including a total of 7754 patients. The pooled relative risk (RR) from these trials was 1.01 (95% confidence interval (95% CI) 0.92 to 1.10). When we excluded the trial with poor qualityallocation concealment, pooled RR was 1.00 (95% CI 0.91 to 1.09). Hydroxyethyl starch - 17 trials compared hydroxyethyl starch with crystalloids, n = 1172 patients. The pooled RR was 1.18 (95% CI 0.96 to 1.44). Modified gelatin - 11 trials compared modified gelatin with crystalloid, n = 506 patients. The pooled RR was 0.91 (95% CI 0.49 to 1.72). (When the trials by Boldt et al were removed from the three preceding analyses, the results were unchanged.) Dextran - nine trials compared dextran with a crystalloid, n = 834 patients. The pooled RR was 1.24 (95% CI 0.94 to 1.65). Colloids in hypertonic crystalloid compared to isotonic crystalloid Eight trials compared dextran in hypertonic crystalloid with isotonic crystalloid, including 1283 randomised participants. Pooled RR was 0.88 (95% CI 0.74 to 1.05). Authors’ conclusions There is no evidence from RCTs that resuscitation with colloids reduces the risk of death, compared to resuscitation with crystalloids, in patients with trauma, burns or following surgery. As colloids are not associated with an improvement in survival, and as they are more expensive than crystalloids, it is hard to see how their continued use in these patients can be justified outside the context of RCTs.

Keywords: 7.5-Percent Sodium-Chloride, Albumin, Allocation, Analyses, Analysis, Authors, Citation, Collection, Colloid, Colloids, Colloids [Therapeutic Use], Conference, Confidence, Context, Controlled Clinical-Trial, Coronary-Artery-Bypass, Criteria, Critical Illness [Therapy], Crystalloid, Data, Death, Dextran, Effectiveness, Effects, Evidence, Fluid Therapy [Methods], Gelatin, Improvement, Intensive-Care-Unit, Interval, ISI, ISI Web of Science, Lactated Ringers Solution, Major Abdominal-Surgery, Medline, Modified, Mortality, Neonates, Patients, Plasma, Plasma Substitutes [Therapeutic Use], Pregnant, Pregnant Women, Protein, Quality, Quality of, Randomised, Randomized Controlled Trials As Topic, Randomized-Trial, Rehydration Solutions, Relative Risk, Respiratory-Distress-Syndrome, Resuscitation, Resuscitation [Methods], Review, Risk, Saline-Dextran Solution, Science, Science Citation Index, Science Citation Index Expanded, Search, Solutions, Starch, Strategy, Surgery, Survival, Trauma, Trial, Volume, Volume Replacement Strategy, Web of Science, Women

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Full Text: [2011\Coc Dat Sys Rev2011, CD001860.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001860.pdf)

Abstract: Background Trachoma is the world’s leading infectious cause of blindness. In 1997 the World Health Organization (WHO) launched an Alliance for the Global Elimination of Trachoma by the year 2020, based on the ‘SAFE’ strategy (surgery, antibiotics, facial cleanliness and environmental improvement). Objectives To assess the evidence supporting the antibiotic arm of the SAFE strategy by assessing the effects of antibiotics on both active trachoma (primary objective) and on Chlamydia trachomatis (C. trachomatis) infection of the conjunctiva (secondary objective). Search strategy We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (The Cochrane Library 2010, Issue 11), MEDLINE (January 1950 to December 2010), EMBASE (January 1980 to December 2010), the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com) (December 2010) and ClinicalTrials. gov (www.clinicaltrials.gov) (December 2010). We used the Science Citation Index to look for articles that cited the included studies. We searched the reference lists of identified articles and we contacted authors and experts for details of further relevant studies. There were no language or date restrictions in the search for trials. The electronic databases were last searched on 12 December 2010. Selection criteria We included randomised trials that satisfied either of two criteria: (a) trials in which topical or oral administration of an antibiotic was compared to placebo or no treatment in people or communities with trachoma, (b) trials in which a topical antibiotic was compared with an oral antibiotic in people or communities with trachoma. A subdivision of particular interest was trials in which topical tetracycline or chlortetracycline and oral azithromycin were compared with each other, or in which one of these treatments was compared with placebo or no treatment, as these are the two WHO recommended antibiotics. We considered individually randomised and cluster-randomised trials separately. Data collection and analysis Two authors independently assessed trial quality and extracted data. We contacted investigators for missing data. Where appropriate, the effect estimates from the individual studies (risk ratios) were pooled using a random-effects model. Main results A total of 14 trials randomised individuals with trachoma to oral antibiotic, topical antibiotic, both, or control (no treatment or placebo) and were eligible for inclusion in this review (n = 3587). Overall, the quality of the evidence provided from these trials was low. Nine of the trials compared antibiotic treatment to control. Most of the studies found a beneficial effect of treatment on active trachoma and ocular chlamydial infection at three and 12 months follow up. There was considerable clinical and statistical heterogeneity between trials, which meant that it was difficult to reliably estimate the size of the treatment effect. It is likely to be in the region of a 20% relative risk reduction. Seven of the 14 trials compared the effectiveness of oral and topical antibiotics. There was no consistent evidence as to whether oral or topical antibiotics were more effective, although one trial suggested that a single dose of oral azithromycin was significantly more effective than unsupervised use of topical tetracycline A further eight trials assessed the effectiveness of community-based treatment. In five trials antibiotic treatment was compared to no (or delayed) treatment (57 communities), and in three trials oral antibiotic was compared to topical treatment (12 communities). The quality of the evidence provided by these trials was variable but at least one trial was considered to provide high quality evidence. There was evidence that community-based antibiotic treatment reduced the prevalence of active trachoma and ocular infection 12 months after single-dose treatment. There was some evidence that oral azithromycin was more effective than topical tetracycline as a community treatment. Data on adverse effects were not consistently reported however there were no reported serious adverse events associated with treatment with oral azithromycin or topical tetracycline; in one sample survey of 671 people treated with azithromycin between 10% and 15% experienced gastrointestinal adverse effects (nausea or vomiting, or both). Authors’ conclusions Antibiotic treatment reduces the risk of active trachoma and ocular chlamydial infection in people infected with C. trachomatis, but we do not know for certain the size of the treatment effect in individuals. Mass antibiotic treatment with single-dose oral azithromycin reduces the prevalence of active trachoma and ocular infection in communities.

Keywords: Active Trachoma, Administration, Administration,Oral, Administration,Topical, Adverse Effects, Analysis, Anti-Bacterial Agents [Therapeutic Use], Antibiotics, Assessing, Authors, Azithromycin, Chlamydia Trachomatis, Citation, Clinical, Clinical-Trial, Collection, Community, Community Based, Control, Criteria, Data, Databases, Effectiveness, Environmental, Estimates, Events, Evidence, Experts, Follow-Up, Heterogeneity, Humans, Hyper-Endemic Trachoma, Improvement, Infected, Infection, Infectious Trachoma, Mass Treatment, Medline, Model, Nausea, Oral, Oral Azithromycin, Placebo, Prevalence, Primary, Quality, Quality of, Random Effects Model, Randomised, Randomized Controlled Trials as Topic, Randomized-Trial, Reduction, Reference, Reference Lists, Region, Relative Risk, Restrictions, Review, Risk, Risk-Factors, Safe, Sample Survey, Science, Science Citation Index, Search, Single-Dose Azithromycin, Size, Strategy, Surgery, Survey, Tetracycline, Topical, Topical Tetracycline, Trachoma [Drug Therapy], Treatment, Trial, Vomiting, World Health Organization

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Full Text: [2011\Coc Dat Sys Rev2011, CD002964.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD002964.pdf)

Abstract: Background Parenting programmes are a potentially important means of supporting teenage parents and improving outcomes for their children, and parenting support is a priority across most Western countries. This review updates the previous version published in 2001. Objectives To examine the effectiveness of parenting programmes in improving psychosocial outcomes for teenage parents and developmental outcomes in their children. Search strategy We searched to find new studies for this updated review in January 2008 and May 2010 in CENTRAL, MEDLINE, EMBASE, ASSIA, CINAHL, DARE, ERIC, PsycINFO, Sociological Abstracts and Social Science Citation Index. The National Research Register (NRR) was last searched in May 2005 and UK Clinical Research Network Portfolio Database in May 2010. Selection criteria Randomised controlled trials assessing short-term parenting interventions aimed specifically at teenage parents and a control group (no-treatment, waiting list or treatment-as-usual). Data collection and analysis We assessed the risk of bias in each study. We standardised the treatment effect for each outcome in each study by dividing the mean difference in post-intervention scores between the intervention and control groups by the pooled standard deviation. Main results We included eight studies with 513 participants, providing a total of 47 comparisons of outcome between intervention and control conditions. Nineteen comparisons were statistically significant, all favouring the intervention group. We conducted nine meta-analyses using data from four studies in total (each meta-analysis included data from two studies). Four meta-analyses showed statistically significant findings favouring the intervention group for the following outcomes: parent responsiveness to the child post-intervention (SMD-0.91, 95% CI-1.52 to -0.30, P = 0.04); infant responsiveness to mother at follow-up (SMD-0.65, 95% CI-1.25 to -0.06, P = 0.03); and an overall measure of parent-child interactions post-intervention (SMD-0.71, 95% CI-1.31 to -0.11, P = 0.02), and at follow-up (SMD-0.90, 95% CI-1.51 to -0.30, P = 0.004). The results of the remaining five meta-analyses were inconclusive. Authors’ conclusions Variation in the measures used, the included populations and interventions, and the risk of bias within the included studies limit the conclusions that can be reached. The findings provide some evidence to suggest that parenting programmes may be effective in improving a number of aspects of parent-child interaction both in the short-and long-term, but further research is now needed.

Keywords: Adolescent, Adolescent Mothers, Analysis, Assessing, Bias, Child, Child Development, Children, Citation, Collection, Control, Control Groups, Criteria, Data, Effectiveness, Evidence, Fathers, Female, Follow-Up, Home, Humans, Infant, Infants, Interaction, Intervention, Interventions, Long Term, Long-Term, Measure, Medline, Meta-Analysis, Metaanalysis, Mother, Mother-Child Relations, Outcome, Outcomes, P, Parenting, Parents, Populations, Pregnancy, Prevention, Program Evaluation, Programmes, Psychosocial, Psychosocial Outcomes, Psycinfo, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Research, Review, Risk, Science, Science Citation Index, Search, Social Science Citation Index, Standard, Strategy, Support, Teenage, Treatment, UK, Version, Videotape

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Full Text: [2011\Coc Dat Sys Rev2011, CD003262.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003262.pdf)

Abstract: Background Rosacea is a common chronic skin condition affecting the face, characterised by flushing, redness, pimples, pustules, and dilated blood vessels. The eyes are often involved and thickening of the skin with enlargement (phymas), especially of the nose, can occur in some patients. A range of treatment options are available but it is unclear which are the most effective. Objectives To assess the evidence for the efficacy and safety of treatments for rosacea. Search strategy In February 2011 we updated our searches of the Cochrane Skin Group Specialised Register, the Cochrane Central Register of Controlled Trials (Clinical Trials) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index, and Ongoing Trials Registers. Selection criteria Randomised controlled trials in people with moderate to severe rosacea. Data collection and analysis Study selection, data extraction, assessment of risk of bias, and analyses were carried out by two independent review authors. Main results Fifty-eight trials, including 27 from the original review, comprising 6633 participants were included in this updated review. Interventions included topical metronidazole, oral antibiotics, topical azelaic cream or gel, topical benzoyl peroxide and/or combined with topical antibiotics, sulphacetamide/sulphur, and others. Only two studies assessed our primary outcome ‘quality of life’. Pooled data from physician assessments in three trials provided some evidence that metronidazole was more effective compared to placebo (RR 1.95, 95% CI 1.48 to 2.56). Three trials provided data, based on participants’ assessments, illustrating azelaic acid was more effective than placebo (RR 1.52, 95% CI 1.32 to 1.76). Physician-based assessments in two trials indicated that doxycycline appeared to be significantly more effective than placebo (RR 1.59, 95% CI 1.02 to 2.47 and RR 2.37, 95% CI 1.12 to 4.99). There was no statistically significant difference in effectiveness between 100 mg and 40 mg doses of doxycycline, but there was evidence of less adverse effects with the lower dose (RR 0.25, 95% CI 0.11 to 0.54). One study reported that cyclosporine ophthalmic emulsion was significantly more effective than artificial tears for treating ocular rosacea (for all outcomes). Authors’ conclusions Although the majority of included studies were assessed as being at high or unclear risk of bias there was some evidence to support the effectiveness of topical metronidazole, azelaic acid, and doxycycline (40 mg) in the treatment of moderate to severe rosacea, and cyclosporine 0.5% ophthalmic emulsion for ocular rosacea. Further well-designed, adequately-powered randomised controlled trials are required.

Keywords: 0.75-Percent Topical Lotion, 124 0.125-Percent Lotion, Acid 15-Percent Gel, Adverse Effects, Analyses, Analysis, Antibiotics, Antiinflammatory Dose Doxycycline, Assessment, Assessments, Authors, Bias, Blood, Chronic, Citation, Clinical Trials, Collection, Criteria, Cyclosporine, Data, Dermatologic Agents [Therapeutic Use], Effectiveness, Efficacy, Emulsion, Enlargement, Evidence, Extraction, Gel, Humans, Life, Medline, Metronidazole, Metronidazole 1-Percent Cream, Options, Oral, Outcome, Outcomes, Patients, Physician, Placebo, Placebo-Controlled Trial, Primary, Pulsed-Dye-Laser, Quality, Quality of, Quality of Life, Randomised, Randomised Controlled Trials, Randomized Controlled Trials as Topic, Randomized Controlled-Trial, Review, Risk, Rosacea [Drug Therapy], Safety, Science, Science Citation Index, Search, Skin, Sodium Sulfacetamide 10-Percent, Steroid-Induced Rosacea, Strategy, Support, Topical, Treatment

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Full Text: [2011\Coc Dat Sys Rev2011, CD004787.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD004787.pdf)

Abstract: Back ground Hepatocellular carcinoma (HCC) results in more than 600,000 deaths per year. Transarterial embolisation (TAE) and transarterial chemoembolisation (TACE) have become standard loco-regional treatments for unresectable HCC. Objectives To assess the beneficial and harmful effects of TACE or TAE. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Cancer Network register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and The Latin American Caribbean Health Sciences Literature (LILACS) from dates of inceptions up to September 2010. Selection criteria We considered for inclusion all randomised trials that compared TACE or TAE versus placebo, sham, or no intervention. Co-interventions were allowed if comparable between intervention groups. Trials with inadequate randomisation were excluded. Data collection and analysis For all-cause mortality, we calculated the log hazard ratio (HR) with standard error as point estimate and pooled them for meta-analysis using the inverse variance method. Sub-group analyses were performed regarding intervention regimen, trial truncation, or co-interventions. We validated the results with trial sequential analyses. We used random-effects model in all meta-analyses in anticipation of statistical heterogeneity among the trials. Main results We included nine trials with 645 participants. Six trials assessed TACE versus control and three trials assessed TAE versus control. Seven trials had low risk of selection bias based on adequate generation of allocation sequence and concealment - but all these trials had other risks of bias. Three trials were stopped early due to interim inspections and one due to slow accrual. For all-cause mortality, statistical heterogeneity between trials was low to moderate (I-2 = 30%). Meta-analysis of trials with low risk of selection bias showed that TACE or TAE versus control does not significantly increase survival (HR 0.88; 95% CI 0.71 to 1.10). Two trials with low risk of selection bias, no early stopping, and no co-intervention did not establish any significant effect of TACE or TAE on overall survival (hazard ratio 1.22, 95% confidence interval 0.82 to 1.83; P = 0.33). Trial sequential analysis confirmed the absence of evidence for a beneficial effect of TACE or TAE on survival indicating the need for future randomisation of up to 383 additional participants. Substantial differences in criteria for assessing tumour response did not allow quantitative analyses. One trial investigated quality of life but did not detect any significant differences between the intervention groups. A range of adverse events including post-embolisation syndrome and serious complications were reported. Authors’ conclusions There is no firm evidence to support or refute TACE or TAE for patients with unresectable HCC. More adequately powered and biasprotected trials are needed.

Keywords: Allocation, Analyses, Analysis, Assessing, Bias, Citation, Clinical-Trials, Collection, Combination Therapy, Complications, Confidence, Control, Criteria, Effects, Error, Events, Evidence, Generation, Hazard, Heterogeneity, Interval, Intervention, Life, Lipiodol Chemoembolization, Literature, Low Risk, Medline, Meta-Analysis, Metaanalysis, Model, Mortality, P, Patients, Percutaneous Ethanol Injection, Placebo, Portal-Vein Chemotherapy, Quality, Quality of, Quality of Life, Radiofrequency Ablation, Random Effects Model, Randomisation, Randomised, Randomized Controlled-Trial, Response Evaluation Criteria, Risk, Risks, Science, Science Citation Index, Science Citation Index Expanded, Search, Standard, Strategy, Support, Survival, Symptomatic Treatment, Syndrome, Transcatheter Arterial Chemoembolization, Trial

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Full Text: [2011\Coc Dat Sys Rev2011, CD006252.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006252.pdf)

Abstract: Back ground Demographic data in North America, Europe, Asia, Australia and New Zealand suggest a rapid growth in the number of persons over the age of 65 years as the baby boomer generation passes retirement age. As older adults make up an increasing proportion of the population, they are an important consideration when designing future evidence-based traffic safety policies, particularly those that lead to restrictions or cessation of driving. Research has shown that cessation of driving among older drivers can lead to negative emotional consequences such as loss of independence and depression. Those older adults who continue to drive tend to do so less frequently than other demographic groups and are more likely to be involved in a road traffic crash, probably due to what is termed the ‘low mileage bias’. There is universal agreement among researchers that vision plays a significant role in driving performance, and that there are age-related visual changes. Vision testing of all drivers, and in particular of older drivers, is therefore an important road safety issue. The components of visual function essential for driving are acuity, field, depth perception and contrast sensitivity, which are currently not fully measured by licensing agencies. Furthermore, it is not known how effective vision screening tools are, and current vision screening regulations and cut-off values required to pass a licensing test vary from country to country. There is, therefore, a need to develop evidence-based tools for vision screening for driving, thereby increasing road safety. Objectives To assess the effects of vision screening interventions for older drivers to prevent road traffic injuries and fatalities. Search strategy We searched the Cochrane Injuries Group’s Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (T h e Cochrane Library 2010, Issue 2), MEDLINE (Ovid), TRANSPORT (Ovid), IBSS (International Bibliography of Social Sciences), ASSIA: Applied Social Sciences Index and Abstracts, ISI Web of Science: Social Sciences Citation Index (SSCI), ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) and PUBMED. We also searched the Internet and checked the reference lists of relevant papers to identify any further studies. The searches were conducted up to the first week of June 2010. Selection criteria Randomised controlled trials (RCTs) and controlled before and after studies comparing vision screening to non-screening of drivers aged 55 years and older, and which assessed the effect on road traffic crashes, injuries, fatalities and any involvement in traffic law violations, were included. Data collection and an anlysis Two authors independently screened the reference lists for eligible articles and independently assessed the articles for inclusion against the criteria. Two authors independently extracted data using a standardised extraction form. Main results No studies were found which met the inclusion criteria for this review. Authors’ conclusions Most countries require a vision screening test for the renewal of an individual’s driver’s license. There is, however insufficient evidence to assess the effects of vision screening tests on subsequent motor vehicle crash reduction. There is a need to develop valid and reliable tools of vision screening that can predict driving performance.

Keywords: Accidents, Adults, Age, Aged, Asia, Australia, Authors, Automobile Driving, Baby, Bias, Bibliography, Cessation, Changes, Citation, Collection, Conference, Country, Criteria, Data, Dementia, Depression, Drive, Driver’s License, Driving, Driving Performance, Effects, Europe, Evidence, Evidence Based, Evidence-Based, Extraction, Fatalities, Field, First, Function, Generation, Growth, Humans, Increased Depressive Symptoms, Internet, Interventions, ISI, ISI Web of Science, Law, Lead, License, License Renewal, Licensing, Medline, Motor Vehicle, Motor-Vehicle Crashes, New Zealand, North, North America, Older Drivers, Papers, Perception, Performance, Policies, Population, PUBMED, Reduction, Reference, Reference Lists, Regulations, Research, Restrictions, Review, Risk, Road, Role, Safety, Science, Screening, Screening Tests, Search, Sensitivity, Social Sciences, Social Sciences Citation Index, Ssci, Strategy, Testing, Traffic, Traffic Crash, Traffic Crashes, Traffic [Prevention & Control], Transport, Useful Field, Vehicle, Vision Screening, Visual Impairment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006768.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006768.pdf)

Abstract: Background Convergence insufficiency is a common eye muscle co-ordination problem in which the eyes have a strong tendency to drift outward (exophoria) when reading or doing close work. Symptoms may include eye strain, headaches, double vision, print moving on the page, frequent loss of place when reading, inability to concentrate, and short attention span. Objectives To systematically assess and synthesize evidence from randomized controlled trials (RCTs) on the effectiveness of non-surgical interventions for convergence insufficiency. Search strategy We searched The Cochrane Library, MEDLINE, EMBASE, Science Citation Index, the metaRegister of Controlled Trials (mRCT) (www.controlled-trials.com) and ClinicalTrials. gov (www.clinicaltrials.gov) on 7 October 2010. We manually searched reference lists and optometric journals. Selection criteria We included RCTs examining any form of non-surgical intervention against placebo, no treatment, sham treatment, or each other. Data collection and analysis Two authors independently assessed eligibility, risk of bias, and extracted data. We performed meta-analyses when appropriate. Main results We included six trials (three in children, three in adults) with a total of 475 participants. We graded four trials at low risk of bias. Evidence from one trial (graded at low risk of bias) suggests that base-in prism reading glasses was no more effective than placebo reading glasses in improving clinical signs or symptoms in children. Evidence from one trial (graded at high risk of bias) suggests that base-in prism glasses using a progressive addition lens design was more effective than progressive addition lens alone in decreasing symptoms in adults. At three weeks of therapy, the mean difference in Convergence Insufficiency Symptoms Survey (CISS) score was -10.24 points (95% confidence interval (CI) -15.45 to -5.03). Evidence from two trials (graded at low risk of bias) suggests that outpatient (or office-based as used in the US) vision therapy/orthoptics was more effective than home-based convergence exercises (or pencil push-ups as used in the US) in children. At 12 weeks of therapy, the mean difference in change in near point of convergence, positive fusional vergence, and CISS score from baseline was 3.99 cm (95% CI 2.11 to 5.86), 13.13 diopters (95% CI 9.91 to 16.35), and 9.86 points (95% CI 6.70 to 13.02), respectively. In a young adult population, evidence from one trial (graded at low risk of bias) suggests outpatient vision therapy/orthoptics was more effective than home-based convergence exercises in improving positive fusional vergence at near (7.7 diopters, 95% CI 0.82 to 14.58), but not the other outcomes. Evidence from one trial (graded at low risk of bias) comparing four interventions, also suggests that outpatient vision therapy/orthoptics was more effective than home-based computer vision therapy/orthoptics in children. At 12 weeks, the mean difference in change in near point of convergence, positive fusional vergence, and CISS score from baseline was 2.90 cm (95% CI 0.96 to 4.84), 7.70 diopters (95% CI 3.94 to 11.46), and 8.80 points (95% CI 5.26 to 12.34), respectively. Evidence was less consistent for other pair-wise comparisons. Authors’ conclusions Current research suggests that outpatient vision therapy/orthoptics is more effective than home-based convergence exercises or home-based computer vision therapy/orthoptics for children. In adult population, evidence of the effectiveness of various non-surgical interventions is less consistent.

Keywords: Adult, Analysis, Authors, Bias, Binocular Vision, Children, Citation, Clinical, Collection, Concentrate, Confidence, Convergence, Coordination, Criteria, Data, Design, Drift, Effectiveness, Efficacy, Evidence, Exercises, Interval, Intervention, Interventions, Journals, Low Risk, Medline, Muscle, Nearpoint, Outcomes, Outpatient, Placebo, Population, Prism, Randomized, Randomized Clinical-Trial, Randomized Controlled Trials, Reading, Reference, Reference Lists, Reliability, Research, Risk, Science, Science Citation Index, Search, Strategy, Symptom Survey, Symptoms, Therapy, Treatment, Trial, US, Work, Young Adult

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Full Text: [2011\Coc Dat Sys Rev2011, CD007132.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007132.pdf)

Abstract: Back ground Residents of nursing care homes for older people are highly likely to die there, making these places where palliative care is needed. Objectives The primary objective was to determine effectiveness of multi-component palliative care service delivery interventions for residents of care homes for older people. The secondary objective was to describe the range and quality of outcome measures. Search strategy The grey literature and the following electronic databases were searched: Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effectiveness (all issue 1, 2010); MEDLINE, EMBASE, CINAHL, British Nursing Index, (1806 to February 2010), Science Citation Index Expanded & AMED (all to February 2010). Key journals were hand searched and a PUBMED related articles link search was conducted on the final list of articles. Selection criteria We planned to include Randomised Clinical Trials (RCTs), Controlled Clinical Trials (CCTs), controlled before-and-after studies and interrupted time series studies of multi-component palliative care service delivery interventions for residents of care homes for older people. These usually include the assessment and management of physical, psychological and spiritual symptoms and advance care planning. We did not include individual components of palliative care, such as advance care planning. Data collection and analysis Two review authors independently assessed studies for inclusion, extracted data, and assessed quality and risk of bias. Meta analysis was not conducted due to heterogeneity of studies. The analysis comprised a structured narrative synthesis. Outcomes for residents and process of care measures were reported separately. Main results Two RCTs and one controlled before-and-after study were included (735 participants). All were conducted in the USA and had several potential sources of bias. Few outcomes for residents were assessed. One study reported higher satisfaction with care and the other found lower observed discomfort in residents with end-stage dementia. Two studies reported group differences on some process measures. Both reported higher referral to hospice services in their intervention group, one found fewer hospital admissions and days in hospital in the intervention group, the other found an increase in do-not-resuscitate orders and documented advance care plan discussions. Authors’ conclusions We found few studies, and all were in the USA. Although the results are potentially promising, high quality trials of palliative care service delivery interventions which assess outcomes for residents are needed, particularly outside the USA. These should focus on measuring standard outcomes, assessing cost-effectiveness, and reducing bias.

Keywords: Advance, Advance Care Planning, Advanced Dementia, Analysis, Assessing, Assessment, Assessment And Management, Authors, Bias, Care, Citation, Clinical Trials, Collection, Cost Effectiveness, Cost-Effectiveness, Criteria, Data, Databases, Delivery, Dementia, Do Not Resuscitate, Effectiveness, End, Experiences, Heterogeneity, Hospice, Hospital, Interrupted Time Series, Intervention, Interventions, Journals, Literature, Living, Management, Medline, Meta-Analysis, Nursing, of-Life Care, Older People, Outcome, Outcome Measures, Outcome Scale, Outcomes, Palliative Care, Perceptions, Physical, Planning, Potential, Primary, Program, PUBMED, Quality, Quality of, Randomized Controlled-Trial, Review, Risk, Satisfaction, Science, Science Citation Index, Science Citation Index Expanded, Search, Service, Services, Sources, Standard, Strategy, Symptoms, Synthesis, The-Literature, Time Series, USA, Validation

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Full Text: [2011\Coc Dat Sys Rev2011, CD007294.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007294.pdf)

Abstract: Background Standard treatment for high grade glioma (HGG) usually entails surgery (either biopsy or resection) followed by radiotherapy plus or minus temozolomide. Implanting wafers impregnated with chemotherapy agents into the resection cavity represents a novel means of delivering drugs directly to the resection cavity with potentially fewer systemic side effects. It is not clear how effective this modality is or whether it should be recommended as part of standard care for patients with HGG. Objectives To estimate the clinical effectiveness of chemotherapy wafers for patients with HGG. Search strategy The following databases were searched: CENTRAL (issue 4. 2010); MEDLINE and EMBASE. The original search strategy also included: Science Citation Index; Physician Data Query; and the meta-Register of Controlled Trials. Reference lists of all identified studies were searched. The Journal of Neuro-Oncology and Neuro-oncology were hand searched from 1999 to 2010, including all conference abstracts. Neuro-oncologists, trial authors and drug manufacturers were contacted regarding ongoing and unpublished trials. Selection criteria Patients included those of all ages with a histologically proven diagnosis of HGG (using intra-operative analysis when undergoing first resection). Therapy could be instigated for either newly diagnosed disease (primary therapy) or at recurrence. Interventions included insertion of chemotherapy wafers to the resection cavity. Included studies had to be randomised controlled trials (RCTs). Data collection and analysis Two independent review authors assessed the search results for relevance and undertook critical appraisal according to pre-specified guidelines. Main results In primary disease two RCTs assessing the effect of carmustine impregnated wafers (Gliadel (R)) and enrolling a total of 272 participants were identified. Survival was increased with Gliadel (R) compared to placebo (hazard ratio (HR) 0.65, 95% Confidence Interval (CI) 0.48 to 0.86, P = 0.003). In recurrent disease a single RCT was included comparing Gliadel (R) with placebo and enrolled 222 participants. It did not demonstrate a significant survival increase (HR 0.83, 95% CI 0.62 to 1.10, P = 0.2). There was no suitable data for any of the secondary outcome measures. Adverse events were not more common in either arm and are presented in a descriptive fashion. Authors’ conclusions Carmustine impregnated wafers (Gliadel (R)) result in improved survival without an increased incidence of adverse events over placebo wafers when used for primary disease therapy. There is no evidence of benefit for any other outcome measures. In recurrent disease Gliadel (R) does not appear to confer any additional benefit.

Keywords: Analysis, Anaplastic Gliomas, Antineoplastic Agents,Alkylating [Administration & Dosage], Assessing, Authors, Biopsy, Brain Neoplasms [Drug Therapy, Brain-Tumors, Care, Carmustine [Administration & Dosage], Chemotherapy, Citation, Clinical, Clinical-Trials, Collection, Combined Modality Therapy [Methods], Criteria, Data, Databases, Diagnosis, Disease, Drug, Drugs, Effectiveness, Events, Evidence, First, Gliadel Wafers, Glioblastoma-Multiforme, Glioma, Glioma [Drug Therapy, Guidelines, Hazard, Humans, Incidence, Interstitial Chemotherapy, Journal, Local Chemotherapy, Malignant Glioma, Medline, Neoplasm Recurrence,Local [Drug Therapy], Outcome, Outcome Measures, P, Patients, Placebo, Primary, Radiation-Therapy, Radiotherapy, Randomised, Randomised Controlled Trials, Randomized Controlled Trials As Topic, Rct, Recurrence, Recurrent, Relevance, Review, Science, Science Citation Index, Search, Search Strategy, Side Effects, Standard, Strategy, Surgery, Surgery], Survival, Therapy, Treatment, Trial

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Full Text: [2011\Coc Dat Sys Rev2011, CD007712.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007712.pdf)

Abstract: Back ground Veno-venous bypass is used to overcome the effects of clamping of the inferior vena cava and portal vein during liver transplanation. The routine use of veno-venous bypass is, however, controversial. Objectives To compare the benefits and harms of veno-venous bypass (irrespective of open or percutaneous technique; heparin-coated or no heparin-coating) versus no veno-venous bypass during liver transplantation. To compare the benefits and harms of the different techniques of veno-venous bypass during liver transplantation. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, and Science Citation Index Expanded until December 2010. Selection criteria We included randomised clinical trials comparing veno-venous bypass during liver transplantation (irrespective of language or publication status). Data collection and analysis Two authors independently assessed trials for inclusion and independently extracted data. We analysed the data with both the fixed-effect and the random-effects models using RevMan Analysis. For continuous outcomes, we calculated the mean difference (MD) with 95% confidence intervals (CI) based on intention-to-treat or available case analysis. For binary outcomes, we used the Fisher’s exact test since none of the comparisons of binary outcomes included more than one trial. Main results We identified three trials with high risk of bias which compared veno-venous bypass (n = 65) versus no veno-venous bypass (n = 66). None of the trials reported patient or graft survival. There were no significant differences regarding renal failure or blood transfusion requirements between the two groups. None of the trials reported on the morbidity related to veno-venous bypass or the requirement of veno-venous bypass in the control group. We identified one trial with high risk of bias which compared percutaneous (n = 20) versus open technique (n = 19) of veno-venous bypass. The patient or graft survival was not reported. There was no difference in veno-venous bypass related morbidity between the two groups. The operating time was significantly shorter in the percutaneous technique group (MD - 59 minutes; 95% CI -102 to 16). Authors’ conclusions There is no evidence to support or refute the use of veno-venous bypass in liver transplantation. There is no evidence to prefer any particular technique of veno-venous bypass in liver transplantation.

Keywords: Activation, Analysis, Authors, Bias, Blood, Blood Transfusion, Case Analysis, Circuits, Citation, Clinical, Clinical Trials, Collection, Confidence, Confidence Intervals, Control, Criteria, Data, Effects, Empirical-Evidence, Evidence, Failure, Graft, Intervals, Liver, Liver Transplantation, Medline, Metaanalysis, Model, Models, Morbidity, Open, Outcomes, Percutaneous, Perioperative Renal-Function, Publication, Quality, Randomised, Randomized Clinical-Trials, Renal, Renal Failure, Requirement, Risk, Science, Science Citation Index, Science Citation Index Expanded, Search, Selective Use, Strategy, Support, Survival, Techniques, Transfusion, Transplantation, Trial

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Full Text: [2011\Coc Dat Sys Rev2011, CD007749.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007749.pdf)

Abstract: Back ground Several liver diseases have been associated with oxidative stress. Accordingly, antioxidants have been suggested as potential therapeutics for various liver diseases. The evidence supporting these suggestions is equivocal. Objectives To assess the benefits and harms of antioxidant supplements for patients with liver diseases. Search strategy We searched The Cochrane Library, MEDLINE, EMBASE, LILACS, the Science Citation Index Expanded, and Conference Proceedings Citation Index-Science to January 2011. We scanned bibliographies of relevant publications and asked experts and pharmaceutical companies for additional trials. Selection criteria We considered for inclusion randomised trials that compared antioxidant supplements (beta-carotene, vitamin A, C, E, and selenium) versus placebo or no intervention for autoimmune liver diseases, viral hepatitis, alcoholic liver disease, and cirrhosis (any aetiology). Data collection and analysis Four authors independently selected trials for inclusion and extracted data. Outcome measures were all-cause mortality, liver-related mortality, liver-related morbidity, biochemical indices at maximum follow-up in the individual trials as well as adverse events, quality-of-life measures, and cost-effectiveness. For patients with hepatitis B or C we also considered end of treatment and sustained virological response. We conducted random-effects and fixed-effect meta-analyses. Results were presented as relative risks (RR) or mean differences (MD), both with 95% confidence intervals (CI). Main results Twenty randomised trials with 1225 participants were included. The trials assessed beta-carotene (3 trials), vitamin A (2 trials), vitamin C (9 trials), vitamin E (15 trials), and selenium (8 trials). The majority of the trials had high risk of bias and showed heterogeneity. Overall, the assessed antioxidant supplements had no significant effect on all-cause mortality (relative risk [RR] 0.84, 95% confidence interval [CI] 0.60 to 1.19, I-2 = 0%), or liver-related mortality (RR 0.89, 95% CI 0.39 to 2.05, I-2 = 37%). Stratification according to the type of liver disease did not affect noticeably the results. Antioxidant supplements significantly increased activity of gamma glutamyl transpeptidase (MD 24.21 IU/l, 95% CI 6.67 to 41.75, I-2 = 0%). Authors’ conclusions We found no evidence to support or refute antioxidant supplements in patients with liver disease. Antioxidant supplements may increase liver enzyme activity.

Keywords: Aetiology, Alpha-Tocopherol, Analysis, Antioxidant, Antioxidants, Authors, Beta Carotene, Bias, Bibliographies, Chronic Hepatitis-C, Cirrhosis, Citation, Clinical-Trial, Collection, Conference, Confidence, Confidence Intervals, Controlled Pilot Trial, Cost Effectiveness, Cost-Effectiveness, Criteria, Data, Disease, Diseases, Events, Evidence, Experts, Follow-up, Gamma, Hepatitis, Hepatitis B, Heterogeneity, Indices, Interval, Intervals, Intervention, Liver, Medline, Morbidity, Mortality, Outcome Reporting Bias, Oxidative Stress, Patients, Placebo, Placebo-Controlled Trial, Potential, Publications, Quality of Life, Randomised, Randomized-Trials, Relative Risk, Risk, Risks, Routine Vitamin Supplementation, Science, Science Citation Index, Science Citation Index Expanded, Search, Selenium, Strategy, Stress, Support, Treatment, Trial Sequential-Analysis, Viral, Viral Hepatitis, Vitamin A, Vitamin C, Vitamin E

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Full Text: [2011\Coc Dat Sys Rev2011, CD007871.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007871.pdf)

Abstract: Background Severe bleeding and coagulopathy as a result of massive transfusion are serious clinical conditions that are associated with high mortality. Thromboelastography (TEG) and thromboelastometry (ROTEM) are increasingly used to guide transfusion strategy but their roles remain disputed. Objectives To systematically assess the benefits and harms of a TEG or ROTEM guided transfusion strategy in randomized trials involving patients with severe bleeding. Search strategy Randomized clinical trials (RCTs) were identified from electronic databases: Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2010, Issue 9); MEDLINE; EMBASE; Science Citation Index Expanded; International Web of Science; CINAHL; LILACS; and the Chinese Biomedical Literature Database (up to 31st October 2010). We contacted trial authors, authors of previous reviews, and manufacturers in the field. Selection criteria We included all RCTs, irrespective of blinding or language, that compared transfusion guided by TEG or ROTEM to transfusion guided by clinical judgement and standard laboratory tests, or both. Data collection and analysis Two authors independently abstracted data; they resolved any disagreements by discussion. We presented pooled estimates of the intervention effects on dichotomous outcomes as relative risks (RR) and on continuous outcomes as mean differences, with 95% confidence intervals (CI). Our primary outcome measure was all cause mortality. We performed subgroup and sensitivity analyses to assess the effect of TEG or ROTEM in adults and children on various clinical and physiological outcomes. We assessed the risk of bias through assessment of trial methodological components and the risk of random error through trial sequential analysis. Main results We included nine RCTs with a total of 776 participants; only one trial had a low risk of bias. We found two ongoing trials but were unable to retrieve any data from them. Compared with standard treatment, TEG or ROTEM showed no statistically significant effect on overall mortality (3.78% versus 5.11%, RR 0.77, 95% CI 0.35 to 1.72; I-2 = 0%) but only five trials provided data on mortality. Our analyses demonstrated a statistically significant effect of TEG or ROTEM on the amount of bleeding (MD -85.05 ml, 95% CI -140.68 to -29.42; I-2 = 26%) but failed to show any statistically significant effect on other predefined outcomes. Authors’ conclusions There is an absence of evidence that TEG or ROTEM improves morbidity or mortality in patients with severe bleeding. Application of a TEG or ROTEM guided transfusion strategy seems to reduce the amount of bleeding but whether this has implications for the clinical condition of patients is still uncertain. More research is needed.

Keywords: Acute Lung Injury, Analyses, Analysis, Application, Assessment, Authors, Bias, Bleeding, Bypass Graft-Surgery, Cardiac Surgical-Patients, Care, Children, Chinese, Citation, Clinical, Clinical Trials, Coagulopathy, Collection, Confidence, Confidence Intervals, Criteria, Critically-Ill Patients, Data, Databases, Effects, Error, Estimates, Evidence, Field, Intervals, Intervention, Intervention Effects, Literature, Long-Term Survival, Low Risk, Measure, Medline, Morbidity, Mortality, Orthotopic Liver-Transplantation, Outcome, Outcomes, Patients, Primary, Quality-of-Life, Randomized, Red-Blood-Cell, Research, Reviews, Risk, Risks, Science, Science Citation Index, Science Citation Index Expanded, Search, Sensitivity, Standard, Strategy, Transfusion, Trauma Patients, Treatment, Trial, Trial Sequential-Analysis, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, MR000012.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20MR000012.pdf)

Abstract: Background Randomised trials use the play of chance to assign participants to comparison groups. The unpredictability of the process, if not subverted, should prevent systematic differences between comparison groups (selection bias). Differences due to chance will still occur and these are minimised by randomising a sufficiently large number of people. Objectives To assess the effects of randomisation and concealment of allocation on the results of healthcare studies. Search strategy We searched the Cochrane Methodology Register, MEDLINE, SciSearch and reference lists up to September 2009. In addition, we screened articles citing included studies (ISI Science Citation Index) and papers related to included studies (PUBMED). Selection criteria Eligible study designs were cohorts of studies, systematic reviews or meta-analyses of healthcare interventions that compared random allocation versus non-random allocation or adequate versus inadequate/unclear concealment of allocation in randomised trials. Outcomes of interest were the magnitude and direction of estimates of effect and imbalances in prognostic factors. Data collection and analysis We retrieved and assessed studies that appeared to meet the inclusion criteria independently. At least two review authors independently appraised methodological quality and extracted information. We prepared tabular summaries of the results for each comparison and assessed the results across studies qualitatively to identify common trends or discrepancies. Main results A total of 18 studies (systematic reviews or meta-analyses) met our inclusion criteria. Ten compared random allocation versus non-random allocation and nine compared adequate versus inadequate or unclear concealment of allocation within controlled trials. All studies were at high risk of bias. For the comparison of randomised versus non-randomised studies, four comparisons yielded inconclusive results (differed between outcomes or different modes of analysis); three comparisons showed similar results for random and non-random allocation; two comparisons had larger estimates of effect in non-randomised studies than in randomised trials; and two comparisons had larger estimates of effect in randomised than in non-randomised studies. Five studies found larger estimates of effect in trials with inadequate concealment of allocation than in trials with adequate concealment. The four other studies did not find statistically significant differences. Authors’ conclusions The results of randomised and non-randomised studies sometimes differed. In some instances non-randomised studies yielded larger estimates of effect and in other instances randomised trials yielded larger estimates of effect. The results of controlled trials with adequate and inadequate/unclear concealment of allocation sometimes differed. When differences occurred, most often trials with inadequate or unclear allocation concealment yielded larger estimates of effects relative to controlled trials with adequate allocation concealment. However, it is not generally possible to predict the magnitude, or even the direction, of possible selection biases and consequent distortions of treatment effects from studies with non-random allocation or controlled trials with inadequate or unclear allocation concealment.

Keywords: Acute Myocardial-Infarction, Clinical Trials As Topic [Methods, Clinical-Trials, Controlled Clinical Trials As Topic [Methods, Design Affects Outcomes, Empirical-Evidence, Historical Controls, Low-Back-Pain, Meta-Regression Analysis, Methodological Quality, Placebo-Controlled Trials, Random Allocation, Randomized Controlled Trials As Topic [Methods, Selection Bias, Standards, Statistics & Numerical Data], Stroke Rehabilitation, Treatment Outcome

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Full Text: [2011\Coc Dat Sys Rev2011, CD001035.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001035.pdf)

Abstract: Background Human papillomavirus (HPV) is the key risk factor for cervical cancer. Continuing high rates of HPV and other sexually transmitted infections (STIs) in young people demonstrate the need for effective behavioural interventions. Objectives To assess the effectiveness of behavioural interventions for young women to encourage safer sexual behaviours to prevent transmission of STIs (including HPV) and cervical cancer. Search strategy Systematic literature searches were performed on the following databases: Cochrane Central Register of Controlled Trials (CENTRAL Issue 4, 2009) Cochrane Gynaecological Cancer Review Group (CGCRG) Specialised Register, MEDLINE, EMBASE, CINAHL, PsychINFO, Social Science Citation Index and Trials Register of Promoting Health Interventions (TRoPHI) up to the end of 2009. All references were screened for inclusion against selection criteria. Selection criteria Randomised controlled trials (RCTs) of behavioural interventions for young women up to the age of 25 years that included, amongst other things, information provision about the transmission and prevention of STIs. Trials had to measure behavioural outcomes (e. g. condom use) and/or biological outcomes (e. g. incidence of STIs, cervical cancer). Data collection and analysis A narrative synthesis was conducted. Meta-analysis was not considered appropriate due to heterogeneity between the interventions and trial populations. Main results A total of 5271 references were screened and of these 23 RCTs met the inclusion criteria. Most were conducted in the USA and in health-care clinics (e. g. family planning). The majority of interventions provided information about STIs and taught safer sex skills (e. g. communication), occasionally supplemented with provision of resources (e. g. free sexual health services). They were heterogeneous in duration, contact time, provider, behavioural aims and outcomes. A variety of STIs were addressed including HIV and chlamydia. None of the trials explicitly mentioned HPV or cervical cancer prevention. Statistically significant effects for behavioural outcomes (e. g. increasing condom use) were common, though not universal and varied according to the type of outcome. There were no statistically significant effects of abstaining from or reducing sexual activity. There were few statistically significant effects on biological (STI) outcomes. Considerable uncertainty exists in the risk of bias due to incomplete or ambiguous reporting. Authors’ conclusions Behavioural interventions for young women which aim to promote sexual behaviours protective of STI transmission can be effective, primarily at encouraging condom use. Future evaluations should include a greater focus on HPV and its link to cervical cancer, with long-term follow-up to assess impact on behaviour change, rates of HPV infection and progression to cervical cancer. Studies should use an RCT design where possible with integral process evaluation and cost-effectiveness analysis where appropriate. Given the predominance of USA studies in this systematic review evaluations conducted in other countries would be particularly useful.

Keywords: African-American Women, Female, Female-Condom Use, Hiv-Risk-Reduction, Human-Immunodeficiency-Virus, Human-Papillomavirus Infection, Humans, Impoverished Minority Women, Inner-City Women, Peer Education-Program, Randomized-Controlled-Trial, Sexual Behavior, Transmitted-Disease Prevention, Uterine Cervical Neoplasms [Prevention & Control]

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Full Text: [2011\Coc Dat Sys Rev2011, CD002041.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD002041.pdf)

Abstract: Background Poisoning with carbon monoxide (CO) remains an important cause of accidental and intentional injury worldwide. Several unblinded non-randomized trials have suggested that the use of hyperbaric oxygen (HBO) prevents the development of neurological sequelae. This has led to the widespread use of HBO in the management of patients with carbon monoxide poisoning. Objectives To examine randomised trials of the efficacy of hyperbaric oxygen (HBO) compared to normobaric oxygen (NBO) for the prevention of neurologic sequelae in patients with acute carbon monoxide poisoning. Search strategy We searched the following electronic databases; Cochrane Injuries Group Specialised Register (searched June 2010), Cochrane Central Register of Controlled Trials (The Cochrane Library 2010, Issue 2), MEDLINE (Ovid SP) 1950 to June 2010, EMBASE (Ovid SP) 1980 to June 2010, ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) 1970 to June 2010, ISI Web of Science: Conference Proceedings Citation Index-Science (CPCI-S) 1990 to June 2010. Selection criteria All randomised controlled trials of HBO compared to NBO, involving non-pregnant adults who are acutely poisoned with carbon monoxide (regardless of severity). Data collection and analysis Two authors independently extracted from each trial information on: the number of randomised patients, types of participants, the dose and duration of the intervention, and the prevalence of neurologic symptoms at follow-up. Main results Seven randomised controlled trials of varying quality were identified; one was excluded because it did not evaluate clinical outcomes. Of the six remaining trials involving 1361 participants, two found a beneficial effect of HBO for the reduction of neurologic sequelae at one month, while four others did not. One of these is an incomplete publication (an abstract of an interim analysis). Although pooled random effects meta-analysis does not suggest a significant benefit from HBOT (OR for neurological deficits 0.78, 95% CI 0.54 to 1.12), significant methodologic and statistical heterogeneity was apparent among the trials, and this result should be interpreted cautiously. Moreover, design or analysis flaws were evident in all trials. Importantly, the conclusions of one positive trial may have been influenced by failure to adjust for multiple hypothesis testing, while interpretation of the other positive trial is hampered by a high risk of bias introduced during the analysis including an apparent change in the primary outcome. Both were also stopped early ‘for benefit’, which is likely to have inflated the observed effect. In contrast three negative trials had low power to detect a benefit of HBO due to exclusion of severely poisoned patients in two and very poor follow-up in the other. One trial that was said to be finished around eight years ago has not reported the final analysis in any forum. Authors’ conclusions Existing randomised trials do not establish whether the administration of HBO to patients with carbon monoxide poisoning reduces the incidence of adverse neurologic outcomes. Additional research is needed to better define the role, if any, of HBO in the treatment of patients with carbon monoxide poisoning. This research question is ideally suited to a multi-center randomised controlled trial.

Keywords: Carbon Monoxide Poisoning [Therapy], Cardiopulmonary-Resuscitation, Clinical-Trial, Emergency Cardiovascular Care, Humans, Hyperbaric Oxygenation, Issues, Normobaric Oxygen, Oxygen Inhalation Therapy, Randomized Controlled Trials As Topic, Sequelae, Therapy

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Full Text: [2011\Coc Dat Sys Rev2011, CD008366.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008366.pdf)

Abstract: Background Multi-strategic community wide interventions for physical activity are increasingly popular but their ability to achieve population level improvements is unknown. Objectives To evaluate the effects of community wide, multi-strategic interventions upon population levels of physical activity. Search strategy We searched the Cochrane Public Health Group Specialised Register, The Cochrane Library, MEDLINE, MEDLINE in Process, EMBASE, CINAHL, LILACS, PsycINFO, ASSIA, The British Nursing Index, Chinese CNKI databases, EPPI Centre (DoPHER, TRoPHI), ERIC, HMIC, Sociological Abstracts, SPORTDiscus, Transport Database and Web of Science (Science Citation Index, Social Sciences Citation Index, Conference Proceedings Citation Index). We also scanned websites of the EU Platform on Diet, Physical Activity and Health; Health-Evidence.ca; the International Union for Health Promotion and Education; the NIHR Coordinating Centre for Health Technology (NCCHTA) and NICE and SIGN guidelines. Reference lists of all relevant systematic reviews, guidelines and primary studies were followed up. We contacted experts in the field from the National Obesity Observatory Oxford, Oxford University; Queensland Health, Queensland University of Technology, the University of Central Queensland; the University of Tennessee and Washington University; and handsearched six relevant journals. The searches were last updated to the end of November 2009 and were not restricted by language or publication status. Selection criteria Cluster randomised controlled trials, randomised controlled trials (RCT), quasi-experimental designs which used a control population for comparison, interrupted time-series (ITS) studies, and prospective controlled cohort studies (PCCS) were included. Only studies with a minimum six-month follow up from the start of the intervention to measurement of outcomes were included. Community wide interventions had to comprise at least two broad strategies aimed at physical activity for the whole population. Studies which randomised individuals from the same community were excluded. Data collection and analysis At least two review authors independently extracted the data and assessed the risk of bias of each included study. Non-English language papers were reviewed with the assistance of an epidemiologist interpreter. Each study was assessed for the setting, the number of included components and their intensity. Outcome measures were grouped according to whether they were dichotomous (physically active, physically active during leisure time and sedentary or physically inactive) or continuous (leisure time physical activity, walking, energy expenditure). For dichotomous measures we calculated the unadjusted and adjusted risk difference, and the unadjusted and adjusted relative risk. For continuous measures we calculated net percentage change from baseline, unadjusted and adjusted risk difference, and the unadjusted and adjusted relative risk. Main results After the selection process had been completed 25 studies were included in the review. Of the included studies, 19 were set in high income countries, using the World Bank economic classification, and the remaining six were in low income countries. The interventions varied by the number of strategies included and their intensity. Almost all of the interventions included a component of building partnerships with local governments or non-governmental organisations (NGOs) (22 studies). None of the studies provided results by socio-economic disadvantage or other markers of equity consideration. However of those included studies undertaken in high income countries, 11 studies were described by the authors as being provided to deprived, disadvantaged, or low socio-economic communities. Fifteen studies were identified as having a high risk of bias, 10 studies were unclear, and no studies had a low risk of bias. Selection bias was a major concern with these studies, with only one study using randomisation to allocate communities (Simon 2008). No studies were judged as being at low risk of selection bias although 16 studies were considered to have an unclear risk of bias. Eleven studies had a high risk of detection bias, 10 with an unclear risk and four with no risk. Assessment of detection bias included an assessment of the validity of the measurement tools and quality of outcome measures. The effects reported were inconsistent across the studies and the measures. Some of the better designed studies showed no improvement in measures of physical activity. Publication bias was evident. Authors’ conclusions Although numerous studies have been undertaken, there is a noticeable inconsistency of the findings of the available studies and this is confounded by serious methodological issues within the included studies. The body of evidence in this review does not support the hypothesis that multi-component community wide interventions effectively increase population levels of physical activity. There is a clear need for well-designed intervention studies and such studies should focus on the quality of the measurement of physical activity, the frequency of measurement and the allocation to intervention and control communities.

Keywords: Cardiovascular-Disease Prevention, Heart-Health-Program, Life-Style Interventions, Promoting Safe Walking, Randomized Controlled-Trial, Reduce Risk-Factors, Sante St-Henri, School-Based-Program, Sedentary Older-Adults, Stanford 5-City Project

? Xia, Y., Luo, H., Liu, J.P. and Gluud, C. (2011), Phyllanthus species for chronic hepatitis B virus infection. *Cochrane Database of Systematic Reviews*, **4**, Article Number: CD008960.

Full Text: [2011\Coc Dat Sys Rev2011, CD008960.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008960.pdf)

Abstract: Background Phyllanthus species for patients with chronic hepatitis B virus (HBV) infection have been assessed in clinical trials, but no consensus regarding their usefulness exists. Objectives To evaluate the benefits and harms of phyllanthus species for patients with chronic HBV infection. Search strategy Searches were performed in The Cochrane Hepato-Biliary Gorup Controlled Trials Register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and the Chinese Biomedical CD Database, China Network Knowledge Information, Chinese Science Journal Database, TCM Online, and Wanfang Database. Conference proceedings in Chinese were handsearched. All searches were conducted until October 2010. Selection criteria Randomised clinical trials comparing phyllanthus species with placebo or no intervention for patients with chronic HBV infection. Co-interventions were allowed if all comparison groups had received the same co-interventions. We included trials irrespective of blinding, publication status, or language. Data collection and analysis Two authors selected the trials and extracted the data independently. The RevMan software was used for statistical analysis of dichotomous data with risk ratio (RR) with 95% confidence intervals (CI). Risk of bias was assessed to control for systematic errors. Trial sequential analysis was used in order to control for random errors. Main results A total of 16 randomised trials with 1326 patients were included. One trial with 42 participants compared phyllanthus with placebo. The trial found no significant difference in HBeAg seroconversion after the end of treatment (RR 0.9; 95% CI 0.73 to 1.25) or follow-up (RR 1.00; 95% CI 0.63 to 1.60). No other outcomes could be assessed. Fifteen trials compared phyllanthus plus an antiviral drug like interferon alpha, lamivudine, adefovir dipivoxil, thymosin, vidarabine, or conventional treatment with the same antiviral drug alone. Phyllanthus did significantly affect serum HBV DNA (RR 0.69; 95% CI 0.52 to 0.91, P = 0.008; I-2 = 71%), serum HBeAg (RR 0.70; 95% CI 0.60 to 0.81, P < 0.00001; I-2 = 68%), and HBeAg seroconversion (RR 0.77; 95% CI 0.63 to 0.92, P = 0.005; I-2 = 78%), but the heterogeneity was substantial. The result obtained regarding serum HBV DNA was not supported by trial sequential analysis. None of the trials reported mortality and hepatitis B-related morbidity, quality of life, or liver histology. Only two trials reported adverse events with numbers without significant differences. No serious adverse events were reported. Authors’ conclusions There is no convincing evidence that phyllanthus compared with placebo benefits patients with chronic HBV infection. Phyllanthus plus an antiviral drug may be better than the same antiviral drug alone. However, heterogeneity, systematic errors, and random errors question the validity of the results. Clinical trials with large sample size and low risk of bias are needed to confirm our findings. Species of phyllanthus should be reported in future trials, and a dose-finding design is warranted.

Keywords: Amarus, Bias, Carriers, Clinical-Trials, Empirical-Evidence, Genus Phyllanthus, Metaanalysis, Quality, Randomized-Trials, Transcription

? Daley, A., Stokes-Lampard, H. and MacArthur, C. (2011), Exercise for vasomotor menopausal symptoms. *Cochrane Database of Systematic Reviews*, **5**, CD006108.

Full Text: [2011\Coc Dat Sys Rev2011, CD006108.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006108.pdf)

Abstract: Background Evidence suggests that many perimenopausal and early postmenopausal women will experience menopause symptoms, hot flushes being the most common. Symptoms caused by fluctuating levels of oestrogen may be alleviated by HRT but there has been a marked global decline in its use due to concerns about the risks and benefits of HRT; consequently many women are now seeking alternatives. As large numbers of women are choosing not to take HRT, it is increasingly important to identify evidence based lifestyle modification interventions that have potential to reduce vasomotor menopausal symptoms. Objectives To examine the effectiveness of any type of exercise intervention in the management of vasomotor menopausal symptoms (hot flushes and night sweats) in perimenopausal and postmenopausal women. Search strategy Searches of the following electronic bibliographic databases were performed to identify randomised controlled trials (RCTs): Cochrane Menstrual Disorders and Subfertility Group Specialised trials register; Cochrane Library (CENTRAL) (Wiley Internet interface), MEDLINE (Ovid), EMBASE (Ovid), PsycINFO (Ovid), Science Citation Index and Social Science Citation Index (Web of Science), CINAHL (Ovid) and SPORT Discus. Searches included dates up until 16-24 March 2010. Selection criteria RCTs in which any type of exercise intervention were compared no treatment/control or other treatments in the management of menopausal vasomotor symptoms in symptomatic perimenopausal/postmenopausal women. Data collection and analysis Six studies were deemed eligible for inclusion. Three authors independently extracted data from eligible studies. Three meta-analyses according to comparator the group were performed. Main results In the comparison of exercise versus no treatment/control (three studies), the non-significant effect size Standardised Mean Difference (SMD) for vasomotor symptoms was -0.14 (95% CI: -0.54 to 0.26); SMD was -0.04, -0.25, -0.38. For the analysis of exercise versus HRT (three studies), the non-significant SMD was 0.49 (95% CI: -0.27 to 1.26); SMD across studies was 0.13, 0.19 and 1.52, with all studies favouring HRT. In the comparison of exercise versus yoga (two studies), the non-significant SMD was -0.09 (95% CI:-0.64 to 0.45); SMD was -0.37 and 0.19. All comparisons were based on small samples. One small study reported data that could not be included in the meta-analysis; in this study hot flush scores were significantly lower in the exercise plus soy milk group (83%) than soy milk only group (72%). Authors’ conclusions The existing studies provided insufficient evidence to determine the effectiveness of exercise as a treatment for vasomotor menopausal symptoms, or whether exercise is more effective than HRT or yoga.

Keywords: Authors, Bibliographic, Bibliographic Databases, Bone-Mineral Density, Citation, Complementary Therapies, Databases, Embase, Estrogen Plus Progestin, Estrogen Replacement Therapy, Exercise, Female, Health-Education Intervention, Hormone-Replacement Therapy, Hot Flashes [Therapy], Humans, Interventions, Medline, Menopause, Meta-Analysis, Mid-Aged Women, Middle Aged, Moderate-Intensity Exercise, Oral Estradiol Treatment, Postmenopausal Women, Quality-of-Life, Randomized Controlled Trial, Science Citation Index, Search Strategy, Sweat Gland Diseases [Therapy], Sweating, Web of Science

? Daley, A., Stokes-Lampard, H. and MacArthur, C. (2011), Exercise for vasomotor menopausal symptoms. *Cochrane Database of Systematic Reviews*, **5**, CD006108.

Full Text: 2011\Coc Dat Sys Rev2011, CD006108.pdf

Abstract: Background Evidence suggests that many perimenopausal and early postmenopausal women will experience menopause symptoms, hot flushes being the most common. Symptoms caused by fluctuating levels of oestrogen may be alleviated by HRT but there has been a marked global decline in its use due to concerns about the risks and benefits of HRT; consequently many women are now seeking alternatives. As large numbers of women are choosing not to take HRT, it is increasingly important to identify evidence based lifestyle modification interventions that have potential to reduce vasomotor menopausal symptoms. Objectives To examine the effectiveness of any type of exercise intervention in the management of vasomotor menopausal symptoms (hot flushes and night sweats) in perimenopausal and postmenopausal women. Search strategy Searches of the following electronic bibliographic databases were performed to identify randomised controlled trials (RCTs): Cochrane Menstrual Disorders and Subfertility Group Specialised trials register; Cochrane Library (CENTRAL) (Wiley Internet interface), MEDLINE (Ovid), EMBASE (Ovid), PsycINFO (Ovid), Science Citation Index and Social Science Citation Index (Web of Science), CINAHL (Ovid) and SPORT Discus. Searches included dates up until 16-24 March 2010. Selection criteria RCTs in which any type of exercise intervention were compared no treatment/control or other treatments in the management of menopausal vasomotor symptoms in symptomatic perimenopausal/postmenopausal women. Data collection and analysis Six studies were deemed eligible for inclusion. Three authors independently extracted data from eligible studies. Three meta-analyses according to comparator the group were performed. Main results In the comparison of exercise versus no treatment/control (three studies), the non-significant effect size Standardised Mean Difference (SMD) for vasomotor symptoms was -0.14 (95% CI: -0.54 to 0.26); SMD was -0.04, -0.25, -0.38. For the analysis of exercise versus HRT (three studies), the non-significant SMD was 0.49 (95% CI: -0.27 to 1.26); SMD across studies was 0.13, 0.19 and 1.52, with all studies favouring HRT. In the comparison of exercise versus yoga (two studies), the non-significant SMD was -0.09 (95% CI:-0.64 to 0.45); SMD was -0.37 and 0.19. All comparisons were based on small samples. One small study reported data that could not be included in the meta-analysis; in this study hot flush scores were significantly lower in the exercise plus soy milk group (83%) than soy milk only group (72%). Authors’ conclusions The existing studies provided insufficient evidence to determine the effectiveness of exercise as a treatment for vasomotor menopausal symptoms, or whether exercise is more effective than HRT or yoga.

Keywords: Authors, Bibliographic, Bibliographic Databases, Bone-Mineral Density, Citation, Complementary Therapies, Databases, Embase, Estrogen Plus Progestin, Estrogen Replacement Therapy, Exercise, Female, Health-Education Intervention, Hormone-Replacement Therapy, Hot Flashes [Therapy], Humans, Interventions, Medline, Menopause, Meta-Analysis, Mid-Aged Women, Middle Aged, Moderate-Intensity Exercise, Oral Estradiol Treatment, Postmenopausal Women, Quality-of-Life, Randomized Controlled Trial, Science Citation Index, Search Strategy, Sweat Gland Diseases [Therapy], Sweating, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD002800.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD002800.pdf)

Abstract: Background Routine use of abdominal drainage in patients undergoing liver transplantation is controversial. Objectives To assess the benefits and harms of routine abdominal drainage after orthotopic liver transplantation versus no drainage and to address different drain types. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and the MetaRegister of Controlled Trials until March 2011 to identify the randomised trials. Selection criteria We planned to include only randomised clinical trials (irrespective of language, blinding, or publication status) addressing this issue. Data collection and analysis Two authors identified the trials for inclusion independently. Two authors planned to collect the data independently. We planned to analyse the data with both the fixed-effect and the random-effects model using RevMan Analysis. For each outcome we planned to calculate the risk ratio (RR) or mean difference (MD) with 95% confidence intervals (CI) based on intention-to-treat analysis whenever possible. Main results We did not identify any randomised clinical trials addressing this issue. Authors’ conclusions There is currently no evidence to conclude whether routine abdominal drainage is useful or harmful in patients undergoing orthotopic liver transplantation. Evidence from non-randomised studies of high risk of bias showed conflicting results on the impact of routine drainage in orthotopic liver transplantation on serious adverse events, showing that this question is an important clinical research question. Well-designed randomised clinical trials with adequate sample size to decrease systematic errors and to decrease random errors are necessary.

Keywords: Authors, Bias, Citation, Clinical Research, Clinical Trials, Efficacy, Embase, Empirical-Evidence, Impact, Medline, Metaanalysis, Model, Publication, Quality, Randomized Clinical-Trials, Research, Science, Science Citation Index, Search Strategy, Survival

? Peng, L.J., Wang, J.Y. and Li, F. (2011), Weight reduction for non-alcoholic fatty liver disease. *Cochrane Database of Systematic Reviews*, **6**, Article Number: CD003619.

Full Text: [2011\Coc Dat Sys Rev2011, CD003619.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003619.pdf)

Abstract: Background Non-alcoholic fatty liver disease (NAFLD) is becoming a wide spread liver disease. The present recommendations for treatment are not evidence-based. Some of them are various weight reduction measures with diet, exercise, drug, or surgical therapy. Objectives To assess the benefits and harms of intended weight reduction for patients with NAFLD. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, PUBMED, EMBASE, Science Citation Index Expanded, Chinese Biomedicine Database, and ClinicalTrials.gov until February 2011. Selection criteria We included randomised clinical trials evaluating weight reduction with different measures versus no intervention or placebo in NAFLD patients. Data collection and analysis We extracted data independently. We calculated the odds ratio (OR) for dichotomous data and calculated the mean difference (MD) for continuous data, both with 95% confidence intervals (CI). Main results The review includes seven trials; five on aspects of lifestyle changes (eg, diet, physical exercise) and two on treatment with a weight reduction drug ‘orlistat’. In total, 373 participants were enrolled, and the duration of the trials ranged from 1 month to 1 year. Only one trial on lifestyle programme was judged to be of low risk of bias. We could not perform meta-analyses for the main outcomes as they were either not reported or there were insufficient number of trials for each outcome to be meta-analysed. We could meta-analyse the available data for body weight and body mass index only. Adverse events were poorly reported. Authors’ conclusions The sparse data and high risk of bias preclude us from drawing any definite conclusion on lifestyle programme or orlistat for treatment of NAFLD. Further randomised clinical trials with low risk of bias are needed to test the beneficial and harmful effects of weight reduction for NAFLD patients. The long-term prognosis of development of fibrosis, mortality, and quality of life should be studied.

Keywords: Aminotransferase Levels, Bariatric Surgery, Bias, Citation, Clinical Trials, Development, Embase, Follow-Up, Hepatic Steatosis, Impaired Glucose-Tolerance, Life-Style Intervention, Obese Children, Outcomes, Placebo-Controlled Trial, PUBMED, Randomized Controlled-Trial, Review, Risk-Factors, Science, Science Citation Index, Search Strategy

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Full Text: [2011\Coc Dat Sys Rev2011, CD005958.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005958.pdf)

Abstract: Background Training and the provision of assistive devices are considered major interventions to prevent back pain and its related disability among workers exposed to manual material handling (MMH). Objectives To determine the effectiveness of MMH advice and training and the provision of assistive devices in preventing and treating back pain. Search strategy We searched CENTRAL (The Cochrane Library 2011, issue 1), MEDLINE, EMBASE, CINAHL, Nioshtic, CISdoc, Science Citation Index, and PsychLIT to February 2011. Selection criteria We included randomised controlled trials (RCT) and cohort studies with a concurrent control group that were aimed at changing human behaviour in MMH and measured back pain, back pain-related disability or sickness absence. Data collection and analysis Two authors independently extracted the data and assessed the risk of bias using the criteria recommended by the Cochrane Back Review Group for RCTs and MINORS for the cohort studies. We based the results and conclusions on the analysis of RCTs only. We compared these with the results from cohort studies. Main results We included nine RCTs (20,101 employees) and nine cohort studies (1280 employees) on the prevention of back pain in this updated review. Studies compared training to no intervention (4), professional education (2), a video (3), use of a back belt (3) or exercise (2). Other studies compared training plus lifting aids to no intervention (3) and to training only (1). The intensity of training ranged from a single educational session to very extensive personal biofeedback. Six RCTs had a high risk of bias. None of the included studies showed evidence of a preventive effect of training on back pain. There was moderate quality evidence from seven RCTs (19,317 employees) that those who received training reported levels of back pain similar to those who received no intervention, with an odds ratio of 1.17 (95% confidence intervals (CI) 0.68 to 2.02) or minor advice (video), with a relative risk of 0.93 (95% CI 0.69 to 1.25). Confidence intervals around the effect estimates were still wide due to the adjustment for the design effect of clustered studies. The results of the cohort studies were similar to those of the randomised studies. Authors’ conclusions There is moderate quality evidence that MMH advice and training with or without assistive devices does not prevent back pain or back pain-related disability when compared to no intervention or alternative interventions. There is no evidence available from RCTs for the effectiveness of MMH advice and training or MMH assistive devices for treating back pain. More high quality studies could further reduce the remaining uncertainty.

Keywords: \*Health Education, \*Self-Help Devices, \*Therapy], Authors, Back Pain [Prevention & Control, Bias, Care Facilities, Citation, Cohort Studies, Education, Embase, Human, Humans, Intervention Program, Interventions, Lifting, Lumbar Supports, Medline, Musculoskeletal Disorders, No Lifting Policy, Nurses, Occupational Diseases [Prevention & Control, Participatory Ergonomics, Prevention, Professional, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Review, Science, Science Citation Index, Search Strategy, Systematic Reviews, Training, Updated Method Guidelines

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Full Text: [2011\Coc Dat Sys Rev2011, CD008143.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008143.pdf)

Abstract: Background Patients with type 2 diabetes mellitus (T2D) exhibit an increased risk of cardiovascular disease and mortality compared to the background population. Observational studies report a relationship between reduced blood glucose and reduced risk of both micro-and macrovascular complications in patients with T2D. Objectives To assess the effects of targeting intensive versus conventional glycaemic control in T2D patients. Search strategy Trials were obtained from searches of CENTRAL (The Cochrane Library), MEDLINE, EMBASE, Science Citation Index Expanded, LILACS, and CINAHL (until December 2010). Selection criteria We included randomised clinical trials that prespecified different targets of glycaemic control in adults with T2D. Data collection and analysis Two authors independently assessed the risk of bias and extracted data. Dichotomous outcomes were assessed by risk ratios (RR) and 95% confidence intervals (CI). Main results Twenty trials randomised 16,106T2D participants to intensive control and 13,880 T2D participants to conventional glycaemic control. The mean age of the participants was 62.1 years. The duration of the intervention ranged from three days to 12.5 years. The number of participants in the included trials ranged from 20 to 11,140. There was no significant difference between targeting intensive andconventional glycaemic control for all-cause mortality (RR 1.01, 95% CI 0.90 to 1.13; 29,731 participants, 18 trials) or cardiovascular mortality (RR 1.06, 95% CI 0.90 to 1.26; 29,731 participants, 18 trials). Trial sequential analysis (TSA) showed that a 10% RR reduction could be refuted for all-cause mortality. Targeting intensive glycaemic control did not show a significant effect on the risk of non-fatal myocardial infarction in the random-effects model but decreased the risk in the fixed-effect model (RR 0.86, 95% CI 0.78 to 0.96; P = 0.006; 29,174 participants, 12 trials). Targeting intensive glycaemic control reduced the risk of amputation (RR 0.64, 95% CI 0.43 to 0.95; P = 0.03; 6960 participants, 8 trials), the composite risk of microvascular disease (RR 0.89, 95% CI 0.83 to 0.95; P = 0.0006; 25,760 participants, 4 trials), retinopathy (RR 0.79, 95% CI 0.68 to 0.92; P = 0.002; 10,986 participants, 8 trials), retinal photocoagulation (RR 0.77, 95% CI 0.61 to 0.97; P = 0.03; 11,142 participants, 7 trials), and nephropathy (RR 0.78, 95% CI 0.61 to 0.99; P = 0.04; 27,929 participants, 9 trials). The risks of both mild and severe hypoglycaemia were increased with targeting intensive glycaemic control but substantial heterogeneity was present. The definition of severe hypoglycaemia varied among the included trials; severe hypoglycaemia was reported in 12 trials that included 28,127 participants. TSA showed that firm evidence was reached for a 30% RR increase in severe hypoglycaemic when targeting intensive glycaemic control. Subgroup analysis of trials exclusively dealing with glycaemic control in usual care settings showed a significant effect in favour of targeting intensive glycaemic control for non-fatal myocardial infarction. However, TSA showed more trials are needed before firm evidence is established. Authors’ conclusions The included trials did not show significant differences for all-cause mortality and cardiovascular mortality when targeting intensive glycaemic control compared with conventional glycaemic control. Targeting intensive glycaemic control reduced the risk of microvascular complications while increasing the risk of hypoglycaemia. Furthermore, intensive glycaemic control might reduce the risk of non-fatal myocardial infarction in trials exclusively dealing with glycaemic control in usual care settings.

Keywords: 10-Year Follow-Up, Acute Myocardial-Infarction, Authors, Bias, Blood-Glucose Control, Cardiac Surgical-Procedures, Citation, Clinical Trials, Cost-Effectiveness, Embase, Insulin-Treatment, Medline, Metabolic-Control, Model, Multifactorial Intervention, Outcomes, Randomized Controlled-Trials, Science, Science Citation Index, Search Strategy, Sternal Wound-Infection

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Full Text: 2011\Coc Dat Sys Rev2011, CD001800.pdf

Abstract: Background The burden of coronary heart disease (CHD) worldwide is one of great concern to patients and healthcare agencies alike. Exercise-based cardiac rehabilitation aims to restore patients with heart disease to health. Objectives To determine the effectiveness of exercise-based cardiac rehabilitation (exercise training alone or in combination with psychosocial or educational interventions) on mortality, morbidity and health-related quality of life of patients with CHD. Search strategy RCTs have been identified by searching CENTRAL, HTA, and DARE (using The Cochrane Library Issue 4, 2009), as well as MEDLINE (1950 to December 2009), EMBASE (1980 to December 2009), CINAHL (1982 to December 2009), and Science Citation Index Expanded (1900 to December 2009). Selection criteria Men and women of all ages who have hadmyocardial infarction (MI), coronary artery bypass graft (CABG) or percutaneous transluminal coronary angioplasty (PTCA), or who have angina pectoris or coronary artery disease defined by angiography. Data collection and analysis Studies were selected and data extracted independently by two reviewers. Authors were contacted where possible to obtain missing information. Main results This systematic review has allowed analysis of 47 studies randomising 10,794 patients to exercise-based cardiac rehabilitation or usual care. In medium to longer term (i.e. 12 or more months follow-up) exercise-based cardiac rehabilitation reduced overall and cardiovascular mortality [RR 0.87 (95% CI 0.75, 0.99) and 0.74 (95% CI 0.63, 0.87), respectively], and hospital admissions [RR 0.69 (95% CI 0.51, 0.93)] in the shorter term (< 12 months follow-up) with no evidence of heterogeneity of effect across trials. Cardiac rehabilitation did not reduce the risk of total MI, CABG or PTCA. Given both the heterogeneity in outcome measures and methods of reporting findings, a meta-analysis was not undertaken for health-related quality of life. In seven out of 10 trials reporting health-related quality of life using validated measures was there evidence of a significantly higher level of quality of life with exercise-based cardiac rehabilitation than usual care. Authors’ conclusions Exercise-based cardiac rehabilitation is effective in reducing total and cardiovascular mortality (in medium to longer term studies) and hospital admissions (in shorter term studies) but not total MI or revascularisation (CABG or PTCA). Despite inclusion of more recent trials, the population studied in this review is still predominantly male, middle aged and low risk. Therefore, well-designed, and adequately reported RCTs in groups of CHD patients more representative of usual clinical practice are still needed. These trials should include validated health-related quality of life outcome measures, need to explicitly report clinical events including hospital admission, and assess costs and cost-effectiveness.

Keywords: Acute Myocardial-Infarction, Artery-Bypass-Surgery, Citation, Comprehensive Rehabilitation, Coronary Disease [Mortality, Costs, Elderly-Patients, Embase, Exercise Therapy, Information, Interventions, Low-Fat Diet, Medline, Meta-Analysis, Myocardial Infarction [Mortality, Outcome Assessment (Health Care), Physical-Exercise, Program J-Carp, Quality Of Life, Quality-of-Life, Randomized Clinical-Trial, Randomized Controlled Trials As Topic, Rehabilitation], Review, Risk-Factors, Science, Science Citation Index, Search Strategy, Systematic Review, Training

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Full Text: [2011\Coc Dat Sys Rev2011, CD008405.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008405.pdf)

Abstract: Background Dual practice, whereby health workers hold two or more jobs, is a common phenomenon globally. In resource constrained low-and middle-income countries dual practice poses an ongoing threat to the efficiency, quality and equity of health services, especially in the public sector. Identifying effective interventions to manage dual practice is important. Objectives To assess the effects of regulations implemented to manage dual practice. Search strategy Databases searched included: The Cochrane Central Register of Controlled Trials (CENTRAL) 2011, Issue 4, part of The Cochrane Library. www.thecochranelibrary.com, including the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (searched 26 May 2011); MEDLINE In-Process & Other Non-Indexed Citations May 24, 2011 (searched 26 May 2011); MEDLINE, Ovid (1948 to May week 2 2011) (searched 26 May 2011); EMBASE, Ovid (1980 to 2011 week 20) (searched 26 May 2011); Science Citation Index and Social Sciences Citation Index, ISIWeb of Science (1975 to present) (searched 04 December 2009); LILACS (searched January 2010); and AIM (December 2009) (searched 18 December 2009). Selection criteria Randomized controlled trials, non-randomized controlled trials, controlled before-and-after studies and interrupted-time-series studies. Dual practice was defined as holding more than one job. Studies for inclusion were those focusing on interventions to manage dual practice among health professionals employed in the public health sector. Data collection and analysis Two review authors independently applied the criteria for inclusion and exclusion of studies when scanning the identified titles and abstracts. The same two review authors independently Main results No studies were found which were eligible for inclusion in this review. Authors’ conclusions There is a need to rigorously evaluate the effects of interventions implemented to manage dual practice among health workers. However, there is still much that is unknown about dual practice itself. The designing of studies to evaluate the effects of interventions to manage dual practice could benefit from prior studies to assess the various manifestations of dual practice, their prevalence and their likely impacts on health services delivery. These findings would then inform the design of studies to evaluate interventions to manage dual practice.

Keywords: Authors, Care, Citation, Citations, Embase, Exploration, Interventions, Medline, Private-Practice, Public Health, Review, Science, Science Citation Index, Search Strategy, Service, Social Sciences

? Flodgren, G., Eccles, M.P., Shepperd, S., Scott, A., Parmelli, E. and Beyer, F.R. (2011), An overview of reviews evaluating the effectiveness of financial incentives in changing healthcare professional behaviours and patient outcomes. *Cochrane Database of Systematic Reviews*, **7**, Article Number: CD009255.

Full Text: [2011\Coc Dat Sys Rev2011, CD009255.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009255.pdf)

Abstract: Background There is considerable interest in the effectiveness of financial incentives in the delivery of health care. Incentives may be used in an attempt to increase the use of evidence-based treatments among healthcare professionals or to stimulate health professionals to change their clinical behaviour with respect to preventive, diagnostic and treatment decisions, or both. Financial incentives are an extrinsic source of motivation and exist when an individual can expect a monetary transfer which is made conditional on acting in a particular way. Since there are numerous reviews performed within the healthcare area describing the effects of various types of financial incentives, it is important to summarise the effectiveness of these in an overview to discern which are most effective in changing health professionals’ behaviour and patient outcomes. Objectives To conduct an overview of systematic reviews that evaluates the impact of financial incentives on healthcare professional behaviour and patient outcomes. Methods We searched the Cochrane Database of Systematic Reviews (CDSR) (The Cochrane Library); Database of Abstracts of Reviews of Effectiveness (DARE); TRIP; MEDLINE; EMBASE; Science Citation Index; Social Science Citation Index; NHS EED; HEED; EconLit; and Program in Policy Decision-Making (PPd) (from their inception dates up to January 2010). We searched the reference lists of all included reviews and carried out a citation search of those papers which cited studies included in the review. We included both Cochrane and non-Cochrane reviews of randomised controlled trials (RCTs), controlled clinical trials (CCTs), interrupted time series (ITSs) and controlled before and after studies (CBAs) that evaluated the effects of financial incentives on professional practice and patient outcomes, and that reported numerical results of the included individual studies. Two review authors independently extracted data and assessed the methodological quality of each review according to the AMSTAR criteria. We included systematic reviews of studies evaluating the effectiveness of any type of financial incentive. We grouped financial incentives into five groups: payment for working for a specified time period; payment for each service, episode or visit; payment for providing care for a patient or specific population; payment for providing a pre-specified level or providing a change in activity or quality of care; and mixed or other systems. We summarised data using vote counting. Mainresults We identified four reviews reporting on 32 studies. Two reviews scored 7 on the AMSTAR criteria (moderate, score 5 to 7, quality) and two scored 9 (high, score 8 to 11, quality). The reported quality of the included studies was, by a variety of methods, low to moderate. Payment for working for a specified time period was generally ineffective, improving 3/11 outcomes from one study reported in one review. Payment for each service, episode or visit was generally effective, improving 7/10 outcomes from five studies reported in three reviews; payment for providing care for a patient or specific population was generally effective, improving 48/69 outcomes from 13 studies reported in two reviews; payment for providing a pre-specified level or providing a change in activity or quality of care was generally effective, improving 17/20 reported outcomes from 10 studies reported in two reviews; and mixed and other systems were of mixed effectiveness, improving 20/31 reported outcomes from seven studies reported in three reviews. When looking at the effect of financial incentives overall across categories of outcomes, they were of mixed effectiveness on consultation or visit rates (improving 10/17 outcomes from three studies in two reviews); generally effective in improving processes of care (improving 41/57 outcomes from 19 studies in three reviews); generally effective in improving referrals and admissions (improving 11/16 outcomes from 11 studies in four reviews); generally ineffective in improving compliance with guidelines outcomes (improving 5/17 outcomes from five studies in two reviews); and generally effective in improving prescribing costs outcomes (improving 28/34 outcomes from 10 studies in one review). Authors’ conclusions Financial incentives may be effective in changing healthcare professional practice. The evidence has serious methodological limitations and is also very limited in its completeness and generalisability. We found no evidence from reviews that examined the effect of financial incentives on patient outcomes.

Keywords: Authors, Citation, Clinical Trials, Compliance, Costs, Delivery Of Health Care, Effectiveness, Embase, Fundholders, General-Practice, Health Care, Immunization Rates, Impact, Incentives, Medicaid Managed Care, Medline, Outcomes, Overview, Papers, Pay-For-Performance, Physician Reimbursement, Prescribing Patterns, Preventive Care, Professional, Quality-of-Care, Review, Science, Science Citation Index, Systematic Reviews

? Flodgren, G., Parmelli, E., Doumit, G., Gattellari, M., O’Brien, M.A., Grimshaw, J. and Eccles, M.P. (2011), Local opinion leaders: effects on professional practice and health care outcomes. *Cochrane Database of Systematic Reviews*, **8**, Article Number: CD000125.

Full Text: [2011\Coc Dat Sys Rev2011, CD000125.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD000125.pdf)

Abstract: Background Clinical practice is not always evidence-based and, therefore, may not optimise patient outcomes. Opinion leaders disseminating and implementing ‘best evidence’ is one method that holds promise as a strategy to bridge evidence-practice gaps. Objectives To assess the effectiveness of the use of local opinion leaders in improving professional practice and patient outcomes. Search strategy We searched Cochrane EPOC Group Trials Register, the Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, HMIC, Science Citation Index, Social Science Citation Index, ISI Conference Proceedings and World Cat Dissertations up to 5 May 2009. In addition, we searched reference lists of included articles. Selection criteria Studies eligible for inclusion were randomised controlled trials investigating the effectiveness of using opinion leaders to disseminate evidence-based practice and reporting objective measures of professional performance and/or health outcomes. Data collection and analysis Two review authors independently extracted data from each study and assessed its risk of bias. For each trial, we calculated the median risk difference (RD) for compliance with desired practice, adjusting for baseline where data were available. We reported the median adjusted RD for each of the main comparisons. Main results We included 18 studies involving more than 296 hospitals and 318 PCPs. Fifteen studies (18 comparisons) contributed to the calculations of the median adjusted RD for the main comparisons. The effects of interventions varied across the 63 outcomes from 15% decrease in compliance to 72% increase in compliance with desired practice. The median adjusted RD for the main comparisons were: i) Opinion leaders compared to no intervention, +0.09; ii) Opinion leaders alone compared to a single intervention, + 0.14; iii) Opinion leaders with one or more additional intervention(s) compared to the one or more additional intervention(s), +0.10; iv) Opinion leaders as part of multiple interventions compared to no intervention, +0.10. Overall, across all 18 studies the median adjusted RD was +0.12 representing a 12% absolute increase in compliance in the intervention group. Authors’ conclusions Opinion leaders alone or in combination with other interventions may successfully promote evidence-based practice, but effectiveness varies both within and between studies. These results are based on heterogeneous studies differing in terms of type of intervention, setting, and outcomes measured. In most of the studies the role of the opinion leader was not clearly described, and it is therefore not possible to say what the best way is to optimise the effectiveness of opinion leaders.

Keywords: \*Leadership, \*Policy Making, Acute Myocardial-Infarction, Analysis, Authors, Bias, Citation, Clinical-Practice, Cochrane, Compliance, Conference, Continuing-Education, Cost-Effectiveness Analysis, Dissertations, Effectiveness, Embase, Evidence-Based Medicine, Evidence-Based Practice, Health Care, Health Outcomes, Hospitals, Humans, Implementation Strategies, Improving Adherence, Intervention, Interventions, ISI, Leaders, Low-Back-Pain, Medline, Outcomes, Patient Outcomes, Physician’s Practice Patterns, Practice, Practice Guidelines, Professional, Professional Practice [\*Standards], Quality Improvement, Quality of Health Care, Randomized Controlled Trials as Topic, Randomized Controlled-Trial, Review, Risk, Science, Science Citation Index, Search Strategy, Strategy

? Sacks, P.L., Harvey, R.J., Rimmer, J., Gallagher, R.M. and Sacks, R. (2011), Topical and systemic antifungal therapy for the symptomatic treatment of chronic rhinosinusitis. *Cochrane Database of Systematic Reviews*, **8**, Article Number: CD008263.

Full Text: [2011\Coc Dat Sys Rev2011, CD008263.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008263.pdf)

Abstract: Background Chronic rhinosinusitis (CRS) is an inflammatory disorder of the nose and sinuses. Since fungi were postulated as a potential cause of CRS in the late 1990s, there has been increasing controversy about the use of both topical and systemic antifungal agents in its management. Although interaction between the immune system and fungus has been demonstrated in CRS, this does not necessarily imply that fungi are the cause of CRS or that antifungals will be effective its management. Objectives To assess the effectiveness of topical or systemic antifungal therapy in the treatment of CRS. Search strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ICTRP and additional sources for published and unpublished trials. The date of the most recent search was 8 March 2011. Selection criteria All randomised, placebo-controlled trials considering the use of topical or systemic antifungal therapy in the treatment of CRS and allergic fungal sinusitis (AFS). CRS was defined using either the European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) or American Academy of Otolaryngology - Head and Neck Surgery (AAO-HNS) criteria. Data collection and analysis We reviewed the titles and abstracts of all studies obtained from the searches and selected trials that met the eligibility criteria. We extracted data using a pre-determined data extraction form. There was significant heterogeneity of outcome data reporting with reports containing both parametric and non-parametric representations of data for the same outcomes. Means and standard deviations for change data were unavailable for a number of trials. Due to the limited reported data, we contacted authors and used original data for data analysis. Main results Six studies were included (380 participants). Five studies investigated topical antifungals and one study investigated systemic antifungals. The risk of bias in all included studies was low, with all trials being double-blinded and randomised. Pooled meta-analysis showed no statistically significant benefit of topical or systemic antifungals over placebo for any outcome. Symptom scores in fact statistically favoured the placebo group. Adverse event reporting was statistically significantly higher in the antifungal group. Authors’ conclusions On the basis of this meta-analysis, there is no evidence to support the use of either topical or systemic antifungal treatment in the management of CRS.

Keywords: Amphotericin-B Irrigation, Analysis, Authors, Bias, Chronic Sinusitis, Clinical-Trials, Cochrane, Cr, Disorder, Double-Blind, Effectiveness, Embase, Epidemiology, Fungal Sinusitis, Fungus, Itraconazole, Management, Meta Analysis, Meta-Analysis, Nasal Polyps, Nonparametric, Outcome, Outcomes, Pubmed, Rhinosinusitis, Risk, Science, Search Strategy, Sinusitis, Spray, Strategy, Surgery, Therapy, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD009274.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009274.pdf)

Abstract: Background Topical corticosteroid is used as part of a comprehensive medical treatment for chronic rhinosinusitis (CRS) without polyps. Nevertheless, there is insufficient evidence to show a clear overall benefit. Trials studying the efficacy of topical corticosteroid use various delivery methods in patients who have or have not had sinus surgery, which directly impacts on topical delivery and distribution. Objectives To assess the effects of topical steroid in patients with CRS without nasal polyps and perform ameta-analysis of symptom improvement data, including subgroup analysis by sinus surgery status and topical delivery methods. Search strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ISRCTN and additional sources for published and unpublished trials. The date of the most recent search was 9 July 2010. Selection criteria All randomised trials in which a topically administered corticosteroid was compared with either a placebo, no treatment or alternative topically administered corticosteroid for the treatment of CRS without polyps in patients of any age. Data collection and analysis Two authors reviewed the search results and selected trials meeting the eligibility criteria, obtaining full texts and contacting authors where necessary. We documented our justification for the exclusion of studies. Two authors extracted data using a pre-determined standardised data form. Main results Ten studies (590 patients) met the inclusion criteria. The trials were of low (six trials) and medium (four trials) risk of bias. The primary outcome was sino-nasal symptoms. When compared to placebo, topical steroid improved symptom scores (standardised mean difference -0.37; 95% confidence interval (CI) -0.60 to -0.13, P = 0.002; five trials, n = 286) and had a greater proportion of responders (risk ratio 1.69; 95% CI 1.21 to 2.37, P = 0.002; four trials, n = 263). With a limited number of studies, the subgroup analyses of patients who had received sinus surgery versus those who had not was not significant (P = 0.35). Subgroup analyses by topical delivery method revealed more benefit when steroid was administered directly to the sinuses than with simple nasal delivery (P = 0.04). There were no differences between groups for quality of life and adverse events. Authors’ conclusions Topical steroid is a beneficial treatment for CRS without polyps and the adverse effects are minor. It may be included in a comprehensive treatment of CRS without polyps. Direct delivery of steroid to the sinuses may bring more beneficial effect. Further studies comparing different topical drug delivery methods to the sinuses, with appropriate treatment duration (longer than 12 weeks), are required.

Keywords: Adenosine-Monophosphate Challenge, Adverse Effects, Adverse Events, Analysis, Aqueous Nasal Spray, Authors, Beclomethasone Dipropionate, Bias, Cochrane, Corticosteroid, Cr, Drug, Drug Delivery, Efficacy, Embase, Endoscopic Sinus Surgery, Fluticasone Propionate, Intranasal Corticosteroids, Medical, Mometasone Furoate, Outcome, Patients, Perennial Rhinitis, Persistent Allergic Rhinitis, Placebo-Controlled Trial, Primary, Pubmed, Quality of Life, Ratio, Rhinosinusitis, Risk, Science, Search Strategy, Sinus, Steroid, Strategy, Surgery, Symptoms, Treatment, Treatment Duration, Web of Science

? Steward, D.L., Grisel, J. and Meinzen-Derr, J. (2011), Steroids for improving recovery following tonsillectomy in children. *Cochrane Database of Systematic Reviews*, **8**, Article Number: CD003997.

Full Text: [2011\Coc Dat Sys Rev2011, CD003997.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003997.pdf)

Abstract: Background This is an update of a Cochrane Review first published in The Cochrane Library in Issue 1, 2003. Tonsillectomy continues to be one of the most common surgical procedures performed worldwide. Despite advances in anesthetic and surgical techniques, post-tonsillectomy morbidity remains a significant clinical problem. Objectives To assess the clinical efficacy of a single intraoperative dose of dexamethasone in reducing post-tonsillectomy morbidity. Search strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ISRCTN; and additional sources for published and unpublished trials. The date of the most recent search was 29 October 2010, following a previous search in September 2002. Selection criteria Randomized, double-blind, placebo-controlled trials of a single dose of intravenous, intraoperative corticosteroid for pediatric patients (age < 18 years) who underwent tonsillectomy or adenotonsillectomy. Data collection and analysis The first author extracted data regarding the primary outcome measures and measurement tools from the published studies. The first author also recorded data regarding study design, patient ages, procedures performed, dose of corticosteroid and method of delivery, as well as methodological quality. When data were missing from the original publications, we contacted the authors for more information. We performed data analysis with a random-effects model, using the RevMan 5.1 software developed by the Cochrane Collaboration. Main results We included 19 studies (1756 participants). We selected only randomized, placebo-controlled, double-blinded studies to minimize inclusion of poor quality studies. However, the risk of bias in the included studies was not formally assessed. Children receiving a single intraoperative dose of dexamethasone (dose range = 0.15 to 1.0 mg/kg) were half as likely to vomit in the first 24 hours compared to children receiving placebo (risk ratio (RR) 0.49; 95% confidence interval (CI) 0.41 to 0.58; P < 0.00001). Routine use in five children would be expected to result in one less patient experiencing post-tonsillectomy emesis (risk difference (RD) -0.24; 95% CI -0.32 to 0.15; P < 0.00001). Children receiving dexamethasone were also more likely to advance to a soft/solid diet on post-tonsillectomy day one (RR 1.45; 95% CI 1.15 to 1.83; P = 0.001) than those receiving placebo. Finally, postoperative pain was improved in children receiving dexamethasone as measured by a visual analog scale (VAS, 0 to 10) (MD -1.07; 95% CI -1.73 to -0.41; P = 0.001), which correlates clinically to a reduction in pain (on a VAS of 0 to 10) from 4.72 to 3.65. No adverse events were noted in the included studies. Authors’ conclusions The evidence suggests that a single intravenous dose of dexamethasone is an effective, safe and inexpensive treatment for reducing morbidity from pediatric tonsillectomy.

Keywords: Adenoidectomy [\*Adverse Effects], Adenotonsillectomy, Adolescent, Adverse Events, Analysis, Antiemetics [\*Therapeutic Use], Author, Authors, Bias, Child, Children, Cochrane, Collaboration, Convalescence, Correlates, Corticosteroid, Design, Dexamethasone [\*Therapeutic Use], Diet, Double-Blind, Efficacy, Embase, Glucocorticoids [\*Therapeutic Use], Humans, Information, Intravenous Dexamethasone, Measurement, Metaanalysis, Model, Morbidity, Oral Intake, Outcome, Pain, Patients, Pediatric, Pediatric Tonsillectomy, Postoperative Nausea, Postoperative Nausea and Vomiting [Drug Therapy], Preoperative Dexamethasone, Primary, Publications, Pubmed, Randomized Controlled Trials as Topic, Randomized-Trial, Ratio, Recovery, Reduction, Review, Risk, Science, Search Strategy, Software, Strategy, Surgical, Time Factors, Tonsillectomy [\*Adverse Effects], Treatment, Treatment Outcome, Web of Science

? Griffin, G. and Flynn, C.A. (2011), Antihistamines and/or decongestants for otitis media with effusion (OME) in children. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD003423.

Full Text: [2011\Coc Dat Sys Rev2011, CD003423.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003423.pdf)

Abstract: Background This is an update of a Cochrane Review first published in The Cochrane Library in Issue 4, 2006. Otitis media with effusion (OME) is common and may cause hearing loss with associated developmental delay. Treatment remains controversial. The effectiveness of antihistamines, decongestants and antihistamine/decongestant combinations in promoting the resolution of effusions has been assessed by randomized controlled trials. Objectives The objective of this review was to determine whether antihistamine, decongestant or combination therapy is effective in treating children who present with OME. . Search strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ISRCTN and additional sources for published and unpublished trials. The date of the most recent search was 1 February 2011, following a previous search in 2006. Selection criteria Randomized controlled trials (RCTs) using antihistamines, decongestants or antihistamine/decongestant combinations as treatment for OME in children. We excluded trials that randomized on the basis of acute otitis media (AOM) even though OME was also studied in follow up. Data collection and analysis Two authors independently extracted data from the published reports using standardized data extraction forms and methods. The two authors assessed the methodological quality of the included studies independently. We expressed dichotomous results as a risk ratio with 95% confidence intervals using a fixed-effect model when homogeneous and a random-effects model when heterogeneous. Nearly all outcomes analyzed were homogeneous. We discussed continuous results qualitatively. We conducted statistical analysis using RevMan 5.1 software. Main results Sixteen studies (1880 participants) were included in the review. No statistical or clinical benefit was found for any of the interventions or outcomes studied. However, treated study subjects experienced 11% more side effects than untreated subjects (number needed to treat to harm = 9). Authors’ conclusions The pooled data demonstrate no benefit and some harm from the use of antihistamines or decongestants alone or in combination in the management of OME, therefore we recommend against their use.

Keywords: 3-Year-Old Children, Acute, Adrenergic Combination, Analysis, Authors, Child, Children, Cochrane, Combination Therapy, Confidence Intervals, Corticosteroid Treatment, Double-Blind, Drug Therapy,Combination, Effectiveness, Embase, Eustachian-Tube Function, Follow-Up, Histamine H1 Antagonists [Adverse Effects, Humans, Interventions, Management, Middle-Ear Effusion, Model, Nasal Decongestant, Nasal Decongestants [Adverse Effects, Oral Decongestant, Otitis, Otitis Media With Effusion [Drug Therapy], Outcomes, Pediatric Practice, Pubmed, Randomized Controlled Trials, Randomized Controlled Trials As Topic, Randomized Trial, Ratio, Review, Risk, Science, Search Strategy, Selection, Side Effects, Software, Statistical, Strategy, Therapeutic Use], Therapy, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD005025.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005025.pdf)

Abstract: Background Current methods of improving medication adherence for health problems are mostly complex, labour-intensive, and not reliably effective. Medication ‘reminder packaging’, which incorporates a date or time for a medication to be taken in the packaging, can act as a reminder to improve adherence. This review of reminder packaging is an update of our 2006 Cochrane review. Objectives The objective of this review was to determine the effects of reminder packaging aids for self-administered medication/s taken for at least one month, on adherence and other outcomes. Search strategy We updated searches of the Cochrane Central Register of Controlled Trials (CENTRAL) and the Database of Abstracts of Reviews of Effects (DARE) (The Cochrane Library Issue 9, 2010), MEDLINE, EMBASE, CINAHL and PsycINFO from the database start dates to September 2010. We searched Current Controlled Trials to identify trials in progress. We performed a cited reference search on the Science Citation Index to identify papers that had cited the original systematic review. We also searched the Internet, contacted packaging manufacturers, and checked abstracts from the Pharm-line database and reference lists from relevant articles. We did not apply any language restrictions. Selection criteria We selected randomised controlled trials with at least 80% follow up. We intended to do a sensitivity analysis of those studies that analysed their data on an intention-to-treat basis. Included studies compared a reminder packaging device with no device, for participants taking self-administered medications for at least one month. Data collection and analysis Three review authors independently assessed studies for inclusion, assessed quality, and extracted data from included studies. Where considered appropriate, data were combined for meta-analysis, or were reported and discussed in a narrative. Main results We included twelve studies containing data on 2196 participants; four of these studies were newly included in this 2011 update of our 2006 Cochrane review. Six intervention groups in four trials provided data on the percentage of pills taken. Reminder packaging increased the percentage of pills taken (mean difference (MD) 11% (95% confidence interval (CI) 6% to 17%)). Notable heterogeneity occurred among these trials (I(2) = 96.3%). Two trials provided data for the proportion of self-reported adherent patients, reporting a reduction in the intervention group which was not statistically significant (odds ratio = 0.89 (95% CI 0.56 to 1.40)). We conducted meta-analysis on data from two trials assessing the effect of reminder packaging on blood pressure measurements. We found that reminder packaging significantly decreased diastolic blood pressure (MD = -5.89 mmHg (95% CI -6.70 to -5.09; P < 0.00001; I(2) = 0%). No effect was seen on systolic blood pressure (mean change -1.01, 95% CI -2.22 to 0.20; P = 0.1, I(2) = 0%). We also conducted meta-analysis on extracted data from two trials that looked at change in glycated haemoglobin. We found that reminder packaging significantly reduced glycated haemoglobin levels (MD -0.72; 95% CI -0.83 to -0.60; P < 0.00001; I(2) = 92%), although there was considerable heterogeneity. No appropriate data were available for meta-analysis of remaining clinical outcomes, which included serum vitamin C and E levels, and self-reported psychological symptoms (one trial each). We reported remaining data narratively. In one study the presence of a reminder packaging aid was found to be preferred by patients with low literacy levels. Authors’ conclusions Reminder packing may represent a simple method for improving adherence for patients with selected conditions. Further research is warranted to improve the design and targeting of these devices.

Keywords: Active Antiretroviral Therapy, Adherence, Analysis, Antimalarial-Drugs, Authors, Blood, Blood Pressure, Blood-Pressure, Citation, Cochrane, Database, Design, Drug Packaging [Methods], Drug-Therapy, Embase, Follow-Up, Glycated Haemoglobin, Haemoglobin, Health-Care Expenditures, Helicobacter-Pylori, Humans, Internet, Intervention, Literacy, Medication, Medication Adherence, Medline, Meta Analysis, Meta-Analysis, Outcomes, Papers, Patient Compliance, Patient Compliance, Patients, Pharmaceutical Preparations [Administration & Dosage], Prescription Refill Compliance, Pressure, Psychological, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Ratio, Reduction, Reminder Systems, Research, Review, Science, Science Citation Index, Search Strategy, Selection, Self Administration, Sensitivity, Strategy, Symptoms, Systematic, Systematic Review, Value-Added Utilities, Vitamin C

? El Dib, R.P., Mathew, J.L. and Martins, R.H.G. (2011), Interventions to promote the wearing of hearing protection. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD005234.

Full Text: [2011\Coc Dat Sys Rev2011, CD005234.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005234.pdf)

Abstract: Background This is an update of a Cochrane Review first published in The Cochrane Library in Issue 2, 2006 and previously updated in 2009. Noise-induced hearing loss can be prevented by eliminating or lowering noise exposure levels. Where the source of the noise cannot be eliminated, workers have to rely on hearing protection equipment. Several trials have been conducted to study the effectiveness of interventions to influence the wearing of hearing protection. Objectives To evaluate the effectiveness of interventions to enhance the wearing of hearing protection among persons regularly exposed to high noise levels. Search strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 1); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ICTRP and additional sources for published and unpublished trials. The date of the most recent search was 8 April 2011. Selection criteria We included studies if they had a randomised design, if they were among noise exposed (> 80 dB(A)) persons, if they included an intervention to promote the wearing of hearing protection (compared to another intervention or no intervention), and if the outcome measured was the amount of use of hearing protection or a proxy measure thereof. Data collection and analysis Two authors selected relevant trials, assessed risk of bias and extracted data. Main results Seven studies, involving 4670 participants, were included. A computer-based intervention lasting 30 minutes, tailored to the risk of an individual worker, was not found to be more effective than a video providing general information among workers, around 80% of whom already used hearing protection. A four-year school-based hearing loss prevention programme found that the intervention group was twice as likely to wear some kind of hearing protection as the control group that received a baseline hearing test and two additional tests at years two and three. We conducted two meta-analyses for the comparisons ‘tailored strategy (the use of communication or other types of interventions that are specific to an individual or a group and aim to change behaviour) versus non-tailored strategy’ and ‘tailored strategy versus a commercial video on the use of hearing protection’ to look at mean percentage use of hearing protective devices (HPDs), that showed improvement in the mean use of HPDs for the tailored group. A meta-analysis of the comparison ‘mixed interventions’ (classroom instruction, distribution of HPDs, mailings, noise level assessments and audiometric testing) versus control (audiometric testing alone) also showed improvement in self reported use of HPDs when shooting firearms. Tailored education showed an improvement in HPD use of 8.3% versus targeted education (6.1%). Authors’ conclusions The evidence found in this review shows that some interventions improve the mean use of hearing protection devices compared to non-intervention. Future trials should have standard outcomes and interventions to allow the combining of results in meta-analysis.

Keywords: Analysis, Authors, Bias, Cochrane, Communication, Conservation Program, Construction, Control, Design, Ear Protective Devices, Education, Effectiveness, Efficacy, Embase, Exposure, Farmers, Health Education [Methods], Hearing Loss,Noise-Induced [Prevention & Control], Humans, Information, Intervention, Interventions, Meta Analysis, Meta-Analysis, Model, Noise, Noise,Occupational [Adverse Effects], Occupational Diseases [Prevention & Control], Outcome, Outcomes, Prevention, Pubmed, Randomized Controlled Trials As Topic, Review, Risk, Science, Search Strategy, Selection, Strategy, Web of Science, Workers Use, Working

? Bellolio, M.F., Gilmore, R.M. and Stead, L.G. (2011), Insulin for glycaemic control in acute ischaemic stroke. *Cochrane Database of Systematic Reviews*, **9**, Article Number: CD005346.

Full Text: [2011\Coc Dat Sys Rev2011, CD005346.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005346.pdf)

Abstract: Background Patients with hyperglycaemia concomitant with an acute stroke have greater stroke severity and greater functional impairment when compared to those with normoglycaemia at stroke presentation. Objectives To determine whether maintaining serum glucose within a specific normal range (4 to 7.5 mmol/L) in the first 24 hours of acute ischaemic stroke influences outcome. Search strategy We searched the Cochrane Stroke Group Trials Register (June 2010), CENTRAL (The Cochrane Library 2010, Issue 2), MEDLINE (1950 to June 2010), EMBASE (1980 to June 2010), CINAHL (1982 to June 2010), Science Citation Index (1900 to June 2010), and Web of Science (ISI Web of Knowledge) (1993 to June 2010). In an effort to identify further published, unpublished and ongoing trials we searched ongoing trials registers and SCOPUS. Selection criteria Eligible studies were randomised controlled trials comparing intensively monitored insulin therapy versus usual care in adult patients with acute ischaemic stroke. Data collection and analysis Two review authors independently extracted the study characteristics, study quality, and data to estimate the odds ratio (OR) and 95% confidence interval (CI), mean difference (MD) and standardised mean difference (SMD) of outcome measures. Main results We included seven trials involving 1296 participants (639 participants in the intervention group and 657 in the control group). We found that there was no difference between treatment and control groups in the outcome of death or disability and dependence (OR 1.00, 95% CI 0.78 to 1.28) or final neurological deficit (SMD -0.12, 95% CI -0.23 to 0.00). The rate of symptomatic hypoglycaemia was higher in the intervention group (OR 25.9, 95% CI 9.2 to 72.7). In the subgroup analyses of diabetes mellitus (DM) versus non-DM, we found no difference for the outcomes of death and dependency or neurological deficit. Authors’ conclusions With the current evidence, we found that the administration of intravenous insulin with the objective of maintaining serum glucose within a specific range in the first hours of acute ischaemic stroke does not provide benefit in terms of functional outcome, death, or improvement in final neurological deficit and significantly increased the number of hypoglycaemic episodes. Specifically, those who were maintained within a more tight range of glycaemia with intravenous insulin experienced a greater risk of symptomatic and asymptomatic hypoglycaemia than those individuals in the control group.

Keywords: Acute, Acute Stroke, Adult, Analysis, Authors, Blood-Glucose, Brain-Damage, Care, Citation, Cochrane, Control, Control Groups, Critically-Ill Patients, Diabetes, Diabetes Mellitus, Disability, Embase, Functional, Glucose-Insulin, Hypoglycaemia, Independent Predictor, Insulin, Intervention, Isi, Knowledge, Medline, Moderate Hyperglycemia, Normal, Outcome, Outcomes, Patients, Ratio, Review, Risk, Science, Science Citation Index, Scopus, Search Strategy, Selection, Spreading Depression, Strategy, Stress Hyperglycemia, Stroke, Systematic Reviews, Therapy, Transient Forebrain Ischemia, Treatment, Web of Knowledge, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006895.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006895.pdf)

Abstract: Background Probiotics may improve a person’s health by regulating their immune function. Some studies show that probiotic strains can prevent respiratory infections. However, no evidence of the benefits of probiotics for acute upper respiratory tract infections (URTIs) and related potential adverse effects has been published. Objectives To assess the effectiveness and safety of probiotics for preventing acute URTIs. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (T h e Cochrane Library 2011, Issue 2), which includes the Cochrane Acute Respiratory Infections Group’s Specialised Register, MEDLINE (Ovid) (1950 to May week 1, 2011), EMBASE (1974 to May 2011), Web of Science which includes Science Citation Index (from 1900 to May 2011) and Conference Proceedings Citation Index (from 1991 toMay 2011), the Chinese Biomedical Literature Database, which includes the China Biological Medicine Database (from 1978 to May 2011), the Chinese Medicine Popular Science Literature Database (from 2000 to May 2011) and the Masters Degree Dissertation of Beijing Union Medical College Database (from 1981 to May 2011). Selection criteria Randomised controlled trials (RCTs) comparing probiotics with placebo to prevent acute URTIs. Data collection and analysis Two review authors independently assessed eligibility, quality of trials and extracted data. Main results We included 14 RCTs, although we could only extract available data to meta-analyse in 10 trials which involved 3451 participants. We found that probiotics were better than placebo when measuring the number of participants experiencing episodes of acute URTI: at least one episode: odds ratio (OR) 0.58; 95% confidence interval (CI) 0.36 to 0.92; at least three episodes: OR 0.53; 95% CI 0.36 to 0.80; rate ratio of episodes of acute URTI: rate ratio 0.88; 95% CI 0.81 to 0.96; and reduced antibiotic prescription rates for acute URTIs: OR 0.67; 95% CI 0.45 to 0.98. Probiotics and placebo were similar when measuring the mean duration ( MD) of an episode of acute URTI: MD -0.29; 95% CI -3.71 to 3.13 and adverse events: OR 0.92; 95% CI 0.37 to 2.28. Side effects of probiotics were minor and gastrointestinal symptoms were the most common. We found that some subgroups had a high level of heterogeneity when conducting pooled analyses. Authors’ conclusions Probiotics were better than placebo in reducing the number of participants experiencing episodes of acute URTIs, the rate ratio of episodes of acute URTI and reducing antibiotic use. This indicates that probiotics may be more beneficial than placebo for preventing acute URTIs. However, the results have some limitations and there were no data for older people.

Keywords: Acute, Adverse Effects, Adverse Events, Analysis, Antibiotic, Attending Day-Care, Authors, Children, China, Citation, Cochrane, Conference, Controlled-Trial, Database, Dietary Consumption, Double-Blind, Effectiveness, Embase, Gastrointestinal, Healthy-Subjects, Immune, Immune-System, Lactic-Acid Bacteria, Lactobacillus-Casei, Literature, Medline, Milk, Older People, Probiotic, Probiotics, Ratio, Respiratory, Respiratory Infections, Review, Safety, Science, Science Citation Index, Search Strategy, Selection, Strategy, Symptoms, Tract, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD007645.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007645.pdf)

Abstract: Background Screening examinations for retinopathy of prematurity (ROP) are performed routinely in the neonatal intensive care unit and are a recognised cause of pain in the newborn. Objectives To determine the effect of instillation of topical anaesthetic eye drops compared with placebo or no treatment on pain in infants undergoing ROP screening. Search strategy We used the standard search strategy of the Cochrane Neonatal Review Group. This included a search of the Cochrane Neonatal Group register and the Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library, Issue 10, 2010). We identified relevant studies by searching the following: (1) computerised bibliographic databases: MEDLINE (1966 to October 2010), EMBASE (1988 to October 2010) and Web of Science (1975 to March 2010; (2) the Oxford Database of Perinatal Trials. We searched electronically abstracts from PAS from 2000 to 2010 and handsearched abstracts from ESPR from 2000 to 2009. Selection criteria All randomised, or quasi-randomised controlled trials, or randomised cross-over trials. Data collection and analysis We used the standard methods of the Cochrane Neonatal Review Group. Main results We identified two studies for inclusion. Both studies were randomised cross-over trials performed in single centres. Both studies used the Premature Infant Pain Profile (PIPP) score as a measure of pain response. Different methods of evaluating PIPP scores are presented including the absolute PIPP score, a PIPP score > 10 or > 12 and an increase in PIPP >= 4 from the baseline value. There is a nonsignificant reduction in pain scores at one minute and a nonsignificant increase at five minutes post insertion of the speculum. PIPP score > 12 at one minute resulted in a statistically significant reduction in the number of patients who experienced pain (typical risk ratio (RR) 0.56, 95% CI 0.36 to 0.89; typical risk difference (RD) -0.23, 95% CI -0.39 to -0.86; number needed to treat to benefit (NNTB) 4). When pain was defined as an increase in PIPP > 4 there was a statistically significant reduction in the absolute number of patients who experienced pain at one minute ( typical RR 0.70, 95% CI 0.52 to 0.94; typical RD -0.19, 95% CI -0.34 to -0.04; NNTB 5.3). Authors’ conclusions The administration of topical proparacaine 30 seconds prior to the ophthalmological evaluation was associated with a reduction in pain scores especially at the time of speculum insertion. However, despite treatment, screening remains a painful procedure and the role of nonpharmacological and pharmacological intervention including different local anaesthetic agents should be ascertained in future randomised trials.

Keywords: Analysis, Bibliographic, Bibliographic Databases, Care, Cochrane, Database, Databases, Embase, Evaluation, Infants, Intensive Care, Intensive Care Unit, Intervention, Management, Medline, Neonatal Intensive Care, Pain, Patients, Pharmacological Intervention, Premature Infant Pain Profile, Prevention, Profile, Ratio, Reduction, Review, Risk, Science, Screening, Search Strategy, Selection, Strategy, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD007673.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007673.pdf)

Abstract: Background The emigration of skilled professionals from low-and middle-income countries (LMICs) to high-income countries (HICs) is a general phenomenon but poses particular challenges in health care, where it contributes to human resource shortages in the health systems of poorer countries. However, little is known about the effects of strategies to help regulate this movement. Objectives To assess the effects of policy interventions to regulate emigration of health professionals from LMICs. Search strategy We searched the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (searched 15 March 2011), the Cochrane Register of Controlled Trials (CENTRAL) (searched 2 March 2011), MEDLINE (searched 5 March 2011), EMBASE (searched 2 March 2011), CINAHL (searched 5 March 2011), LILACS (searched 7 March 2011), WHOLIS (searched 20 March 2011), SocINDEX (searched 11 March 2011), EconLit (searched 8 March 2011), Science and Social Science Citation Index (searched 8 March 2011), NLM Gateway (searched 31 March 2011) and ERIC (searched March 3 2011). We reviewed reference lists of included studies and selected reviews on the topic, contacted authors of included studies and experts on the field, and reviewed relevant websites. Selection criteria Randomised controlled trials (RCT), non-randomised controlled trials (NRCT), controlled before-and-after studies (CBA) and interrupted time series (ITS) studies assessing any intervention in the source, the recipient or both countries that could have an impact on the number of professionals that emigrate from a LMIC. Health professionals, such as physicians, dentists, nurses or midwives, should be nationals of a LMIC whose graduate training was in a LMIC. Data collection and analysis One review author extracted data onto a standard form and a second review author checked data. Two review authors assessed risk of bias. Main results Only one study was included. This time series study assessed the migration of Philippine nurses to the United States of America (USA) from 1954 to 1990. We re-analysed it as an interrupted time series study. The intervention was a modification of migratory law in the US, called the ‘ Act of October 1965’, which decreased the restrictions on Eastern hemisphere immigrants to the USA. The analysis showed a significant immediate increase of 807.6 (95% confidence interval (CI) 480.9 to 1134.3) in the number of nurses migrating to the USA annually after the intervention. This represents a relative increase of 5000% over the underlying pre-intervention trend. There were no significant differences in the slopes of the underlying trends for the number of nurses migrating between the pre-and postintervention periods. Authors’ conclusions There is an important gap in knowledge about the effectiveness of policy interventions in either HICs or LMICs that could regulate positively themovement of health professionals fromLMICs. The only evidence found was froman intervention in aHIC that increased the movement of health professionals from a LMIC. New initiatives to improve records on the migration of health professionals from LMICs should be implemented, as a prerequisite to conductingmore rigorous research in the field. This research should focus on whether the range of interventions outlined in the literature could be effective in retaining health professionals in LMICs. Such interventions include financial rewards, career development and continuing education, improving hospital infrastructure, resource availability, better hospital management and improved recognition of health professionals.

Keywords: Analysis, Author, Authors, Bias, Brain-Drain, Care, Career Development, Challenges, Citation, Cochrane, Continuing Education, Crisis, Dentists, Development, Differences, Education, Effectiveness, Embase, Health, Health Care, Hospital, Human, Impact, Intervention, Interventions, Knowledge, Literature, Low- And Middle-Income Countries, Management, Medline, Migration, Modification, Movement, Nurses, Physicians, Policy, Practice, Recruitment, Research, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Sub-Saharan Africa, Training, Trend, Trends, US, USA, Websites, Workers, Workforce

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Full Text: [2011\Coc Dat Sys Rev2011, CD007897.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007897.pdf)

Abstract: Background Dampness and mould in buildings have been associated with adverse respiratory symptoms, asthma and respiratory infections of inhabitants. Moisture damage is a very common problem in private houses, workplaces and public buildings such as schools. Objectives To determine the effectiveness of remediating buildings damaged by dampness and mould in order to reduce or prevent respiratory tract symptoms, infections and symptoms of asthma. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (T h e Cochrane Library 2011, Issue 2), which contains the Cochrane Acute Respiratory Infections Group’s Specialised Register, MEDLINE (1951 to June week 1, 2011), EMBASE (1974 to June 2011), CINAHL (1982 to June 2011), Science Citation Index (1973 to June 2011), Biosis Previews (1989 to June 2011), NIOSHTIC (1930 to November 2010) and CISDOC (1974 to November 2010). Selection criteria Randomised controlled trials (RCTs), cluster-RCTs (cRCTs), interrupted time series studies and controlled before-after (CBA) studies of the effects of remediating dampness and mould in a building on respiratory symptoms, infections and asthma. Data collection and analysis Two authors independently extracted data and assessed the risk of bias in the included studies. Main results We included eight studies (6538 participants); two RCTs (294 participants), one cRCT (4407 participants) and five CBA studies (1837 participants). The interventions varied from thorough renovation to cleaning only. We found moderate-quality evidence in adults that repairing houses decreased asthma-related symptoms (among others, wheezing (odds ratio (OR) 0.64; 95% confidence interval (CI) 0.55 to 0.75) and respiratory infections (among others, rhinitis (OR 0.57; 95% CI 0.49 to 0.66)). For children, we found moderate-quality evidence that the number of acute care visits (among others mean difference (MD) -0.45; 95% CI -0.76 to -0.14)) decreased in the group receiving thorough remediation. One CBA study showed very low-quality evidence that after repairing a mould-damaged office building, asthma-related and other respiratory symptoms decreased. For children and staff in schools, there was very low-quality evidence that asthma-related and other respiratory symptoms in mould-damaged schools were similar to those of children and staff in non-damaged schools, both before and after intervention. For children, respiratory infections might have decreased after the intervention. Authors’ conclusions We found moderate to very low-quality evidence that repairing mould-damaged houses and offices decreases asthma-related symptoms and respiratory infections compared to no intervention in adults. There is very low-quality evidence that although repairing schools did not significantly change respiratory symptoms in staff or children, pupils’ visits to physicians due to a common cold were less frequent after remediation of the school. Better research, preferably with a cRCT design and with more validated outcome measures, is needed.

Keywords: Acute, Adults, Analysis, Associations, Asthma, Authors, Bias, Care, Children, Citation, Cochrane, Design, Effectiveness, Embase, Feasibility, Health, Home Remediation, Intervention, Interventions, Medline, Moisture Problems, Outcome, Physicians, Quality, Ratio, Remediation, Renovation, Research, Respiratory, Respiratory Infections, Rhinitis, Risk, School, Schools, Science, Science Citation Index, Search Strategy, Selection, Strategy, Symptoms, Tract

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Full Text: [2011\Coc Dat Sys Rev2011, CD008554.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008554.pdf)

Abstract: Background Amyotrophic lateral sclerosis (ALS), also known as motor neuron disease (MND), is a progressive neurodegenerative disease without effective therapies. Several studies have suggested that repetitive transcranial magnetic stimulation (rTMS) may have positive benefit in ALS. However, the efficacy and safety of this therapy remain uncertain. Objectives We aimed to determine the clinical efficacy and safety of rTMS for treating ALS. Search strategy We searched the Cochrane Neuromuscular Disease Group Specialized Register (July 2010), the Cochrane Central Register of Controlled Trials (The Cochrane Library, Issue 2, 2010), MEDLINE (1966 to July 2010), EMBASE (1980 to July 2010), CINAHL (1937 to July 2010), Science Citation Index Expanded (January 1945 to June 2010), AMED (January 1985 to July 2010) and the Chinese Biomedical Database (1979 to September 2010). We also searched for ongoing studies on clinical trials. gov (September 2010). Selection criteria Randomised and quasi-randomised controlled trials assessing the therapeutic efficacy and safety of rTMS for patients with a clinical diagnosis of ALS. Comparisons eligible for inclusion were: 1. rTMS versus no intervention; 2. rTMS versus sham rTMS; 3. rTMS versus physiotherapy; 4. rTMS versus medications; 5. rTMS + other therapies or drugs versus sham rTMS + the same therapies or drugs; 6. different methods of application of rTMS such as high-frequency (> 1Hz) compared to low-frequency (<= 1Hz) rTMS. Data collection and analysis Two authors independently selected papers, assessed risk of bias and extracted data. We resolved disagreements through discussion. We contacted study authors for additional information. Main results Three randomised, placebo-controlled trials with a total of 50 participants were included in the review. All the trials were of poor methodological quality and were insufficiently homogeneous to allow the pooling of results. Moreover, the high rate of attrition further increased the risk of bias. None of the trials provided detailed data on the ALS Functional Rating Scale-Revised (ALSFRS-R) scores at six months follow-up which was pre-assigned as our primary outcome. One trial contained data in a suitable form for quantitative analysis of our secondary outcomes. No difference was seen between rTMS and sham rTMS using the ALSFRS-R scores and manual muscle testing (MMT) scores at 12 months follow-up in this trial. Additionally, none of the trials reported any adverse events associated with the use of rTMS. However, in view of the small sample size, the methodological limitations and incomplete outcome data, treatment with rTMS cannot be judged as completely safe. Authors’ conclusions There is currently insufficient evidence to draw conclusions about the efficacy and safety of rTMS in the treatment of ALS. Further studies may be helpful if their potential benefit is weighed against the impact of participation in a randomised controlled trial on people with ALS.

Keywords: Adverse Events, Al, Als, Analysis, Authors, Bias, Citation, Clinical Trials, Cochrane, Cortex Excitability, Criteria, Database, Depression, Diagnosis, Disease, Double-Blind, Drugs, Efficacy, Embase, Epidemiology, Fatigue, Follow-Up, Frequency, Impact, Information, Intervention, Medline, Outcome, Outcomes, Papers, Patients, Primary, Quantitative, Randomised Controlled Trial, Review, Risk, Safety, Science, Science Citation Index, Search Strategy, Selection, Strategy, Therapy, Theta-Burst Stimulation, Transcranial Magnetic Stimulation, Treatment

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Full Text: [2011\Coc Dat Sys Rev2011, CD008959.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008959.pdf)

Abstract: Background Vitamin and mineral deficiencies, particularly those of iron, vitamin A and zinc, affect more than two billion people worldwide. Young children are highly vulnerable because of rapid growth and inadequate dietary practices. Micronutrient powders (MNP) are single-dose packets containing multiple vitamins and minerals in powder form that can be sprinkled onto any semi-solid food. The use of MNP for home or point-of-use fortification of complementary foods has been proposed as an intervention for improving micronutrient intake in children under two years of age. Objectives To assess the effects and safety of home (point-of-use) fortification of foods with multiple micronutrient powders on nutritional, health and developmental outcomes in children under two years of age. Search strategy We searched the following databases in February 2011: Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library), MEDLINE (1948 to week 2 February 2011), EMBASE (1980 to Week 6 2011), CINAHL (1937 to current), CPCI-S (1990 to 19 February 2011), Science Citation Index (1970 to 19 February 2011), African Index Medicus (searched 23 February 2011), POPLINE (searched 21 February 2011), Clinical Trials.gov (searched 23 February 2011), mRCT (searched 23 February 2011), and World Health Organization International Clinical Trials Registry Platform (ICTRP) (searched 23 February 2011). We also contacted relevant organisations (25 January 2011) for the identification of ongoing and unpublished studies. Selection criteria We included randomised and quasi-randomised trials with either individual or cluster randomisation. Participants were children under the age of two years at the time of intervention, with no specific health problems. The intervention was consumption of food fortified at the point of use with multiple micronutrient powders formulated with at least iron, zinc and vitamin A compared with placebo, no intervention or the use of iron containing supplements, which is the standard practice. Data collection and analysis Two review authors independently assessed the eligibility of studies against the inclusion criteria, extracted data from included studies and assessed the risk of bias of the included studies. Main results We included eight trials (3748 participants) conducted in low income countries in Asia, Africa and the Caribbean, where anaemia is a public health problem. The interventions lasted between two and 12 months and the powder formulations contained between five and 15 nutrients. Six trials compared the use of MNP versus no intervention or a placebo and the other two compared the use of MNP versus daily iron drops. Most of the included trials were assessed as at low risk of bias. Home fortification with MNP reduced anaemia by 31% (six trials, RR 0.69; 95% CI 0.60 to 0.78) and iron deficiency by 51% (four trials, RR 0.49; 95% CI 0.35 to 0.67) in infants and young children when compared with no intervention or placebo, but we did not find an effect on growth. In comparison with daily iron supplementation, the use of MNP produced similar results on anaemia (one trial, RR 0.89; 95% CI 0.58 to 1.39) and haemoglobin concentrations (two trials, MD -2.36 g/L; 95% CI -10.30 to 5.58); however, given the limited amount of data these results should be interpreted cautiously. No deaths were reported in the trials and information on side effects and morbidity, including malaria, was scarce. It seems that the use of MNP is efficacious among infants and young children six to 23 months of age living in settings with different prevalences of anaemia and malaria endemicity, regardless of whether the intervention lasts two, six or 12 months or whether recipients are male or female. Authors’ conclusions Home fortification of foods with multiple micronutrient powders is an effective intervention to reduce anaemia and iron deficiency in children six months to 23 months of age. The provision of MNP is better than no intervention or placebo and possibly comparable to commonly used daily iron supplementation. The benefits of this intervention as a child survival strategy or on developmental outcomes are unclear. Data on effects on malaria outcomes are lacking and further investigation of morbidity outcomes is needed. The micronutrient powders containing multiple nutrients are well accepted but adherence is variable and in some cases comparable to that achieved in infants and young children receiving standard iron supplements as drops or syrups.

Keywords: Adherence, Africa, Anaemia, Analysis, Asia, Authors, Bias, Cambodian Infants, Child, Children, Citation, Cluster-Randomized Trial, Cochrane, Complementary Foods, Databases, Double-Blind, Embase, Growth, Haemoglobin, Health, Income, Infants, Information, Intervention, Interventions, Iron, Iron-Deficiency, Malaria, Male, Medline, Morbidity, Nutrition, Outcomes, Placebo-Controlled Trial, Practice, Preschool-Children, Public Health, Review, Risk, Rural Haiti, Safety, Science, Science Citation Index, Search Strategy, Selection, Side Effects, Strategy, Survival, Vitamin-A Supplementation, Young-Children, Zinc

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Full Text: [2011\Coc Dat Sys Rev2011, CD009337.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009337.pdf)

Abstract: Background Social marketing interventions have been shown to both promote and change many health-related behaviours and issues. As the HIV epidemic continues to disproportionately affect MSM and transgender women around the world, social marketing interventions have the potential to increase HIV/STI testing uptake among these populations. Objectives To assess the impact of social marketing interventions on HIV/STI testing uptake among men who have sex with men and transgender women compared to pre-intervention or control group testing uptake in the same population. Search strategy We searched the following electronic databasesfor results from 01 January 1980 to the search date, 14 July 2010: Cochrane Central Register of Controlled Trials (CENTRAL), EMBASE, LILACS (Latin America and Brazil), PsycINFO, PubMed, Web of Science/Web of Social Science, Chinese National Knowledge Infrastructure (CNKI), and CQ VIP (China). We also searched for conference abstracts in the Aegis archive of HIV/AIDS conference abstracts and the CROI and International AIDS Society websites. In addition to searching electronic databases, we searched the following sources of grey literature: Australasian Digital Theses Program, Canadian Evaluation Society, Eastview: China Conference Proceedings, ProQuest Dissertations and Theses, and World Health Organization Library Information System (WHOLIS). We contacted individual researchers, experts working in the field, and authors of major trials for suggestions of any relevant manuscripts that were in preparation or in press. References of published articles from the databases above were searched for additional, pertinent materials. All languages were included in this search. Selection criteria Randomized controlled trials and controlled clinical trials that compared social marketing interventions with a control were included. Interrupted time series and pretest-posttest design studies (controlled or uncontrolled) that compared social marketing interventions with no intervention or a control were also included. Posttest-only studies and studies that combined pre-post data were excluded. Interventions that targeted at general public but did not include MSM or transgender women as a segment or did not have outcome data for an MSM or transgender segment were excluded. Data collection and analysis Two authors independently extracted data from each included study and assessed study quality. Meta-analyses were conducted to compare pre- and post-intervention and intervention and control group outcomes of HIV and STI testing uptake. Quality of evidence was assessed using the GRADE approach. Main results Three serial, cross-sectional pretest-posttest study designs (one with a control group and two without) were included in the final analysis. Statistical pooling was conducted for two studies and compared to pre-intervention level testing uptake, which showed that multimedia social marketing campaigns had a significant impact on HIV testing uptake (OR=1.58, 95% CI = 1.40 - 1.77). However, the campaigns were not found to be effective in increasing STI testing uptake (OR=0.94, 95% CI = 0.68 - 1.28). Overall, risk of bias was high and quality of evidence was low. None of the studies were conducted in developing countries or included male-to-female transgender women. Authors’ conclusions This review provided limited evidence that multi-media social marketing campaigns can promote HIV testing among MSM in developed countries. Future evaluations of social marketing interventions for MSM should employ more rigorous study designs. Long-term impact evaluations (changes in HIV or STI incidence over time) are also needed. Implementation research, including detailed process evaluation, is needed to identify elements of social marketing interventions that are most effective in reaching the target population and changing behaviours.

Keywords: AID, AIDS, Analysis, Antiretroviral Therapy, Authors, Bias, Bisexual Men, Brazil, China, Clinical Trials, Cochrane, Conference, Control, Controlled Clinical Trials, Databases, Design, Developing Countries, Dissertations, Embase, Evaluation, Gay, General Public, Grade, Health, HIV, HIV Testing, HIV-Infection, HIV, AIDS, Impact, Implementation, Incidence, Intervention, Interventions, Knowledge, Latin America, Literature, Men, Outcome, Outcomes, Preparation, Prevention Campaign, Pubmed, Quality, Randomized Controlled Trials, References, Research, Researchers, Review, Risk, San-Francisco, Science, Search Strategy, Selection, Sex, Sexually-Transmitted-Diseases, Social, Strategy, Syphilis, Testing Uptake, Transmission, Uptake, Websites, Women

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Full Text: [2011\Coc Dat Sys Rev2011, CD000501.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD000501.pdf)

Abstract: Background Vitamin A is necessary for normal lung growth and the integrity of respiratory tract epithelial cells. Preterm infants have low vitamin A status at birth, and this has been associated with increased risk of developing chronic lung disease. Objectives To evaluate vitamin A supplementation on the incidence of death and/or neonatal chronic lung disease and long-term neurodevelopmental disability in very low birthweight infants (VLBW); and to consider the effect of the supplementation route, dose, and timing. Search strategy In August 2011, the Cochrane Central Regsiter of Controlled Trials (Central, The Cochrane Library), MEDLINE, Science Citation Index and the Oxford Database of Perinatal Trials were searched. The reference lists of relevant trials, paediatric and nutrition journals, and conference abstracts and proceedings were handsearched up to 2007. Selection criteria Randomised controlled trials comparing vitamin A supplementation with a control (placebo or no supplementation) or other dosage regimens in VLBW infants (birthweight <= 1500 g or < 32 weeks’ gestation). Data collection and analysis Both review authors screened the search results, extracted data, and assessed the trials’ risk of bias. Results were reported as risk ratios (RR), risk differences (RD), and number needed to treat to benefit (NNTB), all with 95% confidence intervals (CI). Trialists were contacted for additional data. Main results Nine trials met the inclusion criteria, eight compared vitamin A supplementation with a control (1291 infants), and one compared different regimens (120 infants). Compared to the control group, vitamin A appears to be beneficial in reducing death or oxygen requirement at one month of age (RR 0.93, 95% CI 0.88 to 0.99; RD -0.05, 95% CI -0.10 to -0.01; NNTB 20, 95% CI 10 to 100; 1165 infants) and oxygen requirement at 36 weeks’ postmenstrual age (RR 0.87, 95% CI 0.77 to 0.98; RD -0.08, 95% CI -0.14 to -0.01; NNTB 13, 95% CI 7 to 100; 824 infants). A trend towards a reduction in death or oxygen requirement at 36 weeks’ postmenstrual age was also noted (RR 0.91, 95% CI 0.82 to 1.00; 1001 infants). Neurodevelopmental assessment of 88% of surviving infants in the largest trial showed no differences between the groups at 18 to 22 months of age, corrected for prematurity. The different dosage vitamin A regimens showed similar results. Authors’ conclusions Whether clinicians decide to utilise repeat intramuscular doses of vitamin A to prevent chronic lung disease may depend upon the local incidence of this outcome and the value attached to achieving a modest reduction in this outcome, balanced against the lack of other proven benefits and the acceptability of treatment. Information on long-term neurodevelopmental status suggests no evidence of either benefit or harm from the intervention.

Keywords: Analysis, Assessment, Authors, Bias, Birthweight, Bronchopulmonary Dysplasia, Chronic Lung-Disease, Citation, Cochrane, Confidence Intervals, Control, Database, Differences, Disability, Disease, Growth, Humans, Incidence, Infant,Newborn, Infant,Premature, Infant,Premature, Diseases [Prevention & Control], Infant,Very Low Birth Weight, Infants, Intervention, Journals, Low, Low Birthweight, Lung Diseases [Prevention & Control], Medline, Morbidity, Mortality, Normal, Nutrition, Outcome, Paediatric, Premature-Infants, Preterm Infants, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Reduction, Respiratory, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Tract, Treatment, Trend, Vitamin A [Therapeutic Use], Vitamins [Therapeutic Use]

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Full Text: [2011\Coc Dat Sys Rev2011, CD001208.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001208.pdf)

Abstract: Background Human albumin solutions are used for a range of medical and surgical problems. Licensed indications are the emergency treatment of shock and other conditions where restoration of blood volume is urgent, such as in burns and hypoproteinaemia. Human albumin solutions are more expensive than other colloids and crystalloids. Objectives To quantify the effect on mortality of human albumin and plasma protein fraction (PPF) administration in the management of critically ill patients. Search strategy We searched the Cochrane Injuries Group Specialised Register (searched 31 May 2011), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 2), MEDLINE (Ovid) (1948 to week 3 May 2011), EMBASE (Ovid) (1980 to Week 21 2011), CINAHL (EBSCO) (1982 to May 2011), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to May 2011), ISI Web of Science: Conference Proceedings Citation Index - Science (CPCI-S) (1990 to May 2011), PubMed (www.ncbi.nlm.nih.gov/sites/entrez/) (searched 10 June 2011, limit: last 60 days). Reference lists of trials and review articles were checked, and authors of identified trials were contacted. Selection criteria Randomised controlled trials comparing albumin or PPF with no albumin or PPF or with a crystalloid solution in critically ill patients with hypovolaemia, burns or hypoalbuminaemia. Data collection and analysis We collected data on the participants, albumin solution used, mortality at the end of follow up, and quality of allocation concealment. Analysis was stratified according to patient type. Main results We found 38 trials meeting the inclusion criteria and reporting death as an outcome. There were 1,958 deaths among 10,842 trial participants. For hypovolaemia, the relative risk of death following albumin administration was 1.02 (95% confidence interval (CI) 0.92 to 1.13). This estimate was heavily influenced by the results of the SAFE trial, which contributed 75.2% of the information (based on the weights in the meta-analysis). For burns, the relative risk was 2.93 (95% CI 1.28 to 6.72) and for hypoalbuminaemia the relative risk was 1.26 (95% CI 0.84 to 1.88). There was no substantial heterogeneity between the trials in the various categories (Chi(2) = 26.66, df = 31, P = 0.69). The pooled relative risk of death with albumin administration was 1.05 (95% CI 0.95 to 1.16). Authors’ conclusions For patients with hypovolaemia, there is no evidence that albumin reduces mortality when compared with cheaper alternatives such as saline. There is no evidence that albumin reduces mortality in critically ill patients with burns and hypoalbuminaemia. The possibility that there may be highly selected populations of critically ill patients in which albumin may be indicated remains open to question. However, in view of the absence of evidence of a mortality benefit from albumin and the increased cost of albumin compared to alternatives such as saline, it would seem reasonable that albumin should only be used within the context of well concealed and adequately powered randomised controlled trials.

Keywords: 5-Percent Albumin, Analysis, Authors, Blood, Blood Proteins [Therapeutic Use], Cerebral-Blood-Flow, Citation, Cochrane, Colloid Osmotic-Pressure, Conference, Critical Illness [Mortality, Critically Ill Patients, Embase, Emergency, Fluid Resuscitation, Fluid Therapy, Follow-Up, Human, Humans, Hypoalbuminemic Patients, Information, Intensive-Care-Unit, Isi, Isi Web of Science, Major Surgery, Management, Medical, Medline, Meta Analysis, Meta-Analysis, Mortality, Normal Saline, Outcome, Patients, Plasma, Plasma Substitutes [Therapeutic Use], Pubmed, Quality, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Relative Risk, Restoration, Review, Risk, Safe, Science, Science Citation Index, Search Strategy, Selection, Serum Albumin [Therapeutic Use], Serum Globulins, Strategy, Surgical, Therapy], Total Parenteral-Nutrition, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD003236.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003236.pdf)

Abstract: Background Chronic kidney disease (CKD) is a worldwide public health problem. In the National Kidney Foundation Disease Outcomes Quality Initiative guidelines it is stressed that lifestyle issues such as physical activity should be seen as cornerstones of the therapy. The physical fitness in adults with CKD is so reduced that it impinges on ability and capacity to perform activities in everyday life and occupational tasks. An increasing number of studies have been published regarding health effects of various regular exercise programmes in adults with CKD and in renal transplant patients. Objectives We aimed to: 1) assess the effects of regular exercise in adults with CKD and kidney transplant patients; and 2) determine how the exercise programme should be designed (e.g. type, duration, intensity, frequency of exercise) to be able to affect physical fitness and functioning, level of physical activity, cardiovascular dimensions, nutrition, lipids, glucose metabolism, systemic inflammation, muscle morphology and morphometrics, dropout rates, compliance, adverse events and mortality. Search strategy We searched the Cochrane Renal Group’s specialised register, CENTRAL, MEDLINE, EMBASE, CINAHL, Web of Science, Biosis, Pedro, Amed, AgeLine, PsycINFO and KoreaMed. We also handsearched reference lists of review articles and included studies, conference proceeding’s abstracts. There were no language restrictions. Date of last search: May 2010. Selection criteria We included any randomised controlled trial (RCT) enrolling adults with CKD or kidney transplant recipients undergoing any type of physical exercise intervention undertaken for eight weeks or more. Studies using less than eight weeks exercise, those only recommending an increase in physical activity, and studies in which co-interventions are not applied or given to both groups were excluded. Data collection and analysis Data extraction and assessment of study and data quality were performed independently by the two authors. Continuous outcome data are presented as standardised mean difference (SMD) or mean difference (MD) with 95% confidence intervals (CI). Main results Forty-five studies, randomising 1863 participants were included in this review. Thirty two studies presented data that could be meta-analysed. Types of exercise training included cardiovascular training, mixed cardiovascular and resistance training, resistance-only training and yoga. Some studies used supervised exercise interventions and others used unsupervised interventions. Exercise intensity was classed as ‘high’ or ‘low’, duration of individual exercise sessions ranged from 20 minutes/session to 110 minutes/session, and study duration was from two to 18 months. Seventeen per cent of studies were classed as having an overall low risk of bias, 33% as moderate, and 49% as having a high risk of bias. The results shows that regular exercise significantly improved: 1) physical fitness (aerobic capacity, 24 studies, 847 participants: SMD -0.56, 95% CI -0.70 to -0.42; walking capacity, 7 studies, 191 participants: SMD -0.36, 95% CI -0.65 to -0.06); 2) cardiovascular dimensions (resting diastolic blood pressure, 11 studies, 419 participants: MD 2.32 mm Hg, 95% CI 0.59 to 4.05; resting systolic blood pressure, 9 studies, 347 participants: MD 6.08 mm Hg, 95% CI 2.15 to 10.12; heart rate, 11 studies, 229 participants: MD 6 bpm, 95% CI 10 to 2); 3) some nutritional parameters (albumin, 3 studies, 111 participants: MD -2.28 g/L, 95% CI -4.25 to -0.32; pre-albumin, 3 studies, 111 participants: MD -44.02 mg/L, 95% CI -71.52 to -16.53; energy intake, 4 studies, 97 participants: SMD -0.47, 95% CI -0.88 to -0.05); and 4) health-related quality of life. Results also showed how exercise should be designed in order to optimise the effect. Other outcomes had insufficient evidence. Authors’ conclusions There is evidence for significant beneficial effects of regular exercise on physical fitness, walking capacity, cardiovascular dimensions (e.g. blood pressure and heart rate), health-related quality of life and some nutritional parameters in adults with CKD. Other outcomes had insufficient evidence due to the lack of data from RCTs. The design of the exercise intervention causes difference in effect size and should be considered when prescribing exercise with the aim of affecting a certain outcome. Future RCTs should focus more on the effects of resistance training interventions or mixed cardiovascular- and resistance training as these exercise types have not been studied as much as cardiovascular exercise.

Keywords: Activities, Adults, Adverse Events, Aerobic, Ambulatory Peritoneal-Dialysis, Analysis, Assessment, Authors, Bias, Blood, Blood Pressure, Capacity, Cardiovascular, Chronic Kidney Disease, Cochrane, Compliance, Confidence Intervals, Design, Disease, Embase, Energy, Exercise, Extraction, Frequency, Guidelines, Health-Related Quality of Life, Heart Rate, Improves Functional-Capacity, Inflammation, Intervention, Interventions, Kidney, Kidney Disease, Kidney Transplant, Lipids, Low, Maintenance Hemodialysis-Patients, Medline, Mortality, Nutrition, Occupational, Outcome, Outcomes, Patients, Patients Receiving Hemodialysis, Physical Activity, Physical Working Capacity, Predialytic Uremic Patients, Pressure, Public Health, Quality, Quality of Life, Quality-of-Life, Randomised Controlled Trial, Randomized Controlled-Trial, Recombinant-Human-Erythropoietin, Renal, Resistance, Resistance Training, Review, Risk, Science, Search Strategy, Selection, Stage Renal-Disease, Strategy, Therapy, Training, Walking, Web of Science, Yoga

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Full Text: [2011\Coc Dat Sys Rev2011, CD003300.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003300.pdf)

Abstract: Background Graduated driver licensing (GDL) has been proposed as a means of reducing crash rates among novice drivers by gradually introducing them to higher risk driving situations. Objectives To examine the effectiveness of GDL in reducing crash rates among young drivers. Search strategy Studies were identified through searching MEDLINE, EMBASE, CINAHL, Healthstar, Web of Science, NTIS Bibliographic Database, TRIS Online, SIGLE, the World Wide Web, conference proceedings, consultation with experts and reference lists in relevant published literature. The searches were conducted from the time of inception to May 2009, and the Cochrane Injuries Group conducted an updated search of the TRANSPORT database in September 2009. Selection criteria Studies were included if: 1) they compared outcomes pre- and post-implementation of a GDL program within the same jurisdiction, 2) comparisons were made between jurisdictions with and without GDL, or 3) both. Studies had to report at least one objective, quantified outcome. Data collection and analysis Results were not pooled due to substantial heterogeneity. Percentage change was calculated for each year after the intervention, using one year prior to the intervention as baseline. Results were adjusted by internal controls. Analyses were stratified by denominators (population, licensed drivers). Results were calculated for the different crash types and presented for 16 year-olds alone as well as all teenage drivers. Main results We included 34 studies evaluating 21 GDL programs and 2 analyses of >40 US states. GDL programs were implemented in the US (n=16), Canada (n=3), New Zealand (n=1), and Australia (n=1) and varied in their restrictions during the intermediate stage. Based on the Insurance Institute for Highway Safety (IIHS) classification, eleven programs were good, four were fair, five were marginal, one was poor and two could not be assessed. Reductions in crash rates were seen in all jurisdictions and for all crash types. Among 16 year-old drivers, the median decrease in per population adjusted overall crash rates during the first year was 15.5% (range -27 to -8%, five studies). There was a decrease in per population adjusted injury crash rates (median -21%, range -46 to -2%, five studies). Results for all teenage drivers, rates per licensed driver, and rates adjusting for internal controls were generally reduced when comparing within jurisdictions. Authors’ conclusions GDL is effective in reducing crash rates among young drivers, although the magnitude of the effect varies. The conclusions are supported by consistent findings, temporal relationship, and plausibility of the association. Stronger GDL programs (i.e. more restrictions or higher quality based on IIHS classification) appear to result in greater fatality reduction. Future studies should focus on which components and combination of components yield the greatest reductions.

Keywords: 16-Year-Old Drivers, Accidents,Traffic [Prevention & Control, Adolescent, Analysis, Association, Automobile Driving [Legislation & Jurisprudence, Bibliographic, Canada, Cochrane, Consultation, Database, Driving, Effectiveness, Embase, Fatalities, Humans, Impact, Injury, Intervention, Licensure [Legislation & Jurisprudence, Literature, Medline, New Zealand, New-Zealand, Outcome, Outcomes, Passengers, Program, Quality, Reduction, Risk, Road, Safety, Science, Search Strategy, Selection, Standards], Statistics & Numerical Data], Strategy, System, Teenage Drivers, Transport, Us, Web of Science, World Wide Web

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Full Text: [2011\Coc Dat Sys Rev2011, CD003742.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003742.pdf)

Abstract: Background Rotavirus infection is the most common neonatal nosocomial viral infection. It is a major health problem worldwide. Epidemics with the newer P(6)G9 strains have been reported in neonatal units globally. These strains can cause severe symptoms inmost infected infants. Infection control measures become necessary and the utilization of hospital resources increase. Local mucosal immunity in the intestine to rotavirus is important in the resolution of infection and protection against subsequent infections. Boosting local immunity by oral administration of anti-rotaviral immunoglobulin preparations might be a useful strategy in treating rotaviral infections, especially in low birth weight babies. Objectives To determine the effectiveness and safety of oral immunoglobulin preparations for the treatment of rotavirus diarrhea in hospitalized low birth weight infants (birth weight less than 2500 g) Search strategy Electronic databases including The Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library, Issue 3, 2004), MEDLINE, EMBASE and CINAHL, Biological Abstracts (BIOSIS) were searched by the strategy outlined in the protocol. Science Citation Index search for all articles that referenced Barnes 1982 were searched. The proceedings of the Pediatric Academic Societies published online at ‘Abstracts Online’ were searched. Ongoing registered trials at www.clinicaltrials.gov and www.controlled-trials.com were searched. Authors prominent in the field were contacted for any unpublished articles and more information on published articles was sought. Reference lists of identified clinical trials and personal files were also reviewed. The above search was updated in July 2011. Selection criteria The criteria used to select studies for inclusion were: 1) Design: randomized or quasi-randomized controlled trials 2) Hospitalized low birth weight infants with rotavirus diarrhea 3) Intervention: Oral immunoglobulin preparations compared to placebo or no intervention 4) At least one of the following outcomes were reported: All cause mortality during hospital stay, mortality due to rotavirus infection during hospital stay, duration of diarrhea, need for rehydration, duration of viral excretion, duration of infection control measures, length of hospital stay in days, recurrent diarrhea or chronic diarrhea Data collection and analysis The two reviewers were to independently abstract data from eligible trials. No data were available for analysis. Main results No eligible randomized controlled trials were found. Authors’ conclusions No randomized controlled trials that assessed the effectiveness or safety of oral immunoglobulin preparations for the treatment of rotavirus diarrhea in hospitalized low birth weight infants were found. Clinical trials that address the issue of oral immunoglobulin treatment of rotavirus infection are needed.

Keywords: Administration,Oral, Analysis, Children, Citation, Clinical Trials, Clinical-Trial, Cochrane, Control, Cross Infection [Therapy, Databases, Diarrhea [Therapy, Disease, Effectiveness, Embase, Gastroenteritis, Gastrointestinal Infections, Group-A Rotavirus, Hospital, Humans, Immunoglobulins [Administration & Dosage], Infant, Infant,Low Birth Weight, Infant,Newborn, Infants, Infection, Infection Control, Information, Intervention, Intestine, Low, Medline, Mortality, Necrotizing Enterocolitis, Oral, Outcomes, Prevention, Protocol, Randomized Controlled Trials, Risk-Factors, Rotavirus Infections [Therapy], Safety, Science, Science Citation Index, Search Strategy, Selection, Strategy, Symptoms, Treatment, Trypsin-Inhibitors, Utilization, Virology]

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Full Text: [2011\Coc Dat Sys Rev2011, CD004205.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD004205.pdf)

Abstract: Background Mortality and morbidity due to neonatal sepsis and necrotizing enterocolitis (NEC) is high despite the use of potent antimicrobial agents. Agents that modulate inflammation may improve outcomes. Pentoxifylline, a phosphodiesterase inhibitor, is one such agent. Objectives The primary objectives were to assess the effect on mortality and the safety of intravenous pentoxifylline as an adjunct to antibiotic therapy in neonates with suspected or confirmed sepsis and NEC. Search strategy The Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library, Issue 2, 2011), MEDLINE, EMBASE and CINAHL, Science Citation Index for articles referencing Lauterbach 1996, proceedings of the Pediatric Academic Societies (1990 to 2011), BIOSIS (1992 to 2011), conference proceedings (1992 to 2011), ongoing trials and reference lists of identified RCTs were searched in July 2011. Selection criteria Randomised or quasi-randomised trials assessing the efficacy of pentoxifylline as an adjunct to antibiotics for treatment of suspected or confirmed sepsis or NEC in neonates were eligible. Data collection and analysis Two review authors independently abstracted information for the outcomes of interest. Typical relative risk (RR) and risk difference (RD) with 95% confidence intervals (CI) using fixed effects model are reported for dichotomous outcomes and mean differences for continuous outcomes. NNT was calculated for outcomes for which there was a statistically significant reduction in RD. Main results In four randomised controlled trials, 227 neonates with suspected or confirmed sepsis were randomised to pentoxifylline or placebo. Pentoxifylline therapy significantly decreased “all cause mortality during hospital stay” in the overall population of infants with sepsis [typical RR 0.40 (95%CI 0.20 to 0.77); typical RD -0.15 (95%CI -0.26 to -0.05); NNT 7 (95%CI 4 to 20)]. Subgroup analyses revealed significant reduction in mortality in preterm infants, infants with confirmed sepsis and gram-negative sepsis. Pentoxifylline treatment significantly decreased length of hospital stay [mean difference -11.20 [95%CI -22.09 to -0.31] but not development of NEC in neonates with sepsis [typical RR 0.29 (95%CI 0.07 to 1.24); typical RD -0.20 (95%CI -0.41 to 0.01)]. No adverse effects due to pentoxifylline were noted. No completed trial of treatment with pentoxifylline for treatment of NEC was identified. Authors’ conclusions Current evidence from four small studies suggests that the use of pentoxifylline as an adjunct to antibiotics in neonatal sepsis decreases mortality without any adverse effects. Researchers are encouraged to undertake large well-designed multicenter trials to confirm or refute the effectiveness of pentoxifylline in reducing mortality and adverse outcomes in neonates with suspected or confirmed neonatal sepsis and NEC.

Keywords: Adverse Effects, Adverse Outcomes, Analysis, Anti-Bacterial Agents [Therapeutic Use], Anti-Inflammatory Agents [Therapeutic Use], Antibiotic, Antibiotics, Authors, Bacterial Infections [Drug Therapy], Birth-Weight Infants, Chemotherapy,Adjuvant, Citation, Coagulation, Cochrane, Confidence Intervals, Development, Differences, Double-Blind, Effectiveness, Efficacy, Embase, Factor-Alpha, Hemodynamics, Hospital, Humans, Infant,Newborn, Infant,Premature, Infants, Infections, Inflammation, Information, Interest, Medline, Model, Morbidity, Mortality, Outcomes, Pentoxifylline [Therapeutic Use], Phosphodiesterase Inhibitors [Therapeutic Use], Platelet Activating Factor, Premature-Infants, Preterm, Primary, Randomized Controlled Trials As Topic, Reduction, Relative Risk, Research Network, Researchers, Review, Risk, Safety, Science, Science Citation Index, Search Strategy, Selection, Sepsis, Sepsis [Drug Therapy], Strategy, Therapy, Treatment, Tumor-Necrosis-Factor

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Full Text: [2011\Coc Dat Sys Rev2011, CD006423.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006423.pdf)

Abstract: Background Glucagon-like peptide analogues are a new class of drugs used in the treatment of type 2 diabetes that mimic the endogenous hormone glucagon-like peptide 1 (GLP-1). GLP-1 is an incretin, a gastrointestinal hormone that is released into the circulation in response to ingested nutrients. GLP-1 regulates glucose levels by stimulating glucose-dependent insulin secretion and biosynthesis, and by suppressing glucagon secretion, delayed gastric emptying and promoting satiety. Objectives To assess the effects of glucagon-like peptide analogues in patients with type 2 diabetes mellitus. Search strategy Studies were obtained from electronic searches of The Cochrane Library (last search issue 1, 2011), MEDLINE (last search March 2011), EMBASE (last search March 2011), Web of Science (last search March 2011) and databases of ongoing trials. Selection criteria Studies were included if they were randomised controlled trials of a minimum duration of eight weeks comparing a GLP-1 analogue with placebo, insulin, an oral anti-diabetic agent, or another GLP-1 analogue in people with type 2 diabetes. Data collection and analysis Data extraction and quality assessment of studies were done by one reviewer and checked by a second. Data were analysed by type of GLP-1 agonist and comparison treatment. Where appropriate, data were summarised in a meta-analysis (mean differences and risk ratios summarised using a random-effects model). Main results Seventeen randomised controlled trials including relevant analyses for 6899 participants were included in the analysis. Studies were mostly of short duration, usually 26 weeks. In comparison with placebo, all GLP-1 agonists reduced glycosylated haemoglobin A1c (HbA1c) levels by about 1%. Exenatide 2 mg once weekly reduced HbA1c more than exenatide 10 mu g twice daily, sitagliptin and pioglitazone. Liraglutide 1.8 mg reduced HbA1c by 0.33% more than exenatide 10 mu g twice daily. Liraglutide led to similar improvements in HbA1c compared to sulphonylureas but reduced it more than sitagliptin and rosiglitazone. Both exenatide and liraglutide led to greater weight loss than most active comparators, including in participants not experiencing nausea. Hypoglycaemia occurred more frequently in participants taking concomitant sulphonylurea. GLP-1 agonists caused gastrointestinal adverse effects, mainly nausea. These adverse events were strongest at the beginning and then subsided. Beta-cell function was improved with GLP-1 agonists but the effect did not persist after cessation of treatment. None of the studies was long enough to assess long-term positive or negative effects. Authors’ conclusions GLP-1 agonists are effective in improving glycaemic control.

Keywords: Adverse Effects, Adverse Events, Analysis, Assessment, Cardiovascular Risk-Factors, Cochrane, Control, Databases, Diabetes, Diabetes Mellitus, Differences, Double-Blind, Drugs, Embase, Exenatide, Extraction, Gastrointestinal, Glp-1, Haemoglobin, Hormone, Human Glp-1 Analog, Improved Treatment Satisfaction, Improves Glycemic Control, Insulin, Insulin Glargine, Lowers Body-Weight, Medline, Meta Analysis, Meta-Analysis, Model, Once-Daily Liraglutide, Open-Label Trial, Oral, Parallel-Group, Patients, Quality, Risk, Science, Search Strategy, Selection, Strategy, Treatment, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Web of Science, Weight Loss

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Full Text: [2011\Coc Dat Sys Rev2011, CD007103.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007103.pdf)

Abstract: Background Current cancer care increasingly incorporates psychosocial interventions. Cancer patients use dance/movement therapy to learn to accept and reconnect with their bodies, build new self-confidence, enhance self-expression, address feelings of isolation, depression, anger and fear and to strengthen personal resources. Objectives To compare the effects of dance/movement therapy and standard care with standard care alone or standard care and other interventions in patients with cancer. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 2), MEDLINE, EMBASE, CINAHL, PsycINFO, LILACS, Science Citation Index, CancerLit, International Bibliography of Theatre and Dance, Proquest Digital Dissertations, ClinicalTrials.gov, Current Controlled Trials and the National Research Register (all to March 2011). We handsearched dance/movement therapy and related topics journals, reviewed reference lists and contacted experts. There was no language restriction. Selection criteria We included all randomized and quasi-randomized controlled trials of dance/movement therapy interventions for improving psychological and physical outcomes in patients with cancer. Data collection and analysis Two review authors independently extracted the data and assessed the methodological quality. Results were presented using standardized mean differences. Main results We included two studies with a total of 68 participants. No evidence was found for an effect of dance/movement therapy on body image in women with breast cancer. The data of one study with moderate risk of bias suggested that dance/movement therapy had a large beneficial effect on participants’ quality of life (QoL). The second trial reported a large beneficial effect on fatigue. However, this trial was at high risk of bias. The individual studies did not find support for an effect of dance/movement therapy on mood, distress, and mental health. It is unclear whether this was due to ineffectiveness of the treatment or limited power of the trials. Finally, the results of one study did not find evidence for an effect of dance/movement therapy on shoulder range of motion (ROM) or arm circumference in women who underwent a lumpectomy or breast surgery. However, this was likely due to large within-group variability for shoulder ROM and a limited number of participants with lymphedema. Authors’ conclusions We did not find support for an effect of dance/movement therapy on body image. The findings of one study suggest that dance/movement therapy may have a beneficial effect on QoL. However, the limited number of studies prevents us from drawing conclusions concerning the effects of dance/movement therapy on psychological and physical outcomes in cancer patients.

Keywords: Analysis, Authors, Bias, Bibliography, Body, Breast Cancer, Breast-Cancer, Cancer, Care, Citation, Cochrane, Dance, Depression, Diagnosis, Differences, Dissertations, Distress, Embase, Fatigue, Interventions, Journals, Medline, Mental Health, Mood, Movement, Outcomes, Patients, Power, Prevalence, Psychological, Psychosocial, Quality, Quality of Life, Research, Review, Risk, Scale, Science, Science Citation Index, Search Strategy, Selection, Strategy, Surgery, Therapy, Topics, Treatment, Variability, Women

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Full Text: [2011\Coc Dat Sys Rev2011, CD007368.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007368.pdf)

Abstract: Background Diarrhoeal disorders and acute respiratory infections (ARIs), especially pneumonia, are the most common causes of death in low-income countries. Studies evaluating the impact of zinc supplementation as an adjunct in the management of pneumonia are limited and have shown variable results. Objectives To evaluate zinc supplementation, as an adjunct to antibiotics, in the treatment (clinical recovery) of pneumonia in children aged two to 59 months. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 1), which contains the Cochrane Acute Respiratory Infections (ARI) Group’s and the Cochrane Infectious Diseases Group’s Specialised Registers, MEDLINE (1950 to March week 2, 2011), EMBASE (1974 to March 2011), CINAHL (1981 to March 2011), LILACS (1985 to March 2011), AMED (1985 to March 2011), CAB Abstracts (1910 to March 2011) and Web of Science (2000 to March 2011). Selection criteria Randomised control trials (RCTs) evaluating supplementation of zinc as an adjunct to antibiotics for pneumonia in children aged two to 59 months. Data collection and analysis Two review authors independently assessed trial eligibility and screened all available titles and abstracts for inclusion. If the relevance could not be ascertained by screening the title and abstract, we retrieved and reviewed the full text of the article. Main results We included four trials in which 3267 children aged two to 35 months participated. Analysis showed that zinc supplementation in addition to standard antibiotic therapy in children with severe and non-severe pneumonia failed to show a statistically significant effect on clinical recovery (risk ratio (RR) 1.02; 95% confidence interval (CI) 0.93 to 1.11). Similary, zinc supplementation in children with severe pneumonia, as an adjunct to standard antibiotic therapy, did not show a statistically significant effect on clinical recovery measured as resolution of tachypnoea (respiratory rate > 50 breaths per minute) (RR 1.13; 95% CI 0.82 to 1.57) and cessation of chest indrawing (RR 1.08; 95% CI 0.88 to 1.31) as compared to the control group. Zinc supplementation in children with severe pneumonia also showed a non-significant effect on the duration of hospitalization stay as compared to the control (RR 1.04; 95% CI 0.89 to 1.22). Authors’ conclusions Evidence provided in this review is insufficient to recommend the use of zinc as an adjunct to standard antibiotic therapy for pneumonia in children aged two to 35 months.

Keywords: Acute, Aged, Analysis, Antibiotic, Antibiotics, Authors, Chest Indrawing, Childhood Pneumonia, Children, Cochrane, Control, Diarrhea, Diseases, Double-Blind, Embase, Hospitalization, Impact, Infection, Laboratory Diagnosis, Management, Medline, Pneumonia, Prevention, Randomized Controlled-Trial, Ratio, Recovery, Respiratory, Respiratory Infections, Review, Risk, Science, Screening, Search Strategy, Selection, Strategy, Therapy, Treatment, Urban, Vitamin-A, Web of Science, Young-Children, Zinc

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Full Text: [2011\Coc Dat Sys Rev2011, CD007577.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007577.pdf)

Abstract: Background Pneumonia is the most common hospital-acquired infection affecting patients in the intensive care unit (ICU). However, the optimal duration of antibiotic therapy for hospital-acquired pneumonia (HAP) is uncertain. Objectives To assess the effectiveness of short versus prolonged-course antibiotic administration for HAP in critically ill adults, including patients with ventilator-associated pneumonia (VAP). Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 1), which includes the Cochrane Acute Respiratory Infections Group’s Specialised Register, MEDLINE (1950 to February week 4, 2011), EMBASE (1974 to March 2011), LILACS (1985 to March 2011) and Web of Science (1985 to March 2011). Selection criteria We considered all randomised controlled trials (RCTs) comparing fixed durations of antibiotic therapy, or comparing a protocol intended to limit duration of therapy with standard care, for HAP (including patients with VAP) in critically ill adults. Data collection and analysis Two review authors conducted data extraction and assessment of risk of bias. We contacted trial authors for additional information. Main results Eight studies (1703 patients) were included. Methodology varied considerably and we found little evidence regarding patients with a high probability of HAP who were not mechanically ventilated. For patients with VAP, a short seven to eight-day course of antibiotics compared with a prolonged 10 to 15-day course (three studies, N = 508) increased 28-day antibiotic-free days (odds ratio (OR) 4.02; 95% confidence interval (CI) 2.26 to 5.78) and reduced recurrence of VAP due to multi-resistant organisms (OR 0.44; 95% CI 0.21 to 0.95), without adversely affecting other outcomes. However, for cases of VAP due to non-fermenting Gram-negative bacilli (NF-GNB), recurrence was greater after short-course therapy (OR 2.18; 95% CI 1.14 to 4.16; two studies, N = 176), though other outcome measures did not significantly differ. Discontinuation strategies utilising clinical features (one study; N = 302) or procalcitonin (three studies; N = 323) led to a reduction in duration of therapy and, in the procalcitonin studies, increased 28-day antibiotic-free days (mean difference (MD) 2.80; 95% CI 1.39 to 4.21) without negatively affecting other outcomes. Authors’ conclusions We conclude that for patients with VAP not due to NF-GNB, a short fixed-course (seven or eight days) antibiotic therapy may be more appropriate than a prolonged course (10 to 15 days). Use of an individualised strategy (incorporating clinical features or serum procalcitonin) appears to safely reduce duration of antibiotic therapy for VAP.

Keywords: Adults, Analysis, Antibiotic, Antibiotics, Antimicrobial Therapy, Assessment, Authors, Bias, Care, Cochrane, Duration, Effectiveness, Embase, Extraction, Icu, Infection, Information, Intensive Care, Intensive Care Unit, Intensive-Care Units, Medline, Metaanalysis, Methodology, Outcome, Outcomes, Patients, Pneumonia, Procalcitonin, Protocol, Randomized Controlled-Trial, Ratio, Recurrence, Reduction, Review, Risk, Science, Search Strategy, Selection, Septic Patients, Strategy, Therapy, Ventilator-Associated Pneumonia, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD007946.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007946.pdf)

Abstract: Background Tinnitus is the perception of sound, in the ear or in the head, in the absence of any external acoustic stimulation. Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive means of inducing electrical currents in the brain, and has received increasing attention in recent years for the treatment of many neuropsychiatric disorders, including tinnitus. Objectives To assess the effectiveness and safety of rTMS versus placebo in patients with tinnitus. Search strategy We searched the Cochrane Ear, Nose and Throat Disorders Group Trials Register; the Cochrane Central Register of Controlled Trials (CENTRAL); PubMed; EMBASE; CINAHL; Web of Science; BIOSIS Previews; Cambridge Scientific Abstracts; ICTRP and additional sources for published and unpublished trials. The date of the most recent search was 24 May 2011. Selection criteria Randomised controlled trials of rTMS versus sham rTMS. Data collection and analysis Two review authors reviewed the titles, abstracts and keywords of all records retrieved. Three review authors independently collected and extracted data, and assessed the risk of bias of the trials. Main results Five trials comprising of 233 participants met our inclusion criteria. Each study described the use of a different rTMS device that delivered different waveforms at different frequencies. All five trials were relatively small studies but generally they demonstrated a low risk of bias. When considering the impact of tinnitus on patients’ quality of life, the results of only one study demonstrated a statistically significant improvement in Tinnitus Handicap Inventory (THI) scores at four months follow-up (defined as a ‘partial improvement’ by the study authors (THI reduction of 21% to 80%)) when low-frequency rTMS was compared with a sham control treatment. However, no statistically significant improvement was demonstrated by another two studies that considered rTMS at the same frequency. Furthermore, this single positive finding should be taken in the context of the many different variables which were recorded at many different points in time by the study authors. In accordance with our pre-specified subgroup analysis we extracted the data from one study to consider the differential effectiveness between ‘lower’ low-frequency rTMS (1 Hz) and ‘higher’ low-frequency rTMS (10 Hz, 25 Hz). In doing this we were able to demonstrate a statistically significant difference between rTMS employing a frequency of 1 Hz and the sham group when considering tinnitus severity and disability after four months follow-up (‘partial’ improvement). However, no statistically significant difference was demonstrated between 10 Hz and 25 Hz rTMS, and the sham control group, when considering the severity and disability of tinnitus at four months follow-up. When considering tinnitus loudness in patients undergoing rTMS we were able to demonstrate a statistically significant reduction in tinnitus loudness when the results of two studies were pooled (risk ratio 4.17, 95% confidence interval 1.30 to 13.40). However, this finding was based on two small trials and consequently the confidence interval was particularly wide. No serious adverse effects were reported in any of the trials. Authors’ conclusions There is very limited support for the use of low-frequency rTMS for the treatment of patients with tinnitus. When considering the impact of tinnitus on patients’ quality of life, support is from a single study with a low risk of bias based on a single outcome measure at a single point in time. When considering the impact on tinnitus loudness, this is based on the analysis of pooled data with a large confidence interval. Studies suggest that rTMS is a safe treatment for tinnitus in the short-term, however there were insufficient data to provide any support for the safety of this treatment in the long-term. More prospective, randomised, placebo-controlled, double-blind studies with large sample sizes are needed to confirm the effectiveness of rTMS for tinnitus patients. Uniform, validated, tinnitus-specific questionnaires and measurement scales should be used in future studies.

Keywords: Acute Acoustic Trauma, Adverse Effects, Analysis, Attention, Authors, Bias, Brain, Cochrane, Control, Disability, Double-Blind, Effectiveness, Efficacy, Embase, Follow-Up, Frequency, Ginkgo-Biloba, Impact, Low, Measurement, Noise, Occupational Hearing-Loss, Outcome, Patients, Perception, Points, Pubmed, Quality, Quality of Life, Questionnaires, Ratio, Reduction, Review, Risk, Rtms, Safety, Science, Search Strategy, Selection, Severity, Strategy, Tinnitus, Transcranial Magnetic Stimulation, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD009447.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009447.pdf)

Abstract: Background The choice of the appropriate perioperative thromboprophylaxis in patients with cancer depends on the relative benefits and harms of low molecular weight heparin (LMWH) and unfractionated heparin (UFH). Objectives to systematically review the evidence for the relative efficacy and safety of LMWH and UFH for perioperative thromboprophylaxis in patients with cancer. Search strategy A comprehensive search for trials of anticoagulation in cancer patients including a February 2010 electronic search of: the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE and ISI Web of Science. Selection criteria Randomized controlled trials (RCTs) that enrolled cancer patients undergoing a surgical intervention and compared the effects of LMWH to UFH on mortality, deep venous thrombosis (DVT), pulmonary embolism(PE), bleeding outcomes, and thrombocytopenia. Data collection and analysis Two review authors used a standardized form to independently extract in duplicate data on risk of bias, participants, interventions and outcomes of interest. Where possible, we conducted meta-analyses using the random-effects model. Main results of 8187 identified citations, we included 16 RCTs with 11,847 patients in the meta-analyses, all using preoperative prophylactic anticoagulation. The overall quality of evidence was moderate. The meta-analysis did not conclusively rule out either a beneficial or harmful effect of LMWH compared to UFH for the following outcomes: mortality (RR = 0.90; 95% CI 0.73 to 1.10), symptomatic DVT (RR = 0.73; 95% CI 0.23 to 2.28), PE (RR = 0.59; 95% CI 0.25 to1.41), minor bleeding (RR = 0.88; 95% CI 0.47 to 1.66) and major bleeding (RR = 0.84; 95% CI 0.52 to 1.36). LMWH was associated with lower incidence of wound hematoma (RR = 0.60; 95% CI 0.43, 0.84) while UFH was associated with higher incidence of intra-operative transfusion (RR = 1.16; 95% CI 0.69,1.62). Authors’ conclusions We found no difference between perioperative thromboprophylaxis with LMWH verus UFH in their effects on mortality and embolic outcomes in patients with cancer. Further trials are needed to more carefully evaluate the benefits and harms of different heparin thromboprophylaxis strategies in this population.

Keywords: Abdominal-Surgery, Analysis, Authors, Bias, Cancer, Citations, Cochrane, Deep-Vein Thrombosis, Double-Blind Trial, Efficacy, Embase, Fatal Pulmonary-Embolism, General-Surgery, Gynecological Surgery, Heparin, Incidence, Interest, Intervention, Interventions, ISI, ISI Web of Science, Low, Low-Dose Heparin, Low-Molecular-Weight, Medline, Meta Analysis, Meta-Analysis, Model, Molecular, Mortality, Multicenter Trial, Outcomes, Patients, Postoperative Venous Thromboembolism, Quality, Randomized Controlled Trials, Review, Risk, Safety, Science, Search Strategy, Selection, Standard Heparin, Strategy, Surgical, Thrombosis, Venous Thrombosis, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD008931.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008931.pdf)

Abstract: Background Every patient in residential healthcare has a bed. Falling out of bed is associated with preventable patient harm. Various interventions to prevent injury are available. Bed rails are the most common intervention designed to prevent patients falling out of bed; however, their effectiveness is uncertain and bed rail entrapment can also result in injuries. Objectives to assess the effectiveness of interventions designed to prevent patient injuries and falls from their beds. Search strategy We searched the Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials 2010, Issue 2 (The Cochrane Library), MEDLINE (Ovid), EMBASE (Ovid), CINAHL (EBSCO), ISOI Web of Science and Web-based trials registers (all to December 2010) as well as reference lists. Selection criteria Randomised controlled trials of interventions designed to prevent patient injuries from their beds which were conducted in hospitals, nursing care facilities or rehabilitation units were eligible for inclusion. Data collection and analysis Two review authors independently assessed the risk of bias and extracted data from the included studies. Authors contacted investigators to obtain missing information. Main results Two studies met the inclusion criteria, involving a total of 22,106 participants. One study tested low height beds and the other tested bed exit alarms. Both studies used standard care for their control group and both studies were conducted in hospitals. No study investigating bed rails met the inclusion criteria. Due to the clinical heterogeneity of the interventions in the included studies pooling of data and meta-analysis was inappropriate, and so the results of the studies are described. A single cluster randomised trial of low height beds in 18 hospital wards, including 22,036 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls in the bedroom (rate ratio 0.69, 95% CI 0.35 to 1.34), all falls (rate ratio 1.26, 95% CI 0.83 to 1.90) or patient injuries due to all falls (rate ratio 1.35, 95% CI 0.68 to 2.68). One randomised controlled trial of bed exit alarms in one hospital geriatric ward, involving 70 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls out of bed (rate ratio 0.25, 95% CI 0.03 to 2.24), all falls (rate ratio 0.42, 95% CI 0.15 to 1.18) or patient injuries due to all falls (no injuries in either group). Authors’ conclusions The effectiveness of interventions designed to prevent patient injuries from their beds (including bed rails, low height beds and bed exit alarms) remains uncertain. The available evidence shows no significant increase or decrease in the rate of injuries with the use of low height beds and bed exit alarms. Limitations of the two included studies include lack of blinding and insufficient power. No randomised controlled trials of bed rails were identified. Future reports should fully describe the standard care received by the control group.

Keywords: Analysis, Authors, Bias, Care, Cochrane, Control, Effectiveness, Embase, Fall-Related Injuries, Falls, Frequency, Geriatric, Hospital, Hospitalized-Patients, Hospitals, Information, Injury, Intervention, Interventions, Low, Medline, Meta Analysis, Meta-Analysis, Multifactorial Intervention, Nursing, Nursing-Home Residents, Older-People, Patients, Physical Restraint, Power, Randomised Controlled Trial, Randomized Controlled-Trial, Ratio, Reduction, Rehabilitation, Residential, Review, Risk, Risk-Factors, Science, Search Strategy, Selection, Side Rail Use, Strategy, Vitamin-D, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006006.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006006.pdf)

Abstract: Background Prostaglandins may reduce ischaemic injury after liver transplantation. Several small randomised trials have evaluated the effects of prostaglandins in patients undergoing liver transplantation. Results of these trials are inconsistent, and none has enough power to reliably exclude effects of prostaglandins. Objectives to assess the benefits and harms of prostaglandin E1 or E2 in adult liver-transplanted patients. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and LILACS (search on 20 April 2011). In addition, we perused the reference lists of the identified studies and contacted trials investigators, and national and international experts in order to identify more trials for the review. Selection criteria We included randomised clinical trials evaluating prostaglandin E1 or E2 initiated in the perioperative period versus placebo or standard treatment for adult patients undergoing liver transplantation. We did not apply any language or publication status restrictions. Data collection and analysis Two authors independently evaluated methodological quality, ie, risk of bias of the included trials, and extracted data using standardised data extraction forms. We contacted trial investigators in attempt to retrieve information not available in the original manuscripts. We used random-effects model meta-analyses and fixed-effect model meta-analyses to estimate the odds ratio with 95% confidence interval (CI). Main results We included ten trials in which 652 patients were randomised. The risk of bias was considered high in most trials. There was no significant effect of prostaglandins on all-cause mortality (37/298[12.4%] in prostaglandin group versus 47/312[15.1%] in control group; OR 0.84, 95% CI 0.53 to 1.37; I(2) = 0%), on primary non-function of the allograft (8/238 [3.4%] versus. 16/250[6.4%]; OR 0.55, 95% CI 0.23 to 1.33; I(2) = 0%), and on liver re-transplantation (12/161[7.5%] versus 14/171[8.2%]; OR 0.99, 95% CI 0.44 to 2.25; I(2) = 0%). Prostaglandins seemed to significantly decrease the risk of acute kidney failure requiring dialysis (13/158[8.2%] versus 34/171[9.9%]; OR 0.37, 95% CI 0.18 to 0.75; I(2) = 0%). There was no significant increase in the risk of adverse events with prostaglandins. Authors’ conclusions We found no evidence that the administration of prostaglandins to liver transplanted patients reduces the risk of death, primary non-function of the allograft, or liver re-transplantation. Prostaglandins might reduce the risk of acute kidney failure requiring dialysis, but the quality of the evidence is considered only moderate due to high risk of bias in most of the included trials. Moreover, there are risks of outcome measure reporting bias and random errors. Therefore, further randomised, placebo-controlled trials are deemed necessary.

Keywords: Acute, Adult, Adverse Events, Analysis, Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Cochrane, Control, Dialysis, Double-Blind, Embase, Empirical-Evidence, Extraction, Graft Nonfunction, Improve Renal-Function, Information, Injury, Liver Transplantation, Medline, Metaanalyses, Model, Mortality, Outcome, Patients, Power, Primary, Prostacyclin, Publication, Quality, Randomized-Trials, Ratio, Reperfusion Injury, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Transplantation, Treatment

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Full Text: [2011\Coc Dat Sys Rev2011, CD005531.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005531.pdf)

Abstract: Background Measles is an infectious disease caused by the Morbillivirus. Chinese physicians believe that medicinal herbs are effective in alleviating symptoms and preventing complications. Chinese herbal medicines are dispensed according to the particular symptoms. This is the second update of a Cochrane Review first published in 2006. Objectives to assess the effectiveness and possible adverse effects of Chinese medicinal herbs for measles. Search strategy We searched the Cochrane Central Register of Controlled Clinical Trials (CENTRAL Issue 1, 2011) which contains the Cochrane Acute Respiratory Infections Group’s Specialised Register, MEDLINE (1966 to March week 5, 2011), EMBASE (1980 to April 2011), Web of Science (2005 to 30 April 2011), AMED (1985 to 30 April 2011), Chinese Biomedical Database (1976 to 30 June 2011), VIP Information (1989 to 30 June 2011), China National Knowledge Infrastructure (CNKI) (1976 to 30 June 2011), Chinese Journals full-article database (1994 to 30 June 2011) and the m et a Register of Controlled Trials for ongoing trials. Selection criteria Randomised controlled trials (RCTs) of Chinese medicinal herbs in patients with measles (without complications). Data collection and analysis Two review authors (SC, TW) independently assessed trial quality and extracted data. We telephone interviewed the trial authors for missing information regarding participant allocation. Some trials allocated participants according to the sequence they were admitted to the trials, that is to say, by using a pseudo-random allocation method. None of the trials concealed the allocation or used blinding methods. Main results We did not identify any suitable trials for inclusion. In this updated review we identified 80 trials which claimed to use random allocation. We contacted 32 trial authors by telephone and learned that the allocation methods used were not randomised. We excluded 34 studies because the participants experienced complications such as pneumonia. We excluded 10 trials because of non-random allocation and complications experienced by the participants. We were unable to contact the remaining four trials’ authors, so they require further assessment and have been allocated to the ‘Studies awaiting classification’ section. Authors’ conclusions There is no RCT evidence for or against Chinese medicinal herbs as a treatment for measles. We hope high-quality, robust RCTs in this field will be conducted in the future.

Keywords: Adult, Adverse Effects, Analysis, Assessment, Authors, Child, China, Cochrane, Complications, Database, Disease, Drugs, Chinese Herbal [Therapeutic Use], Effectiveness, Embase, Herbal, Humans, Information, Journals, Knowledge, Measles [Drug Therapy], Medline, Patients, Physicians, Pneumonia, Quality, Review, Science, Search Strategy, Selection, Strategy, Symptoms, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006933.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006933.pdf)

Abstract: Background Infections cause both morbidity and mortality in patients undergoing liver resection. Various methods have been advocated to decrease the infectious complications after liver resection. We do not know if they are of any benefit to the patient or the health-care funder. Objectives to determine the benefits and harms of different interventions in decreasing the infectious complications and improving the outcomes after liver resection. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrae Library, MEDLINE, EMBASE, and Science Citation Index Expanded until August 2011. Selection criteria We included all randomised clinical trials that were performed to compare interventions aimed at decreasing the infectious complications after liver resection. Data collection and analysis Two authors independently identified the trials and extracted the data. We analysed the data with both the fixed-effect and the random-effects model using RevMan Analysis. For each outcome we calculated the risk ratio (RR), rate ratio, or mean difference (MD) with 95% confidence intervals (CI) based on available patient data analysis. Main results We included seven trials including 521 patients for this review. The sample size in the trials varied from 12 to 180 patients. All the trials were of high risks of systematic errors and of random errors. Four trials included patients who underwent liver resection only. In the remaining three trials, patients underwent combined liver resection with extrahepatic biliary resection resulting in a biliary enteric anastomosis. Four trials included only major liver resection. The remaining three trials included a mixture of major and minor liver resections. It appears that the proportion of cirrhotic patients in the trials was very low. The comparisons performed included whether antibiotics are necessary routinely during the peri-operative period of liver resection, the duration of antibiotics, the use of prebiotics and probiotics in the perioperative period, use of recombinant bactericidal-permeability increasing protein 21 (rBPI21), and the use of topical povidone iodine gel at the time of wound closure. Only one or two trials were included under each comparison. There was no significant differences in mortality or severe morbidity in any of the comparisons. Quality of life was not reported in any of the trials. Authors’ conclusions There is currently no evidence to support or refute the use of any treatment to reduce infectious complications after liver resections. Further well designed trials with low risk of systematic error and low risk of random errors are necessary.

Keywords: Analysis, Antibiotics, Authors, Bias, Biliary Cancer-Surgery, Citation, Clinical Trials, Clinical-Trials, Cochrane, Complications, Confidence Intervals, Differences, Embase, Empirical-Evidence, Gel, Health Care, Hepatic Resection, Increasing Protein Rbpi(21), Infection, Interventions, Low, Medline, Metaanalysis, Methods, Model, Morbidity, Mortality, Outcome, Outcomes, Patients, Perioperative Synbiotic Treatment, Probiotics, Quality, Quality of Life, Randomized Controlled-Trial, Ratio, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Systematic, Treatment

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Full Text: [2011\Coc Dat Sys Rev2011, CD007992.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007992.pdf)

Abstract: Background It has been suggested that impairments associated with autism spectrum disorders (ASD) may be partially explained by deficits of omega-3 fatty acids, and that supplementation of these essential fatty acids may lead to improvement of symptoms. Objectives to review the efficacy of omega-3 fatty acids for improving core features of ASD (for example, social interaction, communication, and stereotypies) and associated symptoms. Search strategy We searched the following databases on 2 June 2010: CENTRAL (2010, Issue 2), MEDLINE (1950 to May Week 3 2010), EMBASE (1980 to 2010 Week 21), PsycINFO (1806 to current), BIOSIS (1985 to current), CINAHL (1982 to current), Science Citation Index (1970 to current), Social Science Citation Index (1970 to current), metaRegister of Controlled Trials (20 November 2008) and ClinicalTrials.gov (10 December 2010). Dissertation Abstracts International was searched on 10 December 2008, but was no longer available to the authors or editorial base in 2010. Selection criteria All randomised controlled trials of omega-3 fatty acids supplementation compared to placebo in individuals with ASD. Data collection and analysis Three authors independently selected studies, assessed them for risk of bias and extracted relevant data. We conducted meta-analysis of the included studies for three primary outcomes (social interaction, communication, and stereotypy) and one secondary outcome (hyperactivity). Main results We included two trials with a total of 37 children diagnosed with ASD who were randomised into groups that received either omega-3 fatty acids supplementation or a placebo. We excluded six trials because they were either non-randomised controlled trials, did not contain a control group, or the control group did not receive a placebo. Overall, there was no evidence that omega-3 supplements had an effect on social interaction (mean difference (MD) 0.82, 95% confidence interval (CI) -2.84 to 4.48, I(2) = 0%), communication (MD 0.62, 95% CI -0.89 to 2.14, I(2) = 0%), stereotypy (MD 0.77, 95% CI -0.69 to 2.22, I(2) = 8%), or hyperactivity (MD 3.46, 95% CI -0.79 to 7.70, I(2) = 0%). Authors’ conclusions to date there is no high quality evidence that omega-3 fatty acids supplementation is effective for improving core and associated symptoms of ASD. Given the paucity of rigorous studies in this area, there is a need for large well-conducted randomised controlled trials that examine both high and low functioning individuals with ASD, and that have longer follow-up periods.

Keywords: Adhd, Analysis, Authors, Autism, Bias, Children, Citation, Communication, Control, Controlled-Trial, Databases, Depressive Disorder, Double-Blind, Efficacy, Embase, Essential Fatty-Acids, Ethyl-Eicosapentaenoate, Fatty Acids, Follow-Up, International, Lead, Low, Medline, Meta Analysis, Meta-Analysis, Omega-3, Outcome, Outcomes, Prevalence, Primary, Quality, Ratio, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Social, Social Science, Strategy, Supplements, Symptoms

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Full Text: [2011\Coc Dat Sys Rev2011, CD004827.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD004827.pdf)

Abstract: Background Antibiotics alter the microbial balance within the gastrointestinal tract. Probiotics may prevent antibiotic-associated diarrhea (AAD) via restoration of the gut microflora. Antibiotics are prescribed frequently in children and AAD is common in this population. Objectives The primary objectives were to assess the efficacy and safety of probiotics (any specified strain or dose) used for the prevention of AAD in children. Search strategy MEDLINE, EMBASE, CENTRAL, CINAHL, AMED, and the Web of Science (inception to May 2010) were searched along with specialized registers including the Cochrane IBD/FBD review group, CISCOM (Centralized Information Service for Complementary Medicine), NHS Evidence, the International Bibliographic Information on Dietary Supplements as well as trial registries. Letters were sent to authors of included trials, nutra/pharmaceutical companies, and experts in the field requesting additional information on ongoing or unpublished trials. Conference proceedings, dissertation abstracts, and reference lists from included and relevant articles were also searched. Selection criteria Randomized, parallel, controlled trials in children (0 to 18 years) receiving antibiotics, that compare probiotics to placebo, active alternative prophylaxis, or no treatment and measure the incidence of diarrhea secondary to antibiotic use were considered for inclusion. Data collection and analysis Study selection, data extraction as well as methodological quality assessment using the risk of bias instrument was conducted independently and in duplicate by two authors. Dichotomous data (incidence of diarrhea, adverse events) were combined using a pooled relative risk and risk difference (adverse events), and continuous data (mean duration of diarrhea, mean daily stool frequency) as weighted mean differences, along with their corresponding 95% confidence intervals. For overall pooled results on the incidence of diarrhea, sensitivity analyses included available case versus extreme-plausible analyses and random-versus fixed-effectmodels. to explore possible explanations for heterogeneity, a priori subgroup analysis were conducted on probiotic strain, dose, definition of antibiotic-associated diarrhea, antibiotic agent as well as risk of bias. Main results Sixteen studies (3432 participants) met the inclusion criteria. Trials included treatment with either Bacillus spp., Bifidobacterium spp., Lactobacilli spp., Lactococcus spp., Leuconostoc cremoris, Saccharomyces spp., or Streptococcus spp., alone or in combination. Nine studies used a single strain probiotic agent, four combined two probiotic strains, one combined three probiotic strains, one product included ten probiotic agents, and one study included two probiotic arms that used three and two strains respectively. The risk of bias was determined to be high in 8 studies and low in 8 studies. Available case (patients who did not complete the studies were not included in the analysis) results from 15/16 trials reporting on the incidence of diarrhea show a large, precise benefit from probiotics compared to active, placebo or no treatment control. The incidence of AAD in the probiotic group was 9% compared to 18% in the control group (2874 participants; RR 0.52; 95% CI 0.38 to 0.72; I(2) = 56%). This benefit was not statistically significant in an extreme plausible (60% of children loss to follow-up in probiotic group and 20% loss to follow-up in the control group had diarrhea) intention to treat (ITT) sensitivity analysis. The incidence of AAD in the probiotic group was 16% compared to 18% in the control group (3392 participants; RR 0.81; 95% CI 0.63 to 1.04; I(2) = 59%). An a priori available case subgroup analysis exploring heterogeneity indicated that high dose (>= 5 billion CFUs/day) is more effective than low probiotic dose (< 5 billion CFUs/day), interaction P value = 0.010. For the high dose studies the incidence of AAD in the probiotic group was 8% compared to 22% in the control group (1474 participants; RR 0.40; 95% CI 0.29 to 0.55). For the low dose studies the incidence of AAD in the probiotic group was 8% compared to 11% in the control group (1382 participants; RR 0.80; 95% CI 0.53 to 1.21). An extreme plausible ITT subgroup analysis was marginally significant for high dose probiotics. For the high dose studies the incidence of AAD in the probiotic group was 17% compared to 22% in the control group (1776 participants; RR 0.72; 95% CI 0.53 to 0.99; I(2) = 58%). None of the 11 trials (n = 1583) that reported on adverse events documented any serious adverse events. Meta-analysis excluded all but an extremely small non-significant difference in adverse events between treatment and control (RD 0.00; 95% CI -0.01 to 0.02). Authors’ conclusions Despite heterogeneity in probiotic strain, dose, and duration, as well as in study quality, the overall evidence suggests a protective effect of probiotics in preventing AAD. Using 11 criteria to evaluate the credibility of the subgroup analysis on probiotic dose, the results indicate that the subgroup effect based on dose (>= 5 billion CFU/day) was credible. Based on high-dose probiotics, the number needed to treat (NNT) to prevent one case of diarrhea is seven (NNT 7; 95% CI 6 to 10). However, a GRADE analysis indicated that the overall quality of the evidence for the primary endpoint (incidence of diarrhea) was low due to issues with risk of bias (due to high loss to follow-up) and imprecision (sparse data, 225 events). The benefit for high dose probiotics (Lactobacillus rhamnosus or Saccharomyces boulardii) needs to be confirmed by a large well-designed randomized trial. More refined trials are also needed that test strain specific probiotics and evaluate the efficacy (e.g. incidence and duration of diarrhea) and safety of probiotics with limited losses to follow-up. It is premature to draw conclusions about the efficacy and safety of other probiotic agents for pediatric AAD. Future trials would benefit from a standard and valid outcomes to measure AAD.

Keywords: Adolescent, Adverse Events, Alternative, Analysis, Anti-Bacterial Agents [Adverse Effects], Antibiotic, Antibiotics, Assessment, Authors, Bacillus, Balance, Bias, Bibliographic, Child, Child,Preschool, Children, Clostridium-Difficile, Cochrane, Conference, Confidence Intervals, Control, Diarrhea [Chemically Induced, Differences, Double-Blind, Efficacy, Embase, Extraction, Female, Follow-Up, Frequency, Gastrointestinal, Grade, Helicobacter-Pylori Eradication, Humans, Incidence, Infant, Information, International, Lactobacillus-Gg, Loss to Follow-Up, Low, Male, Medline, Meta Analysis, Meta-Analysis, Necrotizing Enterocolitis, Outcomes, Patients, Pediatric, Placebo-Controlled Trial, Prevention, Prevention & Control], Primary, Probiotic, Probiotics, Probiotics [Therapeutic Use], Prophylaxis, Publication Bias, Quality, Randomized Controlled Trials As Topic, Randomized Controlled-Trials, Relative Risk, Restoration, Review, Risk, Risk-Factors, Saccharomyces-Boulardii, Safety, Science, Search Strategy, Selection, Sensitivity, Serious Adverse Events, Strategy, Tract, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD008716.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008716.pdf)

Abstract: Background Hepatic encephalopathy is a disorder of brain function as a result of liver failure and/or portosystemic shunt. Both hepatic encephalopathy (clinically overt) and minimal hepatic encephalopathy (not clinically overt) significantly impair patient’s quality of life and daily functioning and represent a significant burden on health care resources. Probiotics are live microorganisms, which when administered in adequate amounts may confer a health benefit on the host. Objectives to quantify the beneficial and harmful effects of any probiotic in any dosage, compared with placebo or no intervention, or with any other treatment for patients with any grade of acute or chronic hepatic encephalopathy as assessed from randomised trials. Search strategy We searched the The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, conference proceedings, reference lists of included trials and the WHO international clinical trials registry until April 2011 registry platform to identify new and ongoing trials. Selection criteria We included randomised trials that compared probiotics in any dosage with placebo or no intervention, or with any other treatment in patients with hepatic encephalopathy. Data collection and analysis Three authors independently assessed the risk of bias of the included trials and extracted data on relevant outcomes, with differences resolved by consensus. We conducted random-effects model meta-analysis due to obvious heterogeneity of patients and interventions. A P value of 0.05 or less was defined as significant. Dichotomous outcomes are expressed as risk ratio (RR) and continuous outcomes as mean difference (MD) with 95% confidence intervals (CI). Main results We included seven trials of which 550 participants were randomised. Four of the seven trials compared a probiotic with placebo or no treatment in 245 participants, another trial compared a probiotic with lactulose in 40 participants, and the remaining two trials compared a probiotic with both placebo and lactulose in 265 participants. Each trial used different types of probiotics. Duration of administration of the experimental intervention varied from 10 days to 180 days. Two trials were industry funded, and five were unclear about origin of funding. All trials had high risk of bias. When probiotics were compared with no treatment, there was no significant difference in all-cause mortality (2 trials, 105 participants; 1/57 (2%) versus 1/48 (2%): RR 0.72; 95% CI 0.08 to 6.60), lack of recovery (4 trials, 206 participants; 54/107 (50%) versus 68/99 (69%): RR 0.72; 95% CI 0.49 to 1.05), adverse events (3 trials, 145 participants; 2/77 (3%) versus 6/68 (9%): RR 0.34; 95% CI 0.08 to 1.42), quality of life (1 trial, 20 participants contributed to the physical quality of life measurement, 20 participants contributed to the mental quality of life: MD Physical 0.00; 95% CI -5.47 to 5.47; MD Mental 4.00; 95% CI -1.82 to 9.82), or change of/or withdrawal from treatment (3 trials, 175 participants; 11/92 (12%) versus 7/83 (8%): RR 1.28; 95% CI 0.52 to 3.19). No trial reported sepsis or duration of hospital stay as an outcome. Plasma ammonia concentration was significantly lower for participants treated with probiotic at one month (3 trials, 226 participants: MD -2.99 mu mol/L; 95% CI -5.70 to -0.29) but not at two months (3 trials, 181 participants: MD -1.82 mu mol/L; 95% CI -14.04 to 10.41). Plasma ammonia decreased the most in the participants treated with probiotic at three months (1 trial, 73 participants: MD -6.79 mu mol/L; 95% CI -10.39 to -3.19). When probiotics were compared with lactulose no trial reported all-cause mortality, quality of life, duration of hospital stay, or septicaemia. There were no significant differences in lack of recovery (3 trials, 173 participants; 47/87 (54%) versus 44/86 (51%): RR 1.05; 95% CI 0.75 to 1.47), adverse events (2 trials, 111 participants; 3/56 (5%) versus 6/55 (11%): RR 0.57; 95% CI 0.06 to 5.74), change of/or withdrawal from treatment at one month (3 trials, 190 participants; 8/95 (8%) versus 7/95 (7%): RR 1.10; 95% CI 0.40 to 3.03), plasma ammonia concentration (2 trials, 93 participants: MD -6.61 mu mol/L; 95% CI -30.05 to 16.84), or change in plasma ammonia concentration (1 trial, 77 participants: MD 1.16 mu mol/L; 95% CI -1.96 to 4.28). Authors’ conclusions The trials we located suffered from a high risk of systematic errors (‘bias’) and high risk of random errors (‘play of chance’). While probiotics appear to reduce plasma ammonia concentration when compared with placebo or no intervention, we are unable to conclude that probiotics are efficacious in altering clinically relevant outcomes. Demonstration of unequivocal efficacy is needed before probiotics can be endorsed as effective therapy for hepatic encephalopathy. Further randomised clinical trials are needed.

Keywords: Acute, Adverse Events, Ammonia, Analysis, Authors, Bias, Brain, Burden, Care, Cirrhotic-Patients, Citation, Clinical Trials, Cochrane, Confidence Intervals, Differences, Disorder, Double-Blind, Efficacy, Embase, Experimental, Fatty Liver-Disease, Fecal Flora, Funding, Gut Flora, Health Care, Hospital, Industry, Intervention, Interventions, Lactobacillus-Acidophilus, Measurement, Medline, Meta Analysis, Meta-Analysis, Microorganisms, Model, Mortality, Nonalcoholic Steatohepatitis, Outcome, Outcomes, Patients, Plasma, Probiotic, Probiotics, Quality, Quality of Life, Randomized Controlled-Trial, Ratio, Recovery, Risk, Science, Science Citation Index, Search Strategy, Selection, Sepsis, Spontaneous Bacterial Peritonitis, Strategy, Systematic, Therapy, Toll-Like Receptors, Treatment, Who

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Full Text: [2011\Coc Dat Sys Rev2011, CD003985.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003985.pdf)

Abstract: Background Helmets reduce bicycle-related head injuries, particularly in single vehicle crashes and those where the head strikes the ground. We aimed to identify non-legislative interventions for promoting helmet use among children, so future interventions can be designed on a firm evidence base. Objectives to assess the effectiveness of non-legislative interventions in increasing helmet use among children; to identify possible reasons for differences in effectiveness of interventions; to evaluate effectiveness with respect to social group; to identify adverse consequences of interventions. Search strategy We searched the following databases: Cochrane Injuries Group Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); MEDLINE; EMBASE; PsycINFO (Ovid); PsycEXTRA (Ovid); CINAHL (EBSCO); ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED); Social Sciences Citation Index (SSCI); Conference Proceedings Citation Index-Science (CPCI-S); and PubMed from inception to April 2009; TRANSPORT to 2007; and manually searched other sources of data. Selection criteria We included RCTs and CBAs. Studies included participants aged 0 to 18 years, described interventions promoting helmet use not requiring enactment of legislation and reported observed helmet wearing, self reported helmet ownership or self reported helmet wearing. Data collection and analysis Two independent review authors selected studies for inclusion and extracted data. We used random-effects models to estimate pooled odds ratios (ORs) (with 95% confidence interval (CI)). We explored heterogeneity with subgroup analyses. Main results We included 29 studies in the review, 21 of which were included in at least one meta-analysis. Non-legislative interventions increased observed helmet wearing (11 studies: OR 2.08, 95% CI 1.29 to 3.34). The effect was most marked amongst community-based interventions (four studies: OR 4.30, 95% 2.24 to 8.25) and those providing free helmets (two studies: OR 4.35, 95% CI 2.13 to 8.89). Significant effects were also found amongst school-based interventions (eight studies: OR 1.73, CI 95% 1.03 to 2.91), with a smaller effect found for interventions providing education only (three studies: OR 1.43, 95% CI 1.09 to 1.88). No significant effect was found for providing subsidised helmets (seven studies: OR 2.02, 95% CI 0.98 to 4.17). Interventions provided to younger children (aged under 12) may be more effective (five studies: OR 2.50, 95% CI 1.17 to 5.37) than those provided to children of all ages (five studies: OR 1.83, 95% CI 0.98 to 3.42). Interventions were only effective in increasing self reported helmet ownership where they provided free helmets (three studies: OR 11.63, 95% CI 2.14 to 63.16). Interventions were effective in increasing self reported helmet wearing (nine studies: OR 3.27, 95% CI 1.56 to 6.87), including those undertaken in schools (six studies: OR 4.21, 95% CI 1.06 to 16.74), providing free helmets (three studies: OR 7.27, 95% CI 1.28 to 41.44), providing education only (seven studies: OR 1.93, 95% CI 1.03 to 3.63) and in healthcare settings (two studies: OR 2.78, 95% CI 1.38 to 5.61). Authors’ conclusions Non-legislative interventions appear to be effective in increasing observed helmet use, particularly community-based interventions and those providing free helmets. Those set in schools appear to be effective but possibly less so than community-based interventions. Interventions providing education only are less effective than those providing free helmets. There is insufficient evidence to recommend providing subsidised helmets at present. Interventions may be more effective if provided to younger rather than older children. There is evidence that interventions offered in healthcare settings can increase self reported helmet wearing. Further high-quality studies are needed to explore whether non-legislative interventions increase helmet wearing, and particularly the effect of providing subsided as opposed to free helmets, and of providing interventions in healthcare settings as opposed to in schools or communities. Alternative interventions (e.g. those including peer educators, those aimed at developing safety skills including skills in decision making and resisting peer pressure or those aimed at improving self esteem or self efficacy) need developing and testing, particularly for 11 to 18 year olds. The effect of interventions in countries with existing cycle helmet legislation and in low and middle-income countries also requires investigation.

Keywords: Adolescent, Aged, Analysis, And Middle-Income Countries, Authors, Behavior, Bicycle Helmet, Bicycling [Legislation & Jurisprudence, Child,Preschool, Children, Citation, Cochrane, Conference, Databases, Decision Making, Decision-Making, Differences, Education, Effectiveness, Efficacy, Embase, Emergency-Department, Head Protective Devices [Utilization] Child, Helmet, Helmet Use, Humans, Increase Bicycle, Injury, Interventions, Isi, Isi Web of Science, Low, Medline, Meta Analysis, Meta-Analysis, Metaanalysis, Pressure, Program, Promotion, Pubmed, Randomized Controlled-Trial, Review, Safety, Schools, Science, Science Citation Index, Sciences, Search Strategy, Selection, Self-Efficacy, Significant, Social, Social Sciences, Social Sciences Citation Index, SSCI, Statistics & Numerical Data], Strategy, Transport, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD003740.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003740.pdf)

Abstract: Background Rotavirus is a common neonatal nosocomial viral infection and epidemics with the newer P(6) G9 strains have been reported. Local mucosal immunity in the intestine to rotavirus is important in the resolution of infection and protection against subsequent infections. Oral administration of anti-rotaviral immunoglobulin preparationsmight be a useful strategy in preventing rotaviral infections, especially in low birth weight babies. Objectives to determine the effectiveness and safety of oral immunoglobulin preparations for the prevention of rotavirus infection in hospitalized low birthweight infants (birthweight < 2500 g) Search strategy The Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library), MEDLINE, EMBASE, CINAHL, biological Abstracts (BIOSIS), Science Citation Index for articles citing Barnes 1982 and the proceedings of the Pediatric Academic Societies from 1991 onwards were searched in July 2011. Ongoing trials were also searched at clinicaltrials.gov and controlled-trials.com Selection criteria The criteria used to select studies for inclusion were: 1) design: randomized or quasi-randomized controlled trials; 2) participants: hospitalized low birthweight infants; 3) intervention: oral immunoglobulin preparations for prevention of rotavirus infection compared to placebo OR no intervention; 4) at least one of the following outcomes were reported: all cause mortality during hospital stay, mortality due to rotavirus infection during hospital stay, rotavirus infection, duration of diarrhea, need for rehydration, duration of viral excretion, duration of infection control measures, length of hospital stay in days, recurrent diarrhea or chronic diarrhea. Data collection and analysis The two review authors independently abstracted data from the included trials. Main results One published study (Barnes 1982) was eligible for inclusion in this review. Barnes 1982 found no significant difference in the rates of rotavirus infection after oral gammaglobulin versus placebo in hospitalized low birthweight babies [RR 1.27 (95% CI 0.65 to 2.37)]. In the subset of infants who became infected with rotavirus after receiving gammaglobulin or placebo for prevention of rotavirus infection, there was no significant difference in the duration of rotavirus excretion between the group who had gammaglobulin (mean 2 days, range 1 to 4 days) and the group who had placebo (mean 3 days, range 1 to 6 days). Barnes 1982 reported no adverse effects after administration of oral immunoglobulin preparations. Authors’ conclusions Current evidence does not support the use of oral immunoglobulin preparations to prevent rotavirus infection in low birthweight infants. Researchers are encouraged to conduct well-designed neonatal trials using the newer preparations of anti-rotaviral immunoglobulins (colostrum, egg yolk immunoglobulins) and include cost effectiveness evaluations.

Keywords: Administration,Oral, Adverse Effects, Analysis, Authors, Birthweight, Children, Citation, Clinical-Trial, Cochrane, Control, Cost-Effectiveness, Design, Diarrhea, Effectiveness, Embase, Gastroenteritis, Group-A Rotavirus, Hospital, Humans, Immunization,Passive [Methods], Immunoglobulins [Administration & Dosage], Infant,Low Birth Weight, Infant,Newborn, Infants, Infection, Infection Control, Intervention, Intestine, Low, Low Birthweight, Medline, Mortality, Necrotizing Enterocolitis, Newborns, Oral, Outcomes, Prevention, Randomized Controlled Trials As Topic, Researchers, Review, Risk-Factors, Rotavirus Infections [Prevention & Control], Safety, Science, Science Citation Index, Search Strategy, Selection, Strains, Strategy, Trypsin-Inhibitors

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Full Text: [2011\Coc Dat Sys Rev2011, CD009170.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009170.pdf)

Abstract: Background Surgeons and their assistants are especially at risk of exposure to blood due to glove perforations and needle stick injuries during operations. The use of blunt needles can reduce this risk because they don’t penetrate skin easily but still perform sufficiently in other tissues. Objectives to determine the effectiveness of blunt needles compared to sharp needles for preventing percutaneous exposure incidents among surgical staff. Search strategy We searched MEDLINE and EMBASE (until May 2011), CENTRAL, NHSEED, Science Citation Index Expanded, CINAHL, Nioshtic, CISdoc, PsycINFO, and LILACS (until September 2010). Selection criteria Randomised controlled trials (RCTs) of blunt versus sharp suture needles for preventing needle stick injuries among surgical staff measured as glove perforations or self-reported needle stick injuries. Data collection and analysis Two authors independently assessed study eligibility and risk of bias in trials and extracted data. We synthesized study results with a fixed-effect model meta-analysis. Main results We located 10 RCTs involving 2961 participating surgeons performing an operation in which the use of blunt needles was compared to the use of sharp needles. Four studies focused on abdominal closure, two on caesarean section, two on vaginal repair and two on hip replacement. On average, a surgeon that used sharp needles sustained one glove perforation in three operations. The use of blunt needles reduced the risk of glove perforations with a relative risk (RR) of 0.46 (95% confidence interval (CI) 0.38 to 0.54) compared to sharp needles. The use of blunt needles will thus prevent one glove perforation in every six operations. In four studies, the use of blunt needles reduced the number of self-reported needle stick injuries with a RR of 0.31 (95% CI 0.14 to 0.68). Because the force needed for the blunt needles is higher, their use was rated as more difficult but still acceptable in five out of six studies. The quality of the evidence was rated as high. Authors’ conclusions There is high quality evidence that the use of blunt needles appreciably reduces the risk of exposure to blood and bodily fluids for surgeons and their assistants over a range of operations. It is unlikely that future research will change this conclusion.

Keywords: Analysis, At Risk, Authors, Bias, Blood, Blood Exposure, Citation, Effectiveness, Embase, Exposure, Glove Perforations, Health-Care Workers, Injuries, Intervention, Medline, Meta Analysis, Meta-Analysis, Model, Nurses, Quality, Randomized-Controlled-Trial, Relative Risk, Research, Risk, Safety, Science, Science Citation Index, Search Strategy, Selection, Strategy, Surgical

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Full Text: [2011\Coc Dat Sys Rev2011, CD001208.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001208.pdf)

Abstract: Background Human albumin solutions are used for a range of medical and surgical problems. Licensed indications are the emergency treatment of shock and other conditions where restoration of blood volume is urgent, such as in burns and hypoproteinaemia. Human albumin solutions are more expensive than other colloids and crystalloids. Objectives to quantify the effect on mortality of human albumin and plasma protein fraction (PPF) administration in the management of critically ill patients. Search strategy We searched the Cochrane Injuries Group Specialised Register (searched 31 May 2011), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 2), MEDLINE (Ovid) (1948 to week 3 May 2011), EMBASE (Ovid) (1980 to Week 21 2011), CINAHL (EBSCO) (1982 to May 2011), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to May 2011), ISI Web of Science: Conference Proceedings Citation Index - Science (CPCI-S) (1990 to May 2011), PubMed (www.ncbi.nlm.nih.gov/sites/entrez/) (searched 10 June 2011, limit: last 60 days). Reference lists of trials and review articles were checked, and authors of identified trials were contacted. Selection criteria Randomised controlled trials comparing albumin or PPF with no albumin or PPF or with a crystalloid solution in critically ill patients with hypovolaemia, burns or hypoalbuminaemia. Data collection and analysis We collected data on the participants, albumin solution used, mortality at the end of follow up, and quality of allocation concealment. Analysis was stratified according to patient type. Main results We found 38 trials meeting the inclusion criteria and reporting death as an outcome. There were 1,958 deaths among 10,842 trial participants. For hypovolaemia, the relative risk of death following albumin administration was 1.02 (95% confidence interval (CI) 0.92 to 1.13). This estimate was heavily influenced by the results of the SAFE trial, which contributed 75.2% of the information (based on the weights in the meta-analysis). For burns, the relative risk was 2.93 (95% CI 1.28 to 6.72) and for hypoalbuminaemia the relative risk was 1.26 (95% CI 0.84 to 1.88). There was no substantial heterogeneity between the trials in the various categories (Chi(2) = 26.66, df = 31, P = 0.69). The pooled relative risk of death with albumin administration was 1.05 (95% CI 0.95 to 1.16). Authors’ conclusions For patients with hypovolaemia, there is no evidence that albumin reduces mortality when compared with cheaper alternatives such as saline. There is no evidence that albumin reduces mortality in critically ill patients with burns and hypoalbuminaemia. The possibility that there may be highly selected populations of critically ill patients in which albumin may be indicated remains open to question. However, in view of the absence of evidence of a mortality benefit from albumin and the increased cost of albumin compared to alternatives such as saline, it would seem reasonable that albumin should only be used within the context of well concealed and adequately powered randomised controlled trials.

Keywords: 5-Percent Albumin, Analysis, Authors, Blood, Blood Proteins [Therapeutic Use], Cerebral-Blood-Flow, Citation, Cochrane, Colloid Osmotic-Pressure, Conference, Critical Illness [Mortality, Critically Ill Patients, Embase, Emergency, Fluid Resuscitation, Fluid Therapy, Follow-Up, Human, Humans, Hypoalbuminemic Patients, Information, Intensive-Care-Unit, Isi, Isi Web of Science, Major Surgery, Management, Medical, Medline, Meta Analysis, Meta-Analysis, Mortality, Normal Saline, Outcome, Patients, Plasma, Plasma Substitutes [Therapeutic Use], Pubmed, Quality, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Relative Risk, Restoration, Review, Risk, Safe, Science, Science Citation Index, Search Strategy, Selection, Serum Albumin [Therapeutic Use], Serum Globulins, Strategy, Surgical, Therapy], Total Parenteral-Nutrition, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD009131.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009131.pdf)

Abstract: Background Cognitive deficits are a common manifestation in multiple sclerosis (MS) and have a wide effect on the patient’s quality of life. Alleviation of the harmful effects caused by these deficits should be a major goal of MS research and practice. Objectives The aim of this review was to evaluate the effects of neuropsychological/cognitive rehabilitation in MS by conducting a systematic review. Search strategy A systematic literature search was carried out on reports drawn from Cochrane MS Group Specialised Register (To October 2010), Evidence-based medicine (EBM) reviews (To September 2010), MEDLINE (January 1950 to September 2010), EMBASE (1974 to September 2010), PsycINFO (January 1806 to September 2010), WEB of SCIENCE (WOS) (January 1986 to September 2010), CINAHL (1982 to September 2010), and identified from the references in these reports. Selection criteria Randomised Controlled Trials (RCTs) and quasi-randomised trials evaluating the effects of neuropsychological rehabilitation in MS compared to other interventions or no intervention at all and employing neuropsychological rehabilitation methods and outcome measures were included. Data collection and analysis Two review authors individually judged the relevance, risk of bias, and content of the included studies. Results were combined quantitatively with meta-analyses according to the intervention type: 1) Cognitive training and 2) Cognitive training combined with other neuropsychological rehabilitation methods. In addition, narrative presentation was used in reporting the results of those studies which were inappropriate to be included in the meta-analysis. Main results Fourteen studies (770 MS patients) fulfilled the inclusion criteria. On the basis of these studies, low level evidence was found that neuropsychological rehabilitation reduces cognitive symptoms in MS. Cognitive training was found to improve memory span (standardised mean difference 0.54 (95% confidence interval 0.2 to 0.88, P = 0.002)), working memory (standardised mean difference 0.33 (95% confidence interval 0.09 to 0.57, P = 0.006)), and immediate visual memory (standardised mean difference 0.32 (95% confidence interval 0.04 to 0.6, P = 0.02)). There was no evidence of an effect of cognitive training combined with other neuropsychological rehabilitation methods on cognitive or emotional functions. The overall quality as well as the comparability of the included studies were relatively low due to methodological limitations and heterogeneity of outcome measures. Although most of the pooled results in the meta-analyses yielded no significant findings, twelve of the fourteen studies showed some evidence of positive effects when the studies were individually analysed. Authors’ conclusions The review indicates low level evidence for the positive effects of neuropsychological rehabilitation in MS. Interventions included in the review were heterogeneous. Consequently, clinical inferences can basically be drawn from single studies. Therefore, new trials may change the strength and direction of the evidence. to further strengthen the evidence, well-designed high quality studies are needed. In this systematic review, recommendations are given for improving the quality of future studies on the effects of neuropsychological rehabilitation in MS.

Keywords: Analysis, Authors, Bias, Brain Atrophy, Cochrane, Cognitive Rehabilitation, Diagnostic-Criteria, Efficacy, Embase, Evidence-Based Medicine, Follow-Up, Intervention, Interventions, Literature, Low, Medicine, Medline, Memory, Meta Analysis, Meta-Analysis, Ms Patients, Multiple Sclerosis, Of-Science, Outcome, Patients, People, Practice, Quality, Quality of Life, Randomized Controlled-Trial, Recommendations, Rehabilitation, Research, Review, Risk, Science, Search Strategy, Selection, Self-Generation, Strategy, Strength, Symptoms, Systematic, Systematic Review, Training, Web, Web-of-Science, Working-Memory

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Full Text: [2011\Coc Dat Sys Rev2011, MR000027.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20MR000027.pdf)

Abstract: Background In order to minimise publication bias, authors of systematic reviews often spend considerable time trying to obtain unpublished data. These include data from studies conducted but not published (unpublished data), as either an abstract or full-text paper, as well as missing data (data available to original researchers but not reported) in published abstracts or full-text publications. The effectiveness of different methods used to obtain unpublished or missing data has not been systematically evaluated. Objectives to assess the effects of different methods for obtaining unpublished studies (data) and missing data from studies to be included in systematic reviews. Search strategy We identified primary studies comparing different methods of obtaining unpublished studies (data) or missing data by searching the Cochrane Methodology Register (Issue 1, 2010), MEDLINE and EMBASE (1980 to 28 April 2010). We also checked references in relevant reports and contacted researchers who were known or who were thought likely to have carried out relevant studies. We used the Science Citation Index and PubMed ‘related articles’ feature to identify any additional studies identified by other sources (19 June 2009). Selection criteria Primary studies comparing different methods of obtaining unpublished studies (data) or missing data in the healthcare setting. Data collection and analysis The primary outcome measure was the proportion of unpublished studies (data) or missing data obtained, as defined and reported by the authors of the included studies. Two authors independently assessed the search results, extracted data and assessed risk of bias using a standardised data extraction form. We resolved any disagreements by discussion. Main results Six studies met the inclusion criteria; two were randomised studies and four were observational comparative studies evaluating different methods for obtaining missing data. Methods to obtain missing data Five studies, two randomised studies and three observational comparative studies, assessed methods for obtaining missing data (i.e. data available to the original researchers but not reported in the published study). Two studies found that correspondence with study authors by e-mail resulted in the greatest response rate with the fewest attempts and shortest time to respond. The difference between the effect of a single request for missing information (by e-mail or surface mail) versus a multistage approach (pre-notification, request for missing information and active follow-up) was not significant for response rate and completeness of information retrieved (one study). Requests for clarification of methods (one study) resulted in a greater response than requests for missing data. A well-known signatory had no significant effect on the likelihood of authors responding to a request for unpublished information (one study). One study assessed the number of attempts made to obtain missing data and found that the number of items requested did not influence the probability of response. In addition, multiple attempts using the same methods did not increase the likelihood of response. Methods to obtain unpublished studies One observational comparative study assessed methods to obtain unpublished studies (i.e. data for studies that have never been published). Identifying unpublished studies ahead of time and then asking the drug industry to provide further specific detail proved to be more fruitful than sending of a non-specific request. Authors’ conclusions Those carrying out systematic reviews should continue to contact authors for missing data, recognising that this might not always be successful, particularly for older studies. Contacting authors by e-mail results in the greatest response rate with the fewest number of attempts and the shortest time to respond.

Keywords: Analysis, Authors, Bias, Citation, Cochrane, Comparative Study, Controlled-Trials, Correspondence, Drug, Effectiveness, Email, Embase, Extraction, Follow-Up, Industry, Information, Medline, Metaanalysis, Methodology, Methods, Observational, Outcome, Primary, Publication, Publication Bias, Publications, Pubmed, Researchers, Retrieval, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Systematic, Systematic Reviews

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Full Text: [2011\Coc Dat Sys Rev2011, CD009447.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009447.pdf)

Abstract: Background The choice of the appropriate perioperative thromboprophylaxis in patients with cancer depends on the relative benefits and harms of low molecular weight heparin (LMWH) and unfractionated heparin (UFH). Objectives To systematically review the evidence for the relative efficacy and safety of LMWH and UFH for perioperative thromboprophylaxis in patients with cancer. Search strategy A comprehensive search for trials of anticoagulation in cancer patients including a February 2010 electronic search of: the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE and ISI Web of Science. Selection criteria Randomized controlled trials (RCTs) that enrolled cancer patients undergoing a surgical intervention and compared the effects of LMWH to UFH on mortality, deep venous thrombosis (DVT), pulmonary embolism(PE), bleeding outcomes, and thrombocytopenia. Data collection and analysis Two review authors used a standardized form to independently extract in duplicate data on risk of bias, participants, interventions and outcomes of interest. Where possible, we conducted meta-analyses using the random-effects model. Main results Of 8187 identified citations, we included 16 RCTs with 11,847 patients in the meta-analyses, all using preoperative prophylactic anticoagulation. The overall quality of evidence was moderate. The meta-analysis did not conclusively rule out either a beneficial or harmful effect of LMWH compared to UFH for the following outcomes: mortality (RR = 0.90; 95% CI 0.73 to 1.10), symptomatic DVT (RR = 0.73; 95% CI 0.23 to 2.28), PE (RR = 0.59; 95% CI 0.25 to1.41), minor bleeding (RR = 0.88; 95% CI 0.47 to 1.66) and major bleeding (RR = 0.84; 95% CI 0.52 to 1.36). LMWH was associated with lower incidence of wound hematoma (RR = 0.60; 95% CI 0.43, 0.84) while UFH was associated with higher incidence of intra-operative transfusion (RR = 1.16; 95% CI 0.69,1.62). Authors' conclusions We found no difference between perioperative thromboprophylaxis with LMWH verus UFH in their effects on mortality and embolic outcomes in patients with cancer. Further trials are needed to more carefully evaluate the benefits and harms of different heparin thromboprophylaxis strategies in this population.

Keywords: Abdominal-Surgery, Analysis, Authors, Bias, Cancer, Citations, Cochrane, Deep-Vein Thrombosis, Double-Blind Trial, Efficacy, Embase, Fatal Pulmonary-Embolism, General-Surgery, Gynecological Surgery, Heparin, Incidence, Interest, Intervention, Interventions, ISI, ISI Web of Science, Low, Low-Dose Heparin, Low-Molecular-Weight, Medline, Meta Analysis, Meta-Analysis, Model, Molecular, Mortality, Multicenter Trial, Outcomes, Patients, Postoperative Venous Thromboembolism, Quality, Randomized Controlled Trials, Review, Risk, Safety, Science, Search Strategy, Selection, Standard Heparin, Strategy, Surgical, Thrombosis, Venous Thrombosis, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD008931.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008931.pdf)

Abstract: Background Every patient in residential healthcare has a bed. Falling out of bed is associated with preventable patient harm. Various interventions to prevent injury are available. Bed rails are the most common intervention designed to prevent patients falling out of bed; however, their effectiveness is uncertain and bed rail entrapment can also result in injuries. Objectives To assess the effectiveness of interventions designed to prevent patient injuries and falls from their beds. Search strategy We searched the Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials 2010, Issue 2 (The Cochrane Library), MEDLINE (Ovid), EMBASE (Ovid), CINAHL (EBSCO), ISOI Web of Science and Web-based trials registers (all to December 2010) as well as reference lists. Selection criteria Randomised controlled trials of interventions designed to prevent patient injuries from their beds which were conducted in hospitals, nursing care facilities or rehabilitation units were eligible for inclusion. Data collection and analysis Two review authors independently assessed the risk of bias and extracted data from the included studies. Authors contacted investigators to obtain missing information. Main results Two studies met the inclusion criteria, involving a total of 22,106 participants. One study tested low height beds and the other tested bed exit alarms. Both studies used standard care for their control group and both studies were conducted in hospitals. No study investigating bed rails met the inclusion criteria. Due to the clinical heterogeneity of the interventions in the included studies pooling of data and meta-analysis was inappropriate, and so the results of the studies are described. A single cluster randomised trial of low height beds in 18 hospital wards, including 22,036 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls in the bedroom (rate ratio 0.69, 95% CI 0.35 to 1.34), all falls (rate ratio 1.26, 95% CI 0.83 to 1.90) or patient injuries due to all falls (rate ratio 1.35, 95% CI 0.68 to 2.68). One randomised controlled trial of bed exit alarms in one hospital geriatric ward, involving 70 participants, found no significant reduction in the frequency of patient injuries due to their beds (there were no injuries in either group), patient falls out of bed (rate ratio 0.25, 95% CI 0.03 to 2.24), all falls (rate ratio 0.42, 95% CI 0.15 to 1.18) or patient injuries due to all falls (no injuries in either group). Authors' conclusions The effectiveness of interventions designed to prevent patient injuries from their beds (including bed rails, low height beds and bed exit alarms) remains uncertain. The available evidence shows no significant increase or decrease in the rate of injuries with the use of low height beds and bed exit alarms. Limitations of the two included studies include lack of blinding and insufficient power. No randomised controlled trials of bed rails were identified. Future reports should fully describe the standard care received by the control group.

Keywords: Analysis, Authors, Bias, Care, Cochrane, Control, Effectiveness, Embase, Fall-Related Injuries, Falls, Frequency, Geriatric, Hospital, Hospitalized-Patients, Hospitals, Information, Injury, Intervention, Interventions, Low, Medline, Meta Analysis, Meta-Analysis, Multifactorial Intervention, Nursing, Nursing-Home Residents, Older-People, Patients, Physical Restraint, Power, Randomised Controlled Trial, Randomized Controlled-Trial, Ratio, Reduction, Rehabilitation, Residential, Review, Risk, Risk-Factors, Science, Search Strategy, Selection, Side Rail Use, Strategy, Vitamin-D, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006006.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006006.pdf)

Abstract: Background Prostaglandins may reduce ischaemic injury after liver transplantation. Several small randomised trials have evaluated the effects of prostaglandins in patients undergoing liver transplantation. Results of these trials are inconsistent, and none has enough power to reliably exclude effects of prostaglandins. Objectives To assess the benefits and harms of prostaglandin E1 or E2 in adult liver-transplanted patients. Search strategy We searched The Cochrane Hepato-Biliary Group Controlled Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and LILACS (search on 20 April 2011). In addition, we perused the reference lists of the identified studies and contacted trials investigators, and national and international experts in order to identify more trials for the review. Selection criteria We included randomised clinical trials evaluating prostaglandin E1 or E2 initiated in the perioperative period versus placebo or standard treatment for adult patients undergoing liver transplantation. We did not apply any language or publication status restrictions. Data collection and analysis Two authors independently evaluated methodological quality, ie, risk of bias of the included trials, and extracted data using standardised data extraction forms. We contacted trial investigators in attempt to retrieve information not available in the original manuscripts. We used random-effects model meta-analyses and fixed-effect model meta-analyses to estimate the odds ratio with 95% confidence interval (CI). Main results We included ten trials in which 652 patients were randomised. The risk of bias was considered high in most trials. There was no significant effect of prostaglandins on all-cause mortality (37/298[12.4%] in prostaglandin group versus 47/312[15.1%] in control group; OR 0.84, 95% CI 0.53 to 1.37; I(2) = 0%), on primary non-function of the allograft (8/238 [3.4%] versus. 16/250[6.4%]; OR 0.55, 95% CI 0.23 to 1.33; I(2) = 0%), and on liver re-transplantation (12/161[7.5%] versus 14/171[8.2%]; OR 0.99, 95% CI 0.44 to 2.25; I(2) = 0%). Prostaglandins seemed to significantly decrease the risk of acute kidney failure requiring dialysis (13/158[8.2%] versus 34/171[9.9%]; OR 0.37, 95% CI 0.18 to 0.75; I(2) = 0%). There was no significant increase in the risk of adverse events with prostaglandins. Authors' conclusions We found no evidence that the administration of prostaglandins to liver transplanted patients reduces the risk of death, primary non-function of the allograft, or liver re-transplantation. Prostaglandins might reduce the risk of acute kidney failure requiring dialysis, but the quality of the evidence is considered only moderate due to high risk of bias in most of the included trials. Moreover, there are risks of outcome measure reporting bias and random errors. Therefore, further randomised, placebo-controlled trials are deemed necessary.

Keywords: Acute, Adult, Adverse Events, Analysis, Authors, Bias, Citation, Clinical Trials, Clinical-Trials, Cochrane, Control, Dialysis, Double-Blind, Embase, Empirical-Evidence, Extraction, Graft Nonfunction, Improve Renal-Function, Information, Injury, Liver Transplantation, Medline, Metaanalyses, Model, Mortality, Outcome, Patients, Power, Primary, Prostacyclin, Publication, Quality, Randomized-Trials, Ratio, Reperfusion Injury, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Transplantation, Treatment

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Full Text: [2011\Coc Dat Sys Rev2011, CD005531.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD005531.pdf)

Abstract: Background Measles is an infectious disease caused by the Morbillivirus. Chinese physicians believe that medicinal herbs are effective in alleviating symptoms and preventing complications. Chinese herbal medicines are dispensed according to the particular symptoms. This is the second update of a Cochrane Review first published in 2006. Objectives To assess the effectiveness and possible adverse effects of Chinese medicinal herbs for measles. Search strategy We searched the Cochrane Central Register of Controlled Clinical Trials (CENTRAL Issue 1, 2011) which contains the Cochrane Acute Respiratory Infections Group's Specialised Register, MEDLINE (1966 to March week 5, 2011), EMBASE (1980 to April 2011), Web of Science (2005 to 30 April 2011), AMED (1985 to 30 April 2011), Chinese Biomedical Database (1976 to 30 June 2011), VIP Information (1989 to 30 June 2011), China National Knowledge Infrastructure (CNKI) (1976 to 30 June 2011), Chinese Journals full-article database (1994 to 30 June 2011) and the m et a Register of Controlled Trials for ongoing trials. Selection criteria Randomised controlled trials (RCTs) of Chinese medicinal herbs in patients with measles (without complications). Data collection and analysis Two review authors (SC, TW) independently assessed trial quality and extracted data. We telephone interviewed the trial authors for missing information regarding participant allocation. Some trials allocated participants according to the sequence they were admitted to the trials, that is to say, by using a pseudo-random allocation method. None of the trials concealed the allocation or used blinding methods. Main results We did not identify any suitable trials for inclusion. In this updated review we identified 80 trials which claimed to use random allocation. We contacted 32 trial authors by telephone and learned that the allocation methods used were not randomised. We excluded 34 studies because the participants experienced complications such as pneumonia. We excluded 10 trials because of non-random allocation and complications experienced by the participants. We were unable to contact the remaining four trials' authors, so they require further assessment and have been allocated to the 'Studies awaiting classification' section. Authors' conclusions There is no RCT evidence for or against Chinese medicinal herbs as a treatment for measles. We hope high-quality, robust RCTs in this field will be conducted in the future.

Keywords: Adult, Adverse Effects, Analysis, Assessment, Authors, Child, China, Cochrane, Complications, Database, Disease, Drugs,Chinese Herbal [Therapeutic Use], Effectiveness, Embase, Herbal, Humans, Information, Journals, Knowledge, Measles [Drug Therapy], Medline, Patients, Physicians, Pneumonia, Quality, Review, Science, Search Strategy, Selection, Strategy, Symptoms, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD006933.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD006933.pdf)

Abstract: Background Infections cause both morbidity and mortality in patients undergoing liver resection. Various methods have been advocated to decrease the infectious complications after liver resection. We do not know if they are of any benefit to the patient or the health-care funder. Objectives To determine the benefits and harms of different interventions in decreasing the infectious complications and improving the outcomes after liver resection. Search strategy We searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrae Library, MEDLINE, EMBASE, and Science Citation Index Expanded until August 2011. Selection criteria We included all randomised clinical trials that were performed to compare interventions aimed at decreasing the infectious complications after liver resection. Data collection and analysis Two authors independently identified the trials and extracted the data. We analysed the data with both the fixed-effect and the random-effects model using RevMan Analysis. For each outcome we calculated the risk ratio (RR), rate ratio, or mean difference (MD) with 95% confidence intervals (CI) based on available patient data analysis. Main results We included seven trials including 521 patients for this review. The sample size in the trials varied from 12 to 180 patients. All the trials were of high risks of systematic errors and of random errors. Four trials included patients who underwent liver resection only. In the remaining three trials, patients underwent combined liver resection with extrahepatic biliary resection resulting in a biliary enteric anastomosis. Four trials included only major liver resection. The remaining three trials included a mixture of major and minor liver resections. It appears that the proportion of cirrhotic patients in the trials was very low. The comparisons performed included whether antibiotics are necessary routinely during the peri-operative period of liver resection, the duration of antibiotics, the use of prebiotics and probiotics in the perioperative period, use of recombinant bactericidal-permeability increasing protein 21 (rBPI21), and the use of topical povidone iodine gel at the time of wound closure. Only one or two trials were included under each comparison. There was no significant differences in mortality or severe morbidity in any of the comparisons. Quality of life was not reported in any of the trials. Authors' conclusions There is currently no evidence to support or refute the use of any treatment to reduce infectious complications after liver resections. Further well designed trials with low risk of systematic error and low risk of random errors are necessary.

Keywords: Analysis, Antibiotics, Authors, Bias, Biliary Cancer-Surgery, Citation, Clinical Trials, Clinical-Trials, Cochrane, Complications, Confidence Intervals, Differences, Embase, Empirical-Evidence, Gel, Health Care, Hepatic Resection, Increasing Protein Rbpi(21), Infection, Interventions, Low, Medline, Metaanalysis, Methods, Model, Morbidity, Mortality, Outcome, Outcomes, Patients, Perioperative Synbiotic Treatment, Probiotics, Quality, Quality of Life, Randomized Controlled-Trial, Ratio, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Systematic, Treatment

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Full Text: [2011\Coc Dat Sys Rev2011, CD007992.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD007992.pdf)

Abstract: Background It has been suggested that impairments associated with autism spectrum disorders (ASD) may be partially explained by deficits of omega-3 fatty acids, and that supplementation of these essential fatty acids may lead to improvement of symptoms. Objectives To review the efficacy of omega-3 fatty acids for improving core features of ASD (for example, social interaction, communication, and stereotypies) and associated symptoms. Search strategy We searched the following databases on 2 June 2010: CENTRAL (2010, Issue 2), MEDLINE (1950 to May Week 3 2010), EMBASE (1980 to 2010 Week 21), PsycINFO (1806 to current), BIOSIS (1985 to current), CINAHL (1982 to current), Science Citation Index (1970 to current), Social Science Citation Index (1970 to current), metaRegister of Controlled Trials (20 November 2008) and ClinicalTrials.gov (10 December 2010). Dissertation Abstracts International was searched on 10 December 2008, but was no longer available to the authors or editorial base in 2010. Selection criteria All randomised controlled trials of omega-3 fatty acids supplementation compared to placebo in individuals with ASD. Data collection and analysis Three authors independently selected studies, assessed them for risk of bias and extracted relevant data. We conducted meta-analysis of the included studies for three primary outcomes (social interaction, communication, and stereotypy) and one secondary outcome (hyperactivity). Main results We included two trials with a total of 37 children diagnosed with ASD who were randomised into groups that received either omega-3 fatty acids supplementation or a placebo. We excluded six trials because they were either non-randomised controlled trials, did not contain a control group, or the control group did not receive a placebo. Overall, there was no evidence that omega-3 supplements had an effect on social interaction (mean difference (MD) 0.82, 95% confidence interval (CI) -2.84 to 4.48, I(2) = 0%), communication (MD 0.62, 95% CI -0.89 to 2.14, I(2) = 0%), stereotypy (MD 0.77, 95% CI -0.69 to 2.22, I(2) = 8%), or hyperactivity (MD 3.46, 95% CI -0.79 to 7.70, I(2) = 0%). Authors' conclusions To date there is no high quality evidence that omega-3 fatty acids supplementation is effective for improving core and associated symptoms of ASD. Given the paucity of rigorous studies in this area, there is a need for large well-conducted randomised controlled trials that examine both high and low functioning individuals with ASD, and that have longer follow-up periods.

Keywords: Adhd, Analysis, Authors, Autism, Bias, Children, Citation, Communication, Control, Controlled-Trial, Databases, Depressive Disorder, Double-Blind, Efficacy, Embase, Essential Fatty-Acids, Ethyl-Eicosapentaenoate, Fatty Acids, Follow-Up, International, Lead, Low, Medline, Meta Analysis, Meta-Analysis, Omega-3, Outcome, Outcomes, Prevalence, Primary, Quality, Ratio, Review, Risk, Science, Science Citation Index, Search Strategy, Selection, Social, Social Science, Strategy, Supplements, Symptoms

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Full Text: [2011\Coc Dat Sys Rev2011, CD004827.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD004827.pdf)

Abstract: Background Antibiotics alter the microbial balance within the gastrointestinal tract. Probiotics may prevent antibiotic-associated diarrhea (AAD) via restoration of the gut microflora. Antibiotics are prescribed frequently in children and AAD is common in this population. Objectives The primary objectives were to assess the efficacy and safety of probiotics (any specified strain or dose) used for the prevention of AAD in children. Search strategy MEDLINE, EMBASE, CENTRAL, CINAHL, AMED, and the Web of Science (inception to May 2010) were searched along with specialized registers including the Cochrane IBD/FBD review group, CISCOM (Centralized Information Service for Complementary Medicine), NHS Evidence, the International Bibliographic Information on Dietary Supplements as well as trial registries. Letters were sent to authors of included trials, nutra/pharmaceutical companies, and experts in the field requesting additional information on ongoing or unpublished trials. Conference proceedings, dissertation abstracts, and reference lists from included and relevant articles were also searched. Selection criteria Randomized, parallel, controlled trials in children (0 to 18 years) receiving antibiotics, that compare probiotics to placebo, active alternative prophylaxis, or no treatment and measure the incidence of diarrhea secondary to antibiotic use were considered for inclusion. Data collection and analysis Study selection, data extraction as well as methodological quality assessment using the risk of bias instrument was conducted independently and in duplicate by two authors. Dichotomous data (incidence of diarrhea, adverse events) were combined using a pooled relative risk and risk difference (adverse events), and continuous data (mean duration of diarrhea, mean daily stool frequency) as weighted mean differences, along with their corresponding 95% confidence intervals. For overall pooled results on the incidence of diarrhea, sensitivity analyses included available case versus extreme-plausible analyses and random-versus fixed-effectmodels. To explore possible explanations for heterogeneity, a priori subgroup analysis were conducted on probiotic strain, dose, definition of antibiotic-associated diarrhea, antibiotic agent as well as risk of bias. Main results Sixteen studies (3432 participants) met the inclusion criteria. Trials included treatment with either Bacillus spp., Bifidobacterium spp., Lactobacilli spp., Lactococcus spp., Leuconostoc cremoris, Saccharomyces spp., or Streptococcus spp., alone or in combination. Nine studies used a single strain probiotic agent, four combined two probiotic strains, one combined three probiotic strains, one product included ten probiotic agents, and one study included two probiotic arms that used three and two strains respectively. The risk of bias was determined to be high in 8 studies and low in 8 studies. Available case (patients who did not complete the studies were not included in the analysis) results from 15/16 trials reporting on the incidence of diarrhea show a large, precise benefit from probiotics compared to active, placebo or no treatment control. The incidence of AAD in the probiotic group was 9% compared to 18% in the control group (2874 participants; RR 0.52; 95% CI 0.38 to 0.72; I(2) = 56%). This benefit was not statistically significant in an extreme plausible (60% of children loss to follow-up in probiotic group and 20% loss to follow-up in the control group had diarrhea) intention to treat (ITT) sensitivity analysis. The incidence of AAD in the probiotic group was 16% compared to 18% in the control group (3392 participants; RR 0.81; 95% CI 0.63 to 1.04; I(2) = 59%). An a priori available case subgroup analysis exploring heterogeneity indicated that high dose (>= 5 billion CFUs/day) is more effective than low probiotic dose (< 5 billion CFUs/day), interaction P value = 0.010. For the high dose studies the incidence of AAD in the probiotic group was 8% compared to 22% in the control group (1474 participants; RR 0.40; 95% CI 0.29 to 0.55). For the low dose studies the incidence of AAD in the probiotic group was 8% compared to 11% in the control group (1382 participants; RR 0.80; 95% CI 0.53 to 1.21). An extreme plausible ITT subgroup analysis was marginally significant for high dose probiotics. For the high dose studies the incidence of AAD in the probiotic group was 17% compared to 22% in the control group (1776 participants; RR 0.72; 95% CI 0.53 to 0.99; I(2) = 58%). None of the 11 trials (n = 1583) that reported on adverse events documented any serious adverse events. Meta-analysis excluded all but an extremely small non-significant difference in adverse events between treatment and control (RD 0.00; 95% CI -0.01 to 0.02). Authors' conclusions Despite heterogeneity in probiotic strain, dose, and duration, as well as in study quality, the overall evidence suggests a protective effect of probiotics in preventing AAD. Using 11 criteria to evaluate the credibility of the subgroup analysis on probiotic dose, the results indicate that the subgroup effect based on dose (>= 5 billion CFU/day) was credible. Based on high-dose probiotics, the number needed to treat (NNT) to prevent one case of diarrhea is seven (NNT 7; 95% CI 6 to 10). However, a GRADE analysis indicated that the overall quality of the evidence for the primary endpoint (incidence of diarrhea) was low due to issues with risk of bias (due to high loss to follow-up) and imprecision (sparse data, 225 events). The benefit for high dose probiotics (Lactobacillus rhamnosus or Saccharomyces boulardii) needs to be confirmed by a large well-designed randomized trial. More refined trials are also needed that test strain specific probiotics and evaluate the efficacy (e.g. incidence and duration of diarrhea) and safety of probiotics with limited losses to follow-up. It is premature to draw conclusions about the efficacy and safety of other probiotic agents for pediatric AAD. Future trials would benefit from a standard and valid outcomes to measure AAD.

Keywords: Adolescent, Adverse Events, Alternative, Analysis, Anti-Bacterial Agents [Adverse Effects], Antibiotic, Antibiotics, Assessment, Authors, Bacillus, Balance, Bias, Bibliographic, Child, Child, Preschool, Children, Clostridium-Difficile, Cochrane, Conference, Confidence Intervals, Control, Diarrhea [Chemically Induced, Differences, Double-Blind, Efficacy, Embase, Extraction, Female, Follow-Up, Frequency, Gastrointestinal, Grade, Helicobacter-Pylori Eradication, Humans, Incidence, Infant, Information, International, Lactobacillus-Gg, Loss To Follow-Up, Low, Male, Medline, Meta Analysis, Meta-Analysis, Necrotizing Enterocolitis, Outcomes, Patients, Pediatric, Placebo-Controlled Trial, Prevention, Prevention & Control], Primary, Probiotic, Probiotics, Probiotics [Therapeutic Use], Prophylaxis, Publication Bias, Quality, Randomized Controlled Trials As Topic, Randomized Controlled-Trials, Relative Risk, Restoration, Review, Risk, Risk-Factors, Saccharomyces-Boulardii, Safety, Science, Search Strategy, Selection, Sensitivity, Serious Adverse Events, Strategy, Tract, Treatment, Web of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD008716.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD008716.pdf)

Abstract: Background Hepatic encephalopathy is a disorder of brain function as a result of liver failure and/or portosystemic shunt. Both hepatic encephalopathy (clinically overt) and minimal hepatic encephalopathy (not clinically overt) significantly impair patient's quality of life and daily functioning and represent a significant burden on health care resources. Probiotics are live microorganisms, which when administered in adequate amounts may confer a health benefit on the host. Objectives To quantify the beneficial and harmful effects of any probiotic in any dosage, compared with placebo or no intervention, or with any other treatment for patients with any grade of acute or chronic hepatic encephalopathy as assessed from randomised trials. Search strategy We searched the The Cochrane Hepato-Biliary Group Controlled Trials Register, The Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, conference proceedings, reference lists of included trials and the WHO international clinical trials registry until April 2011 registry platform to identify new and ongoing trials. Selection criteria We included randomised trials that compared probiotics in any dosage with placebo or no intervention, or with any other treatment in patients with hepatic encephalopathy. Data collection and analysis Three authors independently assessed the risk of bias of the included trials and extracted data on relevant outcomes, with differences resolved by consensus. We conducted random-effects model meta-analysis due to obvious heterogeneity of patients and interventions. A P value of 0.05 or less was defined as significant. Dichotomous outcomes are expressed as risk ratio (RR) and continuous outcomes as mean difference (MD) with 95% confidence intervals (CI). Main results We included seven trials of which 550 participants were randomised. Four of the seven trials compared a probiotic with placebo or no treatment in 245 participants, another trial compared a probiotic with lactulose in 40 participants, and the remaining two trials compared a probiotic with both placebo and lactulose in 265 participants. Each trial used different types of probiotics. Duration of administration of the experimental intervention varied from 10 days to 180 days. Two trials were industry funded, and five were unclear about origin of funding. All trials had high risk of bias. When probiotics were compared with no treatment, there was no significant difference in all-cause mortality (2 trials, 105 participants; 1/57 (2%) versus 1/48 (2%): RR 0.72; 95% CI 0.08 to 6.60), lack of recovery (4 trials, 206 participants; 54/107 (50%) versus 68/99 (69%): RR 0.72; 95% CI 0.49 to 1.05), adverse events (3 trials, 145 participants; 2/77 (3%) versus 6/68 (9%): RR 0.34; 95% CI 0.08 to 1.42), quality of life (1 trial, 20 participants contributed to the physical quality of life measurement, 20 participants contributed to the mental quality of life: MD Physical 0.00; 95% CI -5.47 to 5.47; MD Mental 4.00; 95% CI -1.82 to 9.82), or change of/or withdrawal from treatment (3 trials, 175 participants; 11/92 (12%) versus 7/83 (8%): RR 1.28; 95% CI 0.52 to 3.19). No trial reported sepsis or duration of hospital stay as an outcome. Plasma ammonia concentration was significantly lower for participants treated with probiotic at one month (3 trials, 226 participants: MD -2.99 mu mol/L; 95% CI -5.70 to -0.29) but not at two months (3 trials, 181 participants: MD -1.82 mu mol/L; 95% CI -14.04 to 10.41). Plasma ammonia decreased the most in the participants treated with probiotic at three months (1 trial, 73 participants: MD -6.79 mu mol/L; 95% CI -10.39 to -3.19). When probiotics were compared with lactulose no trial reported all-cause mortality, quality of life, duration of hospital stay, or septicaemia. There were no significant differences in lack of recovery (3 trials, 173 participants; 47/87 (54%) versus 44/86 (51%): RR 1.05; 95% CI 0.75 to 1.47), adverse events (2 trials, 111 participants; 3/56 (5%) versus 6/55 (11%): RR 0.57; 95% CI 0.06 to 5.74), change of/or withdrawal from treatment at one month (3 trials, 190 participants; 8/95 (8%) versus 7/95 (7%): RR 1.10; 95% CI 0.40 to 3.03), plasma ammonia concentration (2 trials, 93 participants: MD -6.61 mu mol/L; 95% CI -30.05 to 16.84), or change in plasma ammonia concentration (1 trial, 77 participants: MD 1.16 mu mol/L; 95% CI -1.96 to 4.28). Authors' conclusions The trials we located suffered from a high risk of systematic errors ('bias') and high risk of random errors ('play of chance'). While probiotics appear to reduce plasma ammonia concentration when compared with placebo or no intervention, we are unable to conclude that probiotics are efficacious in altering clinically relevant outcomes. Demonstration of unequivocal efficacy is needed before probiotics can be endorsed as effective therapy for hepatic encephalopathy. Further randomised clinical trials are needed.

Keywords: Acute, Adverse Events, Ammonia, Analysis, Authors, Bias, Brain, Burden, Care, Cirrhotic-Patients, Citation, Clinical Trials, Cochrane, Confidence Intervals, Differences, Disorder, Double-Blind, Efficacy, Embase, Experimental, Fatty Liver-Disease, Fecal Flora, Funding, Gut Flora, Health Care, Hospital, Industry, Intervention, Interventions, Lactobacillus-Acidophilus, Measurement, Medline, Meta Analysis, Meta-Analysis, Microorganisms, Model, Mortality, Nonalcoholic Steatohepatitis, Outcome, Outcomes, Patients, Plasma, Probiotic, Probiotics, Quality, Quality of Life, Randomized Controlled-Trial, Ratio, Recovery, Risk, Science, Science Citation Index, Search Strategy, Selection, Sepsis, Spontaneous Bacterial Peritonitis, Strategy, Systematic, Therapy, Toll-Like Receptors, Treatment, WHO

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Full Text: [2011\Coc Dat Sys Rev2011, CD003985.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003985.pdf)

Abstract: Background Helmets reduce bicycle-related head injuries, particularly in single vehicle crashes and those where the head strikes the ground. We aimed to identify non-legislative interventions for promoting helmet use among children, so future interventions can be designed on a firm evidence base. Objectives To assess the effectiveness of non-legislative interventions in increasing helmet use among children; to identify possible reasons for differences in effectiveness of interventions; to evaluate effectiveness with respect to social group; to identify adverse consequences of interventions. Search strategy We searched the following databases: Cochrane Injuries Group Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); MEDLINE; EMBASE; PsycINFO (Ovid); PsycEXTRA (Ovid); CINAHL (EBSCO); ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED); Social Sciences Citation Index (SSCI); Conference Proceedings Citation Index-Science (CPCI-S); and PubMed from inception to April 2009; TRANSPORT to 2007; and manually searched other sources of data. Selection criteria We included RCTs and CBAs. Studies included participants aged 0 to 18 years, described interventions promoting helmet use not requiring enactment of legislation and reported observed helmet wearing, self reported helmet ownership or self reported helmet wearing. Data collection and analysis Two independent review authors selected studies for inclusion and extracted data. We used random-effects models to estimate pooled odds ratios (ORs) (with 95% confidence interval (CI)). We explored heterogeneity with subgroup analyses. Main results We included 29 studies in the review, 21 of which were included in at least one meta-analysis. Non-legislative interventions increased observed helmet wearing (11 studies: OR 2.08, 95% CI 1.29 to 3.34). The effect was most marked amongst community-based interventions (four studies: OR 4.30, 95% 2.24 to 8.25) and those providing free helmets (two studies: OR 4.35, 95% CI 2.13 to 8.89). Significant effects were also found amongst school-based interventions (eight studies: OR 1.73, CI 95% 1.03 to 2.91), with a smaller effect found for interventions providing education only (three studies: OR 1.43, 95% CI 1.09 to 1.88). No significant effect was found for providing subsidised helmets (seven studies: OR 2.02, 95% CI 0.98 to 4.17). Interventions provided to younger children (aged under 12) may be more effective (five studies: OR 2.50, 95% CI 1.17 to 5.37) than those provided to children of all ages (five studies: OR 1.83, 95% CI 0.98 to 3.42). Interventions were only effective in increasing self reported helmet ownership where they provided free helmets (three studies: OR 11.63, 95% CI 2.14 to 63.16). Interventions were effective in increasing self reported helmet wearing (nine studies: OR 3.27, 95% CI 1.56 to 6.87), including those undertaken in schools (six studies: OR 4.21, 95% CI 1.06 to 16.74), providing free helmets (three studies: OR 7.27, 95% CI 1.28 to 41.44), providing education only (seven studies: OR 1.93, 95% CI 1.03 to 3.63) and in healthcare settings (two studies: OR 2.78, 95% CI 1.38 to 5.61). Authors' conclusions Non-legislative interventions appear to be effective in increasing observed helmet use, particularly community-based interventions and those providing free helmets. Those set in schools appear to be effective but possibly less so than community-based interventions. Interventions providing education only are less effective than those providing free helmets. There is insufficient evidence to recommend providing subsidised helmets at present. Interventions may be more effective if provided to younger rather than older children. There is evidence that interventions offered in healthcare settings can increase self reported helmet wearing. Further high-quality studies are needed to explore whether non-legislative interventions increase helmet wearing, and particularly the effect of providing subsided as opposed to free helmets, and of providing interventions in healthcare settings as opposed to in schools or communities. Alternative interventions (e.g. those including peer educators, those aimed at developing safety skills including skills in decision making and resisting peer pressure or those aimed at improving self esteem or self efficacy) need developing and testing, particularly for 11 to 18 year olds. The effect of interventions in countries with existing cycle helmet legislation and in low and middle-income countries also requires investigation.

Keywords: Adolescent, Aged, Analysis, And Middle-Income Countries, Authors, Behavior, Bicycle Helmet, Bicycling [Legislation & Jurisprudence, Child,Preschool, Children, Citation, Cochrane, Conference, Databases, Decision Making, Decision-Making, Differences, Education, Effectiveness, Efficacy, Embase, Emergency-Department, Head Protective Devices [Utilization] Child, Helmet, Helmet Use, Humans, Increase Bicycle, Injury, Interventions, Isi, Isi Web Of Science, Low, Medline, Meta Analysis, Meta-Analysis, Metaanalysis, Pressure, Program, Promotion, Pubmed, Randomized Controlled-Trial, Review, Safety, Schools, Science, Science Citation Index, Sciences, Search Strategy, Selection, Self-Efficacy, Significant, Social, Social Sciences, Social Sciences Citation Index, SSCI, Statistics & Numerical Data], Strategy, Transport, Web of Science

? Pammi, M. and Haque, K.N. (2011), Oral immunoglobulin for the prevention of rotavirus infection in low birth weight infants. *Cochrane Database of Systematic Reviews*, **11** Article Number: CD003740.

Full Text: [2011\Coc Dat Sys Rev2011, CD003740.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD003740.pdf)

Abstract: Background Rotavirus is a common neonatal nosocomial viral infection and epidemics with the newer P(6) G9 strains have been reported. Local mucosal immunity in the intestine to rotavirus is important in the resolution of infection and protection against subsequent infections. Oral administration of anti-rotaviral immunoglobulin preparationsmight be a useful strategy in preventing rotaviral infections, especially in low birth weight babies. Objectives To determine the effectiveness and safety of oral immunoglobulin preparations for the prevention of rotavirus infection in hospitalized low birthweight infants (birthweight < 2500 g) Search strategy The Cochrane Central Register of Controlled Trials (CENTRAL, The Cochrane Library), MEDLINE, EMBASE, CINAHL, biological Abstracts (BIOSIS), Science Citation Index for articles citing Barnes 1982 and the proceedings of the Pediatric Academic Societies from 1991 onwards were searched in July 2011. Ongoing trials were also searched at clinicaltrials.gov and controlled-trials.com Selection criteria The criteria used to select studies for inclusion were: 1) design: randomized or quasi-randomized controlled trials; 2) participants: hospitalized low birthweight infants; 3) intervention: oral immunoglobulin preparations for prevention of rotavirus infection compared to placebo OR no intervention; 4) at least one of the following outcomes were reported: all cause mortality during hospital stay, mortality due to rotavirus infection during hospital stay, rotavirus infection, duration of diarrhea, need for rehydration, duration of viral excretion, duration of infection control measures, length of hospital stay in days, recurrent diarrhea or chronic diarrhea. Data collection and analysis The two review authors independently abstracted data from the included trials. Main results One published study (Barnes 1982) was eligible for inclusion in this review. Barnes 1982 found no significant difference in the rates of rotavirus infection after oral gammaglobulin versus placebo in hospitalized low birthweight babies [RR 1.27 (95% CI 0.65 to 2.37)]. In the subset of infants who became infected with rotavirus after receiving gammaglobulin or placebo for prevention of rotavirus infection, there was no significant difference in the duration of rotavirus excretion between the group who had gammaglobulin (mean 2 days, range 1 to 4 days) and the group who had placebo (mean 3 days, range 1 to 6 days). Barnes 1982 reported no adverse effects after administration of oral immunoglobulin preparations. Authors' conclusions Current evidence does not support the use of oral immunoglobulin preparations to prevent rotavirus infection in low birthweight infants. Researchers are encouraged to conduct well-designed neonatal trials using the newer preparations of anti-rotaviral immunoglobulins (colostrum, egg yolk immunoglobulins) and include cost effectiveness evaluations.

Keywords: Administration,Oral, Adverse Effects, Analysis, Authors, Birthweight, Children, Citation, Clinical-Trial, Cochrane, Control, Cost-Effectiveness, Design, Diarrhea, Effectiveness, Embase, Gastroenteritis, Group-A Rotavirus, Hospital, Humans, Immunization,Passive [Methods], Immunoglobulins [Administration & Dosage], Infant,Low Birth Weight, Infant,Newborn, Infants, Infection, Infection Control, Intervention, Intestine, Low, Low Birthweight, Medline, Mortality, Necrotizing Enterocolitis, Newborns, Oral, Outcomes, Prevention, Randomized Controlled Trials As Topic, Researchers, Review, Risk-Factors, Rotavirus Infections [Prevention & Control], Safety, Science, Science Citation Index, Search Strategy, Selection, Strains, Strategy, Trypsin-Inhibitors

? Parantainen, A., Verbeek, J.H., Lavoie, M.C. and Pahwa, M. (2011), Blunt versus sharp suture needles for preventing percutaneous exposure incidents in surgical staff. *Cochrane Database of Systematic Reviews*, **11**, Article Number: CD009170.

Full Text: [2011\Coc Dat Sys Rev2011, CD009170.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009170.pdf)

Abstract: Background Surgeons and their assistants are especially at risk of exposure to blood due to glove perforations and needle stick injuries during operations. The use of blunt needles can reduce this risk because they don't penetrate skin easily but still perform sufficiently in other tissues. Objectives To determine the effectiveness of blunt needles compared to sharp needles for preventing percutaneous exposure incidents among surgical staff. Search strategy We searched MEDLINE and EMBASE (until May 2011), CENTRAL, NHSEED, Science Citation Index Expanded, CINAHL, Nioshtic, CISdoc, PsycINFO, and LILACS (until September 2010). Selection criteria Randomised controlled trials (RCTs) of blunt versus sharp suture needles for preventing needle stick injuries among surgical staff measured as glove perforations or self-reported needle stick injuries. Data collection and analysis Two authors independently assessed study eligibility and risk of bias in trials and extracted data. We synthesized study results with a fixed-effect model meta-analysis. Main results We located 10 RCTs involving 2961 participating surgeons performing an operation in which the use of blunt needles was compared to the use of sharp needles. Four studies focused on abdominal closure, two on caesarean section, two on vaginal repair and two on hip replacement. On average, a surgeon that used sharp needles sustained one glove perforation in three operations. The use of blunt needles reduced the risk of glove perforations with a relative risk (RR) of 0.46 (95% confidence interval (CI) 0.38 to 0.54) compared to sharp needles. The use of blunt needles will thus prevent one glove perforation in every six operations. In four studies, the use of blunt needles reduced the number of self-reported needle stick injuries with a RR of 0.31 (95% CI 0.14 to 0.68). Because the force needed for the blunt needles is higher, their use was rated as more difficult but still acceptable in five out of six studies. The quality of the evidence was rated as high. Authors' conclusions There is high quality evidence that the use of blunt needles appreciably reduces the risk of exposure to blood and bodily fluids for surgeons and their assistants over a range of operations. It is unlikely that future research will change this conclusion.

Keywords: Analysis, At Risk, Authors, Bias, Blood, Blood Exposure, Citation, Effectiveness, Embase, Exposure, Glove Perforations, Health-Care Workers, Injuries, Intervention, Medline, Meta Analysis, Meta-Analysis, Model, Nurses, Quality, Randomized-Controlled-Trial, Relative Risk, Research, Risk, Safety, Science, Science Citation Index, Search Strategy, Selection, Strategy, Surgical

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Full Text: [2011\Coc Dat Sys Rev2011, CD001208.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD001208.pdf)

Abstract: Background Human albumin solutions are used for a range of medical and surgical problems. Licensed indications are the emergency treatment of shock and other conditions where restoration of blood volume is urgent, such as in burns and hypoproteinaemia. Human albumin solutions are more expensive than other colloids and crystalloids. Objectives To quantify the effect on mortality of human albumin and plasma protein fraction (PPF) administration in the management of critically ill patients. Search strategy We searched the Cochrane Injuries Group Specialised Register (searched 31 May 2011), the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library 2011, Issue 2), MEDLINE (Ovid) (1948 to week 3 May 2011), EMBASE (Ovid) (1980 to Week 21 2011), CINAHL (EBSCO) (1982 to May 2011), ISI Web of Science: Science Citation Index Expanded (SCI-EXPANDED) (1970 to May 2011), ISI Web of Science: Conference Proceedings Citation Index - Science (CPCI-S) (1990 to May 2011), PubMed (www.ncbi.nlm.nih.gov/sites/entrez/) (searched 10 June 2011, limit: last 60 days). Reference lists of trials and review articles were checked, and authors of identified trials were contacted. Selection criteria Randomised controlled trials comparing albumin or PPF with no albumin or PPF or with a crystalloid solution in critically ill patients with hypovolaemia, burns or hypoalbuminaemia. Data collection and analysis We collected data on the participants, albumin solution used, mortality at the end of follow up, and quality of allocation concealment. Analysis was stratified according to patient type. Main results We found 38 trials meeting the inclusion criteria and reporting death as an outcome. There were 1,958 deaths among 10,842 trial participants. For hypovolaemia, the relative risk of death following albumin administration was 1.02 (95% confidence interval (CI) 0.92 to 1.13). This estimate was heavily influenced by the results of the SAFE trial, which contributed 75.2% of the information (based on the weights in the meta-analysis). For burns, the relative risk was 2.93 (95% CI 1.28 to 6.72) and for hypoalbuminaemia the relative risk was 1.26 (95% CI 0.84 to 1.88). There was no substantial heterogeneity between the trials in the various categories (Chi(2) = 26.66, df = 31, P = 0.69). The pooled relative risk of death with albumin administration was 1.05 (95% CI 0.95 to 1.16). Authors' conclusions For patients with hypovolaemia, there is no evidence that albumin reduces mortality when compared with cheaper alternatives such as saline. There is no evidence that albumin reduces mortality in critically ill patients with burns and hypoalbuminaemia. The possibility that there may be highly selected populations of critically ill patients in which albumin may be indicated remains open to question. However, in view of the absence of evidence of a mortality benefit from albumin and the increased cost of albumin compared to alternatives such as saline, it would seem reasonable that albumin should only be used within the context of well concealed and adequately powered randomised controlled trials.

Keywords: 5-Percent Albumin, Analysis, Authors, Blood, Blood Proteins [Therapeutic Use], Cerebral-Blood-Flow, Citation, Cochrane, Colloid Osmotic-Pressure, Conference, Critical Illness [Mortality, Critically Ill Patients, Embase, Emergency, Fluid Resuscitation, Fluid Therapy, Follow-Up, Human, Humans, Hypoalbuminemic Patients, Information, Intensive-Care-Unit, Isi, Isi Web Of Science, Major Surgery, Management, Medical, Medline, Meta Analysis, Meta-Analysis, Mortality, Normal Saline, Outcome, Patients, Plasma, Plasma Substitutes [Therapeutic Use], Pubmed, Quality, Randomized Controlled Trials As Topic, Randomized Controlled-Trial, Relative Risk, Restoration, Review, Risk, Safe, Science, Science Citation Index, Search Strategy, Selection, Serum Albumin [Therapeutic Use], Serum Globulins, Strategy, Surgical, Therapy], Total Parenteral-Nutrition, Treatment, Web Of Science

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Full Text: [2011\Coc Dat Sys Rev2011, CD009131.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20CD009131.pdf)

Abstract: Background Cognitive deficits are a common manifestation in multiple sclerosis (MS) and have a wide effect on the patient's quality of life. Alleviation of the harmful effects caused by these deficits should be a major goal of MS research and practice. Objectives The aim of this review was to evaluate the effects of neuropsychological/cognitive rehabilitation in MS by conducting a systematic review. Search strategy A systematic literature search was carried out on reports drawn from Cochrane MS Group Specialised Register (To October 2010), Evidence-based medicine (EBM) reviews (To September 2010), MEDLINE (January 1950 to September 2010), EMBASE (1974 to September 2010), PsycINFO (January 1806 to September 2010), WEB OF SCIENCE (WOS) (January 1986 to September 2010), CINAHL (1982 to September 2010), and identified from the references in these reports. Selection criteria Randomised Controlled Trials (RCTs) and quasi-randomised trials evaluating the effects of neuropsychological rehabilitation in MS compared to other interventions or no intervention at all and employing neuropsychological rehabilitation methods and outcome measures were included. Data collection and analysis Two review authors individually judged the relevance, risk of bias, and content of the included studies. Results were combined quantitatively with meta-analyses according to the intervention type: 1) Cognitive training and 2) Cognitive training combined with other neuropsychological rehabilitation methods. In addition, narrative presentation was used in reporting the results of those studies which were inappropriate to be included in the meta-analysis. Main results Fourteen studies (770 MS patients) fulfilled the inclusion criteria. On the basis of these studies, low level evidence was found that neuropsychological rehabilitation reduces cognitive symptoms in MS. Cognitive training was found to improve memory span (standardised mean difference 0.54 (95% confidence interval 0.2 to 0.88, P = 0.002)), working memory (standardised mean difference 0.33 (95% confidence interval 0.09 to 0.57, P = 0.006)), and immediate visual memory (standardised mean difference 0.32 (95% confidence interval 0.04 to 0.6, P = 0.02)). There was no evidence of an effect of cognitive training combined with other neuropsychological rehabilitation methods on cognitive or emotional functions. The overall quality as well as the comparability of the included studies were relatively low due to methodological limitations and heterogeneity of outcome measures. Although most of the pooled results in the meta-analyses yielded no significant findings, twelve of the fourteen studies showed some evidence of positive effects when the studies were individually analysed. Authors' conclusions The review indicates low level evidence for the positive effects of neuropsychological rehabilitation in MS. Interventions included in the review were heterogeneous. Consequently, clinical inferences can basically be drawn from single studies. Therefore, new trials may change the strength and direction of the evidence. To further strengthen the evidence, well-designed high quality studies are needed. In this systematic review, recommendations are given for improving the quality of future studies on the effects of neuropsychological rehabilitation in MS.

Keywords: Analysis, Authors, Bias, Brain Atrophy, Cochrane, Cognitive Rehabilitation, Diagnostic-Criteria, Efficacy, Embase, Evidence-Based Medicine, Follow-Up, Intervention, Interventions, Literature, Low, Medicine, Medline, Memory, Meta Analysis, Meta-Analysis, Ms Patients, Multiple Sclerosis, Of-Science, Outcome, Patients, People, Practice, Quality, Quality Of Life, Randomized Controlled-Trial, Recommendations, Rehabilitation, Research, Review, Risk, Science, Search Strategy, Selection, Self-Generation, Strategy, Strength, Symptoms, Systematic, Systematic Review, Training, Web, Web-Of-Science, Working-Memory

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Full Text: [2011\Coc Dat Sys Rev2011, MR000027.pdf](2011/Coc%20Dat%20Sys%20Rev2011,%20MR000027.pdf)

Abstract: Background In order to minimise publication bias, authors of systematic reviews often spend considerable time trying to obtain unpublished data. These include data from studies conducted but not published (unpublished data), as either an abstract or full-text paper, as well as missing data (data available to original researchers but not reported) in published abstracts or full-text publications. The effectiveness of different methods used to obtain unpublished or missing data has not been systematically evaluated. Objectives To assess the effects of different methods for obtaining unpublished studies (data) and missing data from studies to be included in systematic reviews. Search strategy We identified primary studies comparing different methods of obtaining unpublished studies (data) or missing data by searching the Cochrane Methodology Register (Issue 1, 2010), MEDLINE and EMBASE (1980 to 28 April 2010). We also checked references in relevant reports and contacted researchers who were known or who were thought likely to have carried out relevant studies. We used the Science Citation Index and PubMed 'related articles' feature to identify any additional studies identified by other sources (19 June 2009). Selection criteria Primary studies comparing different methods of obtaining unpublished studies (data) or missing data in the healthcare setting. Data collection and analysis The primary outcome measure was the proportion of unpublished studies (data) or missing data obtained, as defined and reported by the authors of the included studies. Two authors independently assessed the search results, extracted data and assessed risk of bias using a standardised data extraction form. We resolved any disagreements by discussion. Main results Six studies met the inclusion criteria; two were randomised studies and four were observational comparative studies evaluating different methods for obtaining missing data. Methods to obtain missing data Five studies, two randomised studies and three observational comparative studies, assessed methods for obtaining missing data (i.e. data available to the original researchers but not reported in the published study). Two studies found that correspondence with study authors by e-mail resulted in the greatest response rate with the fewest attempts and shortest time to respond. The difference between the effect of a single request for missing information (by e-mail or surface mail) versus a multistage approach (pre-notification, request for missing information and active follow-up) was not significant for response rate and completeness of information retrieved (one study). Requests for clarification of methods (one study) resulted in a greater response than requests for missing data. A well-known signatory had no significant effect on the likelihood of authors responding to a request for unpublished information (one study). One study assessed the number of attempts made to obtain missing data and found that the number of items requested did not influence the probability of response. In addition, multiple attempts using the same methods did not increase the likelihood of response. Methods to obtain unpublished studies One observational comparative study assessed methods to obtain unpublished studies (i.e. data for studies that have never been published). Identifying unpublished studies ahead of time and then asking the drug industry to provide further specific detail proved to be more fruitful than sending of a non-specific request. Authors' conclusions Those carrying out systematic reviews should continue to contact authors for missing data, recognising that this might not always be successful, particularly for older studies. Contacting authors by e-mail results in the greatest response rate with the fewest number of attempts and the shortest time to respond.

Keywords: Analysis, Authors, Bias, Citation, Cochrane, Comparative Study, Controlled-Trials, Correspondence, Drug, Effectiveness, Email, Embase, Extraction, Follow-Up, Industry, Information, Medline, Metaanalysis, Methodology, Methods, Observational, Outcome, Primary, Publication, Publication Bias, Publications, Pubmed, Researchers, Retrieval, Risk, Science, Science Citation Index, Search Strategy, Selection, Strategy, Systematic, Systematic Reviews

# Title: Cognition

Full Journal Title: [Cognition](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=4908&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=d4c1f0fd98252ec7cb23097b23a965ca)

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Journal Country/Territory:

Language:

Publisher: W B Saunders Co, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

Vicente, K.J. and Brewer, W.F. (1993), Reconstructive remembering of the scientific literature. *Cognition*, **46** (2), 101-128.

Full Text: [1993\Cognition46, 101.pdf](1993/Cognition46,%20101.pdf)

Abstract: In this paper we investigate the role of reconstructive memory in citation errors that occur in the scientific literature. We focus on the case of de Groot’s (1946) studies of the memory for chess positions by chess experts. Previous work has shown that this research is very often cited incorrectly. In Experiment 1 we show that free recall of this work by research psychologists replicates most of the errors found in the published literature. Experiment 2 shows that undergraduates reading a correct account of the de Groot study also make the same set of errors in recall. We interpret these findings as showing that consistent errors in secondary accounts of experimental findings are frequently reconstructive memory errors due to source confusion and schema-based processes. Analysis of a number of other examples of scientific literature that have been frequently cited incorrectly add additional support to the reconstructive account. We conclude that scientists should be aware of the tendency of reconstructive memory errors to cause violations of the scientific norm of accurate reporting of the scientific literature.

# Title: Colis4: Emerging Frameworks and Methods

Full Journal Title: Colis4: Emerging Frameworks and Methods

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wormell, I. (2002), Informetrics and the use of bibliographic data in a strategic combination. *Colis4: Emerging Frameworks and Methods*, 167-184.

Abstract: Through a sample of research studies the paper presents an approach to knowledge discovery. The novel aspect is the combination of various types of data and quantitative analyses. The reported applications. are intended to illustrate the scope and nature of informetric analyses, where advanced information retrieval theories and methodologies are combined with the quantitative study of information flows in a strategic mix. The concept has a close connection to text and data mining techniques, as well as to modem display and visualization techniques. The sample shows how this methodology gathered useful information for business intelligence, trend analysis, and for the evaluation of scientific, political and business developments. It is an appeal to the modem LIS professionals to adapt the use of the classic bibliometric methods in a modem context, and to utilize the databases not only for retrieval of documents or facts, but also as tools for analytical work.

Keywords: Analyses, Analysis, Approach, Bibliometric, Bibliometric Methods, Business, Context, Data, Data Mining, Data-Mining, Databases, Discovery, Evaluation, Information, Information Retrieval, Knowledge, LIS, Methodologies, Methodology, Methods, Mining, Research, Scope, Strategic, Techniques, Trend, Trend Analysis, Visualization, Work

? Astrom, F. (2002), Visualizing library and information science concept spaces through keyword and citation based maps and clusters. *Colis4: Emerging Frameworks and Methods*, 185-197.

Abstract: Co-citation analysis has been widely accepted as the foremost method for bibliometric mapping of research fields, whereas analyses based on keywords have been discussed, without gaining any overall acceptance. There are, however, advantages with keywords such as being understandable by others than those immediately connected to the field analyzed. This study aims at testing the relation between keyword and citation based analyses, and showing the significance of journal selection while mapping scientific fields. The preliminary study is based on 1135 Social Science Citation Index (SSCI) records from nine library and information science journals with descriptors added from the Resources Information Center Database (ERIC) database. Three maps are compared: one based on co-citations, one on keyword co-occurrences, and one merging citations and keywords. The mappings show the same basic structures, and when merged, cited authors and keywords form corresponding relations. In comparison with earlier bibliometric studies, the wider journal selection makes it possible to identify a library science research area within library and information science.

Keywords: Author Cocitation, Bibliometric, Bibliometric Studies, Citation, Citations, Co-Word, Combined Cocitation, Database, Information Science, Intellectual Structure, Journals, Mapping, Research, Retrieval, Science, Science Citation Index, Social Science Citation Index, Word Analysis

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Keywords: Analysis, Bibliometric, Bibliometric Analysis, Indexing, Literature

# Title: Collection of Czechoslovak Chemical Communications

Full Journal Title: [Collection of Czechoslovak Chemical Communications](http://cccc.uochb.cas.cz/Misc/loc.html); [Collection of Czechoslovak Chemical Communications](http://cccc.uochb.cas.cz/CCCC.html)

ISO Abbreviated Title: Collect. Czech. Chem. Commun.

JCR Abbreviated Title: Collect Czech Chem C

ISSN: 0010-0765

Issues/Year: 12

Journal Country/Territory: United States

Language: Multi-Language

Publisher: Inst Organic Chem and Biochem

Publisher Address: Acad Sci Czech Republic, Flemingovo Nam 2, Prague 6 166 10, Czech Republic

Subject Categories:

Chemistry: Impact Factor 0.717, 56/121

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? Dorfler, H.D. (1977), Effect of adsorption-kinetics on course of adsorption-isotherms of 4,5-imidazoledicarboxylic acid dialkyl amides. *Collection of Czechoslovak Chemical Communications*, **42** (3), 936-942.

? Dracka, O. (1977), Study of kinetics of electrode processes by means of electrolysis with constant current. 27. Irreversible follow-up 2nd-order reaction with linear adsorption of a substance in galvanostatic method with current reversal. *Collection of Czechoslovak Chemical Communications*, **42** (4), 1093-1099.

? Mishra, S.P. and Singh, T.B. (1987), Radiotracer technique in adsorption study. 2. Adsorption of phosphate ions on chromium metal-powder. *Collection of Czechoslovak Chemical Communications*, **52** (4), 960-969.

Keywords: Adsorption, SCI

? Qadeer, R., Hanif, J., Saleem, M. and Afzal, M. (1992), Selective adsorption of strontium on activated-charcoal from electrolytic aqueous solutions. *Collection of Czechoslovak Chemical Communications*, **57** (10), 2065-2072.

Full Text: [1992\Col Cze Che Com57, 2065.pdf](1992/Col%20Cze%20Che%20Com57,%202065.pdf)

Abstract: The adsorption of strontium on activated charcoal has been studied as a function of shaking time, pH, concentration of adsorbate and temperature. Wavelength dispersive X-ray fluorescence spectrometer was used for measuring strontium concentration. The adsorption of strontium obeys Freundlich and Langmuir isotherms. Quantities DELTAH0 and DELTAS0 were calculated from the slope and intercept of plot ln K(D) vs 1/T. The influence of different cations and anions on strontium adsorption has been examined. The adsorption of other metal ions on activated charcoal has been studied under specific conditions to check its selectivity. Consequently strontium was removed from Rh, Pr, Rb and Cs. More than 95% adsorbed strontium on activated charcoal can be recovered with 65 ml 3M HNO3 solution.

Keywords: Sorption, Behavior

? Kotrba, P. and Ruml, T. (2000), Bioremediation of heavy metal pollution exploiting constituents, metabolites and metabolic pathways of livings. A review. *Collection of Czechoslovak Chemical Communications*, **65** (8), 1205-1247.

Full Text: [2000\Col Cze Che Com65, 1205.pdf](2000/Col%20Cze%20Che%20Com65,%201205.pdf)

Abstract: Removal of heavy metals from the soil and water or their remediation from the waste streams “at source” has been a long-term challenge. During the recent era of environmental protection, the use of microorganisms for the recovery of metals from waste streams as well as employment of plants for landfill applications has generated growing attention. Many studies have demonstrated that both prokaryotes and eukaryotes have the ability to remove metals from contaminated water or waste streams. They sequester metals from soils and sediments or solubilize them to aid their extraction. The proposed microbial processes for bioremediation of toxic metals and radionuclides from waste streams employ living cells and non-living biomass or biopolymers as biosorbents. Microbial biotransformation of metals or metalloids results in an alteration of their oxidation state or in their alkylation and subsequent precipitation or volatilization. Specific metabolic pathways leading to precipitation of heavy metals as metal sulfides, phosphates or carbonates possess significance for possible biotechnology application. Moreover, the possibility of altering the properties of living species used in heavy metal remediation or constructing chimeric organisms possessing desirable features using genetic engineering is now under study in many laboratories. The encouraging evidence as to the usefulness of living organisms and their constituents as well as metabolic pathways for the remediation of metal contamination is reviewed here. A review with 243 references.

Keywords: Accumulating Citrobacter Sp, Alcaligenes-Eutrophus Strains, Biomass, Bioprecipitation, Bioremediation, Biosorption, Biotransformation, Cation-Proton Antiporter, Contaminated Industrial Effluents, Dna-Binding Protein, Enterobacter-Cloacae Strain, Escherichia-Coli-Cells, Heavy Metal, Heavy Metals, Metal Chelates, Metalloproteins, Metallothionein-Like Gene, Metallothioneins, Metals, Methylmalonyl-Coa Decarboxylase, Non-Living Biomass, Phytochelatins, Recovery, Remediation, Transgenic Tobacco Plants

# Title: Collection Management

Full Journal Title: [Collection Management](http://www.informaworld.com/smpp/title~db=all~content=t792303985)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bradford, S.C. (1976), Sources of information on specific subjects. *Collection Management*, **1** (3-4), 95-103.

Full Text: [1960-80\Col Man1, 95.pdf](1960-80/Col%20Man1,%2095.pdf)

? Raymond, R.W. and Jacqueline, M.C. (1978), The application of bibliometric techniques to the analysis of materials for young adults. *Collection Management*, **2** (3), 229-246.

Full Text: [1960-80\Col Man2, 229.pdf](1960-80/Col%20Man2,%20229.pdf)

Abstract: The information needs of young adults are no different from those of most people. They tend to be recreational, developmental, and occupational. In selecting materials to meet these needs recommendations of experts as well as what YA’s actually use should be considered. Two studies look at this problem. In this first study, a data base of 19,405 titles has been compiled from 19 lists of “best” books for YA’s. The compilers found that 22&#0037; of all titles occured on more than one list. Books with 3 or more references created a “core” collection of 1134 titles. The second study sampled 270 student papers written by college-bound students in grades 10, 11, and 12. The papers came from a cross-section of metropolitan area schools and were in the humanities and science. Sixty-seven percent of the references were to monographs, and 20&#0037; to journals; the remainder was to a range of materials and media. A typical paper used materials from 3 to 30 years old. Of all the references to monographs (2117), 578 were cited in one or more lists. The top two lists accounted for 69&#0037; of the 578 titles; the top three for 79&#0037;, with a 12&#0037; overlap. The question is raised whether the lists control what will be used, or whether they identify useful materials. The disposition of journal articles referenced by students followed Bradford’s Law. A relatively large number of articles used were concentrated in a few journal titles, while many journals contributed very few articles. There is a need to describe more closely materials for YA use, particularly considering moves toward library cooperation. Reference data can provide one indicator of use. It can be an aid in the decision-making process for funding, for opening or closing stacks or shelving, or just to alert libraries to which materials are chosen most frequently for and by YA’s.

? Koenig, M.E.D. (1978), Citation analysis for the arts and humanities as a collection management tool. *Collection Management*, **2** (3), 247-264.

Full Text: [1960-80\Col Man2, 247.pdf](1960-80/Col%20Man2,%20247.pdf)

Abstract: This paper describes the potential for bibliometric analysis of citation data from the literature of the arts and humanities. To date, such analyses have been very limited, due to the subject orientation of most bibliometric researchers and to the lack heretofore of an appropriate citation data base. Opportunities are opening up for bibliometric research in the arts and humanities, and this research has particular application for journal collection management.

? Bookstein, A. (1980), Explanations of the bibliometric laws. *Collection Management*, **3** (2-3), 151-162.

Full Text: [1960-80\Col Man3, 151.pdf](1960-80/Col%20Man3,%20151.pdf)

Abstract: Many librarians are familiar with Bradford’s law of scattering as a description of how articles in a discipline are dispersed over the universe of journals. Similar and equally surprising regularities are found in a wide range of other areas, such as biology, economics, geography, and linguistics. This paper describes a number of the most prominent of these laws and reformulates them so as to reveal their underlying similarity. It is noted that all of these laws are in essence mathematically identical. The paper reviews several attempts that have been made to derive this common regularity from more basic principles, such as an underlying stochastic process or an information theoretic model of the human mind. It is suggested that one reason for the recurrence of these laws is that they are very stable and likely to result from a wide range of different causes.

? Pao, M.L. (1985), Characteristics of American revolution literature. *Collection Management*, **6** (3), 119-128.

Full Text: [1985\Col Man6, 119.pdf](1985/Col%20Man6,%20119.pdf)

Abstract: Earlier citation studies have shown that the humanist relies heavily on recent publications, and that monographic and journal publications are of equal importance. Such findings suggest that better currcnt awareness service may benefit humanists. This paper presents a bibliometric study of journal articles on the subject of the American Revolution using items contained in a standard indexing journal. Results confirm that a larger group of journals is devoted to this subject than is generally suspected. Moreover, a substantial number of journals of high quality arc found to be productive in this area.

? Kamlesh, G. and Garg, K.C. (1994), Social science research in India: A bibliometric study. *Collection Management*, **17** (4), 95-104.

Full Text: [1994\Col Man17, 95.pdf](1994/Col%20Man17,%2095.pdf)

Abstract: An analysis of 393 papers published by Indian social scientists and included in Social Science Citation Index (SSCI) indicates that most of these papers are published in Indian journals. Some of the papers are directly related to problems faced by Indian society. A major share of the papers are in low impact journals and have a low citation rate. Anthropology, psychology and psychiatry are the strong areas in social science research in India.

? Perrault, A.H. (2004), The role of WorldCat in resources sharing. *Collection Management*, **28** (1-2), 63-75.

Full Text: [2004\Col Man28, 63.pdf](2004/Col%20Man28,%2063.pdf)

Abstract: The 30th anniversary of WorldCat was celebrated in 2001. At that time, there were 45 million records with over 750 million location listings, spanning over 4,000 years of recorded knowledge in 377 languages. In the anniversary year, a bibliometric study was begun under the auspices of an OCLC/ALISE research grant. A 10&#0037; systematic random sample of the database was analyzed utilizing the OCLC iCAs software to profile the monographic contents of WorldCat by type of library, subject and language parameters. The profile reveals the extent of global publications made accessible through the OCLC international network. Several findings of the study can be examined as possible barriers to successful cooperation in collection development and resources sharing. One of the major problems analyzed in the study is the timeliness in the availability of bibliographic records for current publications. This paper explores the feasibility of using WorldCat as a cooperative collection development tool as well as additional measures which might be derived from analyzing bibliographic records. The results can be used to stimulate discussion on the role of WorldCat as an international resource on the universe of publication available for research and resources sharing worldwide.

# Title: College English

Full Journal Title: [College English](http://www.jstor.org/action/showPublication?journalCode=collegeenglish); [College English](http://www.ncte.org/journals/ce/issues)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Howard, R.M. (1995), Plagiarisms, authorships, and the academic death-penalty. *College English*, **57** (7), 788-806.

Full Text: [1995\Col Eng57, 788.pdf](1995/Col%20Eng57,%20788.pdf)

# Title: College & Research Libraries

Full Journal Title: [College & Research Libraries](http://www.ala.org/ala/mgrps/divs/acrl/publications/crljournal/collegeresearch.cfm)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0010-0870

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Voigt, M.J. (1956), Scientific serials - Characteristics and lists of most cited publications in mathematics, physics, chemistry, geology, physiology, botany, zoology, and entomology - Brown, CH. *College & Research Libraries*, **17** (6), 517-518.

Keywords: Characteristics, Chemistry, Mathematics, Physics, Publications, Serials

? Raisig, L.M. and Kilgour, F.G. (1964), The use of medical theses: As demonstrated by Journal Citations, 1850-1960. *College & Research Libraries*, **25** (2), 93-102.

? Morrison, P.D. (1978), Literature and bibliometrics: Nicholas, D, Ritchie, M. *College & Research Libraries*, **39** (5), 414-415.

? Cline, G.S. (1982), *College & Research Libraries*: Its first forty years. *College & Research Libraries*, **43** (??), 208-232.

? Sellen, M.K. (1984), Bibliometrics in Information-Science - A Citation Analysis of 2 Academic-Library Journals. *College & Research Libraries*, **45** (2), 129-132

Keywords: Bibliometrics, Citation

? Gatten, J.N. (1991), Scholarly Communication and Bibliometrics - Borgman, CL. *College & Research Libraries*, **52** (5), 481-483

Keywords: Bibliometrics

? Alger, J. (1996), Can RANK be used to generate a reliable author list for cocitation studies? *College & Research Libraries*, **57** (6), 567-574.

Full Text: Col Res Lib57, 567.pdf

Abstract: This study investigates the possibility of using DIALOG’s RANK command to generate a list of prominent authors for use in cocitation studies. The emerging field of biodiversity is used primarily because it represents a new and rapidly expanding field of study. The results indicate that RANK does not effectively retrieve a quality set of prominent authors for use in cocitation studies. Highly cited authors of general texts on biodiversity cause the derived author map to present a misaligned picture of specialization within the field. By limiting citations to only journal articles, a clearer and more accurate picture of the field should emerge.

Keywords: Articles, Biodiversity, Citations, Journal, Rank, Representations, Science Maps

? Nisonger, T.E. (2000), Use of the *Journal Citation Reports* for serials management in research libraries: An investigation of the effect of self-citation on journal rankings in library and information science and genetics. *College & Research Libraries*, **61** (3), 263-275.

Full Text: [2000\Col Res Lib61, 263.pdf](2000/Col%20Res%20Lib61,%20263.pdf)

Abstract: This article explores the use of the Institute for Scientific Information’s Journal Citation Reports (JCR) for journal management in academic libraries. The advantages and disadvantages to using JCR citation data for journal management are outlined, and a literature review summarizes reported uses of these data by libraries and scholars. This study researches the impact of journal self-citation on JCR rankings of library and information science (LIS) and genetics journals. The 1994 rankings by impact factor and total citations received were recalculated with journal self-citations removed; then the recalculated rankings were compared to the original rankings to analyze the effect of self-citations. It is concluded that librarians can use JCR data without correcting for journal self-citation, although self-citations do exert a major effect on the rankings for a small number of journals.

Keywords: Impact, Impact Factor, Indicators, Lists, Physics

? Lascar, C. and Mendelsohn, L.D. (2001), An analysis of journal use by structural biologists with applications for journal collection development decisions. *College & Research Libraries*, **62** (5), 422-433.

Full Text: [2001\Col Res Lib62, 422.pdf](2001/Col%20Res%20Lib62,%20422.pdf)

Abstract: This paper defines and examines structural biology as a subdiscipline of molecular biology. Using bibliometric methodologies, it analyzes the publication and citation patterns of a sample group of structural biologists from multiple institutions. The citations analyzed covered a very large subject range, demonstrating the multidisciplinary nature of this subfield. The results were consistent with several models for journal selection. These models were used to compile a short list of specialized titles supporting structural biology. Although the research was performed on a relatively small group of local researchers, it has broader applications for other institutions attempting to develop similar collections

Keywords: Bibliometric, Citation, Citations, Faculty, Library, Methodologies, Research

? Davis, P.M. (2002), The effect of the web on undergraduate citation behavior: A 2000 update. *College & Research Libraries*, **63** (1), 53-60.

Full Text: [2002\Col Res Lib63, 53.pdf](2002/Col%20Res%20Lib63,%2053.pdf)

Abstract: This paper provides a 2000 update to the 1996-1999 citation analysis of undergraduate term papers by Philip M. Davis and Suzanne A. Cohen.(1) The total number of bibliographic citations continued to grow from a median of ten in 1996 to thirteen in 2000. However, this growth is entirely explained by the addition of traditionally nonscholarly materials (Web and newspaper citations). A significant improvement in the accuracy of Internet citations was found when term papers were submitted electronically. In 2000, the first year of electronic submissions, 65 percent of the citations pointed directly to the cited document, up from 55 percent in 1999. Internet citations aged six months in both 1999 and 2000 bibliographies were still irretrievable anywhere on the Internet 16 percent of the time. If more scholarly citations in term papers are to be seen, professors must provide clear expectations in their class assignments. Students should be required to submit an electronic copy of their paper so that Internet citations can be scrutinized for accuracy and plagiarism.

? Nisonger, T.E. (2004), Citation autobiography: An investigation of ISI database coverage in determining author citedness. *College & Research Libraries*, **65** (2), 152-163.

Full Text: [2004\Col Res Lib65, 152.pdf](2004/Col%20Res%20Lib65,%20152.pdf)

Abstract: This article presents a case study investigating the coverage completeness of the Institute for Scientific Information’s citation data for specific authors, based on analysis of this author’s lifetime citation record, which was compiled through the ISI database, searching the literature for nearly fifteen years, and through various Web search engines. It was found that (with self-citations disregarded) the ISI captured 28.8 percent of the total citations, 42.2 percent of print citations, 20.3 percent of citations from outside the United States, and 2.3 percent of non-English citations. The definition and classification of Web citations are discussed. It is suggested that librarians and faculty should not rely solely on ISI author citation counts, especially when demonstration of international impact is important.

Keywords: Analysis, Author, Citation, Citation Counts, Citations, Communication, Faculty, ISI, Productivity, Promotion, Quality, Science, Self-Citations, Tenure, Web

? Kellsey, C. and Knievel, J.E. (2004), Global English in the humanities? A longitudinal citation study of foreign-language use by humanities scholars. *College & Research Libraries*, **65** (3), 194-204.

Full Text: [2004\Col Res Lib65, 194.pdf](2004/Col%20Res%20Lib65,%20194.pdf)

Abstract: The authors counted 16,138 citations within 468 articles found in four journals from history, classics, linguistics, and philosophy in the years 1962, 1972, 1982, 1992, and 2002 in order to identify trends in foreign-language citation behavior of humanities scholars over time. The number of foreign-language sources cited in the four subjects has not declined over time. Consistent levels of foreign-language citation from humanities scholars indicate a need for U.S. research libraries to continue to purchase foreign-language materials and to recruit catalogers and collection development specialists with foreign-language knowledge.

Keywords: Journals, Philosophy

? Burright, M.A., Hahn, T.B. and Antonisse, M.J. (2005), Understanding information use in a multidisciplinary field: A local citation analysis of neuroscience research. *College & Research Libraries*, **66** (3), 198-210.

Full Text: [2005\Col Res Lib66, 198.pdf](2005/Col%20Res%20Lib66,%20198.pdf)

Abstract: Assessing the information needs of a multidisciplinary academic community presents challenges to librarians managing journal collections. This case study analyzed the literature used by the neuroscience community at the University of Maryland to determine the following about the publications they cited: their type, their discipline, and how recent they were relative to the citing publication. The authors searched the ISI Science Citation Index and Social Sciences Citation Index to identify the publishing, citing, and coauthoring patterns of both faculty and graduate students to inform library decisions about collecting journals and other types of literature.

Keywords: Analysis, Case Study, Citation, Citation Analysis, Community, Faculty, Field, Graduate, Information, ISI, Journal, Journals, Literature, Local, Maryland, Multidisciplinary, Needs, Publication, Publications, Publishing, Research, Science Citation Index, Students

? Georgas, H. and Cullars, J. (2005), A citation study of the characteristics of the linguistics literature. *College & Research Libraries*, **66** (6), 496-515.

Full Text: [2005\Col Res Lib66, 496.pdf](2005/Col%20Res%20Lib66,%20496.pdf)

Abstract: By analyzing the citation patterns of the linguistics literature, the authors provide a bibliometric description of the discipline that will help librarians who have reference, instruction, or collection development responsibilities in this area understand it better. One important aspect of such an understanding is determining where linguistics classifies within the humanities, the social sciences, and the sciences. Based on several of the citation patterns discovered, namely the importance of recent publications to the field, and the prominence of journals as a primary vehicle of scholarly communication, this analysis concludes that linguistics more closely resembles the disciplines of the social sciences.

Keywords: Behavioral-Sciences, Bibliometric, English, Fine-Arts, Humanities Scholars, Journals, Monographs, Philosophy, Publications, Research Performance, Scholarly Communication, Sciences, Social-Sciences

? Ortega, L. and Antell, K. (2006), Tracking cross-disciplinary information use by author affiliation: Demonstration of a method. *College & Research Libraries*, **67** (5), 446-462.

Full Text: [2006\Col Res Lib67, 446.pdf](2006/Col%20Res%20Lib67,%20446.pdf)

Abstract: In this paper, we report the results of a bibliometric study in which we track cross-disciplinary citation behavior in the sciences. We hypothesize that cross-disciplinary citation in the sciences increased over the time period 1985-2000. Unlike most previous studies in this area, we assign discipline to a paper by its first author’s affiliation, and we hypothesize that assigning papers to disciplines based on first-author affiliation would yield results consistent with previous findings on cross-disciplinary citation rates in the sciences. Using the output of scientists in Biological Sciences, Chemistry, and Physics departments at 12 large research universities in 1985, 1990, 1995, and 2000 as our data set, we measure the cross-disciplinary citation rates of each discipline and compare our results to the findings of previous studies in this area.

Keywords: Behavior, Bibliometric Study, Cocitation Maps, Context, Core Journal Networks, Fields, Impact, Information, Interdisciplinary Research, Management, Multidisciplinary, Output, Paper, Patterns, Research, Sciences, Universities, Yield

? Blessinger, K. and Frasier, M. (2007), Analysis of a decade in library literature: 1994-2004. *College & Research Libraries*, **68** (2), 155-169.

Full Text: [2007\Col Res Lib68, 155.pdf](2007/Col%20Res%20Lib68,%20155.pdf)

Abstract: The purpose of this study was to analyze trends in publication and citation in library and information science journals over a decade (1994-2004) of the literature. This examination revealed the areas of concentration within the research, frequently published subjects through the years, and the characteristics of the top-cited authors and resources during this time. This information allows those in the field to follow the trends in publication, gives researchers the tools to determine which journals might give their work the most exposure and recognition, and can help libraries to make collection management decisions in this subject area.

Keywords: Affiliation, Authorship, Citation, Information-Science Research, Publication

? Vallmitjana, N. and Sabate, L.G. (2008), Citation analysis of Ph.D. dissertation references as a tool for collection management in an academic chemistry library. *College & Research Libraries*, **69** (1), 72-81.

Full Text: [2008\Col Res Lib69, 72.pdf](2008/Col%20Res%20Lib69,%2072.pdf)

Abstract: A bibliometric study was carried out on the citations within the chemistry field Ph.D. dissertations to ascertain what types of documents are the most frequently used in the research process, the most frequently consulted journals and obsolescence rate of the journals. The analysis covered 46 doctoral theses presented at the Institut Quimic de Sarria (IQS) from 1995 to 2003. The results obtained from the 4,203 citations revealed that the most frequently used documents were scientific papers, which accounted for 79 percent of the total; 33 journals met 50 percent of the informational needs; and the age of 50 percent of the citations was no older than 9 years. Finally, the results can be used as a tool for the collection management of the library.

Keywords: Academic, Analysis, Chemistry, Citation, Citation Analysis, Collection, Management, References, Tool

? White, H.D. (2008), Better than brief tests: Coverage power tests of collection strength. *College & Research Libraries*, **69** (2), 155-174.

Full Text: [2008\Col Res Lib69, 155.pdf](2008/Col%20Res%20Lib69,%20155.pdf)

Abstract: Improving on ideas developed in Brief Tests of Collection Strength, this paper presents coverage power tests, an empirical method for evaluating collections in all types of libraries by means of ranked holdings counts from OCLC’s WorldCat. The new method measures library coverage of subject literatures across levels of the WLN or RLG collection intensity scales that are increasingly difficult to attain. It defines literatures and collections unambiguously, permits objective comparisons of libraries, and is potentially automatable. Results of 38 tests in nine subjects at 30 libraries have high face validity in rating collections. Graphical analysis with the new method also clarifies the bibliometric relation between individual collections and subject literatures.

Keywords: Analysis, Bibliometric, Collection, Coverage, Mar, Power, Scales, Strength, Validity

? Hyde, G. (2009), Documentation: A history and critique of attribution, commentary, glosses, marginalia, notes, bibliographies, works-cited lists, and citation indexing and analysis. *College & Research Libraries*, **70** (1), 88-89

Full Text: [2009\Col Res Lib70, 88.pdf](2009/Col%20Res%20Lib70,%2088.pdf)

Keywords: Attribution, Citation, History

? Hendrix, D. (2010), Relationships between Association of Research Libraries (ARL) statistics and bibliometric indicators: A principal components analysis. *College & Research Libraries*, **71** (1), 32-41.

Full Text: [2010\Col Res Lib71, 32.pdf](2010/Col%20Res%20Lib71,%2032.pdf)

Abstract: This study analyzed 2005-2006 Web of Science bibliometric data from institutions belonging to the Association of Research Libraries (ARL) and corresponding ARL statistics to find any associations between indicators from the two data sets. Principal components analysis on 36 variables from 103 universities revealed obvious associations between size-dependent variables, such as institution size, gross totals of library measures, and gross totals of articles and citations. However, size-independent library measures did not associate positively or negatively with any bibliometric indicator. More quantitative research must be done to authentically assess academic libraries’ influence on research outcomes.

Keywords: Articles, Author Self-Citations, Bibliometric, Citations, Faculty Publishing Productivity, Impact-Factors, Research, Science, Science Policy, Statistics, Universities, Web of Science

? Kayongo, J. and Helm, C. (2012), Relevance of library collections for graduate student research: A citation analysis study of doctoral dissertations at Notre Dame. *College & Research Libraries*, **73** (1), 47-67.

Full Text: [2012\Col Res Lib73, 47.pdf](2012/Col%20Res%20Lib73,%2047.pdf)

Abstract: This study focused on determining the extent to which collections of the Hesburgh Libraries of Notre Dame met the needs of graduate students. This study data (2005-2007) consisted of a citation analysis of 248 dissertations and focused on the following questions: What were the graduate students citing in their dissertations? Did the library own the cited items? How did the disciplines compare in their citation patterns? The data showed that over 90 percent of the 39,106 citations were to books and journals. The libraries owned 67 percent of the items graduate students cited in their dissertations. The libraries owned 83 percent of the Arts & Humanities, 90 percent of the Engineering, 92 percent of the Science, and 75 percent of the Social Sciences sources in the top 1,000 most cited titles, indicating a need for funding for further development of Social Sciences collections in the Hesburgh Libraries.

Keywords: Analysis, Arts, Citation, Citation Analysis, Citations, Development, Dissertations, Education, Faculty, Funding, Graduate, Graduate Students, Humanities, Information Use, Journals, Libraries, Management, Patterns, References, Research, Science, Sciences, Social Sciences, Students, Theses

# Title: Collegium Antropologicum

Full Journal Title: [Collegium Antropologicum](http://www.collantropol.hr/?id_0=2)

ISO Abbreviated Title: Coll. Anthropol.

JCR Abbreviated Title: Collegium Antropol

ISSN: 0350-6134

Issues/Year: 2

Journal Country/Territory: Croatia

Language: Multi-Language

Publisher: Collegium Antropologicum

Publisher Address: Inst Anthropological Res, P O Box 290, Ulica Grada Vukovara 72/IV, 10000 Zagreb, Croatia

Subject Categories:

Anthropology: Impact Factor 0.414, / (2001)

Klaić, Z.B. and Klaić, B. (1997), Scientometric analysis of anthropology in the Republic of Croatia for the period of 1980-1996. *Collegium Antropologicum*, **21** (1), 301-318.

Full Text: [1997\Col Ant21, 301.pdf](1997/Col%20Ant21,%20301.pdf)

Abstract: Anthropologists from the Republic of Croatia have published 254 scientific papers in the period from 1980-1996, that are included in the secondary publication. Social Science Citation Index. Scientists working in the scientific subfield anthropology participate with approximately 2% in the overall scientific output of the Republic of Croatia. Thirty-six international articles were published (14.2% of the total number), while the rest of 218 papers were published solely by domestic authors. An average anthropological paper is published by 3.06 authors, and approximately one-third of all articles by a single author. The major part of scientific papers (237 articles or 93.3%), Croatian anthropologists have published in a domestic primary scientific journal Collegium Antropologicum. All scientific papers together obtained 380 citations or 1.5 citations per article. The citation of articles is approximately 60% above the expected average for the respective journals. Published international papers had 6.6 citations, while articles by domestic authors had 0.65 citation per paper Anthropological scientific papers obtained 154 independent citations and participate with 40.5% in the total number of citations. In the first five years after publishing, 166 articles (65.4% of the total number) were not cited, while the world’s average for the scientific subfield anthropology was greater, 79.5% uncited articles. Only 19.4% of international papers and 72.9% of domestic papers were not cited in this five-year period. Based on scientometric indicators of a scientific output, that is, the number of published papers, partial scientific contribution, i.e., partial authorship, and scientific influence, i.e. number of citations, a method for the evaluation of scientific papers and their authors has been suggested in this paper.

? Klaic, B. (1999), The use of scientometric parameters for the evaluation of scientific contributions. *Collegium Antropologicum*, **23** (2), 751-770.

Full Text: [1999\Col Ant23, 751.pdf](1999/Col%20Ant23,%20751.pdf)

Abstract: This paper deals with the application of scientometric parameters in the evaluation of scientists, either as individuals or in small formal groups. The parameters are divided into two groups: parameters of scientific productivity and citation parameters. The scientific productivity teas further subdivided into three types of parameters: (i) total productivity, (II) partial productivity, and (iii) productivity in scientific fields and subfields. These citation parameters were considered: (i) impact factors of journals, (II) impact factors of scientific fields and subfields, (iii) citations of individual papers, (iv) citations of individual authors, (v) expected citation rates and relative citation rates, and (ui) self-citations, independent citations and negative citations. Particular attention was payed to the time-dependence of the scientometric parameters. If available, numeric values of the world parameters were given and compared with the data about the scientific output of Croatian scientists.

Keywords: Citation Analysis, Journals, Croatia, Impact, Period, Tool

? Rudan, P., Skaric-Juric, T. and Rudan, I. (2003), Our “*Collegium Antropologicum*” officially the most improved social science journal in the world for mid-2002. *Collegium Antropologicum*, **27** (1), S1-S4.

Full Text: [2003\Col Ant27, S1.pdf](2003/Col%20Ant27,%20S1.pdf)

Abstract: Thomson ISI(R)’s bimonthly web-product ISI Essential Science Indicators (ESP is an in-depth analytical tool that regularly reports quantitative analyses of research performance and science trends, covering about 8,500 scientific journals from the entire world. In each issue ESI lists the scientists, institutions, countries and journals that are most improved from one update to the next, i.e. that show the largest percentage increase in total citations. In its edition of January 2003, it reported that our Collegium Antropologicum was the most improved journal in the field of Social Sciences during the period from July 2002 to September 2002. The field of Social Sciences is one of 22 categories of science regularly analyzed by ESI. It includes anthropology, public health, sociology, social work and policy, political science, law, education, communication, library and information sciences, environmental studies and rehabilitation. Due to journal’s success, which is based on publications of predominantly Croatian scientists within the past seven post-war years, Croatia was also officially the most improved among more than 200 countries, and University of Zagreb was the most improved in the field of Social Science among thousands of other institutions. We hope that this is an early sign of revival of the scientific activity in our country after the War in Croatia (1991-1995).

Keywords: Citations, Collegium Antropologicum, Croatia, Journal, Journals, Library and Information Sciences, Publications, Research, Scientific Journals, Social Sciences

? Radut, D.S. and Sanz-Valero, J. (2011), Croatian bibliometric analysis, 2000-2007. *Collegium Antropologicum*, **35** (2), 269-274.

Full Text: [2011\Col Ant35, 269.pdf](2011/Col%20Ant35,%20269.pdf)

Abstract: To develop search filters and retrieve information estimating the Croatian scientific output (SO) focusing on Public Health (PH) and Preventive Medicine (PM) in MEDLINE. A PubMed search of the MEDLINE database was performed to retrieve articles added to this database between 2000 and 2007. Search filters inspired by previous strategies were applied involving ‘geographical’, ‘place of publication’, ‘subject’ and ‘language of publication’ aspects. An evaluation of the geographical filter performance was done and sensitivity and specificity were calculated. There were obtained publications in several languages, originated in Croatia, published in Croatia and/or abroad. The Croatian SO in the field of PH-PM was obtained for the same period of time by combining search filters. The evaluation of the filter performance showed sensitivity 95.56% and specificity 100%. The filters constructed permitted the retrieval of the Croatian eight years research output. Increased tendency was observed in the global SO evolution and in the PH-PM area as well. The main languages of publication were English and Croatian. This study is a contribution to research in the field of scientific documentation and further analysis is recommended in constructing and developing search filters to retrieve and focus on specific information.

Keywords: Analysis, Bibliographic, Bibliometric, Bibliometrics, Contribution, Croatia, Databases, Documentation, Evaluation, Evolution, Filter, Health, Information, Journals, Medicine, Medline, pH, Preventive Medicine, Public Health, Publication, Publications, PUBMED, Research, Research Output, Scientific Documentation, Scientific Output, Sensitivity, Sensitivity and Specificity, Specificity

# Title: Colloid & Capillary Chemistry

Methuen and Co. Ltd., London

Freundlich, H.M.F. (1926), *Colloid & Capillary Chemistry*, Methuen and Co. Ltd., London.

# Title: Colloid Journal

Full Journal Title: Colloid Journal

ISO Abbreviated Title: Colloid J.

JCR Abbreviated Title: Colloid J+

ISSN: 1061-933X

Issues/Year: 6

Journal Country/Territory: Russia

Language: English

Publisher: Maik Nauka/Interperiodica

Publisher Address: C/O Plenum/Consultants Bureau 233 Spring St, New York, NY 10013

Subject Categories:

Chemistry, Physical: Impact Factor 0.345, 86/91 (2000)

? Larin, A.V. and Frolova, E.A. (1996), Isotherms and heat of adsorption of ethoxylated isononylphenol from n-decane on silica-gel. *Colloid Journal*, **57** (3), 413-415.

Full Text: Col J57, 413.pdf

Abstract: Adsorption isotherms of nonionic surfactant (ethoxylated isononylphenol, average degree of ethoxylation n is 4) from n-decane on silica gel at 293, 313, 323, and 333 K were measured, and the isosteric heat of adsorption was calculated. The latter was found to be equal to 32±3 kJ/mol. A mechanism of adsorption of nonionic surfactants from hydrocarbon on the surface of silica gel was proposed. According to this mechanism, the end portion of the oxide-ethylene chain of the molecule of ethoxylated isononylphenol (n = 4) interacts with two silanol groups, forming four hydrogen bonds.

? Polunina, I.A., Choi, D.K., Row, K.H. and Larin, A.V. (1996), Adsorption isotherm of deoxyadenosine under the conditions of a reverse phase liquid chromatography. *Colloid Journal*, **58** (6), 805-807.

Full Text: Col J58, 805.pdf

Abstract: Adsorption isotherm of deoxyadenosine from a water-enriched mixture of water and methanol on silica gel with reverse C-18 phases was measured using high-performance chromatography. It was shown that at low concentrations (within the range of 0.1 to 10 µg/cm3) the adsorption isotherm is most satisfactorily approximated by the Freundlich equation. Analysis of the data available on thymine adsorption confirms that the Freundlich equation may be employed in the range of low concentrations to approximate the isotherm of adsorption on silica gel with reverse phases in the case of water-enriched mobile phases.

Keywords: Solute

? Pelekh, V.V., Alentev, A.Y., Yampolskaya, G.P. and Izmailova, V.N. (1998), Effect of alkali metal chlorides on the distribution of serum albumin in the water interfacial adsorption layer toluene system. 1. Accumulation of protein at the interface and its concentration in the hydrocarbon phase. *Colloid Journal*, **60** (2), 211-214.

Full Text: Col J60, 211.pdf

Abstract: The radiometric “scintillating phase” method was used to investigate the effect of the chlorides of alkali metals (lithium, sodium, potassium, and cesium) on the distribution of bovine serum albumin (BSA) between the water phase, the interfacial layer, and toluene in a wide range of protein concentrations (from 5.3×10-10 to 6.3×10-5 M). It was shown that salts, as a rule, increase the relative content of protein in the interfacial layer and decrease it in the hydrocarbon phase. The effects of the maximal accumulation of protein at the interface and its minimal transfer into the hydrocarbon phase are realized in the salt concentration range varying from 0.1 to 0.3 M. At higher concentrations, the salts already do not affect the relative concentrations of protein in the interfacial layer and in the hydrocarbon phase, although the content of protein in the interfacial layer as compared to that in the salt-free system remains higher, whereas it is lower in toluene. The specific effect of potassium chloride at low BSA concentrations was noted; this effect exhibits a considerable increase in the relative content of protein in both the interfacial layer and in the hydrocarbon phase. The accumulation dependence of BSA in the interfacial layer and its concentration in the hydrocarbon phase on the nature of the cation is most pronounced at low initial BSA concentrations. At high protein concentrations, the effect of the alkali metal chlorides is virtually the same. Thus, the effect of the salts on the investigated system containing two immiscible liquids (water-toluene) and protein is similar to that known to exist in liquid-liquid systems containing low-molecular-weight surfactants, and consisting in the concentration of surfactants at the interface.

? Pelekh, V.V., Alentev, A.Y., Yampolskaya, G.P. and Izmailova, V.N. (1998), Effect of alkali metal chlorides on the distribution of serum albumin in the water interfacial adsorption layer toluene system. 2. Effect of salts on the equilibrium distribution of protein in the system. *Colloid Journal*, **60** (2), 215-220.

Full Text: Col J60, 215.pdf

Abstract: The adsorption isotherms of bovine serum albumin (BSA) in the interfacial layer and isotherms of its equilibrium concentration in the hydrocarbon phase are given for a wide range of the BSA concentrations in the aqueous phase in the presence of electrolytes. Separate parts of the isotherms are analytically described. The coefficients of protein distribution between the interfacial layer and two macrophases (aqueous and hydrocarbon) in the presence of salts were calculated. At high BSA concentrations, a polycomponent polymolecular interfacial layer is formed-the third intermediate phase. In the presence of the alkali metal chlorides, a third phase is formed at higher protein concentrations.

? Izmailova, V.N., Pelekh, V.V. and Yampolskaya, G.P. (1998), Structurization and rheological properties of interfacial adsorption layers of bovine serum albumin at the aqueous solution-toluene interface in the presence of alkali metal chlorides: 1. The dynamics of formation and the effect of salts on rheological properties of the interfacial adsorption layers. *Colloid Journal*, **60** (3), 289-292.

Full Text: Col J60, 289.pdf

Abstract: The formation dynamics of the interfacial layer in the aqueous solution of a bovine serum albumin-toluene system in the region of multilayer protein adsorption was studied by rheological methods. Nonequilibrium coagulation structures are formed at the interface during the first 20 min. The presence of salts affects the formation time of the equilibrium layers: in the absence of salts, the structure of these layers is formed during 30 min; in the presence of lithium and potassium chlorides, the layers are formed within 40 min; and with sodium and cesium chlorides, within 60 min. For equilibrium interfacial adsorption layers, the dependences of yield shear stress P-rs and steady-state stress of viscous flow P-ss on concentration are identical for all alkali metal chlorides; when salt concentration increases up to its threshold value (0.2-0.3 M for LiCl and NaCl, 0.4 M for KCl and CsCl), the layer strength drops; when concentration increases above the threshold value, the layer strength ceases to be dependent on the electrolyte concentration.

? Izmailova, V.N. and Pelekh, V.V. (1998), Structurization and rheological properties of the interfacial adsorption layers of bovine serum albumin at the aqueous solution-toluene interface in the presence of alkali metal chlorides: 2. Rheological parameters and durability. *Colloid Journal*, **60** (3), 293-296.

Full Text: Col J60, 293.pdf

Abstract: The flow curves of the interfacial adsorption layers (IAL) of bovine serum albumin (BSA) were obtained and the modulus of elasticity, the Schwedoff and Bingham viscosities, as well as the yield points in the presence of electrolytes (0.5 M LiCl, NaCl, KCl, or CsCl) were determined in the region of multilayer protein adsorption (c (BSA) = 10-5 M, Gamma = 5×10-6 mol/m2). A decrease in the rheological parameter values of the IAL in the presence of salts was established. Unlike the IAL of BSA formed in the absence of salts (and exhibiting clearly pronounced solid-like properties), the IALs formed upon the addition of alkali metal chlorides may be referred to as highly viscous anomalous liquids. The structure-sensitive factor of the interfacial layers of BSA was estimated within the framework of the notions on durability developed by Zhurkov. In the presence of alkali metal chlorides, the value of this factor increases by about 1.3 times.

? Kislenko, V.N., Berlin, A.A., Kavaguchi, M. and Kato, T. (1998), Mathematical simulation of polymer adsorption on metal plate. *Colloid Journal*, **60** (3), 307-312.

Full Text: Col J60, 307.pdf

Abstract: A mathematical model describing polymer adsorption from a solution on the surface of a metal plate is described. This model allows us to determine the adsorption equilibrium constant, the rate constants of adsorption and desorption, as well as the maximal amount of a polymer that may be adsorbed on the unit area of a surface plate. The dependences of these parameters on the polymer molecular mass and solvent quality were studied. The consistency of the proposed mathematical model with the experimental data on the adsorption of polystyrene from its solutions in good and theta-solvents on the chromium plate was demonstrated.

? Kislenko, V.N. and Berlin, A.A. (1998), The peculiarities of adsorption kinetics of monodisperse samples of polystyrene and their mixtures on a metal plate from solution. *Colloid Journal*, **60** (4), 444-448.

Full Text: Col J60, 444.pdf

Abstract: The models of competitive and substitution adsorption of a mixture of monodisperse polymer samples on a metal plate from solution are reported. The proposed mathematical model makes it possible to calculate the rate constants of polymer adsorption and desorption, as well as the substitution constant of a low-molecular-weight polymer sample for a higher-molecular-weight sample. The mathematical model was consistent with the experimental data on competitive and substitution adsorption of polystyrene monodisperse samples on a platinum plate from a solution in theta-solvent (trans-decaline at 20.4°C).

? Kumar, P.S. (2010), Removal of Congo red from aqueous solutions by neem saw dust carbon. *Colloid Journal*, **72** (5), 703-709.

Full Text: [2010\Col J72, 703.pdf](2010/Col%20J72,%20703.pdf)

Abstract: Neem sawdust was used to develop an effective carbon adsorbent. This adsorbent was used for the removal of Congo Red (CR) from aqueous solution. The data suggest that the pH of aqueous solutions influences CR removal due to the decrease of removal efficiency with increasing pH. An optimal pH < 3 for the adsorption of CR onto neem sawdust carbon (NSDC) was determined. The experimental data were analysed by the Langmuir, Freundlich, Redlich-Peterson, Toth, Temkin, Sips and Dubinin-Radushkevich models of adsorption. Three simplified kinetic models based on pseudo-first-order, pseudo-second-order and intraparticle diffusion equations were used to describe the adsorption process. It was shown that the adsorption of CR could be described by the pseudo-second-order equation, suggesting that the adsorption occurs as a chemisorption process. The results indicate that the NSDC can be used as a low cost adsorbent alternative to commercial activated carbon for the removal of dyes from wastewaters.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Agricultural Solid-Waste, Alternative, Anionic Dyes, Aqueous Solution, Aqueous Solutions, Carbon, Chemisorption, Coir Pith, Color Removal, Congo Red, Cost, CR, Data, Diffusion, Dust, Dyes, Efficiency, Experimental, Fly-Ash, Freundlich, Intraparticle Diffusion, Kinetic, Kinetic Models, Langmuir, Low Cost, Low Cost Adsorbent, Models, Neem, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Redlich-Peterson, Removal, Removal Efficiency, Removal of Dyes, Saw Dust, Sawdust, Solution, Solutions, Temkin, Textile Effluents, Wastewaters, Water

? Chen, Y.X., Li, W.S. and Zhang, X. (2011), Adsorption behavior of carboxymethyl starch on titanium dioxide surfaces. *Colloid Journal*, **73** (2), 267-274.

Full Text: [2011\Col J73, 267.pdf](2011/Col%20J73,%20267.pdf)

Abstract: The adsorption of carboxymethyl starch (CMS) on titanium dioxide surface from aqueous solution of electrolyte was investigated by adsorption and electrokinetics mobility measurements. Zeta potential measurements showed that the addition of CMS resulted in a shift of isoelectric point to the more acidic region, indicating the adsorption of CMS from the aqueous solution onto titanium dioxide surface. The positively charged and hydrophilic surface sites of titanium dioxide favor the adsorption of CMS molecules. The adsorption capacity of CMS on titanium dioxide surface was found to be controlled by the number of functional group on CMS that promotes surface charge CMS adsorption in agreement with Langmuir isotherm. For the adsorption of CMS, the pseudo-second-order kinetics of chemical reaction provides the best correlation of the experimental data.

Keywords: Adsorption, Alumina-Water Interface, Aqueous Solution, Aqueous Suspensions, Calcium, Copolymers, Dispersions, Flocculation, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Molecular-Weight, Polyacrylic-Acid, Stability

? Kumar, P.S., Abhinaya, R.V., Lashmi, K.G., Arthi, V., Pavithra, R., Sathyaselvabala, V., Kirupha, S.D. and Sivanesan, S. (2011), Adsorption of methylene blue dye from aqueous solution by agricultural waste: Equilibrium, thermodynamics, kinetics, mechanism and process design. *Colloid Journal*, **73** (5), 651-661.

Full Text: [2011\Col J73, 651.pdf](2011/Col%20J73,%20651.pdf)

Abstract: The adsorption of methylene blue (MB) dye from aqueous solution onto a cashew nut shell (CNS) was investigated as a function of parameters such as solution pH, CNS dose, contact time, initial MB dye concentration and temperature. The CNS was shown to be effective for the quantitative removal of MB dye, and the equilibrium was reached in 60 min. The experimental data were analysed by two-parameter isotherms (Langmuir, Freundlich, Temkin and Dubinin-Radushkevich models) using nonlinear regression analysis. The characteristic parameters for each isotherm and the related correlation coefficients were determined. Thermodynamic parameters such as ΔGAº, ΔHAº and ΔSAº were also evaluated, the sorption process was found to be spontaneous and exothermic. Pseudo-first-order, pseudo-second-order and Elovich kinetic models were used to analyze the adsorption process. The results of the kinetic study suggest that the adsorption of MB dye matches the pseudo-second-order equation, suggesting that the adsorption process is presumably chemisorption. The adsorption process was found to be controlled by both surface and pore diffusion. Analysis of adsorption data using a Boyd kinetic plot confirmed that the external mass transfer is a rate determining step in the sorption process. A single-stage batch adsorber was designed for different CNS doses to effluent volume ratios using the Freundlich equation. The results indicated that the CNS could be used effectively to adsorb MB dye from aqueous solutions.

Keywords: Adsorption, Aqueous Solution, Biosorption, CNS, Diffusion, Dye, Equilibrium, Freundlich, Gases, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Mechanism, Methylene Blue, Models, Nonlinear, pH, Pseudo Second Order, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Water

# Title: Colloid Journal-USSR

Full Journal Title: Colloid Journal-USSR

ISO Abbreviated Title: Colloid J. USSR

JCR Abbreviated Title: Colloid J USSR

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor (2000)

? Veselov, V.V. (1966), Kinetics of adsorption of benzene by silica gel from a mixture with n-heptane. *Colloid Journal-USSR*, **28** (6), 643-??.

? Krasnova, G.S., Skrylev, L.D. and Morkushi, S.G. (1967), Kinetics of adsorption of gelatin-activated colloidal particles at a mobile hydrosol-gas interface. *Colloid Journal-USSR*, **29** (4), 387-??.

? Plekhotk, V.F. (1972), Calculation of adsorption isotherm for a nonideal vapor. *Colloid Journal-USSR*, **34** (2), 207-??.

# Title: Colloid Journal of the USSR

Full Journal Title: Colloid Journal of the USSR

ISO Abbreviated Title: Colloid J. USSR

JCR Abbreviated Title: Colloid J USSR (Colloid J USSR-Engl Tr)

ISSN: 0010-1303

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Plenum Publ Corp, New York

Publisher Address:

Subject Categories:

: Impact Factor (2000)

? Klimenko, N.A., Permilovskaya, A.A. and Koganovskii, A.M. (1975), Equations for isotherm of nonionic surfactant adsorption on carbon sorbents from aqueous-solutions. *Colloid Journal of the USSR*, **37** (5), 870-872.

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? Abarzhi, I.I. and Malkin, E.S. (1976), Kinetics for adsorption and diffusion in a biporous medium from a film. *Colloid Journal of the USSR*, **38** (1), 106-109.

? Krotov, V.V. and Rusanov, A.I. (1977), Adsorption-kinetics of surfactants in liquid solutions. 1. Case of one surfactant. *Colloid Journal of the USSR*, **39** (1), 37-44.

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? Fainerman, V.B. (1977), Kinetics of surfactant adsorption from solution. *Colloid Journal of the USSR*, **39** (1), 85-90.

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? Fainerman, V.B. and Silina, V.D. (1977), Diffusion-controlled kinetics of adsorption of surface-active substances from solutions. *Colloid Journal of the USSR*, **39** (4), 736-739.

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? Markina, Z.N., Zadymova, N.M. and Tsikurina, N.N. (1978), Kinetics of formation of cetyltrimethylammonium bromide adsorption layers at liquid interfaces. *Colloid Journal of the USSR*, **40** (5), 728-735.

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? Noskov, B.A., Kochurova, N.N. and Rusanov, A.I. (1979), Kinetics of the adsorption of alcohols on the liquid-gas boundary - non-equilibrium surface electrical potential of aqueous-solutions of alcohols. *Colloid Journal of the USSR*, **41** (3), 495-500.

? Klimenko, N.A. (1979), Equation of the adsorption-isotherm of surfactants from aqueous-solutions on a carbon sorbent with equilibrium concentrations above the CMC. *Colloid Journal of the USSR*, **41** (4), 666-669.

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? Ulberg, Z.R., Marochko, L.G., Polishchuk, T.A. and Pertsov, N.V. (1990), Selective sorption of metals by metallophilic microorganisms from mixed electrolyte-solutions. *Colloid Journal of the USSR*, **52** (3), 459-461.

Abstract: The ability of bacterial cells and microalgae for the selective sorption of metals from mixed electrolyte solutions has been established. The metal is extracted preferably from a mixture the further left it stands in the order Fe3+ > Cu2+ > Ni2+ > Zn2+ > Co2+ > Fe2+ > Mn2+ which characterizes the increase in the instability constants of the metal complexes with alpha-amino acids and polypeptides. It is shown that the sorption capacity of living cells exceeds considerably that of inactivated cells and inorganic sorbents.

# Title: Colloid and Polymer Science

From Volume 1 (1906) to Volume 12 (1913), this journal was published as Zeitschrift für Chemie und Industrie der Kolloide.

From Volume 13 (1913) to Volume 110/1 (1945 and from Volume 110/2 (1948) to Volume 179 (1961), this journal was published as Kolloid Zeitschrift.

From Volume 180 (1962) to Volume 251 (1973), this journal was published as Kolloid-Zeitschrift & Zeitschrift für Polymere. (Kolloid Zeits.)

Full Journal Title: [Colloid and Polymer Science](http://www.springerlink.com/(jjca5d55wgbqitjlooxxjkm4)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:101551,1;&absoluteposition=614#A614); [Colloid and Polymer Science](http://link.springer-ny.com/link/service/journals/00396/index.htm); [Colloid and Polymer Science](http://www.springeronline.com/sgw/cda/frontpage/0,11855,5-175-70-1063499-0,00.html)

ISO Abbreviated Title: Colloid Polym. Sci.

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Language: Multi-Language

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Chemistry, Physical: Impact Factor 1.132, 53/91 (2000)

Polymer Science: Impact Factor 1.132, 15/69 (2000)

? Jaroniec, M. and Rudziński, W. (1975), General method for evaluating energy-distribution function from observed adsorption isotherm. *Colloid and Polymer Science*, **253** (8), 683-685.

Full Text: [1960-80\Col Pol Sci253, 683.pdf](1960-80/Col%20Pol%20Sci253,%20683.pdf)

Abstract: A general method for evaluating the energy distribution function from the experimental adsorption isotherm is presented. The method is based on well known integral representation for the overall adsorption isotherm on heterogeneous surfaces. The development of the local adsorption isotherm and of the energy distribution function into a series with regard to a complete system of orthonormal functions, reduces the problem evaluating the energy distribution to solve the linear system equations.

? Jaroniec, M. and Tóth, J. (1976), Adsorption of gas mixtures on heterogeneous solid surfaces: I. Extension of Tóth isotherm on adsorption from gas mixtures. *Colloid and Polymer Science*, **254** (7), 643-649.

Full Text: [1960-80\Col Pol Sci254, 643.pdf](1960-80/Col%20Pol%20Sci254,%20643.pdf)

Abstract: It was proved that the partial adsorbed quantities can be calculated from the individual adsorption isotherms. This calculation can be carried out by equations which take into’ account the energetical heterogeneity of the surface of adsorbent as well. Thus, the partial isotherms equations which can be applied are as followsV A (p A,p B) =p A /[b a + (p A +b AB p B) m ] 1/m andV B (p A,p B) =p B /[b B + (p B +b BA p A) m ] 1/m wherep A andp B are the partial equilibrium pressures, whileb A,b B andm are constants which can be determined on the basis of the individual isotherms.

? Petrov, J.G. and Miller, R. (1977), Solution of diffusion problems in adsorption-kinetics. *Colloid and Polymer Science*, **255** (7), 669-674.

Full Text: [1960-80\Col Pol Sci255, 669.pdf](1960-80/Col%20Pol%20Sci255,%20669.pdf)

? Dobiáš, B. (1978), Adsorption kinetics of surface active substances from micellar solutions on solid phase. *Colloid and Polymer Science*, **256** (5), 465-470.

Full Text: [1960-80\Col Pol Sci256, 465.pdf](1960-80/Col%20Pol%20Sci256,%20465.pdf)

Abstract: The adsorption kinetics was studied of anion- and cation-active tensides on mineral surface from solutionsc eq < CMC andc eq ≥ CMC, and the adsorption mechanisms of ion exchange and ion pairing were discussed.

In the range ofc eq ≤ c eb mono, the adsorption mechanism can be described using the Elovič-Zeldovič kinetic equations.

In the rangec eq ≥ CMC, the adsorption kinetics is more complicated. For very small values oft that lie beyond the possibility of measurements, the tenside molecules adsorb spontaneously, most probably as micelles, and then they desorb.

As the measurements of Γt (t) for the adsorption of H+ or OH– have shown, the adsorption of tenside molecules in aqueous solutions occur in the presence of H+ or OH– in the electric bilayer.

The parallel course of both kinetics explains the anomalous behaviour in the range of the maximum, before the kinetic equilibrium is reached.

? Cerofolini, G.F., Jaroniec, M. and Sokołowski, S. (1978), Theoretical isotherm for adsorption on heterogeneous surface. *Colloid and Polymer Science*, **256** (5), 471-477.

Full Text: [1960-80\Col Pol Sci256, 471.pdf](1960-80/Col%20Pol%20Sci256,%20471.pdf)

Abstract: A new theoretical isotherm is proposed for the description of physical adsorption on heterogeneous surfaces in the submonolayer range.

This description can be applied to surfaces grown in ‘equilibrium’ conditions, and for particular choices of parameters the isotherm here proposed becomes similar to the classic Freundlich and Dubinin-Radushkevich isotherms. This result can be considered a first step toward a better understanding of the phenomenology of adsorption on real surfaces.

? Jaroniec, M. and Tóth, J. (1978), Adsorption of gas mixtures on heterogeneous solid surfaces. III. Extension of Tóth isotherm on multilayer adsorption of gas mixtures. *Colloid and Polymer Science*, **256** (7), 690-695.

Full Text: [1960-80\Col Pol Sci256, 690.pdf](1960-80/Col%20Pol%20Sci256,%20690.pdf)

Abstract: The analytical equations for multilayer adsorption isotherms of binary gas mixtures on heterogeneous solid surfaces are derived by using the well-known integral equation. These equations were obtained from the generalized Tóth and Freundlich isotherms (i. e., extended pure-gas Tóth and Freundlich isotherms to monolayer adsorption of binary gas mixtures), when the multilayer adsorption isotherm of Gonzalez and Holland was used to describe the local adsorption of binary gas mixtures. One of the derived multilayer adsorption isotherms has been applied to examine the experimental adsorption isotherms of hydrocarbons on charcoal (Nuxit-AL). The obtained numerical parameters have been compared with the parameters characterizing the monolayer adsorption, which were presented in the first part of this paper.

? Miller, R. (1980), Adsorption kinetics on surface of growing drops. *Colloid and Polymer Science*, **258** (2), 179-185.

Full Text: [1960-80\Col Pol Sci258, 179.pdf](1960-80/Col%20Pol%20Sci258,%20179.pdf)

Abstract: Equations are given, describing the adsorption at the surface of a growing drop. Models for the diffusion controlled and mixed “diffusion-kinetic-controlled” adsorption are considered. Using a numerical algorithm the integral equations given are interpreted for a Henry and a Langmuir eqation of state. Appropriate models for the adsorption at an invariant surface and at the surface of a growing drop are compared.

? Schay, G. (1982), On the definition of interfacial excesses in a system consisting of an insoluble solid adsorbent and a binary-liquid mixture. *Colloid and Polymer Science*, **260** (9), 888-891.

Full Text: [1982\Col Pol Sci260, 888.pdf](1982/Col%20Pol%20Sci260,%20888.pdf)

Abstract The paper deals with the problem whether the interfacial excess volumeV σ has to be set zero in the case of the systems in question as stated by D. H. Everett, or eventually different from zero as proposed by G. Schay. First it is shown that the current operational definitions of the interfacial excess amounts as relative or reduced excesses are quite independent of the choice of the reference volume (or amount) of equilibrium bulk liquid. Everett operates with the Gibbs dividing surface, letting it coincide with the surface of the solid, the corresponding operational definition of the interfacial excess amount being then that of n σ (v). It is shown that this definition, while compatible with those of the relative or reduced excesses, is not cogent. Relative and reduced excesses are usually interpreted as the values resulting when the adsorption of either one selected component or the total adsorption is set arbitrarily zero. With this interpretation, the assumptionV σ =0 for the total system could be maintained only by admitting an adsorption excess of the solid different from zero which appears, however, unnatural.

Keywords: Adsorption From Liquid Solutions, Interfacial Excesses

? Mccoy, B.J. (1983), Analytical solutions for diffusion-controlled adsorption kinetics with non-linear adsorption isotherms. *Colloid and Polymer Science*, **261** (6), 535-539.

Full Text: [1983\Col Pol Sci261, 535.pdf](1983/Col%20Pol%20Sci261,%20535.pdf)

Abstract: A regular perturbation series method provides a solution to the diffusion equation when the boundary condition is a non-linear adsorption isotherm. For adsorption at the interface the Freundlich and Langmuir isotherms yield power series in the square root of time. Convergence of the power series solutions is improved by applying the Shanks transformation. The solutions are compared to limiting cases and to published numerical solutions. The results are most accurate for small time where the numerical finite difference method is least reliable.

Keywords: Diffusion Controlled Adsorption Kinetics, Application of Regular Perturbation Method and Laplace Transformation, Langmuir and Freundlich Isotherms

? Qadeer, R., Hanif, J., Saleem, M. and Afzal, M. (1993), Surface characterization and thermodynamics of adsorption of Sr2+, Ce3+, Sm3+, Gd3+, Th4+, UO22+ on activated charcoal from aqueous solution. *Colloid and Polymer Science*, **271** (1), 83-90.

Full Text: [1993\Col Pol Sci271, 83.pdf](1993/Col%20Pol%20Sci271,%2083.pdf)

Abstract: Surface parameters of the activated charcoal were measured using precise instrumental techniques for dehydration, carbon content, trace metals impurities, anions, bulk, tap and true densities, surface area, pore volume, porosity and average particle diameter. The adsorption of Sr2+, Ce3+, Sm3+, Gd3+, Th4+ and UO22+ ions on activated charcoal from aqueous solution was studied as a function of temperature. Thermodynamic parameters such as ΔH° and ΔS° were calculated from the slopes and intercepts of the linear variation of In K1 vs. 1/T, where K1 is obtained from Langmuir equation. The results show endothermic heats of adsorption, but negative free energy values indicate that the adsorption process of metal ions on activated charcoal is favored at high temperature. The value of isosteric heat of adsorption, calculated from the Clausius-Clapeyron equation, shows that the surface of the activated charcoal is heterogeneous with respect to activity. A wavelength dispersive x-ray fluorescence spectrometer was used for measuring the concentration of metal ions.

Keywords: Activated Charcoal, Surface Characterization, Adsorption of Metal Ions (Sr, Ce, Sm, Gd, Th, U), Sorption

? Nadiyetabbiruka, M.S. and Haynes, J.M. (1994), The kinetics of silylation of hydroxylated silica. 1. Aerosil. *Colloid and Polymer Science*, **272** (12), 1602-1610.

Full Text: [1994\Col Pol Sci272, 1602.pdf](1994/Col%20Pol%20Sci272,%201602.pdf)

Abstract: The kinetics of the silylation of hydroxylated silica, the non-porous Aerosil using trimethylchlorosilane, under various reaction conditions has been investigated by a gravimetric technique and found to follow the law: [1+b, t]In{M(infinity), M(infinity)-M(t)}-M(t)b, M(infinity)t = k(a) which represents a first order reaction retarded by one of its products. From this analysis, the activation energy in the temperature range 598 K to 673 K, was found to be 155 kJ mol-1. The reaction is independent of pressure at values greater than 15 torr.

Keywords: Aerosil, Kinetics, Silylation Kinetics, Trimethylchlorosilane

? Lee, D.J. (1995), Enthalpy-entropy compensation in ionic micelle formation. *Colloid and Polymer Science*, **273** (6), 539-543.

Full Text: [1995\Col Pol Sci273, 539.pdf](1995/Col%20Pol%20Sci273,%20539.pdf)

Abstract: The enthalpy-entropy compensation in ionic surfactant micellization process over a large temperature range is examined. The surfactants SDS and C(16)TAB are investigated experimentally, and the enthalpy and entropy changes are evaluated based on phase separation or mass action models together with the other three surfactant systems. The relationship between compensation temperature and the reference temperatures is discussed.

Keywords: Enthalpy-Entropy Compensation, Ionic Surfactant Critical, Micelle Concentration, Reference Temperature, Temperature Effect, Temperature-Dependence, Water, Micellization, 50°C, 0°C, Surfactant, Heat

? Ilic, M., González, J., Pohlmeier, A., Narres, H.D. and Schwuger, M.J. (1996), Interaction of sodium dodecylsulfate (SDS) with homoionic montmorillonites: Adsorption isotherms and metal-ion release. *Colloid and Polymer Science*, **274** (10), 966-973.

Full Text: [1996\Col Pol Sci274, 966.pdf](1996/Col%20Pol%20Sci274,%20966.pdf)

Abstract: The interaction of dodecylsulfate anions (DS-) with homoionic Ca-, Mg-, Ni-, Cu-, Cd-, Pb- and Fe-montmorillonites were investigated. Mg-and Cd-montmorillonite do not adsorb DS-, and an anion exchange at the edges of the clay mineral does not take place. Three different adsorption processes are identified on the other montmorillonites: (i) Fe-montmorillonite is covered with amorphous iron hydroxide, and DS-anions are bound at positively charged sites. (II) On Ca-and Pb-montmorillonite DS-is precipitated as Me (DS)2. (iii) On Ni-and Cu-montmorillonite DS-forms ion pairs with the cations on the surface. In all cases DS-is not bound above the CMC but the metal ions are mobilized from the surface either by solubilization of the precipitates or by formation of mixed micelles.

Semmler, A. and Kohler, H.H. (2000), A simple adsorption model for ionic surfactants. *Colloid and Polymer Science*, **278** (10), 911-918.

Full Text: [C\Col Pol Sci278, 911.pdf](C/Col%20Pol%20Sci278,%20911.pdf)

Abstract: In the past, few theoretical attempts have been made to describe quantitatively the adsorption of ionic surfactants at liquid interfaces. Well-known adsorption isotherms due to Frumkin or Hill-de Beer cannot respond to the specific electrostatic and geometric properties of the surfactant molecules. Our approach is based on a combination of the Gouy-Chapman theory with a modified Frumkin isotherm. The modification implies that the system is free to choose an optimal head group area and an optimal arrangement of the surfactant molecules in the interface as a function of bulk concentration. Interaction energies between neighbouring adsorbed surfactant molecules and between surfactant and water molecules are taken into consideration. The minimum of the Gibbs free energy of the system is equivalent to a minimal interfacial tension. Thus, the thermodynamically stable isotherm can be obtained as the lower envelope of the family of sigma versus ln c isotherms resulting from different choices of the model parameters, including the area per molecule. According to the Gibbs equation, the Gamma versus In c adsorption isotherm is obtained as the derivative of this envelope. By variation of the model parameters, the envelope of the calculated adsorption isotherms can be fitted to experimental data of the interfacial tension versus bulk concentration. A computer program is used to calculate the sigma versus c and the Gamma versus ln c curves as well as to fit the parameters.

Keywords: Ionic Surfactants, Adsorption, Model, Isotherm, Surface Tension, Tension, Water, Interface, Apparatus

Seoane, R., Dynarowicz-tstka, P., Miñones, Jr., J. and Rey-Gómez-Serranillos, I. (2001), Mixed Langmuir monolayers of cholesterol and ‘essential’ fatty acids. *Colloid and Polymer Science*, **279** (6), 562-570.

Full Text: [C\Col Pol Sci279, 562.pdf](C/Col%20Pol%20Sci279,%20562.pdf)

Abstract: Langmuir monolayers of cholesterol and various fatty acids, such as stearic, oleic, linoleic, alpha -linolenic, and arachidonic acids. spread at the air/water interface are investigated. The system of cholesterol and stearic acid is found to be immiscible. with only one collapse, occurring at the same surface pressure for all composition range. However, surface pressure (pi) - area (A) isotherms of cholesterol/unsaturated fatty acids show a characteristic course with two collapse states. The pressure of the first collapse varies with the proportion of the components in the mixture. while the second collapse, occurring at the surface pressure characteristic of cholesterol alone, is independent of mole fraction of the investigated fatty acid. The application of the surface phase rule indicates that the unsaturated fatty acids/cholesterol mixtures are miscible up to the surface pressure corresponding to the first collapse. Negative values of the excess free energy of mixing in all composition ranges prove that the mixtures are stable. The interactions existing in mixtures of cholesterol and unsaturated fatty acids possessing even numbers of double bonds are strongest in the lower region of fatty acid proportion, and the results are consistent with the minimum values of the excess free energy of mixing, indicating the most stable mixtures. For cholesterol and unsaturated fatty acids with odd numbers of double bonds the behavior is different, and the strongest interactions occur in both low and high regions of mole fraction of an acid.

Keywords: Mixed Monolayers, Cholesterol, Unsaturated Fatty Acids, Interaction, Air/Water Interface, Air-Water-Interface, Miscibility, Mixtures, Films

Dékány, Gy., Csóka, I. and Erös, I. (2001), Adsorption of neutral polymers on negatively charged liposomes. A novel quantitative method to measure the rate of polymer adsorption on the liposomal surface. *Colloid and Polymer Science*, **279** (10), 966-975.

Full Text: [C\Col Pol Sci279, 966.pdf](C/Col%20Pol%20Sci279,%20966.pdf)

Abstract: We studied the adsorption of two neutral polymers [poly(vinyl pyrrolidone) and poly(vinyl alcohol) (PVA)] on negatively charged liposomes composed of 25: 2: 3 (molar ratio) soy lecithin/dicetyl phosphate/cholesterol. The liposomes were prepared in buffered solution at pH 7.4 and were mixed with the solution of the polymers in the desired polymer/lipid ratios. Adsorption was measured by determination of the equilibrium bulk concentration of the polymer. Protamine hydrochloride was used to aggregate the liposomes with polymers adsorbed on their surface and to facilitate their separation from the equilibrium bulk solution. In the case of PVA, quantitative adsorption measurements with a specific reagent were possible. Adsorption isotherms were recorded at 25±0.2 degreesC. It was concluded that adsorbed and non-adsorbed PVA molecules are in equilibrium even at low polymer/lipide ratios. The results were confirmed by dynamic laser light scattering, X-ray diffraction and thermal activity monitoring experiments.

Keywords: Liposomes, Polymer Adsorption, Microcalorimetry, Particle Size Determination, Adsorption Layer Structure, Vesicles, Bilayers

Okubo, M., Wang, Z., Ise, E. and Minami, H. (2001), Adsorption of styrene on micron-sized, monodisperse, cross-linked polymer particles in a snowman-shaped state by utilizing the dynamic swelling method. *Colloid and Polymer Science*, **279** (10), 976-982.

Full Text: [C\Col Pol Sci279, 976.pdf](C/Col%20Pol%20Sci279,%20976.pdf)

Abstract: Polystyrene/styrene-divinylbenzene copolymer composite particles with different cross-linking densities were produced by seeded copolymerization for (styrene/divinylbenzene)-swollen polystyrene particles prepared by utilizing the dynamic swelling method (DSM) which was proposed by the authors in 1991. Using the cross-linked, composite particles as seeds, styrene-adsorbed (swollen) composite particles having snowman shapes were prepared by the DSM. With a decrease in the cross-linking density in the composite particles, the volume of the composite particle which was embedded in a spherical styrene phase in the snowman-shaped, styrene-adsorbed particle increased and the contact angle of the styrene phase on the composite particle decreased. In the DSM process, the absorption stage of styrene in the composite particles and the adsorption stage thereon were clearly observed. This suggests that the cross-linking density of the composite particles greatly affects the morphology of the snowman-shaped particles.

Keywords: Dynamic Swelling Method, Snowman Shape, Particle, Morphology, Contact Angle, Seeded Polymerization, Dispersion Polymerization, Aqueous Dispersions, Vinyl Groups, Suspension, Emulsion, Thermodynamics, Microspheres, Oligomer, Capacity

Snukiškis, J. and Gefeniene, A. (2001), Simultaneous sorption of nonionic surfactant (alkylmonoethers) and copper(II) in a weak acid polyacrylic cation exchanger. *Colloid and Polymer Science*, **279** (11), 1126-1133.

Full Text: [C\Col Pol Sci279, 1126.pdf](C/Col%20Pol%20Sci279,%201126.pdf)

Abstract: The mutual influence of copper(II) cations and nonionic surfactant alkylmonoethers on their simultaneous sorption by the hydrogen form of Purolite C 106 polyacrylic acid functionalized cation exchanger was investigated considering the suitability for the prevention of environmental contamination. Sorption isotherms were measured and sorption equilibrium coefficients calculated. The modelling of copper(II) sorption and copper(H) carboxyl complex formation was carried out. The sorption of coppcr(II) proceeds predominantly by complex (ionic and coordinate) bonding followed by the change in pH, also by single coordinate bonding. The mutual action of copper(II) and alkylmonoethers leads to a decrease in the equilibrium sorption for both copper(H) and the surfactant. The sorption of copper(II) and alkylmonoethers could be applicable for the purification of sewage including copper plating rinsewater from both contaminants simultaneously for the control of copper(H) and the surfactant in sewage effluents.

Keywords: Copper(II), Nonionic Surfactant, Sorption, Cation Exchanger, Recovery, Sewage, Water, Ions

Johnson, S.B., Dunstan, D.E. and Franks, G.V. (2004), A novel thermally-activated crosslinking agent for chitosan in aqueous solution: A rheological investigation. *Colloid and Polymer Science*, **282** (6), 602-612.

Full Text: [C\Col Pol Sci282, 602.pdf](C/Col%20Pol%20Sci282,%20602.pdf)

Abstract: The use of 2,5-dimethoxy-2,5-dihydrofuran (DHF) as a temperature-controlled gelation agent for chitosan under acidic conditions has been examined by dynamic oscillatory and viscometry techniques. In particular, the rate and extent of gelation have been examined over a range of different temperatures (40-98 degreesC), DHF concentrations (10-100 mM) and pH conditions (0.9-2.1). The gelation time, t(G), decreases, and the maximum gelation rate increases substantially as a function of rising temperature. When fit with a simple Arrhenius function, the t(G) data yield an activation energy for gelation of 55±8 kJ mol-1. Gelation is found to occur on the shortest time-scale, and the strongest gels result, at the highest DHF concentrations investigated. Similarly, the gelation rate and gel strength are highest for the most acidic solution conditions examined. Experimental findings are interpreted in terms of a competition between the crosslinking reaction (which drives gel formation, and is initially dominant) and protolytic decomposition of chitosan (which disrupts the gel structure, and becomes increasingly important as time progresses). Syneresis phenomena additionally impact results obtained at DHF concentrations greater than or equal to 50 mM.

Keywords: Ion Adsorption Capacity, Linked Chitosan, Controlled-Release, Drug-Release, Gel Point, Linear Viscoelasticity, Poly(Vinyl Alcohol), Sustained-Release, Reactive Dye, Beads

? Rytwo, G. and Gonen, Y. (2006), Very fast sorbent for organic dyes and pollutants. *Colloid and Polymer Science*, **284** (7), 817-820.

Full Text: [2006\Col Pol Sci284, 817.pdf](2006/Col%20Pol%20Sci284,%20817.pdf)

Abstract: The increasing use of organic compounds endangering the environment encourages search for more efficient sorbents. While crude clay minerals are effective for the adsorption of cations, modified organoclays may adsorb negative and hydrophobic molecules. In this short communication, we present a very fast adsorbing organoclay based on montmorillonite with crystal violet preadsorbed up to neutralization of the negative charges. Sorption of erythrosin-B and 2,4,5-trichlorophenol to such organoclay reaches equilibrium in less than a minute, whereas with activated carbon, it took tens of minutes. The pseudo second-order kinetic coefficient for the process was at least two orders of magnitude smaller for the organoclay. Because sorption kinetics is an important factor in water purification, such fast sorbent might have broad environmental applications.

Keywords: Organoclays, Sorption Kinetics, Montmorillonite, Crystal Violet, Erythrosine-B, 2,4,5-Trichlorophenol, Hydrophobic Layer Silicates, Alcohol-Benzene Mixtures, Liquid-Phase Adsorption, Aqueous-Solution, Clay-Minerals, Metal-Ions, Montmorillonite, Kinetics, Sorption, Phenol

? Stewart, T.J., Yau, J.H., Allen, M.M., Brabander, D.J. and Flynn, N.T. (2009), Impacts of calcium-alginate density on equilibrium and kinetics of lead(II) sorption onto hydrogel beads. *Colloid and Polymer Science*, **287** (9), 1033-1040.

Full Text: [2009\Col Pol Sci287, 1033.pdf](2009/Col%20Pol%20Sci287,%201033.pdf)

Abstract: Chronic exposure to Pb2+ above the 15-mu g/L US Environmental Protection Agency action level for drinking water has been shown to cause a host of health problems in humans. Thus, it is important to study new methods available for the treatment and removal of Pb2+ from drinking water and wastewater, where elevated levels of heavy metals are found. Alginate-based beads represent one such possible method for heavy metal removal. The impact of alginate density on the equilibrium and kinetics of Pb2+ sorption onto hydrogel beads was investigated using Ca-alginate beads ranging from 1% to 8% (w/v) and exposed to Pb2+ concentrations ranging from 100 to 1,000 mg/L. When Ca-alginate beads were characterized using Fourier transform infrared analysis, the carboxylic acid groups of the mannuronate and guluronate residues in alginate were the primary functional groups that interacted with Pb2+. Hydration of Ca-alginate beads was also examined and found to decrease as Ca-alginate density increased. A positive correlation was observed between Ca-alginate hydration and Pb2+ sorption. Sorption of Pb2+ was fast, reaching equilibrium after approximately 4 h, and is well described by the Langmuir adsorption isotherm. Maximum sorption capacities for 1%, 4%, and 8% beads were 500±A 100, 360±A 30, and 240±A 20 mg/g (dry weight), respectively. The kinetics of sorption were best described by the pseudo-second-order Lagergren model, with rate constants determined as 3.2±A 0.1×10-4, 1.0±A 0.1×10-4, and 1.6±A 0.1×10-4 g mg-1 min-1 for 1%, 4%, and 8% beads, respectively.

Keywords: Acid, Adsorption, Adsorption Isotherm, Alginate, Analysis, Beads, Biosorption, Ca-Alginate, Calcium Alginate, Carboxylic, Correlation, Drinking Water, Egg-Box Model, Equilibrium, Exposure, Functional Groups, Health, Heavy Metal, Heavy Metal Removal, Heavy Metals, Host, Humans, Hydration, Hydrogel, Impact, Ions, Isotherm, Kinetics, Lagergren Model, Laminaria-Digitata, Langmuir, Langmuir Adsorption Isotherm, Lead, Lead(II), Metal, Metals, Methods, Model, Pb2+, Primary, Pseudo Second Order, Pseudo-Second-Order, Rate Constants, Removal, Sorption, Treatment, US, Wastewater, Water

# Title: Colloids and Surfaces

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Notes: IIsotherm

Abe, I., Hayashi, K. and Hirashima, T. (1984), Relationship between the Freundlich adsorption constants k and 1/n for activated carbon adsorption. *Colloids and Surfaces*, **8** (3), 315-318.

Full Text: [C\Col Sur8, 315.pdf](C/Col%20Sur8,%20315.pdf)

Harvey, D.T. and Linton, R.W. (1984), X-ray photoelectron-spectroscopy (XPS) of adsorbed zinc on amorphous hydrous ferric-oxide. *Colloids and Surfaces*, **11** (1-2), 81-96.

Full Text: [C\Col Sur8, 81.pdf](C/Col%20Sur8,%2081.pdf)

Abstract: The adsorption of Zn on amorphous hydrous ferric oxide (HFO) was monitored using both solution measurements of the non-absorbed Zn and X-ray photoelectron spectroscopy (XPS) measurements of the adsorbed Zn. Solution results suggest that, at low adsorption densities and/or low pH’s, the mechanism of Zn adsorption may be similar to the adsorption of Cd, Cu and Pb. However, at higher adsorption densities and higher pH’s, there is an apparent change in Zn speciation. Chemical shift and adsorbate thickness values derived from XPS provide information on the mechanism of the surface adsorption of Zn. The XPS studies show that submonolayer coverages of Zn are largely chemically adsorbed at solution pH’s less than 6.5, while at higher pH’s the Zn is partially hydrolyzed to form a surface layer containing physisorbed Zn(OH)2, which may exceed monolayer thicknesses.

Khan, A.A. and Singh, R.P. (1987), Adsorption thermodynamics of carbofuran on Sn(IV) arsenosilicate in H+, Na+ and Ca2+ forms. *Colloids and Surfaces*, **24** (1), 33-42.

Full Text: [C\Col Sur24, 33.pdf](C/Col%20Sur24,%2033.pdf)

Abstrac: The adsorption thermodynamics of carbofuran was studied on Sn(IV) arsenosilicate cation exchanger in the H+, Na+ and Ca2+ forms at 25 and 50°C. The adsorption isotherms of carbofuran were found to follow the Freundlich adsorption model and yield ‘S’ and ‘L’ class isotherms. The order of adsorption of carbofuran on the different forms of cation exchanger is H+ > Na+ > Ca2+. The thermodynamic equilibrium constant (*K*0), standard free energy (Δ*G*0), enthalphy (Δ*H*0) and entropy (Δ*S*0) changes were also been calculated to predict the nature of adsorption.

Kumari, K., Singh, R.P. and Saxena, S.K. (1988), Adsorption thermodynamics of carbofuran on fly-ash. *Colloids and Surfaces*, **33** (1-2), 55-61.

Full Text: [C\Col Sur33, 55.pdf](C/Col%20Sur33,%2055.pdf)

Abstract: Adsorption of carbofuran on fly ash was studied at 25 and 50°C. The data were analysed in terms of isotherm, Freundlich equation and various thermodynamic parameters. The data fit in close agreement with the Freundlich equation and yield ‘S’ type isotherms. The degree of adsorption of carbofuran was determined and found to be in accordance with the partial moral free energies and *K*d values. The thermodynamic constants (*K*0 and standard free energy (Δ*G*0 and enthalpy (Δ*H*0 and entropy changes (Δ*S*0 were calculated for predicting the nature of adsorption.

? Gu, T.R. and Zhu, B.Y. (1990), The S-type isotherm equation for adsorption of nonionic surfactants at the silica-gel water interface. *Colloids and Surfaces*, **44**, 81-87.

Full Text: [1990\Col Sur44, 81.pdf](1990/Col%20Sur44,%2081.pdf)

Abstract: Generally the adsorption of nonionic surfactants from aqueous solution onto polar adsorbents (e.g., silica gel) exhibits an S-type curve. In this work, based on the consideration of hemimicelle formation, the mass-action model has been extended to nonionic surfactant adsorption systems. The S-type adsorption isotherm equation has been derived and this makes possible the calculation of the hemimicelle aggregation number (n), equilibrium constant (K) and the standard free energy of hemimicellization (&,,G”) from the experimental data. The previous adsorption data of three nonionic surfactants (i.e., octylmethylsulfoxide, decylmethylsulfoxide and Triton X-100) on two silica gels with different porosities have been used to test the model. The results show that the S-type isotherm equation and the mass-action model agree with the experimental data very well.

Brandão, M.S.B. and Galembeck, F. (1990), Copper, lead and zinc adsorption on MnO2-impregnated cellulose acetate. *Colloids and Surfaces*, **48**, 351-362.

Full Text: [C\Col Sur48, 351.pdf](C/Col%20Sur48,%20351.pdf)

Abstract: Manganese(IV) oxide supported on cellulose acetate (MnO2/CA) is a material which combines the adsorbent properties of MnO2 with the handling characteristics of the polymer fibers.

CA was impregnated with noncrystalline MnO2 by immersion of this polymer in acidic potassium permanganate solution at 60°C.

The adsorption capacity of the composite was evaluated, using Cu(II), Zn(II) and Pb(II) ions. Isotherms were obtained showing the following characteristics: high affinity at low concentrations; saturation above an equilibrium concentration of 2.0 m*M*. Adsorption capacities are: 1.7 mmol g-1 MnO2 for Cu(II) and 2.3 mmol g-1 MnO2 for Pb(II). Adsorption capacity of Cu(II) increases with temperature and is nearly constant above pH 3.

During continuous flow of CuSO4 solution through columns packed with MnO2/CA, Cu(II) ions are effectively removed, even when the feed stream concentration is as low as 5 ppm. Cu(II) adsorption is irreversible and occurs with desorption of manganese ions.

Potgieter, J.H. (1990), An experimental study of the adsorption behaviour of Methylene blue on activated carbon. *Colloids and Surfaces*, **50**, 393-399.

Full Text: [C\Col Sur50, 393.pdf](C/Col%20Sur50,%20393.pdf)

Xyla, A.G., Giannimaras, E.K. and Koutsoukos, P.G. (1991), The precipitation of calcium carbonate in aqueous solutions. *Colloids and Surfaces*, **53** (2), 241-255.

Full Text: [C\Col Sur53, 241.pdf](C/Col%20Sur53,%20241.pdf)

Abstract: The stability of calcium carbonate supersaturated solutions was studied between 25-80-degrees-C and pH 8.00-9.00. The stability diagrams showed narrow supersaturation ranges, for which very reproducible induction times could be obtained. Investigation of the precipitation process by a plethostatic (i.e., in which a constant number of moles is maintained) experimental approach, enabled us to identify vaterite as the initially forming crystalline phase, throughout the pH and temperature range investigated. The precipitation took place via a polynuclear mechanism. Ethane-1-hydroxyethylideno-1,2-diphosphonic acid (EHDP) caused not only retardation in the rates of spontaneous precipitation but resulted also in stabilization of the initially forming vaterite. An apparent activation energy of 46 kJ mol-1 was obtained for the precipitation reaction of vaterite. Seeded growth experiments on calcite seed crystals over the temperature range 10-37-degrees-C, gave second order kinetics suggesting a spiral growth mechanism. In all cases, calcite was found to be the only phase forming. The presence of additives such as orthophosphate and oxalate reversed the surface charge of the calcite particles while metal ions such as Cd2+ or Zn2+ resulted in a marked reduction of the rates of precipitation by adsorption on the active growth sites on the surface of the calcite crystals.

Keywords: Induction Periods, Crystal-Growth, Crystallization, Kinetics, Aragonite

Notes: IIsotherm

Iyer, K.P.D. and Kunju, A.S. (1992), Extension of Harkins-Jura adsorption isotherm to solute adsorption. *Colloids and Surfaces*, **63** (3-4), 235-240.

Full Text: [C\Col Sur63, 235.pdf](C/Col%20Sur63,%20235.pdf)

Abstract: An adsorption isotherm of general applicability is not available at present for solution solid systems. The Langmuir and BET isotherms have only limited applicability. The Harkins-Jura adsorption isotherm, which is applicable to gas-solid systems, is extended to solution solid systems assuming that the adsorbed film is of the condensed type. The extended Harkins-Jura adsorption isotherm is verified for eleven different systems, using activated charcoal as the adsorbent. In ten cases, two intersecting straight lines are obtained and the point of intersection is shown to be the point at which second-order phase transition occurs. At the point of intersection, a monolayer is complete with flat orientation of the admolecules and, hence, the specific adsorption at this point is the monolayer value with flat orientation. The monolayer values thus obtained are closer to the specific adsorption at point B than Langmuir monolayer values.

Keywords: Interface, Monolayer, Orientation, Phase-Transition, Specific Surface Area

Lenhart, J.J., Figueroa, L.A., Honeyman, B.D. and Kaneko, D. (1997), Modeling the adsorption of U(VI) onto animal chitin using coupled mass transfer and surface complexation. *Colloids and Surfaces*, **120** (1-3), 243-254.

Full Text: [C\Col Sur120, 243.pdf](C/Col%20Sur120,%20243.pdf)

Abstract: This paper reports the development of a treatment system, using animal chitin as a passive biosorbent, for removing U(VI) from aqueous waste streams. An integral part of this system is a model that provides for the optimization of the treatment system through simulation of U(VI) removal efficiency based on the characteristics of the influent waste stream. The model accounts for changing solution matrix conditions through the coupling of surface complexation and mass transfer models. Complexation of U(VI) by chitin surface sites was modeled using FITEQL. Application of FITEQL in the “forward” mode provided the sorbed and aqueous phase concentrations needed for the mass transfer model. The mass transfer model was derived for both batch and continuously stirred tank reactor (CSTR) configurations using Fick’s Law, reactor mass balances and rate law expressions. The coupled model was successfully validated using CSTR data at pH 6.5 and rate constants determined from batch sorption experiments. The CSTR configuration yields a steady-state, eighty percent U(VI) removal for 1 μM influent U(VI) with a solution-phase pH of 6.5 and 3.9 g l−1 chitin.

Keywords: Uranium, Chitin, Sorption, Treatment, Mass Transfer

# Title: Colloids and Surfaces A-Physicochemical and Engineering Aspects

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Tiwari, R.K., Ghosh, S.K., Rupainwar, D.C. and Sharma, Y.C. (1993), Managing aqueous-solutions rich in Mn(II): An inexpensive technique. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **70** (2), 131-137.

Full Text: [C\Col Sur A-Phy Eng Asp70, 131.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp70,%20131.pdf)

Abstract: The ability of fly ash to remove manganese from aqueous solutions by adsorption was investigated. The extent of removal was dependent on concentration, pH and temperature of the solution. The applicability of the Langmuir isotherm to the fly ash-manganese system was tested at 30-degrees-C and pH 8.0. These were the optimum conditions for maximum removal. The values of the adsorptive capacity Q0 and bonding constant b were found to be 0.20 mg g-1 and 1.25 mg-1 respectively under the above conditions. With an initial concentration of 1.0 mg l-1 and at 30-degrees-C and pH 8.0, the removal was found to be 80.0%. The time to reach equilibrium was 2 h. The process of uptake is governed by first-order rate kinetics and under optimum conditions the rate constant of the reaction was found to be 2.40 . 10-2 min-1. The pH dependence study revealed that at pH 8.0 the uptake was 80.0% but at pH 9.0, 99.0% removal was found. The higher uptake at pH 9.0 was attributed to adsorption coupled with hydrolysis followed by oxidation. The dibasic behaviour of fly ash also facilitated Mn(II) adsorption at higher pH owing to the low pH required for constant zeta potential.

Keywords: Adsorption, Fly Ash, Inexpensive, Mn(II), pH, Wollastonite, Manganese, Effluents, Removal

Mehrian, T., Dekeizer, A., Korteweg, A.J. and Lyklema, J. (1993), Thermodynamics of adsorption of dodecylpyridinium chloride on Na-kaolinite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **73**, 133-143.

Full Text: [C\Col Sur A-Phy Eng Asp73, 133.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp73,%20133.pdf)

Abstract: A study was undertaken to determine the influence of temperature and electrolyte concentration on the adsorption of dodecylpyridinium chloride (DPC) on Na-kaolinite. Enthalpies were measured using an isothermal microcalorimeter by titration of a kaolinite suspension with a concentrated surfactant solution at 6, 20 and 60°C.

Curves of cumulative adsorption enthalpies against amount adsorbed show a break around the transition from monolayer to bilayer coverage. The curves are fairly linear both before and after the break, and result in partial molar adsorption enthalpy values that are independent of surface coverage, confirming that the surface is homogeneous with respect to the DPC adsorption. This is additional evidence that the surfactant is hardly adsorbed on the edges.

Adsorption isotherms at different electrolyte concentrations exhibit a common intersection point that coincides with the isoelectric point and correponds to the transition from monolayer to bilayer coverage. Isotherms are independent of temperature up to monolayer coverage, implying a zero isosteric adsorption enthalpy, but upon bilayer formation the adsorption has a maximum at about 23°C, implying a transition from an endothermic to an exothermic process. The calorimetric adsorption enthalpies change sign at T almost-equal-to 24-30°C. In this respect, the adsorption process is very similar to micellization. The electrolyte concentration has a minor effect on the adsorption enthalpies of the first and second layers. There are some qualitative agreements and some quantitative discrepancies between the isosteric heats of adsorption and the directly measured heats.

Our experimental data fit well to a bilayer model based on the Frumkin-Fowler-Guggenheim equation.

Keywords: Adsorption, Calorimetry, Clay, Dodecylpyridinium Chloride, Electrosorption, Kaolinite, Surfactants, Surfactant Adsorption, Electrolyte Interface, Anionic Surfactants, Organic Cations, Microcalorimetry, Alumina, Model

Newcombe, G., Hayes, R. and Drikas, M. (1993), Granular activated carbon: Importance of surface-properties in the adsorption of naturally-occurring organics. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **78**, 65-71.

Full Text: [C\Col Sur A-Phy Eng Asp78, 65.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp78,%2065.pdf)

Abstract: The presence of dissolved organic matter (humic material in particular) in source water decreases the effectiveness of granular activated carbon filters in the treatment of drinking water. Results from potentiometric titrations. electrophoretic mobility measurements and BET surface area analyses suggest that this may be due to an increase in the negative charge on the carbon surface and a decrease in available surface area after adsorption. An increase in pH and the application of heat causes organics to desorb. After a subsequent acid treatment the carbon exhibits an increased ability to adsorb dissolved organic material. X-ray photoelectron spectroscopy was used to examine the carbon surface before adsorption, after adsorption and after regeneration treatment.

Keywords: Activated Carbon, Adsorption of Humic Material, Chemical Regeneration, Surface Charge, X-Ray Photoelectron Spectroscopy

Garris, J.P. and Sikes, C.S. (1993), Use of polyamino acid analogs of biomineral proteins in dispersion of inorganic particulates important to water-treatment. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **80** (2-3), 103-112.

Full Text: [C\Col Sur A-Phy Eng Asp80, 103.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp80,%20103.pdf)

Abstract: Synthetic polyamino acids (peptides) based on the structure and activity of matrix proteins isolated from oyster shell and other biomineral structures have been identified for use in the prevention of mineral scaling. Matrix proteins are polyanionic and are thought to act as regulators of crystallization during the development of skeletal and other mineral structures. These proteins and their synthetic analogs also contain hydrophobic regions that may enhance their surface-active properties. The dispersion activity of a variety of polyamino acids that are matrix protein analogs has been evaluated in bench-top tests using inorganic mineral particles.

Dispersion activities were measured using particles of iron oxide, kaolin, calcium carbonate, and calcium phosphate (hydroxyapatite). The activity was measured by increases in the spectrophotometric absorbance of test particle suspensions in the presence of dispersants. The increases in absorbance were due to turbidity resulting from the production of smaller particle sizes or slower rates of settling. The results suggest that biopolymers composed of polyanionic polyamino acids may be effective as dispersants. Polyamino acids containing a hydrophobic or phosphorylated domain attached to a polyaspartate backbone demonstrate enhanced activity over polyaspartate. These polyamino acids display comparable activity to commercially available hydrocarbon-based polymeric dispersants.

An economical process for the manufacture of polyamino acids by thermal polycondensation is under development. Clearly, non-toxic and biodegradable polyamino acids present a desirable alternative to toxic non-biodegradable polymers in a number of applications such as detergents and cooling tower additives.

Keywords: Biopolymers, Dispersion, Minerals, Polyacrylate, Polyaspartate, Calcium-Carbonate, Crystallization, Inhibition, Adsorption

Greenwood, R., Luckham, P.F. and Gregory, T. (1995), The effect of particle-size on the layer thickness of a stabilizing polymer adsorbed onto 2 different classes of polymer latex, as determined from rheological experiments. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **98** (1-2), 117-125.

Full Text: [C\Col Sur A-Phy Eng Asp98, 117.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp98,%20117.pdf)

Abstract: The effect of the particle size on the adsorbed layer thickness of an ABA block copolymer has been studied using theological techniques. Several poly(methyl methacrylate) (PMMA) and polystyrene latices were prepared and stabilised with the minimum amount of copolymer, calculated from adsorption isotherms. The thickness of the adsorbed layer was then determined using two different theological techniques; firstly by comparing the high shear rate limiting viscosity to the Krieger-Dougherty equation, and secondly by measuring the elastic modulus of the dispersion. The results from the two methods were in reasonable agreement. For the same polymer the adsorbed layer thickness increased with the particle radius and was found to scale with the radius to a power of 0.80 for the PMMA latices and with 0.60 for the polystyrene latices. The results are in broad agreement with earlier light scattering studies. The particle size effect could not be explained fully by conventional geometric arguments, associated with the fact that the volume available to the polymer around a small particle for a given adsorbed layer is greater than that for a larger particle. As the adsorbed amount of copolymer on both latices was similar (about 1.6 mg m-2) the difference in the scaling power between the two sets of particles must be due to different adsorption characteristics, a consequence of the different surface properties of the latex particles.

Keywords: A-B-A Block Copolymers, Concentrated Dispersions, Polymer Latices, Polymer Layer Thickness, Rheology, Molecular-Weight Fractions, Block Copolymers, Adsorption, Polyvinyl-Alcohol), Lattices, Silica

Fairhurst, A.J., Warwick, P. and Richardson, S. (1995), The influence of humic-acid on the adsorption of europium onto inorganic colloids as a function of pH. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **99** (2-3), 187-199.

Full Text: [C\Col Sur A-Phy Eng Asp99, 187.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp99,%20187.pdf)

Chang, C.H. and Franses, E.I. (1995), Adsorption dynamics of surfactants at the air/water interface: a critical review of mathematical models, data, and mechanisms. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **100**, 1-45.

Full Text: [C\Col SurA Phy Eng Asp100, 1.pdf](C/Col%20SurA%20Phy%20Eng%20Asp100,%201.pdf)

Abstract: This review covers equilibrium and dynamic aspects of surface tension and adsorption, primarily of single nonmicellar or premicellar surfactants at the air/water interface. Equilibrium tension data have been related to the Langmuir adsorption equilibrium isotherm and the Gibbs isotherm. A set of Langmuir isotherm parameters has been compiled. Dynamic adsorption models with the diffusion-controlled and mixed-kinetic mechanisms are discussed in some detail and applied to several sets of data. Apparent diffusion coefficients, inferred from dynamic tension data, and kinetic adsorption parameters, derived from application of the models to the data, are presented and critically evaluated. The adsorption of most of the surfactants examined is slower than predicted by diffusion-controlled models. Exceptions are mostly non-ionic surfactants and certain alcohols.

Keywords: Adsorption Dynamics, Adsorption-Rate Limited, Adsorption Dynamics, Diffusion-Controlled, Adsorption Dynamics, Mixed-Kinetic, Adsorption Dynamics, Surfactants, Adsorption Equilibria, Dynamic Surface Tension, Data, Dynamic Surface Tension, Methods of Measurement, Dynamic Surface Tension, Models, Frumkin Isotherm, Langmuir-Hinshelwood Kinetics, Langmuir Isotherm, Modified Langmuir-Hinshelwood Kinetics, Surface Equation of State

Singh, D.B., Prasad, G. and Rupainwar, D.C. (1996), Adsorption technique for the treatment of As(V)-rich effluents. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **111** (1-2), 49-56.

Full Text: [C\Col SurA Phy Eng Asp111, 49.pdf](C/Col%20SurA%20Phy%20Eng%20Asp111,%2049.pdf)

Abstract: Unconventional adsorbents like hematite and feldspar have been employed for the removal of As(V) from aqueous system. The effect of important parameters like solute concentration, detention time, pH, temperature, agitation rate and particle size of the adsorbent has been addressed. The process of uptake follows first-order kinetics and the data fit the Langmuir isotherm. Mass transfer coefficients and diffusion coefficients have also been determined to study the dynamics of transport. The pH of the system has been found to play a key role in the uptake. The maximum removal was found to be 100% with hematite and 97% with feldspar under optimum conditions at 13.35 µmol L-1 arsenic concentration. The data were subjected to multiple-regression analysis and a model has been developed to predict the uptake capacity of the adsorbents under given boundary conditions.

Keywords: Adsorption, As(V), Feldspar, Hematite, Waste-Water, Removal, Adsorbents, Color

Varshney, K.G., Khan, A.A., Gupta, U. and Maheshwari, S.M. (1996), Kinetics of adsorption of phosphamidon on antimony(V) phosphate cation exchanger evaluation of the order of reaction and some physical parameters. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **113** (1-2), 19-23.

Full Text: [C\Col Sur A-Phy Eng Asp113, 19.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp113,%2019.pdf)

Abstract: The kinetics of adsorption of the pesticide phosphamidon on beads of antimony(V) phosphate cation exchanger have been studied. Physical parameters such as order of reaction, rate constant, activation energy, enthalpy of activation, entropy of activation and free energy of activation have been obtained. The adsorption behaviour is found to be second order during the first 15 min and thereafter, up to 180 min, it is first order.

? Terzyk, A.P., Wojsz, R., Rychlicki, G. and Gauden, P.A. (1996), Fractal dimension of microporous carbon on the basis of Polanyi-Dubinin theory of adsorption. Dubinin-Radushkevich adsorption isotherm equation. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **119** (2-3), 175-181.

Full Text: [1996\Col SurA Phy Eng Asp119, 175.pdf](1996/Col%20SurA%20Phy%20Eng%20Asp119,%20175.pdf)

Abstract: A new adsorption isotherm equation has been proposed which allows calculation of the structural parameters of activated carbons, including the fractal dimension. The equation is based on the extension of the potential theory of adsorption which was formulated by Dubinin and Stoeckli, and the pore size distribution proposed by Pfeifer and Avnir. In this paper the properties of the new equation and the energetics of adsorption in fractal microporous solids are discussed. The adsorption results, obtained on the basis of some model calculations, are not in agreement with those published by Avnir and Jaroniec which were based on the approximate solution of the problem presented here.

Keywords: Adsorption Isotherm, Fractal Dimension, Microporous Carbon, Surfaces

Grassi, M.T., Shi, B. and Allen, H.E. (1997), Sorption of copper by suspended particulate matter. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **120** (1-3), 199-203.

Full Text: [C\Col SurA Phy Eng Asp120, 199.pdf](C/Col%20SurA%20Phy%20Eng%20Asp120,%20199.pdf)

Abstract: The sorption of copper by suspended particulate matter from river water was investigated as a function of pH and solids concentration. Water was collected from the Delaware River and particulate matter was concentrated using Tangential-Flow Filtration (TFF). The adsorption of copper increased with increasing pH until pH 9.0. A decrease in copper adsorption was found for higher pH values. The adsorption of copper was greater for the samples with added copper than for the suspension for which no metal was added. An increase of copper adsorption proportional to particulate matter concentration was also observed. At both pH 6.0 and 7.0, there was a decrease in the adsorption of copper with increasing copper concentration.

Keywords: Copper, Adsorption, Tangential-Flow Filtration, Water Quality Criteria, Partition Coefficients, Colloids, Metals

Crawford, R.J., Mainwaring, D.E. and Harding, I.H. (1997), Adsorption and coprecipitation of heavy metals from ammoniacal solutions using hydrous metal oxides. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **126** (2-3), 167-179.

Full Text: [C\Col SurA Phy Eng Asp126, 167.pdf](C/Col%20SurA%20Phy%20Eng%20Asp126,%20167.pdf)

Abstract: The importance of metal ion hydrolysis to the processes of adsorption and coprecipitation is investigated. The metal ions studied were Cr(III), Zn(II) and Ni(II) and the substrates used were amorphous hydrous iron(III) oxide (HFO) and amorphous hydrous chromium(III) oxide (HCO). Adsorption and coprecipitation experiments were performed using an ammoniacal background electrolyte, where the ammonia present could form ammine complexes with the metal ions, and hence significantly suppress hydrolysis. It is suggested that this suppression of hydrolysis inhibits adsorption, both through competitive equilibria and also through diminished capability for hydrogen bonding in the presence of ammoniacal ligands. The removal profiles obtained for Zn(II) adsorption and coprecipitation on HFO and HCO were modelled using a modified version of the James-Healy model for metal ion adsorption.

Keywords: X-Ray Absorption, Water Interface, Surface Precipitation, Cr(III) Oxidation, Hydrated Oxides, Ions, Copper, Model, Nickel, Cobalt, Adsorption, Adsorption Model, Ammine Complexation, Ammonia, Coprecipitation, Hydrous Chromium(III) Oxide, Hydrous Iron(III) Oxide, Heavy Metals

? Zakaria, E.S. and El-Naggar, I.M. (1998), Ion-exchange selectivities of tin(IV) and iron(III) antimonates for lithium and potassium ions. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **131** (1-3), 33-37.

Full Text: [1998\Col SurA Phy Eng Asp131, 33.pdf](1998/Col%20SurA%20Phy%20Eng%20Asp131,%2033.pdf)

Abstract: The equilibrium exchange of Li+ and K+ ions with the hydrogen form of tin(IV) and iron(III) antimonates was investigated in MCl-HCl media at 25, 45 and 60°C. The exchange isotherms were measured for both the forward and reverse reactions at a solution ionic strength of 0.1 by the batch technique. Enthalpy and entropy changes accompanying the Li+-H+ and K+-H+ exchanges were determined by the temperature variation method. The Li+-K+ and K+-H+ exchanges are enthalpy directed, the enthalpy change determining the selectivity of the alkali metal ions over hydrogen ion. (C) 1998 Elsevier Science B.V.

Keywords: Alkali Metal Ions, Ion-Exchange Selectivity, Iron(III) Antimonate, Tin(IV) Antimonite, Alkali-Metal Ions, Thermodynamics, Cerium(IV), Earth

? Pandit, B. and Chudasama, U. (1998), A new inorgano-organic ion exchanger: Chromotropic acid anchored onto zirconium molybdate. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **132** (2-3), 145-151.

Full Text: [1998\Col SurA Phy Eng Asp132, 145.pdf](1998/Col%20SurA%20Phy%20Eng%20Asp132,%20145.pdf)

Abstract: A new inorgano-organic ion exchanger has been prepared by anchoring chromotropic acid (4, 5-dihydroxynapthalene-3,7-disulphonic acid, disodium salt) onto zirconium molybdate (ZM). The inorgano-organic ion exchanger has been termed ZMCA. ZM and ZMCA have been characterised for elemental, spectral and thermal analyses. Chemical stability in several acidic, basic and organic media has been assessed. Ion exchange capacity (i.e.c.) for these materials has been determined and the effect of heating on i.e.c. has been studied. The distribution coefficient K-d for several metal ions has been determined and compared. The new material ZMCA exhibits high Kd values for several metal ions compared with ZM. It is also stable up to a fairly high temperature, besides exhibiting stability in different acidic, basic and organic media. ZMCA thus exhibits the characteristics of a promising ion exchanger. (C) 1998 Elsevier Science B.V.

Keywords: Anchored Ion Exchangers, Derivatized Ion Exchangers, Inorgano-Organic Ion Exchangers, Phosphate-Phosphite, Intercalation, Phosphonates

Wieβner, A., Remmler, M., Kuschk, P. and Stottmeister, U. (1998), The treatment of a deposited lignite pyrolysis wastewater by adsorption using activated carbon and activated coke. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **139** (1), 91-97.

Full Text: [C\Col SurA Phy Eng Asp139, 91.pdf](C/Col%20SurA%20Phy%20Eng%20Asp139,%2091.pdf)

Abstract: To study the functions of activated carbon and activated coke adsorption for the treatment of highly contaminated discolored industrial wastewater with a wide molecular size distribution of organic compounds, the deposited lignite pyrolysis wastewater from a filled open-cast coal mine was used for continuous and discontinuous experiments. The investigations were performed using (11), mples taken from various depths of the deposit pond. These differently loaded (11), mples, with various spectra of humic-like macromolecules in sizes from >1 kDa up to the µm-range, were used untreated as well as treated by flocculation prior to the experiments. The results show that, in principle, decolorization connected with TOC (total organic carbon) removal is possible for each of the water samples. The treated waters from the bottom of the deposit contain about 100 mg/l consisting mainly of hydrophilic compounds. In contrast, the organic compounds of the completely autoxidized surface water were almost nearly completely adsorbed (94%). The adsorption processes were influenced by fouling and secondary sequential loading of the organic substances with various molecular sizes in the range up to 100 kDa. Further, secondary adsorption effects of low molecular-weight compounds were observed. A comparison of the capacities of the adsorption materials used showed, that because of its large number of macro and mesopores, activated coke is more suitable for wastewater treatment and in addition cheaper than activated carbon.

Keywords: Organic Pollutants, Sorption, Adsorption, Activated Carbon, Activated Coke, Deposited Lignite Pyrolysis Wastewater, Ultrafiltration

Misra, D.N. (1998), Interaction of some alkali metal citrates with hydroxyapatite: Ion-exchange adsorption and role of charge balance, *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **141** (2), 173-179.

Full Text: [C\Col SurA Phy Eng Asp141, 173.pdf](C/Col%20SurA%20Phy%20Eng%20Asp141,%20173.pdf)

Abstract: Proper balancing of the concentration of citrate ions in soft drinks is important in order to regulate the cariogenic potential of these ions. The uptake, or ion-exchange adsorption, of sodium or potassium citrates from their aqueous solutions onto synthetic hydroxyapatite at 22°C was investigated in the present study as a means to elucidate the role of citrate ions in the cariogenic process. For each salt, the amount of uptake, or removal of citrate ions from its aqueous solutions by the apatite, bears a simple ratio to the amount of calcium or phosphate ions released into the solution by the substrate. The uptake isotherms may be represented by their Langmuir plots. The interaction is purely ion-exchange adsorption; there is no indication of the presence of any foreign phase. Plausible equations for ion-exchange equilibria show that the surface is electrically charged upon the adsorption of salts, but remains neutral upon the adsorption of the citric acid, and this may have a bearing on the effective area occupied by the absorbate species.

Esumi, K., Hayashi, H., Koide, Y., Suhara, T. and Fukui, H. (1998), Adsorption of metal ion and aromatic compounds by anionic surfactant-coated particles of titanium dioxide. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **144** (1-3), 201-206.

Full Text: [C\Col SurA Phy Eng Asp144, 201.pdf](C/Col%20SurA%20Phy%20Eng%20Asp144,%20201.pdf)

Abstract: Adsorption of Cu2+ and 2-naphthol from aqueous solutions was examined by anionic surfactant (sodium dodecyl sulfate, SDS) adsorbed on titanium dioxide, Two types of titanium dioxide were used one was untreated and the other was hydrophobic with dodecyl chain groups, At pH 3, 4 and 5, the adsorption of Cu2+ increased with increasing SDS concentration and then decreased slightly on untreated titanium dioxide; the adsorption of Cu2+ decreased in a following order, pH 5 > pH 4 > pH 3. The adsorption behavior of Cu2+ by the SDS adsorbed on hydrophobic titanium dioxide was similar to that on untreated titanium dioxide. although the amount of SDS adsorbed on the former was half as that on the latter. This difference derives from different adsorption states of SDS. In addition, simultaneous adsorption of Cu2+ and 2-naphthol on both untreated and hydrophobic titanium dioxides by addition of SDS was performed at pH 5; the amount of Cu2+ adsorbed was almost the same as those without 2-naphthol for both titanium dioxides and the amount of SDS adsorbed was enhanced in the presence of 2-naphthol where 2-naphthol was adsolubilized more efficiently in the SDS adsorbed layer on hydrophobic titanium dioxide than on untreated titanium dioxide. This anionic surfactant-adsorbed layer can remove both metal ions and the nonionic aromatic compound simultaneously.

Keywords: Sorption, Adsolubilization, Interface, 2-Naphthol, Soil, Adsolubilization of 2-Naphthol, Anionic Surfactant-Adsorbed Layer, Removal of Cu2+, Titanium Dioxide With Hydrophobic Chain

Dias, N.L. (1998), Adsorption of copper(II) and cobalt(II) complexes on a silica gel surface chemically modified with 3-amino-1,2,4-triazole. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **144** (1-3), 219-227.

Full Text: [C\Col SurA Phy Eng Asp144, 219.pdf](C/Col%20SurA%20Phy%20Eng%20Asp144,%20219.pdf)

Abstract: The isotherms of adsorption of MX2 (M=Cu2+, Co2+; X=Cl−, Br−, *ClO−4*) by silica gel chemically modified with 3-amino-1,2,4-triazole (SiATR) were studied in acetone and ethanol solutions, at 25°C. The 3-amino-1,2,4-triazole molecule, covalently bound to the silica gel surface, adsorbs MX2 from solvent by forming a surface complex. At low loading, the electronic and electron spin resonance spectral parameters indicated that the Cu2+ complexes have a distorted tetragonal symmetry. The CoX2 (X=Cl−, Br−) analogues exhibit a distorted-tetrahedral geometry, whilst the (SiATR)*m*Co(ClO4)2 complex has a tetragonally distorted octahedral geometry, with four equatorial nitrogen atoms around the cobalt. (C) 1998 Elsevier Science B.V. All rights reserved.

Keywords: 3-Amino-1,2,4-Triazole, Copper and Cobalt Complexes With 3-Amino-1,2,4-Triazole, Electron Spin Resonance, Modified Silica Gel, Electron-Spin Resonance, Voltammetric Determination, Metal-Ions, Preconcentration, Mercury(II), Pyridinium, Sorption

Weerasooriya, R., Wickramarathne, H.U.S. and Dharmagunawardhane, H.A. (1998), Surface complexation modeling of fluoride adsorption onto kaolinite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **144** (1-3), 267-273.

Full Text: [C\Col SurA Phy Eng Asp144, 267.pdf](C/Col%20SurA%20Phy%20Eng%20Asp144,%20267.pdf)

Abstract: The aim of this research was to provide a mechanistic interpretation for fluoride adsorption onto kaolinite over a range of experimental conditions that are important environmentally. Proton titration data of kaolinite showed that the pHzpc=8.9, and the intrinsic acidity constants (of dominant AlOH) sites were p*K*a1=−9.23, and p*K*a2=7.57. The mineral surface exhibited some site heterogeneity. The diffused layer model using the following reaction stoichiometries was employed to quantify anion adsorption data:

AlOH+H++F−→AlF+H2O; log *K*AlO–F=15.16

SiOH+H++F−→SiF+H2O; log *K*SiO–F=13.10

Keywords: Fluoride, Kaolinite, Surface Complexation

Notes: highly cited

? Kinniburgh, D.G., van Riemsdijk, W.H., Koopal, L.K., Borkovec, M., Benedetti, M.F. and Avena, M.J. (1999), Ion binding to natural organic matter: Competition, heterogeneity, stoichiometry and thermodynamic consistency *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **151** (1-2), 147-166.

Full Text: [1999\Col Sur A-Phy Eng Asp151, 147.pdf](1999/Col%20Sur%20A-Phy%20Eng%20Asp151,%20147.pdf)

Abstract: The general principles of cation binding to humic materials are discussed. Important aspects that need to be included in general purpose speciation models are: the extreme binding heterogeneity of natural humic materials, the variable stoichiometry of binding (monodentate, bidentate and tridentate), the competition between specifically-bound ions, especially protons and metal ions, and electrostatic effects which give rise to ionic strength effects and the nonspecific binding of counterions. The NICCA-Donnan model is a semi-empirical model that addresses these issues. It is similar to the previously published NICA-Donnan model except that it introduces an additional degree of scaling that ensures thermodynamic consistency and allows for variable stoichiometry of binding. It implicitly accounts for the large degree of chemical heterogeneity of humic particles. The NICCA (consistent NICA) model also recognizes that the affinity distributions are ion specific and are not fully correlated. The model requires no assumptions to be made about the geometry of the humic particles, but the Donnan submodel does allow for shrinking and swelling. Important model parameters such as the site density and median binding constants (log (K) over tilde) are not dependent on pH, metal ion concentration, ionic strength, etc. Data are analysed for H+, Ca2+, Cd2+, Cu2+, Pb2+ and Al3+ binding to a single purified peat humic acid. The NICCA-Donnan model captures the non-linearity of the observed isotherms even at very low free metal ion concentrations. After fitting the model to datasets containing only the proton and one metal ion, the model was able to predict Cd2+-Ca2+, Cu2+-Ca2+ and Pb2+-Al3+ competition reasonably well. It also gave satisfactory predictions of the H+/Mz+ molar exchange ratios. These ratios varied strongly with metal ion: Ca2+ (0.2-0.5); Cd2+ (0.5-1.0); Pb2+ (1.1-1.2); Cu2+ (1.2-1.7) and Al3+ (2.1-2.7), and also to a varying degree with pH and free metal ion concentration. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Sorption, Humic Acid, Fulvic Acid, Donnan, Ion Binding, Heterogeneity, Simple Electrostatic Model, Humic-Acid, Affinity Distributions, Adsorption-Isotherms, Stability-Constants, Proton Binding, Metal-Ions, Complexation, Substances, Surfaces

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Full Text: [1999\Col Sur A-Phy Eng Asp151, 167.pdf](1999/Col%20Sur%20A-Phy%20Eng%20Asp151,%20167.pdf)

Abstract: A dual reactive domain model (DRDM) for sorption of hydrophobic organic contaminants by soils, sediments, and other geosorbents is described. The model is predicated on the hypothesis that heterogeneous natural sorbent organic matter (SOM) comprises two principal chemostructurally different domains; a highly amorphous domain and a relatively condensed domain. The existence of two chemically and phenomenologically different SQM domains is evidenced by observations of a glass transition for a soil-derived humic acid. Extensive examinations of phenanthrene sorption and desorption for a broad range of soils, sediments, shales, and kerogens reveal that sorption by condensed SOM matrices is nonlinear and hysteretic while sorption by amorphous SOM domains is linear and completely reversible. Semi-quantitative correlations between SOM oxygen, carbon (O, C) atomic ratios and isotherm linearity (n), single-point K-oc, values, and degrees of sorption-desorption hysteresis indicate that the geochemistry of SOM determines binding and sequestration of organic contaminants by soils and sediments. The model reconciles observations of, and provides predictability for, various complex sorption phenomena associated with soils and sediments (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption-Desorption, Chemicals, Contaminant Sequestration, Desorption, Distributed Reactivity Model, Geosorbent Organic Matter, Humic Acid Glass Transitions, Hydrophobic Organic Contaminants, Hydrophobic Pollutants, Hysteresis, Natural Sediments, Phenanthrene, Polynuclear Aromatic-Hydrocarbons, Soils, Sorption, Sorption, Systems

Heijman, S.G.J. and Hopman, R. (1999), Activated carbon filtration in drinking water production: Model prediction and new concepts. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **151** (1-2), 303-310.

Full Text: [C\Col Sur A-Phy Eng Asp151, 303.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp151,%20303.pdf)

Abstract: For drinking water companies, it is important to predict the lifetime of granular activated carbon (GAC) for the removal of pesticides. Full-scale experiments in pilot GAC filters are expensive and time-consuming, but fast laboratory experiments do not have the accuracy necessary for a realistic prediciton of the breakthrough curves of pesticides. The problems with these experiments and the models used fbr the translation of these experiments to full-scale columns are discussed. Although at the moment laboratory experiments do not predict full-scale behaviour satisfactorily, they are very useful in evaluating new combinations of treatment methods or new adsorbents. In the small-scale column tests, combinations of ozone/activated carbon and nanofiltration/activated carbon are evaluated. Also, the performance of activated carbon fibres are evaluated on a small scale. (C) 1999 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption Tests, Design, Activated Carbon, Adsorption, Atrazine, Bentazon, Drinking Water, Model, Pesticides, Prediction, Water Treatment

Vlasova, N.N. (2000), Adsorption of Cu2+ ions onto silica surface from aqueous solutions containing organic substances. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **163** (2-3), 125-133.

Full Text: [C\Col Sur A-Phy Eng Asp163, 125.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp163,%20125.pdf)

Abstract: The influence of 2,2’-bipyridine and 2-picolinic acid on adsorption of copper ions onto a surface of highly dispersed silica has been investigated. The adsorption of copper ions is enhanced by 2,2’-bipyridine and attenuated by 2-picolinic acid as compared to noncomplex copper ions. These results are interpreted in terms of ternary surface complex formation. The intrinsic equilibrium reaction constants of binary and ternary complex formation have been calculated with the use of the constant capacitance model (CMC). According to one of the definitions of this model the adsorption of background electrolyte ions is assumed absent.

Keywords: Oxide-Water Interface, Metal-Ions, Complexation, Model, Ionization, Adsorption, Silica, Copper, Ternary Surface Complex

Terzyk, A.P. and Rychlicki, G. (2000), The influence of activated carbon surface chemical composition on the adsorption of acetaminophen (paracetamol) in vitro: The temperature dependence of adsorption at the neutral pH. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **163** (2-3), 135-150.

Full Text: [C\Col Sur A-Phy Eng Asp163, 135.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp163,%20135.pdf)

Abstract: The in vitro adsorption and desorption of acetaminophen from water solution on four activated carbons at three temperatures (300, 310 and 320 K) and at the neutral pH (7) were investigated. The carbons were characterized using the low temperature nitrogen adsorption, the mercury porosimetry, Bachmann’s method, Boehm’s method as well as the water immersion calorimetry. As an initial adsorbent, the de-ashed-commercial, ‘non-modified’ carbon D43/1 (Carbo-Tech, Essen, Germany) was applied. To change the chemical composition of its surface, concentrated nitric and sulfuric acids as well as gaseous ammonia were applied as chemical modificators. The acetaminophen adsorption and desorption isotherms on the ‘non-modified’ as well as on the chemically modified carbons were measured, together with the enthalpy of immersion in paracetamol solution. It is shown that, generally, for all the investigated carbons, acetaminophen adsorption increases with temperature. A slightly marked hysteresis on adsorption-desorption isotherms was observed at higher adsorption values. Among the applied procedures of the changing of carbon surface chemical composition, the modification with fuming sulphuric acid leads to the increase in paracetamol adsorption, whilst the opposite effect is observed for the carbon modified with concentrated nitric acid. The modification in the stream of ammonia practically does not change the adsorption properties towards paracetamol. The changes in the adsorption properties of carbons after modification are analysed using isotherms, adsorbability, relative enthalpy of displacement as well as the values of the integral enthalpy of adsorption. To calculate this enthalpy the solubility of acetaminophen in the investigated range of temperatures was determined, and the enthalpy of solution at infinite dilution was calculated using Abraham’s method. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Acetaminophen, Activated Carbon, Acetaminophen Solubility, Adsorption From Solution, Enthalpy of Adsorption, Enthalpy of Immersion, Porosity, Paracetamol, Surface Groups, Charcoal, Thermodynamics, Black

Bišćan, J., Kallay, N. and Smolić, T. (2000), Determination of iso-electric point of silicon nitride by adhesion method. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **165** (1-3), 115-123.

Full Text: [C\Col Sur A-Phy Eng Asp165, 115.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp165,%20115.pdf)

Abstract: The iso-electric point (i.e.p.) of silicone nitride is an important parameter in the fine ceramics production technology. The determination of its value may present a problem, primarily because of surface reactivity of silicone nitride. For this purpose the adhesion method for i.e.p. determination was developed. In this paper the batch method was demonstrated. The kinetics of attachment of silicone nitride colloid particles on titanium collector beads was followed. The closed cylinders containing colloidal suspension of silicone nitride together with certain amount of titanium beads were rotated, and the particle number concentration of silicone nitride was measured as a function of time. From the experimental data the rate constants of attachment were determined by considering the reverse detachment process. The i.e.p. of titanium is at pH 2, so that titanium surface was negatively charged in the whole examined pH region. In the region of pH < 8 silicone nitride was positively charged which promoted the attachment. At pH > 8, both silicone nitride and titanium surface are negatively charged which significantly reduces the attachment rate. The theoretical rate constant in absence of interaction forces (k(diff)) was calculated by considering the convection diffusion of colloid particles towards the moving beads. The velocity of titanium beads, with respect to liquid suspension, was calculated, taking into account gravitation, bouyancy and friction forces. The pH at which the experimental rate constant coincides with the theoretical k(diff) value was taken as the iso-electric point. The results were confirmed by independent electrokinetic measurements. Preliminary experiments in non-aqueous medium indicated the applicability of adhesion method also to these systems. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Adhesion, Adhesion Rate Constant, Interaction Energy, Colloid Stability, Iso-Electric Point, Point of Zero Charge, Silicone Nitride, Surface-Chemistry, Particle Adhesion, Model Systems, Powders, Dispersion, Steel

Yuan, Y., Oberholzer, M.R. and Lenhoff, A.M. (2000), Size does matter: Electrostatically determined surface coverage trends in protein and colloid adsorption. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **165** (1-3), 125-141.

Full Text: [C\Col Sur A-Phy Eng Asp165, 125.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp165,%20125.pdf)

Abstract: The surface coverage of charged colloidal particles such as proteins adsorbed at solid surfaces is determined by a variety of properties of the particles, surface, solution and the process itself. A review is presented of the mechanisms determining the ultimate coverage based on the energetics of interaction of the particles with one another and with the adsorbent surface. In particular, two limiting cases are identified. In the first, in which adsorption is irreversible, the coverage is determined largely by interparticle repulsion, and can be modelled by a variant of the random sequential adsorption (RSA) approach; this leads to a prediction of increasing coverage with increasing ionic strength. In the second limiting situation the particle-surface interactions are weaker and may be attenuated by increasing ionic strength, leading to-a more complex balance with interparticle interactions. The situation is modelled using a mechanistically based isotherm in which various trends with both particle and salt concentration are possible. The first limiting case tends to occur more frequently with larger particles and the second with smaller ones such as proteins. Experimental data are presented in the intermediate range for the large globular protein catalase adsorbed on negatively charged self-assembled monolayers (SAM), which was studied by liquid tapping mode atomic force microscopy (LTM-AFM). The influence of increasing ionic strength on surface coverage varies, showing increasing coverage at low ionic strength, then a drop at intermediate ionic strength, and another increase at high ionic strength. The initial increase is interpreted as being consistent with the modified RSA mechanism and the subsequent decrease with screening of particle-surface attraction in the isotherm model, while the final increase is thought to be caused by depletion forces. The results indicate the potential complexity of surface coverage trends that may occur in different experimental situations. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Charged Colloidal Particles, Random Sequential Adsorption, Ionic Strength, Adsorption Isothern, Atomic-Force Microscopy, Scanning Tunneling Microscopy, Random Sequential Adsorption, Self-Assembled Monolayers, Bovine Pancreas Ribonuclease, Charged Polystyrene Surfaces, Human-Plasma Albumin, Structural-Changes, Globular-Proteins, Cation-Exchangers

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Full Text: [2000\Col Sur A-Phy Eng Asp166, 251.pdf](2000/Col%20Sur%20A-Phy%20Eng%20Asp166,%20251.pdf)

Abstract: Competitive adsorption of molybdate, selenite, selenate, chromate, and sulfate onto γ-Al2O3 was investigated in the present study. Binary-solute systems of MoO42-/SeO32-, CrO42-/SO32-, and CrO42-/SeO42- as well as single anion systems were evaluated for the relative influence on competitive adsorption on oxide surface. As would be expected, the adsorption density of each anion in the binary-solute systems decreases, as compared to the respective density in a single anion system. Furthermore, MoO42- inhibits SeO32- adsorption in acidic condition and that SO42- or SeO42- depresses CrO42-. The order of the relative retainment of anions on oxide surface is molybdate > selenite > selenate sulfate > chromate, which corresponds to the magnitude of the overall proton coefficient of the corresponding anions. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Amorphous Iron Oxyhydroxide, Chromate, Competitive Adsorption, Complexation, Desorption, Electrolytes, Goethite, Kinetics, Mechanisms, Molybdate, Oxide-Water Interface, Phosphate, Selenate, Selenite, Sulfate, Surface Ionization, TLM

Leboda, R., Marciniak, M., Gun’ko, V.M., Grzegorczyk, W., Malygin, A.A. and Malkov, A.A. (2000), Structure of carbonized mesoporous silica gel/CVD-titania. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **167** (3), 275-285.

Full Text: [C\Col Sur A-Phy Eng Asp167, 275.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp167,%20275.pdf)

Abstract: Carbon/titania/silica gels containing different amounts of CVD-titania and carbon deposit were investigated using adsorption/desorption and theoretical methods. Analysis of the low-temperature nitrogen adsorption/desorption data for all the examined samples leads to conclusion that their porosity decrease with increasing amounts of titania and carbon covered the oxide surface not only in pores but also at the outer surface of particles. The influence of the carbon deposit on the changes in an accessible surface area of adsorbents is lower than that of titania due to the difference in the texture of these phases and in features of contacts between the deposit and the substrate particles. These features reflect in complicated dependence of the fractal dimension on the concentrations of carbon and titania. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Silica Gel, CVD-Titania/Silica Gel, Carbonized Silica Gel, Carbonized Titania/Silica Gel, Nitrogen Adsorption/Desorption, Pore Structure, Fractal Dimension, Polanyi-Dubinin Theory, Adsorption-Isotherm Equation, Surface Fractal Dimension, Microporous Carbon, Polyfurfuryl Alcohol, H1-NMR Spectroscopy, Nitrogen Adsorption, Gas-Chromatography, Integral-Equations, Black Particles

Dambies, L., Guibal, E. and Roze, A. (2000), Arsenic(V) sorption on molybdate-impregnated chitosan beads. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **170** (1), 19-31.

Full Text: [C\Col Sur A-Phy Eng Asp170, 19.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp170,%2019.pdf)

Abstract: A new adsorption process for As(V) ion removal from an aqueous solution was studied using molybdate impregnated chitosan beads (MICB). Arsenate ions were strongly adsorbed in the pH range from 2 to 4 with a minimum release of molybdate ions. The sorption mechanism is a complexation between arsenate ions and molybdate ions. Even at low equilibrium concentration, the sorption capacity is high, and allows the process to be used as a finishing treatment. Phosphate ions significantly depressed arsenate collection because of a competing reaction for the active sites. Simultaneously with the arsenate sorption, molybdate is released to a significant extent. This release can be reduced using a treatment of MICE with orthophosphoric acid (to obtain MICB-PO4). The treatment allows weakly bound molybdenum to be removed from the sorbent during As sorption: molybdate release does not exceed 2%. The Langmuir equation fits best the experimental data for As(V) sorption on MICB-PO4 at pH 3 up to equilibrium concentration of 80 mg 1-1. A selective and total elution can be carried out using a 0.05-1 mol 1-1 orthophosphoric acid solution. Three sorption/desorption cycles were performed with no significant decrease in uptake performance. (C) 2000 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Arsenic, Chitosan, Desorption, Isotherm, Phosphate, Molybdate, Recycling, Activated Carbon, Aqueous-Solutions, Removal, Adsorption, Water, Molybdoarsenate, Groundwater, Derivatives, Arsenate, Waste

Tarasevich, Y.I. (2001), Porous structure and adsorption properties of natural porous coal. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **176** (2-3), 267-272.

Full Text: [C\Col Sur A-Phy Eng Asp176, 267.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp176,%20267.pdf)

Abstract: From the analysis of the adsorption of hexane vapour, the volumes of micro-and mesopores, half widths, and specific surface areas of mesopores of natural porous coal were calculated. The quantities of acidic and basic groups existing at the surface of the coal were determined. II was shown that a high concentration of hydrophilic sites initiates the adsorption of water molecule associates in micro-and mesopores of the coal already at the initial part of the isotherm. The role of micro-and mesopores and the chemistry of the coal surface in the adsorption of phenol, p-nitroaniline, crystalline violet and the commercial non-ionic surfactant OP-10 from aqueous solutions were discussed. A comparative analysis of the adsorptive properties of natural coal and CAD-iodine active carbon showed that natural coal is a promising material for the removal of various organic compounds from water. (C) 2001 Published by Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Coal Adsorbents, Mesopore Surface, Specific Surface, Water Purification, Water

? Terzyk, A.P. (2001), The influence of activated carbon surface chemical composition on the adsorption of acetaminophen (paracetamol) in vitro Part II. TG, FTIR, and XPS analysis of carbons and the temperature dependence of adsorption kinetics at the neutral pH. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **177** (1), 23-45.

Full Text: [2001\Col Sur A-Phy Eng Asp177, 23.pdf](2001/Col%20Sur%20A-Phy%20Eng%20Asp177,%2023.pdf)

Abstract: The presented paper is the subsequent one of the series concerning the results of the influence of carbon surface chemical composition on paracetamol adsorption from water solutions. The non-modified de-ashed commercial carbon D43/1, (Carbo-Tech, Essen, Germany) as well as modified ones (using cone. nitric acid. fuming sulphuric acid, ammonia, and modified via ionic exchange process with Cu2+) were used as adsorbents. For these, characterised previously, carbons the results of some additional measurements, i.e. thermogravimetry in He and in air, FTIR, and XPS are reported, to expose the type of carbon surface groups created by chemical modifications. The results of kinetic measurements (performed at three temperatures: 300, 310 and 320 K) are reported. They were described using very simple kinetic equation proposed by Korta and co-workers; moreover, this equation has been modified in the current paper. It is shown that, up to the relative adsorption value equal to 0.5 the kinetics of the process of paracetamol adsorption is determined by the hydrophilicity of carbon surface. The rate of this process increases linearly with the values of the enthalpy of carbon immersion in water. Moreover, for all the carbons, except for the modified one with Cu2+, the rate of adsorption is determined by the presence of surface groups and it increases with the total acidity of carbon. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Kinetics, Ammonia, Analysis, Aqueous-Solutions, Carbon, Charcoal, Chemistry, Cu2+, Enthalpy, Evolution, Fibers, FTIR, Germany, IR, Kinetic, Kinetics, Oxygen, Paracetamol, pH, Pyrolysis, Rights, Sulphuric Acid, Surface Groups, Temperature, Thermal Analysis, Thermogravimetry, Water, XPS

Mohan, D., Gupta, V.K., Srivastava, S.K. and Chander, S. (2001), Kinetics of mercury adsorption from wastewater using activated carbon derived from fertilizer waste. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **177** (2-3), 169-181.

Full Text: [C\Col Sur A-Phy Eng Asp177, 169.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp177,%20169.pdf)

Abstract: The waste slurry generated in a fertilizer plant was converted into a carbonaceous material and used as an adsorbent for the uptake of Hg(II) from wastewater. The kinetics of adsorption depends on the adsorbate concentration, and the physical and chemical characteristics of the adsorbent. Studies were conducted to delineate the effect of pH, temperature, initial absorbate concentration, particle size of the adsorbent and solid to liquid ratio. The adsorption of Hg(II) increased with the decrease in pH and the process was exothermic. On the basis of these studies, various parameters such as mass transfer coefficient, effective diffusion coefficient, activation energy and entropy of activation were evaluated to establish the mechanisms. It was concluded that the adsorption occurs through a film diffusion mechanism at low concentrations, and particle diffusion at higher concentrations. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Activated Carbon, Carbonaceous Material, Solid Waste Utilization, Mercury Removal, Wastewater Treatment, Heavy-Metal Ions, Aqueous-Solutions, Removal, Water, Sorption, Pollutants, Adsorbent, Hg(II), Rubber, Peat

Mohan, D. and Chander, S. (2001), Single component and multi-component adsorption of metal ions by activated carbons. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **177** (2-3), 183-196.

Full Text: [C\Col Sur A-Phy Eng Asp177, 183.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp177,%20183.pdf)

Abstract: The adsorption by activated carbons was investigated as a method to recover metal ions from acid mine drainage. The adsorption of ferrous, manganese, zinc and calcium in single, binary, ternary, and quaternary systems was studied. Equilibrium isotherms were determined at selected pHs to characterize the adsorption process. Adsorption capacities were compared in single, binary, ternary and multi-component systems for different types of activated carbons. The adsorption data fitted Freundlich and Langmuir isotherms in most of the cases. The results indicate that Langmuir isotherm fits the data better in single component systems whereas the Freundlich is better in multi-component systems. Breakthrough curves were presented to demonstrate the effectiveness of adsorption in packed bed for treatment of metal bearing wastewaters. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Competitive Adsorption, Heavy Metals, Adsorbent, Activated Carbons, Acid Mine Drainage Treatment, Ferrous, Ferric, Manganese, Zinc, Acid-Mine Drainage, Aqueous-Solutions, Systems, Cadmium, Removal, Iron, pH

Dambies, L., Guimon, C., Yiacoumi, S. and Guibal, E. (2001), Characterization of metal ion interactions with chitosan by X-ray photoelectron spectroscopy. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **177** (2-3), 203-214.

Full Text: [C\Col Sur A-Phy Eng Asp177, 203.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp177,%20203.pdf)

Abstract: X-ray photoelectron spectroscopy (XPS) is employed to study chemical interactions between three metal ions — Cu(II), Mo(VI), and Cr(VI) — and chitosan, a natural biopolymer extracted from crab shells. Three forms of chitosan are used — flakes, beads, and modified beads obtained by glutaraldehyde cross-linking. XPS provides identification of the sorption sites involved in the accumulation of metals, as well as the forms of species sorbed on the biopolymer. It is found that sorption occurs on amine functional groups for all the three metals. With copper, the sorption step is not followed by reduction of the metal. More complex phenomena are involved in molybdate removal. A partial reduction (about 20–25% of the total molybdenum content) occurs with chitosan beads and flakes. The distribution of reduced Mo(V) on the surface of the sorbent differs from that in the bulk of the sorbent for raw chitosan beads, while the glutaraldehyde cross-linking allows uniform distribution of reduced Mo(V) throughout the sorbent. The difference between these two forms of chitosan can be related to a complementary photoreduction step occurring on the surface of the biopolymer. For chromium, a similar trend with molybdenum is followed but to a greater extent; with cross-linked sorbents all chromate previously sorbed is reduced to Cr(III), while with raw chitosan beads Cr(VI) reduction does not exceed 60%.

Keywords: Chitosan, Glutaraldehyde Cross-Linking, Metal Sorption, X-Ray Photoelectron Spectroscopy, Photoreduction

Prosser, A.J. and Franses, E.I. (2001), Adsorption and surface tension of ionic surfactants at the air-water interface: Review and evaluation of equilibrium models. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **178** (1-3), 1-40.

Full Text: [C\Col Sur A-Phy Eng Asp178, 1.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp178,%201.pdf)

Abstract: A series of old and new equilibrium tension models are reviewed and evaluated for single premicellar ionic surfactants at the air-water interface with or without added salt with a common ion. Several experimental methods used to measure surface tensions, adsorbed densities, and surface potentials are also reviewed. The models are based on the Gibbs adsorption isotherm, and classified as ‘pseudo-nonionic’ when the surface charge is ignored or ‘ionic’ when the surface charge and its electric double layer are accounted for. The former models fit and represent well tension and adsorption density data but are not predictive, primarily because the underlying adsorption isotherms, the Langmuir or the Frumkin, are independent of salinity. tonic models are to an extent predictive, based on the Davies or a combined Frumkin-Davies isotherm, and provide estimates of the adsorbed density and surface potential. Counterion binding is incorporated in the new models using a fractional binding parameter analogous to that used in micellar models. Certain advanced binding models proposed by Kralchevsky et al., Kalinin and Radke, and Warszyski et al, are also examined. The models are tested with tension data at 25 degreesC for sodium dodecylsulfate (SDS) in the presence of several sodium chloride (NaCl) concentrations. Both the model predictions and the fitted parameter values are evaluated with respect to physical plausibility and overall goodness of fit to the available data. Although the pseudo-nonionic models can fit the data well, the fitted parameters depend strongly on salinity. The more advanced ionic models can fit the data nearly as well as the pseudo-nonionic models, and provide a plausible description of the surface electrostatics. More detailed electrostatic models, and reliable data on both adsorbed densities and surface potentials at the surfactant-water interface are needed for developing more definitive and less empirical models, and For improving further our fundamental understanding of the adsorption and tension behavior of ionic surfactants. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Ionic Surfactants, Equilibrium Tension Models, Adsorption Isotherms, Counterion Binding, SDS, Sodium Dodecyl-Sulfate, Air/Water Interface, Neutron Reflection, Fluid Interfaces, Phase-Behavior, Potential Measurements, Nonionic Surfactants, Dynamic Adsorption, Aqueous-Solutions, Active Substance

Zhao, X.S., Lu, G.Q. and Hu, X. (2001), Organophilicity of MCM-41 adsorbents studied by adsorption and temperature-programmed desorption. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **179** (2-3), 261-269.

Full Text: [C\Col Sur A-Phy Eng Asp179, 261.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp179,%20261.pdf)

Abstract: In this paper, the organophilic property of MCM-41 was studied and compared with hydrophobic silicalite-l using adsorption and temperature-programmed desorption (TPD) methods. The surface heterogeneity of MCM-41 was evaluated in terms of activation energy for desorption (E-d) and isosteric heat of adsorption (q(st)). Results show that MCM-41 has a higher affinity to polar organic compounds than to non-polar organics while silicalite-l has a higher affinity to non-polar organic compounds than to polar organics. This organophilic behaviour of MCM-41 is attributed to its surface heterogeneity. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: MCM-41, Organophilicity, Adsorption, TPD, VOCs, Mesoporous Molecular-Sieves, Pore Structure, Zeolites, Silicalite, Catalysis, Sorbates, Sorption, Alkanes, Carbon, ZSM-5

Sismanoglu, T. and Pura, S. (2001), Adsorption of aqueous nitrophenols on clinoptilolite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **180** (1-2), 1-6.

Full Text: [C\Col Sur A-Phy Eng Asp180, 1.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp180,%201.pdf)

Abstract: The adsorption of o-, m- and p-nitrophenols on clinoptilolite type natural zeolite has been studied as a function of the solution concentration and temperature. The adsorption rates were observed to be equal to the first-order kinetics. The rate constants were calculated for 25.0-40.0-50.0 degreesC at constant concentration. The activation energies, (E-a) for nitrophenoles adsorption on zeolite, were estimated using the Arrhenius equation. Thermodynamic parameters were calculated for all nitrophenols. Adsorption isotherms of o-, m- and p-nitrophenols on natural zeolite were determined. These isotherms were modeled according to the Freundlich and Langmuir adsorption isotherms. The isotherms for nitrophenols on clinoptilolite were assigned as L curves. The L curve of p-nitrophenol is two step while the L curves of o- and m-nitrophenols are one-step. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption Rate, Natural Zeolite, Nitrophenols, Freundlich and Langmuir Type Isotherm

El-Hendawy, A.N.A., Samra, S.E. and Girgis, B.S. (2001), Adsorption characteristics of activated carbons obtained from corncobs. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **180** (3), 209-221.

Full Text: [C\Col Sur A-Phy Eng Asp180, 209.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp180,%20209.pdf)

Abstract: Dried, crushed, corncobs were carbonized at 500 degreesC and steam activated (in one-or two-step schemes), or activated with H3PO4. The products were characterized by N2 adsorption at 77 K, using the BET. alpha (s) and DR methods. Adsorption capacity was demonstrated by the iodine and phenol numbers, and the isotherms of Methylene Blue and Pb2+ ions, from aqueous solutions. A distribution of porosity in the carbons was estimated within the various ranges (ultra-, super-, meso-and macropores). Simple carbonization yields a poor adsorbing carbon: only its uptake for iodine was high and proposed to be due to an addition reaction on residual unsaturation of the parent lignocellulosic structures. Enhanced porosity was best associated with chemical activation and: or steam pyrolysis at: 700 degreesC. These activated carbons proved highly porous and rich in mesopores, and showed high adsorption capacity for Methylene Blue and Pb2+ ions. Phenol uptake was found to depend on surface chemical nature of the carbon rather than its porous properties. Corncobs were postulated to be feasible as feedstock to produce good adsorbing carbons, under the one-step activation schemes outlined here. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Corncobs, H3PO4, Steam Activation, Pb2+ Removal, Agricultural By-Products, Aqueous-Solutions, Phosphoric-Acid, Microporous Carbons, Steam Pyrolysis, Apricot Stones, Olive Stones, Lead Removal, Isotherms, Vapors

Myers, A.L. and Siperstein, F. (2001), Characterization of adsorbents by energy profile of adsorbed molecules. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **187-188**, 73-81.

Full Text: [C\Col Sur A-Phy Eng Asp187, 73.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp187,%2073.pdf)

Abstract: The energy profile, which is the energy of the adsorbed phase as a function of loading, is essential for characterizing the equilibrium behavior of adsorbents. The energy of the adsorbed phase is measured directly by calorimetry or indirectly by differentiating adsorption isotherms at constant loading. The adsorption isotherm and energy profile are sufficient for the determination of thermodynamic variables such entropy and provide a basis for predicting the behavior of nonideal, multicomponent mixtures from single-gas isotherms. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Adsorption, Mixture, Simulation, Energy, Enthalpy, Adsorption-Isotherms, Calorimetric Heats, Activity-Coefficients, Gas-Adsorption, Mixtures, C2H6, CO2, Ch4, Silicalite, O2

Hamieh, T., Rezzaki, M. and Schultz, J. (2001), Study of the transition temperatures and acid–base properties of poly (methyl methacrylate) adsorbed on alumina and silica, by using inverse gas chromatography technique. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **189** (1-3), 279-291.

Full Text: [C\Col Sur A-Phy Eng Asp189, 279.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp189,%20279.pdf)

Abstract: The study of phenomena transitions in polymers is of vital importance in material sciences and more particularly when polymers are adsorbed on oxides. In a previous study, we determined the glass transition temperatures of poly (methyl methacrylate) (PMMA) adsorbed on alumina, by using the inverse gas chromatography (IGC) at infinite dilution. This technique proved to be an excellent technique to determine not only the glass transitions, but also β-transition and liquid–liquid transitions of polymers adsorbed on solid substrates. In this paper, we also used the IGC technique to determine the second order transitions of the systems PMMA/SiO2 and PMMA/Al2O3, at various covered surface fractions and for various tacticities of the polymer (atactic, isotactic and syndiotactic). The maxima of the dispersive component of the surface energy γsd of our two systems, obtained by IGC at infinite dilution, indicated clearly the presence of transition temperatures (glass or local transitions). In general, we observed with PMMA, three principal maxima that reflect the changes in motions leading to reorganisation and rearrangement of the various groups or chain segments of the polymer. The change in the retention mechanism of the probes at the transition temperatures is attributed to an increased molecular mobility of the polymer segments, allowing for the penetration of the probes into the polymer layer. The study of the chemical physical properties of PMMA/SiO2 and PMMA/Al2O3, revealed an important difference in the acidic and basic behaviour, in Lewis terms, of oxide covered by various concentrations of PMMA. This study also highlighted an important effect of the tacticity of the polymer on the acidic basic character of PMMA adsorbed on oxides.

Keywords: Transition Temperatures, Adsorption, Inverse Gas Chromatography, Retention Volume, Surface Energy, PMMA, Silica, Alumina, Acid–Base Interactions

Goyal, M., Rattan, V.K., Aggarwal, D. and Bansal, R.C. (2001), Removal of copper from aqueous solutions by adsorption on activated carbons. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **190** (3), 229-238.

Full Text: [C\Col Sur A-Phy Eng Asp190, 229.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp190,%20229.pdf)

Abstract: The adsorption isotherms of Cu(II)) ions from aqueous solutions in the concentration range 40-1000 mg l-1 on two samples of granulated and two samples of activated carbon fibres containing varying amounts of associated oxygen have been reported. The adsorption isotherms are type I of BET classification showing initially a rapid adsorption tending to be asymptotic at higher concentrations. The amounts of oxygen associated with the carbon surface has been enhanced by oxidation with nitric acid and ammonium persulphate in the solution phase and with oxygen gas at 350 degreesC and decreased by degassing of the oxidized carbon samples at 400, 650 and 950 degreesC. The adsorption of Cu(II) ions increases on oxidation and decreases on degassing. The increase in adsorption on oxidation depends on the nature of the oxidative treatment while the decrease in adsorption on degassing depends on the temperature of degassing. This has been attributed to the increase in the carbon-oxygen acidic surface groups on oxidation and their decrease on degassing. Suitable mechanisms consistent with the results have been proposed. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Surface Groups, Adsorption Isotherm

Hossain, Md.M., Suzuki, T. and Kato, T. (2002), Phase behavior of *n*-hexadecyl phosphate in Gibbs adsorption layers. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **198-200**, 53-57.

Full Text: [C\Col Sur A-Phy Eng Asp198-200, 53.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp198-200,%2053.pdf)

Abstract: Phase behavior of sparingly water soluble *n*-hexadecyl phosphate in adsorption layers at the air–water interface has been investigated by Brewster angle microscopy. Two distinct phase transitions have been found to occur before attaining the condensed monolayer phase at the global equilibrium. A surface pressure relaxation in the *π*–*t* curve which is accompanied by two phase coexistent state is a direct evidence for the first-order phase transition. A second-order phase transition is attributed to a gradual change in the surface morphology from bright isotropic to anisotropic condensed phase. The domains formed during the former transition have a very characteristic worm-like structure at 28°C although the equilibrium shapes of the domains are circular at lower temperatures.

Keywords: Phase Transition; Linetension; Brewster Angle Microscopy; N-Hexadecyl Phosphate

Benguella, B. and Benaissa, H. (2002), Effects of competing cations on cadmium biosorption by chitin. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **201** (1-3), 143-150.

Full Text: [C\Col Sur A-Phy Eng Asp201, 143.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp201,%20143.pdf)

Abstract: In natural aqueous systems several metallic ions will be present, and a selective uptake of these ions by chitin surface groups can be expected. In order to investigate this phenomenon, the effect of co-ions Cu2+ and Zn2+ on the cadmium biosorption kinetic and equilibrium on chitin was examined, at free solution pH and 25°C, in static conditions. All experimental cadmium biosorption rate curves exhibited common characteristics. The apparent equilibrium biosorption was reached within the 6 h of contact. All determined biosorption isotherms exhibited a similar shape resembling that of Langmuir type isotherm of gas adsorption. The biosorption of individual metals followed the sequence Cu>Cd>Zn. While, Zn2+ ions had any appreciate effect on the cadmium uptake capacity of chitin under the conditions examined, the presence of Cu2+ ions alter the affinity of chitin for cadmium: the uptake of Cd decreased.

Keywords: Biosorption, Cadmium, Copper, Zinc, Metals Mixture, Chitin

Juang, R.S., Wu, F.C. and Tseng, R.L. (2002), Characterization and use of activated carbons prepared from bagasses for liquid-phase adsorption. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **201** (1-3), 191-199.

Full Text: [C\Col Sur A-Phy Eng Asp201, 191.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp201,%20191.pdf)

Abstract: The adsorption of two commercial dyes and phenol from water on activated carbons was investigated at 30 C. The carbons were prepared from bagasses and were activated by steam with different extents of burn-off by varying the temperature in the range of 750-840 degreesC. Pore structures of the carbons were characterized by the t-plot method based on N2 adsorption isotherms. Three simplified models including the pseudo-first-order equation, pseudo-second-order equation, and intraparticle diffusion models were used to test the adsorption kinetics. It was shown that the adsorption of dyes could be best fitted by the intraparticle diffusion model; the kinetic parameter was calculated and correlated with the extent of burn-off of the carbons. Neither of the three models had a preference for describing the adsorption of phenol, presumably due to its combined control of chemisorption and intraparticle diffusion. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Bagasse, Characterization, Adsorption Kinetics, Dyes, Phenol, Intraparticle Diffusion, Surface-Area, Sorption, Kinetics, Removal, Adsorbents, Silica, Model, Color, Ash

dos Santos, E.A., Pagano, R.L., Simoni, J.D., Airoldi, C., Cestari, A.R. and Vieira, E.F.S. (2002), The influence of the counter ion competition and nature of solvent on the adsorption of mercury halides on SH-modified silica gel. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **201** (1-3), 275-282.

Full Text: [C\Col Sur A-Phy Eng Asp201, 275.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp201,%20275.pdf)

Abstract: The adsorption behavior of thiol-modified silica gel, Si-SH, towards mercury(II) chloride and bromide in water, ethanol, methanol and water-methanol solutions has been studied by a batch technique. The influence of the counter-ion competition and mixture of solvents were investigated. The Langmuir expression for adsorption isotherm was applied in order to determine the maximum adsorption capacity to form a monolayer, N-mon, and the constant related to the adsorption intensity, b. In aqueous solutions there was a significant adsorption increase with the temperature and pronounced synergistic effects were observed. Adsorption measurements made in water(w)/ methanol(MeOH) mixtures indicated that the synergism effect of mercury adsorption followed the order 75% (w) + 25% (MeOH) > 50% (w) + 50% (MeOH) > 25% (w) + 75% (MeOH). From temperature effect on adsorption, exothermic enthalpy changes for a monolayer of anchored cations per gram of surface, Delta(mon)H(m), are shown to be consistent with our previous calorimetric results for similar systems. The antagonistic effects for Delta(mon)H(m) results showed that the counter-ion competition is not favorable to the mercury/surface interaction strengths. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Silica Gel, Adsorption, Solvents Mixtures, Mercury Halides, Divalent-Cations, Calorimetric Titration, Copper(II) Complexes, Free-Energy, Surface

Bayramoğlu, G. and Arıca, M.Y. (2002), Procion Green H-4G immobilized on a new IPN hydrogel membrane composed of poly(2-hydroxyethylmethacrylate)/chitosan: Preparation and its application to the adsorption of lysozyme. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **202** (1), 41-52.

Full Text: [C\Col Sur A-Phy Eng Asp202, 41.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp202,%2041.pdf)

Abstract: The adsorption of lysozyme has been investigated on the Procion Green H-4G immobilized novel poly(2-hydroxyethyl methacrylate)/chitosan) (pHEMA/chitosan; IPN) porous hydrogel membrane. The IPN membranes were prepared by UV initiated photo-polymerization using 2-HEMA and chitosan. The IPN membrane reached an equilibrium swelling within about 60 min. The water content of the dye immobilized membrane was 50±2% and the amount of immobilized Procion Green H-4G on the membrane was 0.678 mumol ml-1. The rates of adsorption of lysozyme on pHEMA/chitosan and pHEMA/chitosan-dye immobilized membranes were measured in a stirred cell, The adsorption capacities of these membranes were determined by changing pH and the concentration of lysozyme in the adsorption medium. The adsorption phenomena appeared to follow a typical Langmuir isotherm. Lysozyme adsorption capacity of the pHEMA/chitosan and pHEMA/chitosan-dye immobilized membranes were 0.18 and 14.06 mg ml-1, respectively. The maximum lysozyme adsorption capacity (qm) of the pHEMA-chitosan-dye immobilized membranes was 20.28 mg ml-1 and the dissociation constant (Kd) value was found to be 1.01 mg ml-1 lysozyme. The experimental data were also analysed using first order Van’t Hoff equation for lysozyme-adsorbent interactions, the change in entropy and Gibbs energy of binding were determined at different temperatures and the enthalpy of the system was calculated as 2.5 kcal mol-1. All of the adsorbed lysozyme were desorbed in 60 min in the desorption medium containing 1.0 M KSNC at pH 8.0. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Interpenetrating Networks, Ipn, Phema, Chitosan, Procion Green H-4g, Ion Exchange Membrane, Lysozyme, Adsorption, Chitin Affinity Membranes, Cibacron-Blue F3Ga, Metal-Ion Affinity, Poly(2-Hydroxyethyl Methacrylate), Protein Separation, Chromatography, Purification, Performance, Adsorbents, Exchange

Chatterjee, J. (2002), A novel mechanism of dynamic interfacial tension reduction in triglyceride-alkaline aqueous solution system. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **204** (1-3), 93-102.

Full Text: [C\Col Sur A-Phy Eng Asp204, 93.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp204,%2093.pdf)

Abstract: Emulsification of edible oils in aqueous solutions is of interest in diverse applications. The energy required for emulsification of oil in water is dependent on properties like the viscosity ratio, the local shear rates and the Interfacial Tension (IFT) of the oil–water interface, at the expansion rates prevailing during the process. This paper shows that dynamic IFT and emulsification in edible oil/water systems is dependent on the aqueous phase pH. Experiments aimed at identifying the causes of this are discussed. This study, of the pH dependence of dynamic IFT, reveals a novel mechanism for IFT lowering which is more effective than surfactant adsorption. The results of this study clearly show that the dynamic IFT of an edible-oil–aqueous solution interface, has marked pH dependence, at room temperature. However, when the commercial edible oil is purified, using known techniques for triglyceride purification, the sensitivity of its dynamic IFT to pH of the aqueous phase is significantly reduced. This study shows that the observed pH dependence of dynamic IFT and ease of emulsification at high aqueous phase pHs, is due to in-situ surfactant generation, which occurs during edible oil–alkaline aqueous solution contact. Surprisingly, in-situ surfactant generation is much more effective in reducing oil–water dynamic IFT compared with adsorption of its pre-formed equivalent. This study probes this observation. Not only is in-situ generation more effective in tension reduction, experiments discussed in this paper show that the presence of pre-formed surfactants is actually detrimental to the tension reduction that is achievable by in-situ generation.

Keywords: In-Situ Surfactant Generation, Emulsification, Dynamic Interfacial Tension, IFT Reduction, Drop Volume Technique

Adhiya, J., Cai, X.H., Sayre, R.T. and Traina, S.J. (2002), Binding of aqueous cadmium by the lyophilized biomass of *Chlamydomonas reinhardtii*. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **210** (1), 1-11.

Full Text: [C\Col Sur A-Phy Eng Asp210, 1.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp210,%201.pdf)

Abstract: Biosorption of aqueous Cd by Chlamydomonas reinhardtii was examined. Cd uptake increased from pH 2 to 10, and was measured at different initial Cd concentrations (0.09–8.75 mM). Proton affinity models of potentiometric titration data indicated the presence of two major functional group clusters on the cell walls, corresponding to ionic strength dependent pKa values in the ranges 3.8–4.7 and 8.3–9.6, with an average functional group acidity of approximately 2 mmol of protonable charge per g of lyophilized cells. Cd-binding was not significantly affected by the presence of equimolar (and greater) concentrations of aqueous macro-ions Ca2+ and K+. FTIR spectra indicated that Cd-binding was dominated by complexation to carboxylic functional groups, and Cd sorption could be modeled with a single-site Gaussian distribution model. This study shows the potential for the use of C. reinhardtii for cadmium recovery in various water and wastewater treatment applications.

Keywords: Algal Biosorption, Proton Affinity, Cadmium Binding, Gaussian Distribution Model

? Zakaria, E.S., Ali, I.M. and El-Naggar, I.M. (2002), Thermodynamics and ion exchange equilibria of Gd3+, Eu3+ and Ce3+ ions on H+ form of titanium(IV) antimonate. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **210** (1), 33-40.

Full Text: [2002\Col Sur A-Phy Eng Asp210, 33.pdf](2002/Col%20Sur%20A-Phy%20Eng%20Asp210,%2033.pdf)

Abstract: Titanium(IV) antimonate as a cation exchanger has been obtained in amorphous form by mixing titanium tetrachloride to antimony pentachloride in molar ratio of Ti/Sb in the starting solutions is unity. Ion-exchange equilibria of Gd3+, Eu3+ and Ce3+ ions with HI form of titanium(IV) antimonate in MCl3-HCl media with a solution ionic strength of 0.1, in the reaction

Mn+ + R-H reversible arrow R-M + nH+

has been measured in both forward and reverse reactions at different reaction temperatures 25, 40 and 60°C (±1°C) by batch method. The thermodynamic selectivity sequence as a function of X, decrease in the order Gd3+ > Eu3+ > Ce3+ and this selectivity order is parallel to the equilibrium capacity of rare earth metal ions on H+ form of titanium(IV) antimonate. On the basis of exchange isotherms, thermodynamic equilibrium constants, and values of ΔG°, ΔH° and ΔS° for exchange of Gd3+/H+, Eu3+/H+ and Ce3+/H+ on titanium(IV) antimonate have been calculated. Negative values of entropy changes (AS’) have been reported for all exchange systems studied (M3+/H+) on the exchange materials of titanium(IV) antimonate. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Thermodynamics, Selectivity, Ion Exchange Equilibria, Gadolinium, Europium, Cerium, Titanium Antimonite, Alkali-Metal Ions, Cation-Exchanger, Selectivity, Lithium, Tin(IV)

Sen, T.K., Mahajan, S.P. and Khilar, K.C. (2002), Adsorption of Cu2+ and Ni2+ on iron oxide and kaolin and its importance on Ni2+ transport in porous media. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **211** (1), 91-102.

Full Text: [C\Col Sur A-Phy Eng Asp211, 91.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp211,%2091.pdf)

Abstract: Adsorption of divalent heavy metal ions on iron oxide and kaolin is important to determine the transport and ultimate fate of ions in underground water and soil. In this study, kinetics and equilibrium adsorption of Cu2+ and Ni2+ metal ions from their aqueous solutions on iron oxide, kaolin and sand have been investigated. Batch adsorption studies show that Cu2+ and Ni2+ adsorb more strongly on the colloidal fines, iron oxide and kaolin than on the sand material. It is shown that the adsorption of Cu2+ and Ni2+ is a function of system pH, and solid adsorbent concentration. The equilibrium data follow the most widely used nonlinear Freundlich isotherm equilibrium model which has the general form of *X*=*K*F *Cn*. It is found that ‘*n*’ is strongly dependent on the nature of the adsorbent and virtually independent of conditions such as pH. The other parameter, ‘*K*F’ strongly depends on the pH of the solution. Finally, predictions of contaminant transport of Ni2+ due to the presence of colloidal fines, kaolin based on batch adsorption value has been compared with measured data using sand-kaolin packed beds.

Keywords: Freundlich Isotherm, Oxide Particles, Metal Adsorption, Kinetics, Colloid-Associated Transport

Crepaldi, E.L., Tronto, J., Cardoso, L.P. and Valim, J.B. (2002), Sorption of terephthalate anions by calcined and uncalcined hydrotalcite-like compoun. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **211** (2-3), 103-114.

Full Text: [C\Col Sur A-Phy Eng Asp211, 103.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp211,%20103.pdf)

Abstract: The uptake of terephthalate anions (TA) from aqueous solutions by Mg-Al-CO3 layered double hydroxides (LDHs) has been investigated. The sorption process, that takes place by the reconstruction of the calcined LDH and involves the intercalation and adsorption of TA, is much more efficient in the uptake of such anion than the pure adsorption process occurring in the parent LDH. The extraction ratio (defined as the ratio between the sorbed quantity of TA and the total amount of TA in the system) observed in the concentration range usually found in industrial wastes of purified terephthalic acid (PTA) production plants varied from 83 to 57% for the calcined LDH. The investigation of the sorption kinetics showed that this process is relatively slow, and occurs by a two step mechanism, i.e. a fast rehydration of the mixed oxide (calcined LDH) with intercalation of hydroxyl anions, and a slow anion exchange of the hydroxyl anions by TA. The displacement of OH- by TA increased the pH. Therefore, the pH is a parameter of paramount importance in the process, since it affects the ratio between TA and OH- in solution and, consequently, in the LDH interlayer. Recycling of the sorbent, in cycles of calcination and reconstruction in TA solution, showed a small reduction (around 10%) in the uptake capacity up to the 5th cycle. This small reduction can be related to the easy elimination of the TA anions by calcination and, unlike previously reported results, to the absence of Al(III)-rich phase segregation. Therefore, Mg-Al-LDHs can be considered as very promising sorbents for TA. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Hydrotalcite, Layered Double Hydroxide, Terephthalic Acid, Sorption, Adsorption, Wastewater, Layered Double Hydroxides, Sodium Dodecyl-Sulfate, Waste-Water, Anaerobic-Digestion, I-131(-) Sorption, Metal-Hydroxides, Acid Plant, Exchange, Removal, Adsorption

? Zouboulis, A.I., Matis, K.A., Loukidou, M. and Sebesta, F. (2003), Metal biosorption by PAN-immobilized fungal biomass in simulated wastewaters. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **212** (2-3), 185-195.

Full Text: [2003\Col Sur A-Phy Eng Asp212, 185.pdf](2003/Col%20Sur%20A-Phy%20Eng%20Asp212,%20185.pdf)

Abstract: The ability of microorganisms to remove metal ions from solution was investigated by using dead fungal biomass. The latter was immobilized by polyacrylonitrile, a known binding polymer for inorganic ion exchangers. This product was examined in batchwise experiments for the removal of toxic metals from aqueous mixtures containing copper, zinc and nickel (i.e. simulated wastewaters) in order to examine whether this separation technique may improve biomass performance as a metals sorbent. The metal removal capacities of the beads PAN-B/50% for zinc, copper and nickel were 16, 7 and 0.25 mg g-1, respectively, while the zinc, copper and nickel adsorption capacities of PAN-B/75% were 18, 7.9 and 0.25 mg g-1, respectively. The obtained results were compared with those using plain dispersed biomass. Certain column experiments were also performed. Promising results were obtained in the laboratory, as effective metal removals were observed. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Biosorption, Immobilization, Polyacrylonitrile, Fungi, Metals, Dilute Aqueous-Solutions, Heavy-Metals, Removal, Ions, Recovery, Cadmium, Desorption, Binding, Beds

Daifullah, A.A.M. and Girgis, B.S. (2003), Impact of surface characteristics of activated carbon on adsorption of BTEX. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **214** (1-3), 181-193.

Full Text: [C\Col Sur A-Phy Eng Asp214, 181.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp214,%20181.pdf)

Abstract: Five residues of botanical origin were tested as potential activated carbon precursors; these are: date pits (DP), cotton stalks (CS), peach stones (PS), almond shells (ALS), and olive stones (OS). A standard activation procedure was followed (impregnation with 50% H3PO4 and heat treatment at 773 K) for the sake of comparison. Texture characteristics were determined by analysis of the N-2/77 K isotherms. Highly to good adsorbing carbons were obtained in the order: PS, ALS, CS, OS and DP, respectively. Acidity/basicity characteristics were estimated by the selective titration method of Boehm. All carbons contained residual phosphates and showed high content of surface oxygen complexes mostly of acidic type. Removal of benzene, toluene, ethylbenzene and p-xylene (BTEX) was evaluated for each component in the mixture and in terms of total uptake. Low amounts of BTEX were adsorbed, which were irregularly correlated to either of the porosity or surface-chemical parameters. It is assumed that the complexity of the carbon surface with developed porosity and high content of hydrophilic oxygen functionalities determine the uptake of the hydrophobic organic molecules. In general, the order of uptake appears consistent to previous investigations as B < T < E < X, as related to decreased water solubility and increased molecular weight. A single air oxidized activated carbon at 625 K (OSA) showed a considerable reduction in porosity as well as increased acidity and improved removal capacity of BTEX per unit area. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Agricultural By-Products, BTEX, Surface Characteristics, Phosphoric-Acid, Oxidation, IR

Sharma, Y.C. (2003), Cr(VI) removal from industrial effluents by adsorption on an indigenous low-cost material. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **215** (1-3), 155-162.

Full Text: [C\Col Sur A-Phy Eng Asp215, 155.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp215,%20155.pdf)

Abstract: Feasibility of an indigenous low-cost clay mineral, wollastonite, has been examined for the removal of Cr(VI) from aqueous solutions and wastewaters. The removal is found to be dependent on concentration of Cr(VI) and low concentrations favour the uptake. The uptake increased from 41.7 to 69.5% by decreasing the concentration of Cr(VI) in solution from 2.0×10-4 to 0.5×10-4 M at 0.01 M NaClO4 ionic strength, 2.5 pH and at 30 degreesC. Rate of uptake was found to be 3.0×10-2 min-1 under optimum conditions and the process is governed by first-order kinetic equation. The process involves both film and pore diffusion, and the value of rate constant for intraparticle diffusion was found to be 5.0×10-4 mg g-1 min-1/2 under favourable conditions, while mass transfer coefficient for film mass transfer was found to be 2.31×10-3 s-1 at 0.5×10-4 M Cr(VI) concentration at optimum conditions. The process is a typical example of endothermic adsorption and therefore higher temperatures favour the uptake. pH has pronounced effect on process of removal and removal is higher in lower pH range, maximum (69.5%) being at 2.5 pH and minimum (12.3) at pH 8.0. Various predictive empirical models have been developed. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Cadmium, China-Clay, Fly-Ash, Removal, Water Pollution, Wollastonite

Dávila-Jiménez, M.M., Elizalde-González, M.P., Geyer, W., Mattusch, J. and Wennrich, R. (2003), Adsorption of metal cations from aqueous solution onto a natural and a model biocomposite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **219** (1-3), 243-252.

Full Text: [C\Col Sur A-Phy Eng Asp219, 243.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp219,%20243.pdf)

Abstract: Batch adsorption studies have shown that a solid material (CACMM) extracted from a cactus was able to sorb Cu2+, Cd2+, Cr3+, CrO42-, Fe3+, Ni2+, Pb2+ and Zn2+ from aqueous solutions in the concentration range 100–1000 mg l-1. Fractions of CACMM with different particle diameter presented different sorption patterns upon the studied metal cations. Copper retention was much greater than that of other cations for all the fractions under identical experimental conditions with a maximum efficiency of 84% for 1000 mg l-1 Cu2+ solutions. Adsorption magnitude onto large particles of CACMM1 (450 (μm) decreased in the series Cu2+>Ni2+>Cr3+>Pb2+>Zn2+>Cd2+>Fe3+ that correlates with the stability constants of the respective oxalate complexes indicating that the interaction of the metal cations follows a surface adsorption–complexation mechanism. The composition of a model composite, which simulates the sorption capacity of the natural cactus powders upon copper, was found. (C) 2003 Elsevier Science B.V. All rights reserved.

Keywords: Heavy Metals, Adsorption, Biocomposite, Model, Water Treatment, Adsorbent Cacmm2, Industry Waste, Removal, Ions, Lead, Sorption, Water, Chromium, Cadmium, Peat

? Titus, E., Kalkar, A.K. and Gaikar, V.G. (2003), Equilibrium studies of adsorption of amino acids on NaZSM-5 zeolite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **223** (1-3), 55-61.

Full Text: [2003\Col Sur A-Phy Eng Asp223, 55.pdf](2003/Col%20Sur%20A-Phy%20Eng%20Asp223,%2055.pdf)

Abstract: The adsorption of amino acids such as phenylalanine, alanine, tyrosine and tryptophan on highly hydrophobic NaZSM-5 zeolite were studied. Selective adsorption of phenylalanine and tyrosine were observed. The single component adsorption isotherms were fitted in Langmuir model. For the amino acids considered in this work, the isotherms are essentially independent of pH, but they vary significantly with the temperature. Heats of adsorption were obtained from van’t Hoff plots of the Henry’s law constant limit of the Langmuir isotherm and found to be higher for more hydrophobic solute. (C) 2003 Published by Elsevier B.V.

Keywords: Aminoacids, Separation, Adsorption, Ion-Exchange Chromatography, Liquid-Chromatography, Separation, Phenylalanine, Silicalite, ZSM-5

Tsai, W.T., Lai, C.W. and Hsien, K.J. (2003), The effects of pH and salinity on kinetics of paraquat sorption onto activated clay. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **224** (1-3), 99-105.

Full Text: [C\Col Sur A-Phy Eng Asp224, 99.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp224,%2099.pdf)

Abstract: In the present study, activated clay was used as adsorbent for the kinetics of paraquat adsorption from aqueous solution at 25 °C in a batch adsorber. The rate of adsorption has been investigated under the controlled process parameters like initial pH and salinity. A pseudo-second order model has been tested to predict the rate constant of adsorption, equilibrium adsorption capacity, and distribution coefficient by the fittings of the experimental data. The results showed that the adsorption process could be well described with the reaction model. Also, the results were reasonable to be explained by competitive adsorption in the ion exchange process. Further, the process kinetics was reasonably described by the proposed mechanism, which was based on the concepts of completely mixed batch reactor, mass conservation, and homogeneous elementary reaction.

Keywords: Sorption, Paraquat, Clay Adsorbent, Kinetic Modeling, Aqueous-Solution, Bleaching Earth, Metal-Ions, Adsorption, Removal, Montmorillonite, Contaminants, Desorption, Chitosan, Water

Valenzuela-Calahorro, C., Navarrete-Guijosa, A., Stitou, M. and Cuerda-Correa, E.M. (2003), Retention of progesterone by four carbonaceous materials: Study of the adsorption kinetics. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **224** (1-3), 135-147.

Full Text: [C\Col Sur A-Phy Eng Asp224, 135.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp224,%20135.pdf)

Abstract: The process by which progesterone in an ethanol solution is retained by four carbonaceous materials involves a reversible mechanism that conforms to a kinetic equation of unity partial order in both the progesterone concentration in solution, the coverage fraction (*θ*) of the adsorbing surface and (1-*θ*). Over the temperature range 10–40°C, the specific rate constant varies from 5.29×10-4 to 44.85×10-4 s-1. The formation of the activated species involved in the adsorption process is an endothermal, exoentropic step. The rate of the adsorption–desorption process is primarily determined by diffusion of progesterone molecules in the pores of the sorbent.

Keywords: Adsorption, Progesterone, Kinetic Model, Carbon Black

Abou-Mesalam, M.M. (2003), Sorption kinetics of copper, zinc, cadmium and nickel ions on synthesized silico-antimonate ion exchanger. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **225** (1-3), 85-94.

Full Text: [C\Col Sur A-Phy Eng Asp225, 85.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp225,%2085.pdf)

Abstract: Silico-antimonate as inorganic ion exchange material has been synthesized and characterized using different available tools (X-ray diffraction (XRD) pattern, X-ray fluorescence, infrared spectroscopy and differential thermal analysis). From the analysis data, the empirical formula of silico-antimonate was obtained to be H2SiSb4O13.10H2O. Sorption kinetics for Cu2+, Zn2+, Cd2+ and Ni2+ ions on silico-antimonate were studied and found to be follow the first order kinetics obeying the Freundlich isotherm over the entire range for the bulk concentration of the metal ions. Thermodynamic parameters (i.e. ΔG°, ΔS° and ΔH°) have also been calculated for the adsorption of Cu2+, Zn2+, Cd2+ and Ni2+ ions on silico-antimonate showing that the overall adsorption process is spontaneous and exothermic.

Keywords: Sorption Kinetics, Synthesis, Ion Exchanger, Silico-Antimonate

Özacar, M. and Şengil, İ.A. (2003), Evaluation of tannin biopolymer as a coagulant aid for coagulation of colloidal particles. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **229** (1-3), 85-96.

Full Text: [C\Col Sur A-Phy Eng Asp229, 85.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp229,%2085.pdf)

Abstract: Tannin is a biodegradable anionic polymer. Tannin as a coagulant aid can be a potential substitute for synthetic anionic polyelectrolytes in water treatment because it can: (1)avoid the health effects from residual aluminum(III) and synthetic polymers, and (2) produce biodegradable sludge. In the present work, the coagulant characteristics of the tannin obtained from valonia were examined and whether or not tannin could be used a coagulant aid was determined. The effectiveness of tannin as a coagulant aid was investigated in jar test experiments. The jar test were conducted using water sample prepared in varying its pH and turbidity. In the turbidity removal from snythetic water, both Al2(SO4)3 + tannin and Al2(SO4)3 + AN913 showed significant improvement compared with Al2(SO4)3 only. However, tannin as a coagulant aid was more effective than AN913 and it significantly reduced the required doses of the Al2(SO4)3. The sludge filterability was determined by specific resistance measurements. Tannin and Al-2(SO4)3 together gave a significant improvement comparing with Al2(SO4)3 only. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Tannins, Alum, Natural Coagulant Aid, Polyelectrolytes, Coagulation, Moringa-Oleifera Seeds, Natural Organic-Matter, Waste-Water Treatment, Drinking-Water, Spectrophotometric Determination, Turbidity Removal, Humic-Acid, Flocculation, Purification, Separation

Chubar, N., Carvalho, J.R. and Correia, M.J.N. (2003), Cork biomass as biosorbent for Cu(II), Zn(II) and Ni(II). *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **230** (1-3), 57-65.

Full Text: [C\Col Sur A-Phy Eng Asp230, 57.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp230,%2057.pdf)

Abstract: The removal of Cu(II), Zn(II) and Ni(II) from solutions using biosorption in cork powder is described. The adsorption isotherms were determined, along with the effect of different variables, such as the solid–liquid ratio, temperature and pH on the removal efficiency of the metals. The potentiometric titration curve of the cork biomass was determined and some zeta-potential studies were carried out. The effect of the pre-treatment by Fisher esterification on the biosorption properties of cork is also presented. It was concluded that the adsorption of the heavy metals was favoured by an increase in pH. The degree of heavy metal removal is directly related to the concentration of cork biomass, and the maximum sorption capacity of cork biomass for Cu(II), Zn(II) and Ni(II) was 0.63, 0.76 and 0.34 meq./g, respectively. It is shown that ion exchange plays a more important role in the sorption of Cu(II) and Ni(II) on cork biomass than in the sorption of Zn(II). The pre-treatment by Fisher esterification confirmed the important role of the carboxylic groups in binding of Cu(II) and Ni(II) and showed that they are the only binding sites for Zn(II).

Keywords: Copper, Zinc, Nickel, Biosorption, Cork Biomass

Montes-H, G. and Geraud, Y. (2004), Sorption kinetic of water vapour of MX80 bentonite submitted to different physical–chemical and mechanical conditions. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **235** (1-3), 17-23.

Full Text: [C\Col Sur A-Phy Eng Asp235, 17.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp235,%2017.pdf)

Abstract: The clay materials are widely used in industrial processes. One significant application is as a solid desiccant agent or as a dehydrator of gases. In this case, it is fundamental to investigate on the sorption kinetics of water vapour. The main aim of the current study has been to present an experimental–theoretical study on the sorption kinetics of water vapour, using as reference material MX80 bentonite. This clay mineral was submitted at different physical, chemical and mechanical conditions. Then 0.5 g of the modified-sample previously dried for 24 h at 110 °C was placed in plastic desiccators (2 l) under isothermal conditions and atmospheric pressure, here the relative humidity was controlled by a supersaturated salt solution. This instrumental system allowed us to study the sorption kinetics of water vapour of MX80 bentonite where the control parameters were the interlayer cation (bentonite exchanged with Na, Li, K, Mg, Ca), mechanical compaction (uni-axial system at 21, 35 and 63 MPa), drying temperature of sample (110, 150, 250 and 500 °C), relative humidity (61, 75, 87 and 95%) and the amount of the sample (0.5, 1, 2, 3, 4 and 5 g).

Thanks to a kinetic model of second order it was possible to estimate that the sorption kinetic of water vapour of MX80 bentonite depends directly on the relative humidity, the interlayer cation and amount of the sample. In contrast, the sorption kinetics of water vapour was lightly affected by the mechanical compaction. Finally, the sorption kinetics of water vapour was modified by the drying temperature of sample exclusively when this is very high (for example, 500°C).

Keywords: MX80 Bentonite, Water Sorption, Kinetic, Mechanical Compaction, Cation Saturation

Youssef, A.M., El-Nabarawy, Th. and Samra, S.E. (2004), Sorption properties of chemically-activated carbons: 1. Sorption of cadmium(II) ions. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **235** (1-3), 153-163.

Full Text: [C\Col Sur A-Phy Eng Asp235, 153.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp235,%20153.pdf)

Abstract: Chemically-activated carbons were prepared by reacting corn-stalks with concentrated sulphuric acid at 180–220 °C and by activation with zinc chloride at 600 °C. Sulphuric acid-activated carbons measure surface areas in the order of 20 m2/g, while those activated with zinc chloride measure surface areas of about 700–900 m2/g. The concentrations of carbon–oxygen functional groups, on sulphuric acid-activated carbons are higher than those on zinc chloride-activated ones. Sorption of Cd(II) depends on the chemistry of the surface of activated carbon rather than on its surface area. Light metals ions such as Na+ decreased the Cd(II) ion sorption onto activated carbons, high concentration of Na+ may stop sorption of Cd(II) onto activated carbons. Chemically-activated carbons can be used for a number of cycles after regeneration with a slight decrease in sorption capacity after each cycle.

The sorption of Cd(II) onto chemically-activated carbons is associated with a release of protons indicating that the sorption of this heavy metal ion and probably of other metal ions takes place via ion exchange mechanism. The sorption of Cd(II) ions is controlled at least partially by pore diffusion. Cadmium(II) sorption on chemically-activated carbons depends on the concentration of the metal ions indicating first-order mechanism.

Keywords: Chemically-Activated Carbons, Removal of Heavy Metals, Cd(II) Sorption, Breakthrough

? Bajpai, J., Shrivastava, R. and Bajpai, A.K. (2004), Dynamic and equilibrium studies on adsorption of Cr(VI) ions onto binary bio-polymeric beads of cross linked alginate and gelatin. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **236** (1-3), 81-90.

Full Text: [2004\Col Sur A-Phy Eng Asp236, 81.pdf](2004/Col%20Sur%20A-Phy%20Eng%20Asp236,%2081.pdf)

Abstract: Static and dynamic adsorption studies of Cr(VI) have been undertaken at fixed pH and ionic strength taking binary bio-polymeric beads of cross linked alginate and cross linked gelatin as adsorbents. The adsorption data were applied to Langmuir and Freundlich isotherm equations and various static parameters were calculated. The dynamic nature of adsorption was quantified in terms of several kinetic constants such as rate constants for adsorption (k(l)), Lagergreen rate constant (k(ad)), interparticle diffusion rate constant (k(p)) and pore diffusion coefficient (D). The influence of various experimental parameters such as solid to liquid ratio, pH, temperature, presence of salts and chemical composition of bio-polymeric beads were investigated on the adsorption of dichromate ion. Various thermodynamic parameters were also calculated. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Chromium(VI), Adsorption, Kinetics, Alginate, Gelatin, Beads, Activated Carbon, Heavy-Metal, Solution Interface, Dissolved Copper, Aqueous-Solution, Removal, Biosorption, Bed, Chromium(VI), Bentonite

Khattak, A.K., Mahmood, K., Afzal, M., Saleem, M. and Qadeer, R. (2004), Thermodynamic studies of methanol adsorption on metal impregnated γ-alumina samples. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **236** (1-3), 103-110.

Full Text: [C\Col Sur A-Phy Eng Asp236, 103.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp236,%20103.pdf)

Abstract: A series of metal impregnated alumina samples has been prepared by impregnation of the host oxide (γ-alumina) with different additives (Cr, Mn, Fe and Co). In the present paper, a study has been made of the adsorption isotherms of methanol (MeOH) on parent and metal impregnated γ-alumina samples in the temperature range 273–313 K as a function of temperature and coverage, using CAHN 1000 electrobalance. Furthermore, the effect of different concentrations of the metals loaded on γ-alumina has also been investigated by means of X-ray diffraction (XRD), low temperature nitrogen adsorption, and thermal analysis techniques (thermogravimetry (TG) and differential thermogravimetry (DTG)). From the adsorption data, thermodynamic parameters such as free energy (Δ*G*°), differential enthalpy (Δ*H*) and molar entropy (Δ*S*°) of adsorption have been determined as a function of temperatures and coverage. From the data, it is noted that values of the enthalpy (Δ*H*) are higher for metal impregnated alumina as compared to parent alumina indicating that strong adsorbate–adsorbent interaction is found after impregnation. It is also evident from the results that values of the free energy of adsorption (Δ*G*°) for the adsorption of MeOH on alumina systems are negative, showing that adsorption processes are spontaneous in nature These values decrease with increase in temperature indicating that alumina samples have higher adsorption affinity for methanol at low temperature. The low values of entropy (Δ*S*°) for metal impregnated alumina indicate more constraint on the mobility of the adsorbate molecules. It is noted from the result of X-ray diffraction that surface properties of γ-alumina change with metal impregnation. X-ray diffraction analysis on the impregnated alumina also reveals the existence of crystalline material. Furthermore, analysis of the Dubinin–Radushkevich (D–R) plot of nitrogen adsorption indicates that microporosity of the alumina decreases due to progressive closure of the micropores as the metals are loaded on the surface of the alumina. This decrease in microporosity further supports the idea that these impregnated metals residues distribute uniformly over the surface of the alumina. It is also found from TG curves that mass loss for metal impregnated alumina systems in all cases is greater than for parent alumina which means that transition metals used for impregnation are able to increase the percentage loss in mass. The DTG analysis of dehydration of water process confirms the results of TG, showing endothermic peaks which correspond to mass loss on TG curve.

Keywords: Metal Impregnated Alumina, Adsorption, Thermodynamics of Adsorption, Structural Properties, Porosity, Thermal Study

da Silva, K.M.P. and da Silva, M.I.P. (2004), Copper sorption from diesel oil on chitin and chitosan polymers. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **237** (1-3), 15-21.

Full Text: [C\Col Sur A-Phy Eng Asp237, 15.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp237,%2015.pdf)

Abstract: Chitin, chitosan and modified chitosan, biopolymers which have structures similar to that of cellulose, are proposed for removal of copper ion from diesel oil. These natural polymers had been used before for recovering traces of metals from aqueous solutions and from industrial and sea waters. The present work describes the obtention and characterisation of chitin, chitosan and modified chitosan polymers. The removing ability of these polymers for copper ion has been demonstrated in diesel oil and chitosan presented the best performance. The removal percentage from kinetic studies depends on several factors as the polymer type, the temperature and the contact time and reaches values of about 92% at equilibrium. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Biopolymer, Chitin, Chitosan, Cu Sorption, Diesel Oil, Metal Ions, Aqueous-Solutions, Adsorption, Removal

Das, M.R., Sahu, O.P., Borthakur, P.C. and Mahiuddin, S. (2004), Kinetics and adsorption behaviour of salicylate on α-alumina in aqueous medium. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **237** (1-3), 23-31.

Full Text: [C\Col Sur A-Phy Eng Asp237, 23.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp237,%2023.pdf)

Abstract: The adsorption of salicylate on α-alumina was studied in aqueous medium over the pH range 4–9. Kinetics of adsorption of salicylate on α-alumina was studied at pH 5 and 25, 30 and 40 °C. The state of equilibrium was obtained after 2.5 h. The adsorption density of salicylate on α-alumina increases with the increase of temperature due to increase in surface loading and decreases with the increase of pH and ionic strength of the system. The decrease in adsorption density is attributed to decrease of the positive surface charge and the double layer thickness. The rate constant for adsorption of salicylate on α-alumina was found to increase with the increase in temperature and the thermodynamic parameters were estimated. The FTIR spectra of salicylate after adsorption on the α-alumina surfaces were recorded for obtaining the bonding properties of salicylate. The phenolic group is not deprotonated as evident by the presence of the characteristic band at 1266 cm−1. The shifting of the characteristics peak frequencies of ---COO− and appearance of a new band at ≈1710 cm−1 due to >C=O indicate that the salicylate is coordinated monodentally with respect to the carboxyl group.

Keywords: Adsorption, α-Alumina, Kinetics, Sodium Salicylate, Ftir Spectroscopy

Chubar, N., Carvalho, J.R. and Correia, M.J.N. (2004), Heavy metals biosorption on cork biomass: Effect of the pre-treatment. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **238** (1-3), 51-58.

Full Text: [C\Col Sur A-Phy Eng Asp238, 51.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp238,%2051.pdf)

Abstract: The effect of the pre-treatment of cork biomass on the biosorption of heavy metals (Cu, Zn and Ni) was studied. The pre-treatment by Fisher reaction confirmed the important role of carboxylic groups in the binding of the heavy metals. The pre-treatment of the cork biomass with a 0.5 M sodium chloride solution led to an increase of 30% of cork sorption capacity for copper, while the pre-treatment with a 0.5 M calcium chloride solution did not improve significantly the performance of the biomass. The sorption capacity of cork biomass did not change after being boiled in deionised water or washed with solutions 0.1 M NaCl and NaOH, while the heating/boiling in alkaline solutions increased the amount of copper adsorbed in the biomass. The use of oxidising agents (NaClO and NalO3) in the pre-treatment step allowed an increase of the sorption capacity of the biomass. Actually, an increase of 70-80% of the sorption capacity was obtained when the pre-treatment was carried out for 30 min with a solution containing 7% of active chlorine at room temperature. Finally, the porous carbon produced from cork by direct activation with steam at 700 and 800degreesC presented a sorption capacity four to six times higher than the original cork biomass, when contacting a 200 mg/dm3 copper solution. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Heavy Metals, Cork, Pre-Treatment, Biosorption, Aqueous-Solutions, Removal, Adsorption, Sorption, Mercury, Waste; Lead

? Huang, F.C., Lee, J.F., Lee, C.K. and Chao, H.P. (2004), Effects of cation exchange on the pore and surface structure and adsorption characteristics of montmorillonite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **239** (1-3), 41-47.

Full Text: [2004\Col Sur A-Phy Eng Asp239, 41.pdf](2004/Col%20Sur%20A-Phy%20Eng%20Asp239,%2041.pdf)

Abstract: Ca-montmorillonite was exchanged with the metal cations, titanium, iron, and copper and the ion-exchange effects on the surface area, pore structure and adsorption property of the montmorillonite were studied. The changes in the pore structure and the surface roughness of the montmorillonite were first characterized based on the classical and fractal analyses of the nitrogen adsorption isotherms as well as the XRD and TGA/DSC patterns. Then, the adsorption isotherms of benzene, hexane, and cyclohexane were measured to identify how exchange process affected the adsorption characteristics of the montmorillonite. It was found that the ion-exchange processes could induce enormous changes in the surface and pore structure of montmorillonite and these changes could be interpreted with the coverture of the surface roughness (surface screening effect), the inhibition of the movement of nitrogen molecule into pores (pore blocking effect), and the interlamellar expansion of the montmorillonite (pore opening effect). The effect of alterations of the surface area and the pore structure on the adsorption characteristics of montmorillonite was discussed. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Montmorillonite, Metal Cations, Surface Area, Surface Fractal Dimension, Pore Connectivity, Pillared Clays, Percolation Analysis, Connectivity, Sorption, Aluminum, Te

Wu, Z.J., Ahn, I.S., Lee, C.H., Kim, J.H., Shul, Y.G. and Lee, K.T. (2004), Enhancing the organic dye adsorption on porous xerogels. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **240** (1-3), 157-164.

Full Text: [C\Col Sur A-Phy Eng Asp240, 157.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp240,%20157.pdf)

Abstract: We investigate the adsorption of four different organic dyes (i.e., methyl orange, alizarin red S, brilliant blue FCF, and phenol red) on porous xerogels. To understand the factors affecting the adsorption capacity of the xerogels, we vary the hydrophobicity and the textural properties of the xerogels as well as the solution pH. We control the hydrophobicity by mixing two different precursors (i.e., vinyltriethoxysilane (VTES) and tetraethoxysilane (TEOS)) and the textural properties by using cetyltrimethylammonium bromide (CTAB) as a templating agent. We find that the adsorption capacity is enhanced as the organic/inorganic hybrid xerogel or the templated xerogel is used instead of the purely inorganic or the untemplated xerogel. In all the cases studied, adsorption decreases as the pH is increased due to the electrostatic repulsion between the dyes and the xerogel surface. We find that both the hydrophobic surface and larger pore size/volume are required to enhance the adsorption capacity significantly. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Organic Dyes, Templated, Hybrid Xerogels, Adsorption Mechanism, Mesoporous Molecular-Sieves, Brilliant Blue FCF, Aqueous-Solution, Selective Adsorption, Surface-Properties, Controlled-Release, Silica, Gel, Water, Ethyl(Hydroxyethyl)Cellulose

? Machida, M., Kikuchi, Y., Aikawa, M. and Tatsumoto, H. (2004), Kinetics of adsorption and desorption of Pb(II) in aqueous solution on activated carbon by two-site adsorption model. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **240** (1-3), 179-186.

Full Text: [C\Col Sur A-Phy Eng Asp240, 179.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp240,%20179.pdf)

Abstract: The adsorption and desorption equilibrium and kinetics of lead ions from aqueous solutions on a granular activated carbon (GAC) were examined. Rapid increase followed by slow increase in Pb(II) amount on the GAC was observed as a function of time for the adsorption, while rapid decrease and consecutive very slow decrease was observed in desorption. Based on the experimental results, a two-site adsorption model was proposed for the adsorption and the desorption of Pb(II) under the study conditions. The Pb(II) adsorption on the GAC was estimated to have simultaneously occurred on the strong and the weak adsorption sites. Conventional Langmuir-type kinetic equations were introduced to quantitatively predict the adsorption and desorption with the two-site model by optimizing the parameters to fit the equilibrium and the kinetic experimental results. The equilibrium and kinetic experimental results could be represented by the equations by using one set of the common Langmuir parameters. Resultant kinetic parameters revealed that the adsorption equilibrium constant was two orders of magnitude greater for strong adsorption site than for weak adsorption site, though the maximum number of weak adsorption site was 1.5 times as great as that of strong adsorption site. The strong adsorption equilibrium constant resulted from a small desorption rate constant for the site. The equations were demonstrated to be applicable for predicting other desorption performances as well.

Keywords: Adsorption, Activated Carbon, Kinetics, Two-Site Model, Langmuir

Loukidou, M.X., Zouboulis, A.I., Karapantsios, T.D. and Matis, K.A. (2004), Equilibrium and kinetic modeling of chromium(VI) biosorption by *Aeromonas caviae*. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **242** (1-3), 93-104.

Full Text: [C\Col Sur A-Phy Eng Asp242, 93.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp242,%2093.pdf)

Abstract: Biosorption of hexavalent chromium, from aqueous solutions, on *Aeromonas caviae* particles was investigated in a well-stirred batch reactor. Equilibrium and kinetic experiments were performed at various initial bulk concentrations, biomass loads, temperatures and ionic background. Equilibrium data were well described by typical Langmuir and Freundlich adsorption isotherms. Furthermore, a detailed analysis has been conducted testing several chemical reaction kinetic models in order to identify a suitable kinetic equation, assuming that biosorption is chemical sorption controlled. Predictions based on the so-called pseudo second order rate expression were found in satisfactory accordance with experimental data.

Keywords: Biosorption, Chromium(VI), Equilibrium Study, Kinetic Study, Metals

Özacar, M. and Şengil, İ.A. (2004), Application of kinetic models to the sorption of disperse dyes onto alunite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **242** (1-3), 105-113.

Full Text: [C\Col Sur A-Phy Eng Asp242, 105.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp242,%20105.pdf)

Abstract: The sorption of three disperse dyes, namely, Disperse Blue 56 (DB56), Disperse Red 74 (DR74) and Disperse Yellow 119 (DY119), onto alunite has been studied in terms of pseudo-first- and second-order sorptions and intraparticle diffusion processes thus comparing chemical sorption and diffusion sorption processes. The pseudo-second-order model provided a high degree of correlation with the experimental data for the sorption processes. There was a small discrepancy at the beginning of the experiments (5–30 min) which suggested that intraparticle diffusion may be involved up to 30 min of the sorption process. The kinetics of sorption, based on the sorption capacities of disperse dyes on alunite, were followed at various time intervals. Results show that the intraparticle diffusion may be rate-limiting, followed by the pseudo-second-order kinetic model in the sorption of disperse dyes onto alunite during agitated batch contact time experiments. The rate constant, the equilibrium sorption capacity and the initial sorption rate were calculated as a function of the effect of alunite particle size, alunite dose, initial dye concentration and pH of the solution.

Keywords: Disperse Dye, Alunite, Sorption, Kinetics, Pseudo-Second-Order, Intraparticle Diffusion

Prado, A.G.S., Miranda, B.S. and Dias, J.A. (2004), Attachment of two distinct humic acids onto a silica gel surface. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **242** (1-3), 137-143.

Full Text: [C\Col Sur A-Phy Eng Asp242, 137.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp242,%20137.pdf)

Abstract: A method for the attachment of two different humic acids onto silica gel has been developed. In the first step, the precursor was prepared by reacting the silylant agent 3-aminopropyltrimethoxysilane (APTS) with silica gel. Elemental analysis of the product showed the presence of 1.23 mmol of silylant agent per gram of support. Humic acid extracted from peat soil, HA(ps), and commercial humic acid, HA(FL), were connected by hydrogen bonds to the amine groups previously anchored onto silica gel, producing new materials named SiHA(ps) and SiHA(FL), with 84.7±0.04 and 101.7±0.04 mg of humic acid per gram of modified silica for SiHA(PS) and SiHA(FL), respectively. Thermogravimetry, infrared, C-13 and Si-29 CP/MAS-NMR spectra have confirmed the success of the attachment and the scanning electron microscopy-energy dispersive spectrometer (SEM-EDS) technique showed a good dispersion of the humic acids onto modified silica surface for both materials. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Humic Acid, Silica, Immobilization, 2,4-Dichlorophenoxyacetic Acid, Heterogeneous Routes, Size Fractionation, Stationary Phases, Organic-Matter, Immobilization, Substances, Adsorption, Extraction, Preconcentration

Lyubchik, S.I., Lyubchik, A.I., Galushko, O.L., Tikhonova, L.P., Vital, J., Fonseca, I.M. and Lyubchik, S.B. (2004), Kinetics and thermodynamics of the Cr(III) adsorption on the activated carbon from co-mingled wastes. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **242** (1-3), 151-158.

Full Text: [C\Col Sur A-Phy Eng Asp242, 151.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp242,%20151.pdf)

Abstract: The kinetics and the thermodynamics of the chromium(III) adsorption on novel activated carbons prepared from co-mingled natural organic wastes have been studied by the sets of equilibrium and time-based experiments at various conditions (temperature, initial chromium concentration and carbon loading). The results are compared to those for commercially available Norit activated carbon post-oxidized with 1 M HNO3.

Two classical empirical models of Freundlich and Langmuir have been applied to fit the experimental data. Total chromium uptake by the novel activated carbon from co-mingled wastes was found to be higher then that for commercial Norit activated carbon under similar conditions (1.09 and 1.01 mmol/g, respectively, at 30degreesC). Relatively low activation energy of similar to 60 kJ/mol suggests a diffusion-controlled adsorption on the carbons from co-mingled waste, whereas relatively high values for the oxidized Norit carbon of 92 kJ/mol indicates the process controlled by chemical reactions. The free energy of the adsorption at all temperatures was negative indicating a spontaneous process. The positive entropy values indicate the existence of ion-exchange and the substitution reactions resulted in creation of steric hindrances in the systems studied. The overall processes were found to be endothermic and the enthalpy changes of 3-11 kJ/mol indicate the complex character of the Cr(III) adsorption on the studied activated carbons.

Thus, the results obtained suggest that Cr(III) sorption on activated carbons from co-mingled wastes is either a physisorption or simple ion-exchange process, however, diffusion-controlled reactions have been taken into account for the description of the adsorption kinetics under studied experimental conditions. On the other hand, the Cr(Ill) adsorption on the oxidized Norit activated carbon, which is more rich by surface oxygen functionalities, is more likely to be a combined ion-exchange-surface complexation.

The results of the present study are towards application of novel porous materials resulting from thermal co-utilization of natural carbon wastes as selective adsorbents for heavy metal removal from industrial wastewater. A Spanish leather industry wastewater stock solution was studied as the source of trivalent chromium. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Chromium, Activated Carbon, Kinetics, Thermodynamics, Heavy-Metals, Removal, Biosorption, Chromium, Equilibrium, Sorption, Sawdust, Silica

Cosultchi, A., Bosch, P. and Lara, V.H. (2004), Adsorption of petroleum organic compounds on natural Wyoming montmorillonite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **243** (1-3), 53-61.

Full Text: [C\Col Sur A-Phy Eng Asp243, 53.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp243,%2053.pdf)

Abstract: Adsorption of petroleum organic compounds on natural Wyoming montmorillonite clay is an irreversible process, as most of organic species still remain adsorbed on mineral after aging. The process is conditioned by the petroleum paraffinic content and by molecules containing alkane chains, as only these type of compounds easy intercalate within the clay interlayer. Such adsorption also involves an irreversible displacement of part of the clay interlayer water. The partial dissolution of the clay matrix is indicated by XRD as an irreversible modification of the clay structure. On the contrary, adsorption of *n*-heptane or toluene molecules on the same clay are reversible processes, since the clay mineral recover its original crystalline structure after aging and evaporation of the organic species.

Keywords: Wyoming Montmorillonite, Petroleum, *n*-Heptane, Toluene

Mullet, M., Boursiquot, S. and Ehrhardt, J.J. (2004), Removal of hexavalent chromium from solutions by mackinawite, tetragonal FeS. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **244** (1-3), 77-85.

Full Text: [C\Col Sur A-Phy Eng Asp244, 77.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp244,%2077.pdf)

Abstract: The ability of mackinawite, an iron(II) monosulphide, to reduce Cr(VI) was studied at pH values of 5 and 7, Cr(VI) solution concentrations ranging from 10−4 to 6×10−3 M and fixed ionic strength. Mackinawite suspensions (0.6 g L−1 and 1.2 g L−1) and Cr(VI) solutions were reacted for 4.5 h in a nitrogen atmosphere. The oxidation of mackinawite was determined by analysing both solutions and solid phases after Cr(VI) reaction. The solid phases were characterised by using complementary electrokinetic measurements and X-ray Photoelectron Spectroscopy and by Transmission Electron Microscopy. Solutions were analysed using colorimetric methods for Fe(II) and Cr(VI) and capillary electrophoresis for sulphur speciation. Mackinawite was found to be a very effective reductant of Cr(VI) under the conditions of the experiments. The removal capacity was determined to be around 130 mg Cr(VI)/g FeS at pH 7 and 240 mg Cr(VI)/g FeS at pH 5. The presence of an iron(III) and chromium(III) (oxyhydr)oxide layer covering the mackinawite crystals was evidenced with a constant Cr to Fe ratio of 1.4 ± 0.2. The extent of the metal (oxyhydr)oxide layer increases with the initial Cr(VI) concentration, thus probably limiting the Cr(VI) reduction at high initial Cr(VI) concentrations.

Keywords: Iron Sulphides, Oxidation, Chromate, X-Ray Photoelectron Spectroscopy, Surface Charge

Phan, T.N.T., Louvard, N., Bachiri, S.A., Persello, J. and Foissy, A. (2004), Adsorption of zinc on colloidal silica, triple layer modelization and aggregation data. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **244** (1-3), 131-140.

Full Text: [C\Col Sur A-Phy Eng Asp244, 131.pdf](C/Col%20Sur%20A-Phy%20Eng%20Asp244,%20131.pdf)

Abstract: In view of the control of the formation of silica conversion coatings on galvanized substrates, the interaction between silica nanoparticles and dissolved zinc species was studied as a function of pH. The influence of the concentration of zinc species, mostly Zn2+ and ZnOH+, on the ionization of the silica surface was measured and modelized using the triple layer model and a single set of interfacial parameters (inner and outer dielectric capacitances, ionization and adsorption equilibrium constants, surface density of active sites). The critical coagulation (gelation) concentration (CCC) of zinc salt in the colloidal silica dispersion was measured between pH 7 and 9.5. It was observed that the CCC’s correspond almost exactly to the zinc adsorption level where it balances the surface charge of the silica particles, showing that the DLVO theory applies in this case.

Keywords: Colloidal Silica, Surface Ionization, Zinc Adsorption, Critical Coagulation Concentration, Proton/Zinc Exchange Ratio, Triple Layer Model

Oguz, E. (2005), Adsorption characteristics and the kinetics of the Cr(VI) on the Thuja oriantalis. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **252** (2-3), 121-128.

Full Text: [2005\Col Sur A-Phy Eng Asp252, 121.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp252,%20121.pdf)

Abstract: The cone biomass of Thuja oriantalis is a waste itself and a readily available adsorbent in nature. The kinetics of adsorption of Cr(VI) by the Thuja oriantalis was found fast, and reached equilibrium in 20 min and followed pseudo second order rate equation. The adsorption behavior of Cr(VI) on the Thuja oriantalis has been studied as a function of the solution agitation rate, pH and temperature. Results have been analyzed by Langmuir Freundlich, Radke-Prausnitz, Brunauer, Emet and Teller (BET) and Dubinin–Radushkevich (D–R) adsorption isotherms. The mean energy of adsorption was calculated as 38.3 kJ mol−1 from the D–R adsorption isotherm. The rate constants have been calculated for 289, 315 and 333 K, and the activation energy (Ea) was derived using the Arhenius equation. Thermodynamic parameters such as ΔH°, ΔS° and ΔG° were calculated from the slope and intercept of linear plot of ln KD against 1/T. The ΔH° and ΔG° values of Cr(VI) adsorption on the Thuja oriantalis show endothermic heat of adsorption. But negative free energy value, indicating that the process of Cr(VI) adsorption is favored at high temperatures.

Keywords: Chromium, Adsorption Isotherms, Thuja Oriantalis

Psareva, T.S., Zakutevskyy, O.I., Chubar, N.I., Strelko, V.V., Shaposhnikova, T.O., Carvalho, J.R. and Correia, M.J.N. (2005), Uranium sorption on cork biomass. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **252** (2-3), 231-236.

Full Text: [2005\Col Sur A-Phy Eng Asp252, 231.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp252,%20231.pdf)

Abstract: This work presents the effect of the pre-treatment of cork biomass with a hydrochloric acid solution on its sorption affinity towards uranium. The results show that the conversion of cork biomass into the H-form by the acid wash allowed to increase the sorption capacity towards uranium more than twice, due to the increase of the concentration of strong acidic and weak acidic groups on its surface. The optimum pH for uranium sorption was 5.0–5.2 for the original and 5.5–7.0 for the H-form biomass. The adsorption isotherms for uranyl ions on the natural and H-form cork biomass were determined. Finally, the kinetics of uranium adsorption on both biomasses was studied and a second-order model was fitted to the experimental data. It was found that the adsorption is faster for the H-form (k = 0.196 min−1) than for the original biomass (k = 0.057 min−1).

Keywords: Uranium, Biosorption, Cork Biomass

Arıca, M.Y. and Bayramoğlu, G. (2005), Cr(VI) biosorption from aqueous solutions using free and immobilized biomass of *Lentinus sajor-caju*: Preparation and kinetic characterization. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **253** (1-3), 203-211.

Full Text: [2005\Col Sur A-Phy Eng Asp253, 203.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp253,%20203.pdf)

Abstract: The potential use of the free and immobilized mycelia (in carboxymethylcellulose (CMC)) of Lentinus sajor-caju to remove hexavalent form of chromium ions, Cr(VI), from aqueous solutions was evaluated using CMC bead as a control system for immobilised form of fungus. The CMC beads containing immobilized fungus mycelia were incubated for the uniform growth on the beads surface at 30 °C for 3 days. Effects of pH, biosorption time, initial concentration and biosorbent dosages on the biosorption of Cr(VI) ions were studied. The biosorption of Cr(VI) ions on the biosorbents showed a highest value at around pH 2.0. The biosorption of Cr(VI) ions on both free and immobilized L. sajor-caju biomass (mg/g) was increased as the initial concentration of Cr(VI) ions increased in the medium. Biosorption equilibrium was established in about 2.0 h. The determined maximum biosorption capacities of the free and immobilized fungus were 18.9 and 32.2 mg/g dry weight, respectively. The biosorption equilibrium was also represented with Langmuir and Freundlich adsorption isotherms. The biosorption of Cr(VI) on these biomasses follows pseudo-second-order kinetics. The temperature change in the range of 5–40 °C affected the biosorption capacities of the biosorbents. The biosorbent systems can be regenerated using 0.1 M NaOH, with more than 95% recovery, the biosorbents reused in five biosorption–desorption cycles without any considerable loss in the biosorption capacity.

Keywords: Cr(IV), Heavy Metal, CMC, Biosorption, Lentinus Sajor-Caju, Heavy-Metals, Adsorption, Removal, Chromium(VI), Accumulation, Copper, Fungi, Cells, Biosorbents, Membranes

? Dávila-Jiménez, M.M., Elizalde-González, M.P. and Peláez-Cid, A.A. (2005), Adsorption interaction between natural adsorbents and textile dyes in aqueous solution. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **254** (1-3), 107-114.

Full Text: [2005\Col Sur A-Phy Eng Asp254, 107.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp254,%20107.pdf)

Abstract: Agricultural wastes from maize culture fields were prepared and activated yielding the natural absorbents designated as SOMAP SOMAP 1, SOMAP2, HELAP, HELAP1, SAGAP, and SAGAP1. The samples were further characterized using microscopy, FTIR spectroscopy, titration, and adsorption from solution. The dry and wet methods of analysis confirmed the presence of functional groups (hydroxyl, carboxylic, phenolic, and lactonic) in the bulk and on the surface, respectively. Each prepared solid sample was tested for adsorption ability using aqueous dye solutions of basic blue 41 (131341), acid blue 74 (AB74), and reactive black 5 (RB5). The adsorption affinity decreased according to BB41>AB74>RB5. For BB41 the relative adsorbent saturation followed the series: SOMAP2<SOMAP1<SOMAP, HELAP<HELAP1 and SAGAP<SAGAP1. Adsorption equilibrium concentrations were followed by HPLC with diode array detection. The equilibrium data fitted well with both Langmuir and Freundlich models of adsorption. The values of the Freundlich exponent I hi correlated with the variance of the group distribution curves. The monolayer capacity of all studied adsorbents using the basic dye BB41 correlated acceptably with the corresponding amount of total acid groups on the adsorbent Surface. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Palm-Fruit Bunch, Activated Carbons, Color Removal, Waste-Water, Basic-Dyes, Coir Pith, Acid Dyes, Corn Cob, Effluent, Cost

Adak, A., Bandyopadhyay, M. and Pal, A. (2005), Removal of anionic surfactant from wastewater by alumina: A case study. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **254** (1-3), 165-171.

Full Text: [2005\Col Sur A-Phy Eng Asp254, 165.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp254,%20165.pdf)

Abstract: The adsorption characteristics of sodium dodecyl sulfate (SDS) on neutral alumina were studied in detail. Alumina was found to be an efficient adsorbent for SDS and could be used for the removal of anionic surfactant (AS) from wastewater when it is present in high concentration (several thousand ppm). In the present work the actual laundry wastewater was treated by both batch and continuous mode. The initial AS concentration in wastewater was 8068 ppm. The optimum adsorbent dose and equilibrium time found were 120 g/l and 1 h, respectively. Under optimised conditions the removal efficiency was found to be 94%. The removal of SDS by alumina follows the pseudo-second order reaction kinetics. In column study the flow rate was maintained at 1.63 m3/m2/h. The breakthrough and exhaust time were found to be 48 and 86 min, respectively, using 10 cm column depth. Height of adsorption zone was found to be 5.5 cm and the rate at which the adsorption zone was moving through the bed was 9.42 cm/h. The percentage of the total column saturated at breakthrough was found 75.5%. The value of adsorption rate coefficient (*K*) and adsorption capacity coefficient (*N*) were obtained as 0.000824 l/(mg h) and 143460 mg/l, respectively. After exhaustion, aqueous NaOH could efficiently regenerate alumina.

Keywords: Alumina, Anionic Surfactant, Equilibrium Time, Adsorption Rate Coefficient, Adsorption Capacity Coefficient

Chubar, N.I., Kanibolotskyy, V.A., Strelko, V.V., Gallios, G.G., Samanidou, V.F., Shaposhnikova, T.O., Milgrandt, V.G. and Zhuravlev, I.Z. (2005), Adsorption of phosphate ions on novel inorganic ion exchangers. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **255** (1-3), 55-63.

Full Text: [2005\Col Sur A-Phy Eng Asp255, 55.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp255,%2055.pdf)

Abstract: The demand for cost effective adsorbents is widespread recognition through drinking water–liquid wastes treatment technologies. The novel ion exchangers based on individual and mixed hydrous oxides (ZrO2·*x*H2O, Fe2O3·Al2O3·*x*H2O and Fe2O3·2Al2O3·*x*H2O) have been obtained by sol–gel method from easily available and cheap raw materials and employed for adsorption of H2PO4− from aqueous systems. High specific surface area of the materials was found: 404, 396 and 388 m2 g−1 for ZrO2·*x*H2O, Fe2O3·Al2O3·*x*H2O and Fe2O3·2Al2O3·*x*H2O correspondingly. Adsorbents were characterized by potentiometric titration (anion exchange and cation exchange capacities (on H and OH− ions)), zeta-potential and pore volume studies. pH effect of phosphate ions sorption on the double hydroxides of Fe and Al was stronger than on the hydrated zirconium dioxide, however, all investigated sorbents are capable to work in the pH range from 3 to 10 having sufficient sorption capacity. Increasing the ionic strength of the solutions with adding electrolyte NaCl increased sorption of phosphate ions on ZrO2·*x*H2O. The presence of Ca2+ in the solution increased sorption capacity at the higher equilibrium concentration of phosphate ions >40 mg P l−1. Isotherms of the phosphate ions sorption on Fe2O3·Al2O3·*x*H2O and Fe2O3·2Al2O3·*x*H2O were obtained at the pHs 3, 6 and 9. Isotherms fitted the Langmuir model. Data on the kinetics of phosphate sorption fit well to the pseudo-second-order model. It is supposed that mechanism of phosphate ions adsorption onto individual oxides hydrated is not only ion exchange between P(V) ions and hydroxide groups, present on the surface, but it is also a result of nucleophylic SN2-i-replacement of OH groups via formation of intermediate six-centered complex with the release of water molecules.

Keywords: Inorganic Ion Exchangers, Adsorption, Phosphate Anions

? Srivastava, V.C., Mall, I.D. and Mishra, I.M. (2005), Treatment of pulp and paper mill wastewaters with poly aluminium chloride and bagasse fly ash. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **260** (1-3), 17-28.

Full Text: [2005\Col Sur A-Phy Eng Asp260, 17.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp260,%2017.pdf)

Abstract: The present study deals with the use of poly aluminium chloride (PAC) as a coagulant and bagasse fly ash (BFA), which is generated in sugar mills, as an adsorbent for the removal of chemical oxygen demand (COD) and colour of pulp and paper mill effluents. Under optimal conditions of pH 3 and initial PAC dosage of 3 g/l, about 80% COD removal and 90% colour removal were obtained. The optimal conditions for the adsorptive removal of COD and colour with BFA were pH 4 and BFA dosage of 2 g/l. Under these conditions, COD and colour removal were, respectively, 50 and 55%. Adsorptive removal of COD by BFA followed second-order kinetics. Intra-particle diffusion was found to be rate controlling. Freundlich and Langmuir adsorption isotherms were found to fit the equilibrium adsorption data with BFA. Two-stage treatment using PAC (3 g/l) as a coagulant in the first stage and BFA (2 g/l) as an adsorbent in the second stage gave the combined COD and colour removal of nearly 87 and 95%, respectively, for different effluents without any pH adjustment. Two-stage adsorptive treatment using BFA (2 g/l) in both the stages gave a combined COD and colour removal of about 70%. The sludge obtained can be dewatered by centri-clarifiers, dried, briquetted and incinerated to recover its energy content.

Keywords: Adsorption, Bagasse Fly Ash (BFA), Coagulation, Poly Aluminium Chloride (PAC), Pulp and Paper Mill Effluents

? Won, S.W., Choi, S.B. and Yun, Y.S. (2005), Interaction between protonated waste biomass of Corynebacterium glutamicum and anionic dye Reactive Red 4. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **262** (1-3), 175-180.

Full Text: Col Sur A-Phy Eng Asp262, 175.pdf

Abstract: The protonated waste biomass of Corynebacterium glutamicum discharged from an industrial lysine fermentation plant was used as a new type of biosorbent for the removal of anionic dye Reactive Red 4. The dye uptake increased as the solution pH was decreased and at pH > 7, the uptake was negligible. The maximum uptake of dye was estimated to be 104.6±8.7 mg/g at pH 1. To identify the binding sites in the biomass, the biomass was potentiometrically titrated. As a result, three types of functional groups were present in the biomass, which was confirmed by FTIR analysis. Among functional groups, primary amine groups (-NH2) were likely the binding sites for anionic Reactive Red 4. The proton dissociated constant pK(H) and molar content of the protonated amine groups were 9.14±0.07 and 0.68±0.02 mmol/g, respectively. It was also found that carboxyl and phosphonate groups played a role in electrostatic interference with the binding of dye molecules. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Biomass, Biomass Waste, Biosorbent, Biosorption, Biosorption, Color Removal, Corynebacterium Glutamicum, Dye, Dye Uptake, Elsevier, FTIR, Groups, pH, Primary, Reactive Red 4, Removal, Textile Effluent

? Mall, I.D., Srivastava, V.C., Agarwal, N.K. and Mishra, I.M. (2005), Adsorptive removal of malachite green dye from aqueous solution by bagasse fly ash and activated carbon-kinetic study and equilibrium isotherm analyses. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **264** (1-3), 17-28.

Full Text: [2005\Col Sur A-Phy Eng Asp264, 17.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp264,%2017.pdf)

Abstract: Adsorption of malachite green (MG) was studied using three adsorbents namely, bagasse fly ash (BEA), a sugar industry waste, and activated carbons commercial grade (ACC) and laboratory grade (ACL). Batch adsorption studies were conducted to evaluate the effect of various parameters such as pH, adsorbent dose, contact time and initial MG concentration on the removal of MG. The initial pH of the dye solution strongly affected the chemistry of both the dye molecules and adsorbents in an aqueous solution. The effective pH was 7.0 for adsorption of MG by the three adsorbents. Equilibrium reached in about 4 h contact time. Optimum BFA, ACC and ACL dosages were found to be 1, 20 and 4 g l-1, respectively. The adsorption followed pseudo-second-order kinetics. Equilibrium adsorption data on BFA, ACC and ACL were analyzed by Freundlich, Langmuir, Dubnin-Radushkevich, Redlich-Peterson and Temkin isotherm equations using regression analysis. Non-linear error analysis showed that the Freundlich isotherm best-fits the equilibrium data for adsorptive removal of MG by BFA and ACC and Redlich-Peterson best follows the equilibrium data for ACL. Thermodynamic study showed that MG adsorption on BFA was comparable to that obtained with ACC or ACL. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Dye Removal, Bagasse Fly Ash, Adsorption Kinetics, Isotherms, Error Analyses, Sorption Kinetics, Heavy-Metals, Acid Dyes, Basic Dye, Ions, Waste, Water, Adsorbent, Chitosan, Sawdust

? Bayramoğlu, G., Yalçın, E. and Arıca, M.Y. (2005), Characterization of polyethylenimine grafted and Cibacron Blue F3GA immobilized poly (hydroxyethylmethacrylate-co-glycydylmethacrylate) membranes and application to bilirubin removal from human serum. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **264** (1-3), 195-202.

Full Text: [2005\Col Sur A-Phy Eng Asp264, 195.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp264,%20195.pdf)

Abstract: In this study, acrylic hydrogel copolymer membrane was synthesized from 2-hydroxyethylmethacrylate (HEMA) and glycidyl methacrylate (GMA) monomers. The pol ethylenimine polymer was then grafted onto membrane surface (poly(HEMA-co-GMA)-PEI). A dye-ligand (i.e., Cibacron Blue F3GA) was then covalently immobilized on the membrane through the amino groups of the polyethylenimine molecules (poly(HEMA-co-GMA)-PEI-CB). Both affinity membranes were used for the removal of bilirubin (BR) from aqueous solutions and human serum. The effects of pH, ionic strength, temperature and initial BR concentration on the adsorption capacity of both affinity membranes were investigated in a batch system. Separation of BR from human serum was also investigated in a batch system. Experimental data indicate that poly(HEMA-co-GMA)-PEI affinity membrane shows more adsorption capacity to BR than that of the poly(HEMA-co-GMA)-PEI-CB membrane, which may be explained on the basis of opposite charge on both PEI and BR. The BR adsorption on the poly(HEMA-co-GMA)-PEI and poly(HEMA-co-GMA)-PEI-CB affinity membrane did not well described by the Langmuir model, but obeyed the Freundlich isotherm model. The poly(HEMA-co-GMA)-PEI and poly(HEMA-co-GMA)-PEI-CB affinity membranes are stable when subjected to sanitization with sodium hydroxide after repeated adsorption-desorption cycles. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Affinity Membranes, Albumin, Behavior, Bilirubin, Chromatography, Contact Angle, Grafting, Hydrogel, Immunoglobulin-G, Isotherm, Ligand, Lysozyme Separation, Membrane, Membranes, Pei, Purification, Resins

? Özcan, A.S., Erdem, B. and Özcan, A. (2005), Adsorption of Acid Blue 193 from aqueous solutions onto BTMA-bentonite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **266** (1-3), 73-81.

Full Text: [2005\Col Sur A-Phy Eng Asp266, 73.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp266,%2073.pdf)

Abstract: The adsorption of Acid Blue 193 (AB193) onto benzyltrimethylammonium (BTMA)-bentonite was investigated in aqueous solution in a batch system with respect to contact time, pH and temperature. The surface modification of BTMA-bentonite was examined using the FTIR technique. The pseudo-first-order, pseudo-second-order kinetic models and the intraparticle diffusion model were used to describe the kinetic data and the rate constants were evaluated. The experimental data fitted very well the pseudo-second-order kinetic model and also followed the intraparticle diffusion model up to 60 min, whereas diffusion is not only the rate controlling step. The Langmuir, Freundlich and Dubinin-Radushkevich (D-R) adsorption models were applied to describe the equilibrium isotherms and the isotherm constants were also determined. The Langmuir, Freundlich and D-R models agree with experimental data well. The change of free energy, enthalpy and entropy of adsorption were also evaluated for the adsorption of AB 193 onto BTMA-bentonite. The results show that BTMA-bentonite could be employed as low-cost material for the removal of acid dyes from effluents. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Bentonite, Adsorption, Acid Dye, Surfactant, Kinetics, Acid Dyes, Methylene-Blue, Removal, Equilibrium; Kinetics, Adsorbents, Isotherm, Water, Montmorillonite, Biosorbent

? Chang, M.Y. and Juang, R.S. (2005), Equilibrium and kinetic studies on the adsorption of surfactant, organic acids and dyes from water onto natural biopolymers. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **269** (1-3), 35-46.

Full Text: [2005\Col Sur A-Phy Eng Asp266, 35.pdf](2005/Col%20Sur%20A-Phy%20Eng%20Asp266,%2035.pdf)

Abstract: In order to improve the mechanical property of chitosan beads, the powder of loofah fiber was added in chitosan/acetic acid slurry to prepare composite beads with and without freeze-drying. The former was called the dried bead and the latter was the wet bead. The equilibria and kinetics for adsorption of linear alkylbenzene sulfonate, tannic acid, humic acid, and three dyes (reactive, acidic, and basic) onto these two beads were compared at 30°C. It was shown that the adsorption capacity with the wet bead was generally higher than that with the dried bead. Lumped kinetic analysis indicated that the pseudo-first-order equation could well describe the adsorption processes. On the other hand, the better fit of kinetic data by the Elovich equation instead of by intraparticle diffusion model suggested the significance of chemisorption mechanism during the processes. The parameters of these kinetic models were also evaluated and discussed. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Tannic Acid, Humic Acid, Surfactant, Dyes, Loofah Fiber, Chitosan, Activated Carbons, Aqueous-Solutions, Reactive Dyes, Tannic-Acid, Humic-Acid, Chitosan, Sorption, Metal, Removal, Immobilization

? Srivastava, V.C., Swamy, M.M., Mall, I.D., Prasad, B. and Mishra, I.M. (2006), Adsorptive removal of phenol by bagasse fly ash and activated carbon: Equilibrium, kinetics and thermodynamics. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **272** (1-2), 89-104.

Full Text: [2006\Col Sur A-Phy Eng Asp272, 89.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp272,%2089.pdf)

Abstract: Present study deals with the adsorption of phenol on carbon rich bagasse fly ash (BFA) and activated carbon-commercial grade (ACC) and laboratory grade (ACL). 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 phenol. C0 varied from 75 to 300 mg/l for the adsorption isotherm studies and the effect of temperature on adsorption. Optimum conditions for phenol removal were found to be pH0 ≈ 6.5, adsorbent dose ≈ 10 g/l of solution and equilibrium time ≈5 h. Adsorption of phenol followed pseudo-second order kinetics with the initial sorption rate for adsorption on ACL being the highest followed by those on BFA and ACC. The effective diffusion coefficient of phenol is of the order of 10−10 m2/s. Equilibrium isotherms for the adsorption of phenol on BFA, ACC and ACL were analysed by Freundlich, Langmuir, Temkin, Redlich–Peterson, Radke–Prausnitz and Toth isotherm models using non-linear regression technique. Redlich–Peterson isotherm was found to best represent the data for phenol adsorption on all the adsorbents. The change in entropy (ΔS°) and heat of adsorption (ΔH°) for phenol adsorption on BFA were estimated as 1.8 MJ/kg K and 0.5 MJ/kg, respectively. The high negative value of change in Gibbs free energy (ΔG°) indicates the feasible and spontaneous adsorption of phenol on BFA. The values of isosteric heat of adsorption varied with the surface loading of phenol.

Keywords: Adsorption, Phenol Removal, Bagasse Fly Ash (BFA), Activated Carbon, Adsorption Thermodynamics, Temperature, Kinetics, Isotherms

? Kundu, S. and Gupta, A.K. (2006), Investigations on the adsorption efficiency of iron oxide coated cement (IOCC) towards As(V)—kinetics, equilibrium and thermodynamic studies. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **273** (1-2), 121-128.

Full Text: [2006\Col Sur A-Phy Eng Asp273, 121.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp273,%20121.pdf)

Abstract: The potential of using iron oxide coated cement (IOCC) as a new material for the adsorption of As(V) from aqueous solution was investigated. The iron content of the adsorbent was 22.5 mg g−1 and the pH of the point of zero charge (PZC), pHPZC = 11.1. Laboratory experiments were carried out as a function of pH, contact time, initial As(V) concentration and temperature to study the removal of As(V) on IOCC in a batch system. The IOCC showed a maximum removal for As(V) at pH ~ 8. The kinetics of adsorption of As(V) by IOCC, at room temperature and at various initial concentrations, was found to be fast, and reached equilibrium within 2 h and best described by the pseudo-second order model. With an adsorbent dose of 3 g l−1 and contact time of 2 h, removal ranged from 98.7 to 88% at room temperature for initial As(V) concentrations ranging from 0.5 to 10 mg l−1, respectively, at an initial solution pH ~ 7. The adsorption data fitted well with the Langmuir, Freundlich and Dubinin–Radushkevich (D–R) isotherms at 288, 298 and 308 K. The mean free energy values calculated from the D–R adsorption isotherm indicated a physical nature of adsorption. The thermodynamic parameters, such as ΔH°, ΔS° and ΔG°, were calculated from the slope and intercept of linear plot of ln KD against 1/T. Evaluation of the thermodynamic parameters depicts a spontaneous and endothermic nature of adsorption. The results indicate that IOCC is an effective adsorbent for removing As(V) from the aqueous environment.

Keywords: Adsorption, As(V) Removal, Iron Oxide Coated Cement, Isotherms, Thermodynamics

? Liu, Y. (2006), Some consideration on the Langmuir isotherm equation. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **274** (??), 34-36.

? Weng, C.H. and Pan, Y.F. (2006), Adsorption characteristics of Methylene blue from aqueous solution by sludge ash. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **274** (1-3), 154-162.

Full Text: [2006\Col Sur A-Phy Eng Asp274, 154.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp274,%20154.pdf)

Abstract: Kinetics and equilibrium adsorption experiments were conducted to evaluate the adsorption characteristics of a cationic dye (Methylene blue, MB) onto bio-sludge ash. Results showed that the ash could remove the dye effectively from aqueous solution. The adsorption rate was fast and about 80% of absorbed-MB was removed in 10 min. The adsorption kinetics could be expressed by the modified Freundlich equation and intra-particle diffusion model. It was found that both the initial MB concentration and ionic strength could affect the rate of adsorption. The effect of electrical double layer thickness on the adsorption kinetics was discussed. The equilibrium adsorption data were correlated well to the non-linear multilayer adsorption isotherm. The maximum adsorption capacities for MB were 7.3×10-6, 6.3×10-6, 5.0×10-6, and 3.5×10-6 mol/g, respectively, at temperature of 4, 14, 24, and 34°C. Values of the first-layer adsorption energy, Delta G degrees, ranged from -6.62 to -7.65 kcal/mol, suggesting that the adsorption could be considered as a physical process, which is simultaneously enhanced by the electrostatic effect. The multilayer adsorption energy, Delta G degrees, ranged from -4.51 to -5.02 kcal/mol, suggesting that the adsorption was of the typical physical type. On the basis of the monolayer dye adsorption capacity, the specific surface area of this ash sample was estimated as 2.1-2.9 m2/g which is close to the Value (3.7 m2/g) obtained via BET nitrogen gas adsorption measurements. (c) 2005 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Dye, Methylene Blue, Sludge, Ash, Fly-Ash, Color Removal, Surface-Area, Rhodamine-B, Coccine Dye, Chrome Dye, Kinetics, Adsorbents, Mechanism, Phosphate

? Podkościelny, P., Nieszporek, K. and Szabelski, P. (2006), Adsorption from aqueous phenol solutions on heterogeneous surfaces of activated carbons—Comparison of experimental data and simulations. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **277** (1-3), 52-58.

Full Text: [2006\Col Sur A-Phy Eng Asp277, 52.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp277,%2052.pdf)

Abstract: Adsorption-energy distribution (AED) for phenol on activated carbons, generated by utilization of regularization method (INTEG program) has been verified. As independent verification tool, the Grand Canonical Monte Carlo (GCMC) simulation method carried out on a square lattice has been chosen. The final stage of verification was comparison of experimental adsorption isotherms and those obtained by employment GCMC simulations based on parameters of AED functions calculated by INTEG algorithm. The experimental data of phenol adsorption on activated carbons prepared from two bituminous coals BW and MT have been taken from literature.

Keywords: Liquid-Phase Adsorption, Activated Carbon, Phenol, Computer Simulation, Grand Canonical Monte Carlo

? Adak, A., Pal, A. and Bandyopadhyay, M. (2006), Removal of phenol from water environment by surfactant-modified alumina through adsolubilization. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **277** (1-3), 63-68.

Full Text: [2006\Col Sur A-Phy Eng Asp277, 63.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp277,%2063.pdf)

Abstract: Alumina was found to be a very efficient adsorbent for the removal of anionic surfactant (AS) from its highly concentrated wastewater. After removal of AS in several cycles, the exhausted surfactant-coated alumina becomes useless. This exhausted alumina, however, posses the ability to remove organic solutes from aquatic environment through the process called adsolubilization. In the present study, the exhausted alumina, hereafter designated as surfactant-modified alumina (SMA), was used for the removal of phenol from water environment. In the present study, the SMA was prepared by shaking alumina with sodium dodecyl sulfate (SDS; a representative member of AS) solution in batch study under optimized condition. The kinetic studies showed that 1.5 h shaking time was sufficient to achieve the equilibrium for phenol removal. The removal of phenol followed the second order kinetics. Studies were conducted to see the effects of SMA dose on the removal of phenol. The pH was maintained at 6.7±0.1. SMA was found to be very efficient and ~90% efficiency could be achieved under optimized conditions for the removal of phenol from phenol-spiked distilled water. This process is useful even when phenol is present at a very high concentration (5.32×10−4 mol/L). The effects of various other parameters such as SDS coverage on alumina, pH, temperature, agitation speed, the presence of different ions (Cl−, NO3−, SO42−, HPO42−, Fe3+ and Mg2+) and humic acid on the phenol removal were studied. The pH<7 favors the removal. It was observed that the removal efficiency was increased due to the presence of anions and was decreased a little due to the presence of cations. Temperature and humic acid had no effect on the removal of phenol. To test whether the removal of phenol was possible from wastewater using SMA, the adsorption study was conducted using synthetically prepared wastewater. The removal of phenol from distilled water and wastewater was comparable. Desorption of both SDS and phenol from the SMA surface was possible using 0.25 M sodium hydroxide solutions. Desorption of only phenol is possible by acetone or rectified spirit.

Keywords: Alumina, Sodium Dodecyl Sulfate, Surfactant-Modified Alumina, Phenol, Removal, Adsolubilization

? Özcan, A., Öncü, E.M. and Özcan, A.S. (2006), Kinetics, isotherm and thermodynamic studies of adsorption of Acid Blue 193 from aqueous solutions onto natural sepiolite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **277** (1-3), 90-97.

Full Text: [2006\Col Sur A-Phy Eng Asp277, 90.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp277,%2090.pdf)

Abstract: In the present study, natural sepiolite was used as an adsorbent for the investigation of the adsorption kinetics, isotherms and thermodynamic parameters of an acid dye (Acid Blue 193, AB193) from aqueous solution at various pHs, temperatures and concentrations. Two simplified kinetic models, first-order and pseudo-second-order, were used to predict the adsorption rate constants. It was found that the kinetics of the adsorption of AB193 onto natural sepiolite at different operating conditions was the best described by the pseudo-second-order model. The rate parameters of the intraparticle diffusion model for adsorption were also evaluated and compared to identify the adsorption mechanisms. Adsorption isotherms and equilibrium adsorption capacities were determined by the fittings of the experimental data to three well-known isotherm models including Langmuir, Freundlich and Dubinin-Radushkevich (D-R). The results showed that the D-R model appears to fit the adsorption better than other adsorption models for the adsorption of AB193 onto natural sepiolite. The equilibrium constants were used to calculate thermodynamic parameters, such as the change of free energy, enthalpy and entropy.

Keywords: Sepiolite, Adsorption, Acid Dye, Kinetics, Isotherm

? Bhattacharyya, K.G. and Gupta, S.S. (2006), Pb(II) uptake by kaolinite and montmorillonite in aqueous medium: Influence of acid activation of the clays. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **277** (1-3), 191-200.

Full Text: [2006\Col Sur A-Phy Eng Asp277, 191.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp277,%20191.pdf)

Abstract: The adsorptive interactions of Pb(II) ions with kaolinite, montmorillonite, and their acid activated derivatives in aqueous medium are investigated in this work. The adsorption experiments were carried out under batch process with Pb(II) concentration, amount of clay, pH, time and temperature as the variables. The adsorption was strongly dependent on pH of the medium, and the uptake of Pb(II) increased from pH 1.0 to 6.0 after which the experiments could not be continued due to decreasing solubility of Pb(II). Adsorption was very fast at low coverage and equilibrium was approached within 180 min. The results best fitted the second order kinetic model with the rate constant, k2, in the range of 3.5×10−2 to 11.2×10−2 g mg−1 min−1. Langmuir and Freundlich isotherms were applied and isotherm coefficients were computed. The Langmuir monolayer capacity of the clay adsorbents was from 11.5 to 31.4 mg g−1. The adsorption process was exothermic (ΔH = −58.9 to −83.4 kJ mol−1) accompanied by decrease in entropy (ΔS = −116.4 to −258.7 J mol−1 K−1) and Gibbs energy (ΔG = −35.8 to −79.6 kJ mol−1). The results are discussed to highlight the influence of acid activation on Pb(II)-adsorption characteristics of the clays.

Keywords: Kaolinite, Montmorillonite, Acid Activated Clay, Adsorption, Isotherms, Kinetics, Thermodynamics

? Ngah, W.S.W. and Fatinathan, S. (2006), Chitosan flakes and chitosan–GLA beads for adsorption of *p*-nitrophenol in aqueous solution. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **277** (1-3), 214-222.

Full Text: [2006\Col Sur A-Phy Eng Asp277, 214.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp277,%20214.pdf)

Abstract: A batch adsorption system was applied to study the adsorption of p-nitrophenol onto chitosan flakes and a cross-linked chitosan beads. The cross-linked chitosan beads were prepared using glutaraldehyde (GLA), a cross-linking agent, to enhance the chemical resistance and mechanical strength of chitosan beads. Adsorption experiments were carried out as function of pH, agitation period, agitation rate and different concentration of p-nitrophenol. Langmuir and Freundlich adsorption models were applied to describe the isotherms and isotherm constants. Equilibrium data agrees very well to the Freundlich model giving adsorption capacity of 0.63 mg g−1 for chitosan flakes and 2.48 mg g−1 for chitosan–GLA beads. The kinetic experimental data properly correlated with the second-order kinetic model with a rate constant of 3.82×10−1 g mg−1 min−1 and 3.34×10−1 gm g−1 min−1 for chitosan flakes and chitosan–GLA beads, respectively. Results showed that chitosan flakes and chitosan–GLA beads are favourable adsorbents.

Keywords: Chitosan Flakes, Cross-Linked Chitosan Beads, Adsorption Isotherm, Adsorption Capacities, Adsorption Rates

? Zhang, H.X., Dong, Z. and Tao, Z.Y. (2006), Sorption of thorium(IV) ions on gibbsite: Effects of contact time, pH, ionic strength, concentration, phosphate and fulvic acid. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **278** (1-3), 46-52.

Full Text: [2006\Col Sur A-Phy Eng Asp278, 46.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp278,%2046.pdf)

Abstract: The sorption of Th(IV) on gibbsite was determined at differing experimental conditions by using the batch technique. The effects of contact time between the solid phase and aqueous solution, pH, ionic strength (background electrolyte, KNO3), concentration of tetravalent thorium, phosphate and fulvic acid (FA) were investigated. The sorption was rapidly increased in the first 20 h, and then remained constant in the period 20–78 h. It was found that the Th(IV) is strongly sorbed onto gibbsite, when the surface charge is positive; that the sorption is abruptly increased with increasing pH in the range 3–4; that the sorption is insensitive to the increase in ionic strength from 0.001 to 0.1 mol/L KNO3 and that the sorption remains constant at pH 3.90–4.15 and in the concentration range of Th4+ 2.0–6.0×10−5 mol/L and the saturated solid phase concentration is about 4×10−6 mol/g. In addition, the sorption of phosphate on gibbsite as a function of contact time, pH and concentration and the effects of phosphate and FA on Th(IV) sorption onto gibbsite were investigated too. The significantly positive effects of phosphate and FA and the mutual positive effect of thorium(IV) and phosphate were demonstrated. These positive effects are interpreted in terms of formation of surface ternary complexes and precipitate.

Keywords: Sorption, Thorium(IV), Gibbsite, Phosphate, Fulvic Acid

? Atia, A.A., Farag, F.M. and Youssef, A.M. (2006), Studies on the adsorption of dodecylbenzenesulfonate and cetylpyridinium bromide at liquid/air and bentonite/liquid interfaces. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **278** (1-3), 74-80.

Full Text: [2006\Col Sur A-Phy Eng Asp278, 74.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp278,%2074.pdf)

Abstract: Adsorption of dodecylbenzenesulfonate (DBS) and cetylpyridinium bromide (CPBr) at liquid/air and bentonite/liquid interfaces was studied. The surface excess concentration as well as the area occupied by each adsorbed surfactant molecule at liquid/air interface was calculated. The cationic surfactant (CPBr) was found to adsorb on bentonite surface to a higher extent compared with anionic surfactant (DBS). The adsorption of CPBr exceeded the CEC of bentonite and was assumed to proceed via cation exchange and to be enhanced by the mutual hydrophobic interaction among the hydrocarbon chains. On the other hand, adsorption of DBS was explained to proceed due to specific adsorption. Both surfactants were found to follow the pseudo second order kinetic indicating that the rate of the adsorption is controlled by both the concentration of the surfactant as well as the surface properties of bentonite. The thermodynamic parameters indicated that the adsorption of both DBS and CPBr is of physical nature.

Keywords: Adsorption, Surfactants, Bentonite, Interfaces, CEC

? Elizalde-González, M.P., Geyer, W., Guevara-Villa, M.R.G., Mattusch, J., Peláez-Cid, A.A. and Wennrich, R. (2006), Characterization of an adsorbent prepared from maize waste and adsorption of three classes of textile dyes. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **278** (1-3), 89-97.

Full Text: [2006\Col Sur A-Phy Eng Asp278, 89.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp278,%2089.pdf)

Abstract: In the past years, investigations have been accomplished in order to evaluate both inexpensive and alternative materials as potential adsorbents for pollutants and colored compounds. A novel adsorbent SOMAP, prepared from maize waste, was activated and characterized under the aspect of its reproducible employment using elemental analysis, thermogravimetry, porosimetry and adsorption of different dyes from solution.

In the pretreated samples, the nitrogen content and the concentration of carboxylic groups was smaller than in the washed adsorbent. No major differences in the porosity of the pretreated and non-pretreated adsorbent were observed. The adsorption capacity was evaluated against basic (basic blue BB41), reactive (reactive black RB5) and acid (methyl orange MO) dyes. The adsorption equilibrium in batch experiments was more slowly reached in the case of the reactive and acid dyes. The affinity upon the dyes graded according the series: MO < RB5 < BB41, and the desorption efficiency increased in the inverse order. The adsorption equilibrium was examined in terms of absolute adsorption isotherms for SOMAP and two different lots of the treated material, and was fitted according to Henry, Langmuir and Freundlich models of adsorption for a quantitative evaluation. ATR/IR spectra provided information about the interaction sites and orientation of the adsorbed dyes. Determination of the adsorption equilibrium concentrations was accomplished by two independent analytical methods, i.e. HPLC and VIS spectrophotometry.

Keywords: Natural Adsorbents, Characterization, Dyes, Adsorption, Desorption

? Mall, I.D., Srivastava, V.C., Kumar, G.V.A. and Mishra, I.M. (2006), Characterization and utilization of mesoporous fertilizer plant waste carbon for adsorptive removal of dyes from aqueous solution. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **278** (1-3), 175-187.

Full Text: [2006\Col Sur A-Phy Eng Asp278, 175.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp278,%20175.pdf)

Abstract: This paper presents the physico-chemical characteristics of low-cost fertilizer plant waste carbon (WC) for the adsorption of different dyes. The particle size analysis showed an average particle size of 167.35 μm. Proximate and CHN analysis showed the presence of high amount of carbon in WC. Bulk density and heating value of WC were found to be 308.03 kg/m3 and 22.3 MJ/kg, respectively. The pore size distribution results showed that the WC was predominantly mesoporous. The BET surface area was 357 m2/g. The average pore diameter by BET was 6.483 nm. The mesoporous surface area for adsorption was 96% of the total pore surface area. The polar groups present on the WC surface imparted considerable cation exchange capacity to it. WC was further used as an adsorbent for the removal of Auramine-O (AR), Congo red (CR), Orange-G (OG) and methyl violet (MV) dyes from aqueous solutions. Optimum initial pH (pH0) was found to be 7.0. WC dose of 1 g/l was found to be optimum for the adsorption of all dyes at a concentration of 20 mg/l. The adsorption of dyes on WC was found to be gradual process and quasi-equilibrium reached in 5 h. The adsorption kinetics followed pseudo-second-order kinetics. The effective diffusion coefficient was of the order of 10−12 m2/s. Error analysis showed that Redlich-Peterson (R-P) isotherm best represented the equilibrium adsorption data for all the dyes. Thermodynamics showed that the adsorption of CR on WC was most favourable in comparison to other dyes. The desorption study showed that the recovery of dyes and the regeneration of the WC using different solvents viz. water, acids and alkalies were not feasible. Spent WC can, however, be used as a fuel to recover its high energy content and the bottom ash obtained after its combustion/incineration can be blended with clay/cement–concrete mixture to make bricks and building blocks for its safe disposal. WC has been found to have high potential as an adsorbent for the removal of AR, CR, OG and MV dyes from aqueous solutions.

Keywords: Surface area, Porosity, Waste Carbon (WC), Dye Removal, Kinetic Study, Isotherms, Error analyses

? Savić, J.Z. and Vasić, V.M. (2006), Thermodynamics and kinetics of 1,8-dihydroxy-2-(imidazol-5-ylazo)-naphthalene-3,6-disulphonic acid immobilization on Dowex resin. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **278** (1-3), 197-203.

Full Text: [2006\Col Sur A-Phy Eng Asp278, 197.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp278,%20197.pdf)

Abstract: The sorption of 1,8-dihydroxy-2-(imidazol-5-ylazo)-naphthalene-3,6-disulphonic acid (IACA) onto the anion exchange resins Dowex 1-X8 and Dowex 2-X8 was studied by following the absorption spectra of solid phase, as the function of acidity, dye concentration, temperature and time. The aim of this work was to elucidate the thermodynamics and kinetics of the sorption process and to investigate the influence of the sorption on the ionic forms of the modified dye.

The Langmuir model was applied to describe equilibrium isotherms of dye sorption onto Dowex 1-X8, 50–100 mesh at pH 4.5. The values of Gibbs free energy ΔG were between −26.0 kJ/mol and −30.5 kJ/mol, in the temperature range from 0 to 25 °C. The results of the kinetic experiments, performed in batch conditions, showed that sorption was pseudo-first order process. IACA diffusion coefficients from 5.2×10−9 to 8.2×10−9 cm2/s for Dowex 1-X8 and from 4.5×10−9 to 7.1×10−9 cm2/s for Dowex 2-X8 were obtained. Activation energy values calculated by using Arrhenius equation, were 25.8 kJ/mol, for Dowex 1-X8, and 25.4 kJ/mol for Dowex 2-X8.

The apparent equilibrium constants of protonation of the imidazole moiety (log Kp = 2.4) and dissociation of －OH group from naphthalene nucleus (pKd = 6.4) of the modified dye were determined from the spectrophotometric data using Donnan model, and compared to the values obtained in the solution.

Keywords: Kinetics, Thermodynamics, Azo-Dyes, Immobilization, Ion Exchangers

? Huang, W. and Zhao, J.X. (2006), Adsorption of quaternary ammonium gemini surfactants on zinc and the inhibitive effect on zinc corrosion in vitriolic solution. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **278** (1-3), 246-251.

Full Text: [2006\Col Sur A-Phy Eng Asp278, 246.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp278,%20246.pdf)

Abstract: Adsorption of the quaternary ammonium gemini surfactants alkanediyl-α,ω-bis-(dimethyl dodecyl ammonium bromide), referred as C12-s-C12·2Br (s = 2,3,4,6), on the zinc surface in 0.5 mol/L H2SO4 solution was investigated using gravimetric measurements. The adsorption of C12-s-C12·2Br on the zinc surface accorded to the Frumkin isotherm model. The maximal inhibition efficiency for zinc was reached at the saturated adsorption concentration Cc that was larger than its critical micelle concentration in 0.5 mol/L H2SO4 solution. The inhibition efficiency for zinc slightly reduced with increasing s since C12-s-C12·2Br formed different morphologies of the surface aggregates. The adsorption ability and the inhibition efficiency for corrosion reduced with increment of temperature.

Keywords: Quaternary Ammonium Gemini Surfactants, Zinc, Vitriolic Aqueous Solution, Adsorption, Corrosion Inhibition

? Tseng, R.L., Tseng, S.K. and Wu, F.C. (2006), Preparation of high surface area carbons from Corncob with KOH etching plus CO2 gasification for the adsorption of dyes and phenols from water. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **279** (1-3), 69-78.

Full Text: [2006\Col Sur A-Phy Eng Asp279, 69.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp279,%2069.pdf)

Abstract: Carbonaceous adsorbents with controllable surface area and the microporous volume ratio (Vmicro/Vpore) were activated from carbonized corncobs (i.e., char) with KOH etching plus CO2 gasification in this work. Activated carbons derived from KOH/char ratio equal to 1 and CO2 gasification time from 0 to 60 min exhibited BET surface area increasing from 1071 to 1991 m2 g−1 and the Vmicro/Vpore values decreasing rapidly from 0.805 to 0.565. And those derived from KOH/char ratio of 4 and CO2 gasification time from 0 to 30 min exhibited high BET surface area from 2402 to 2844 m2 g−1. Scanning electron microscopic (SEM) results revealed that violent reactions took place on the surfaces of honeycombed holes in these carbons when the KOH/char ratio was equal to 1 and CO2 gasification was used. The adsorption of three dyes (MB, BB1, and AB74) and three phenols (phenol, 4-CP, and 2,4-CP) from water on all activated carbons at 30 °C were investigated. Adsorption kinetics was in agreement with the Elovich equation, and the values of the Elovich parameter (1/b) of the carbons with different CO2 gasification time were compared. The equilibrium isotherms were in agreement with the Langmuir equation, and they were used for comparing the amounts of adsorption corresponding to the monolayer coverage of the different carbons.

Keywords: Activated Carbons, KOH Etching Plus CO2 Gasification, Corncob, Pore Properties, Adsorption

? Zou, W.H., Han, R.P., Chen, Z.Z., Zhang, J.H. and Shi, J. (2006), Kinetic study of adsorption of Cu(II) and Pb(II) from aqueous solutions using manganese oxide coated zeolite in batch mode. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **279** (1-3), 238-246.

Full Text: [2006\Col Sur A-Phy Eng Asp279, 238.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp279,%20238.pdf)

Abstract: The effect of solution temperature and the determination of the kinetic parameters of adsorption of Cu(II) and Pb(II) from aqueous solution on manganese oxide coated zeolite (MOCZ) is important in understanding the adsorption mechanism. Variables of the system include adsorption time, particle size and initial solution concentration. The pseudo-second-order model was the best choice among all the kinetic models to describe the adsorption behavior of Cu(II) and Pb(II) onto MOCZ, suggesting that the adsorption mechanism might be a chemisorption process. The activation energy of adsorption (Ea) was determined as Cu(II) 9.72 kJ mol−1 and Pb(II) 11.9 kJ mol−1, respectively. The low value of Ea shows that Cu(II) and Pb(II) adsorption process by MOCZ may be an activated chemical adsorption. The thermodynamic parameters (ΔG0, ΔH0, and ΔS0) were also determined from the temperature dependence. The results show that the process of adsorption Cu(II) and Pb(II) is spontaneous and endothermic process and rise in temperature favors the adsorption.

Keywords: Manganese Oxide Coated Zeolite (MOCZ), Adsorption, Cu(II), Pb(II), Kinetic, Thermodynamic Parameters

? Zhang, C.X., Wang, Y.X. and Yan, X.F. (2006), Liquid-phase adsorption: Characterization and use of activated carbon prepared from diosgenin production residue. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **280** (1-3), 9-16.

Full Text: [2006\Col Sur A-Phy Eng Asp280, 9.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp280,%209.pdf)

Abstract: The adsorption behavior of activated carbon (AC) prepared from the residue of diosgenin by-product was characterized. The adsorption capacities of AC such as iodine, phenol and Methylene blue (MB) are 933.28, 145.38 and 165 mg/g, respectively. The results of MP analysis and BJH method show AC has developed micropore and mesopore volumes, which are 0.1621 and 0.2623 cm3/g respectively, with the mean pore diameter of 1.49 nm. Comparison of the liquid phase adsorption capacities of AC to the standard activated carbon (SAC) and the commercial activated carbon (CAC) for wastewater treatment showed AC was superior to SAC and CAC. Experiments on phenol and MB adsorption and COD and chroma removal from diosgenin wastewater were carried out under different conditions of contact time, temperature, concentration, adsorbent dose and pH. The removal of COD and chroma of 10-multiple wastewater is 92.46 mg/g and 88 %, respectively. Adsorption parameters for the Langmuir and Freundlich isotherm models were determined. At lower temperatures, the data for phenol and COD fitted Freundlich model better than Langmuir model and vise versa for MB and chroma. Adsorption followed second-order kinetics. The study proves that AC prepared from the residue of diosgenin by-product can be used as adsorbent for the treatment of diosogenin wastewater as a cost-effective approach of resource recycle of Discorea zingiberensis C.H. Wright.

Keywords: Liquid-Phase Adsorption, Activated Carbon, Characterization, Wastewater Treatment, Reaction Kinetics

? Chang, C.F., Lin, P.H. and Höll, W. (2006), Aluminum-type superparamagnetic adsorbents: Synthesis and application on fluoride removal. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **280** (1-3), 194-202.

Full Text: [2006\Col Sur A-Phy Eng Asp280, 194.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp280,%20194.pdf)

Abstract: Two effective types of superparamagnetic nano-scale adsorbents of bayerite/SiO2/Fe3O4 have been synthesized via three sequential steps: chemical precipitation of Fe3O4, coating of SiO2 on Fe3O4 using acidifying method, and further coating of bayerite (Al(OH)(3)) on SiO2/Fe3O4 adopting sol-gel (MASG) or homogeneous precipitation (MAHP) methods. The characteristics of MASG and MAHP were identified using the transmission electron microscopy (TEM) micrograph, scanning electron microscopy with energy dispersive X-ray spectroscopy (SEM/EDX), X-ray powder diffractometer (XRD), and superconducing quantum interference device (SQUID). Removal of fluoride from aqueous solution was examined to evaluate the adsorptive capacity of MASG, MAHP, and commercial activated alumina (CA), and the effects of enclosure of Fe3O4 with SiO2 for SiO2/Fe3O4, MASG, and MAHP particles. Among the adsorbents tested under the same experimental condition, MASG is the most effective adsorbent, of which the adsorption capacities are 38 g/kg (based on adsorbent mass of adsorption in terms of equilibrium constant q(L) of Langmuir isotherm), and can compete with CA even at a high pH value. The innovative superparamagnetic adsorbents synthesized in this study possess physicochemical stability at pH range of 6-8 and great potential in the adsorption processes due to not only their high adsorption capacity but also the conveniently magnetic separation which can overcome the difficulty in solid-liquid separation for nano-particles in solutions. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Superparamagnetism, Bayerite, Silica Film, Magnetite, Adsorption Isotherm, Fluoride Removal, Magnetic Separation, Oxide Magnetic Composites, Water, Adsorption, Contaminants, Particles

? Talman, R.Y. and Atun, G. (2006), Effects of cationic and anionic surfactants on the adsorption of toluidine blue onto fly ash. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **281** (1-3), 15-22.

Full Text: [2006\Col Sur A-Phy Eng Asp281, 15.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp281,%2015.pdf)

Abstract: The adsorption of cationic dye toluidine blue (TB) onto fly ash has been studied from aqueous solution, in the presence of cationic surfactant cetyl pyridinium chloride (CPC) and anionic surfactant sodium dodecyl sulfate (SDS) at three different temperatures.

Two-step adsorption isotherms are observed for TB adsorption in aqueous solution. Isotherm shape is also preserved in the presence of CPC. The equilibrium saturation adsorption capacities of fly ash for TB decreased in the presence of CPC as a result of the competitive adsorption for the same sites between the same charged dye and surfactant molecules. Four-region adsorption isotherms are obtained in the presence of SDS. The adsorption of the cationic dye at low SDS concentration is enhanced by adsolubilization phenomenon because of the favorable interaction with the negatively charged adsorbed micelles. Above the critical micelle concentration free micelles are formed, TB is distributed between the free and the adsorbed aggregates, and therefore the global adsolubilization decreases. The order of changing of Freundlich isotherm constant (n) gives information about isotherm shape whether two-step or four-region adsorption isotherm. Adsorption isotherms of SDS and CPC in aqueous solution have also been constructed for interpreting adsorption results of TB in the presence of surfactants. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Toluidine Blue, Fly Ash, Cetyl Pyridinium Chloride, Sodium Dodecyl Sulfate, Adsorption Isotherms, Critical Micelle Concentration, Gel Water Interface, Low-Cost Adsorbents, Methylene-Blue, Waste-Water, Aqueous-Solutions, Ionic Surfactants, Fullers Earth, Rhodamine 3b, Basic-Dyes

? Bhakat, P.B., Gupta, A.K., Ayoob, S. and Kundu, S. (2006), Investigations on arsenic(V) removal by modified calcined bauxite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **281** (1-3), 237-245.

Full Text: [2006\Col Sur A-Phy Eng Asp281, 237.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp281,%20237.pdf)

Abstract: The present study suggests a solution to the real life problem of arsenic poisoning of potable ground water by examining the use of calcined bauxite, a locally available adsorbent in a modified form, for arsenic(V) scavenging. This adsorbent (modified calcined bauxite, MCB) exhibited excellent As(V) removal (99–100%) over a wide range of pH ~ 2–8 in batch studies. In the neutral pH range (pH ~ 7), the intensity of adsorption increased from 0.099 to 1.37 mg g−1 corresponding to initial As(V) concentrations of 0.5–8 mg l−1 with a dose of 5 g l−1 within 3 h. The sorption kinetics was found to follow the pseudo-second order model. The Langmuir, Freundlich and Dubinin–Radushkevich models were tried to represent the equilibrium data of As(V) adsorption. The removal of As(V) can be best modeled using Langmuir isotherm which renders the maximum adsorption capacity as 1.566 mg g−1. The sorption process was almost unaffected by temperature variations. During sorption, no appreciable ionic effects except from SO42− and EDTA complex were observed from the background ions Ca2+, Fe3+, Cl−, NO3−, PO43− and F−. The most distinguishing characteristic was the pH of the effluent within the drinking water range of 6–7.5. The column study results show that at a sorbent bed depth of 10 cm and feed flow rate of 8 ml min−1, the MCB media was capable of treating 8.16 l (260 bed volumes) of As(V) spiked water (C0 = 2 mg l−1) before breakthrough. The values of adsorption rate coefficient (K) and adsorptioncapacity coefficient (N) are calculated using Logit method of column design and were found to be 0.2467 l mg−1 h−1 and 865.85 mg l−1, respectively. The XRD data analysis describes chemical combinations of the sorption mechanism. The consistency in arsenic sorption over a wide pH range, availability and adaptability in the local environment, excellent sorption potential, least interference from most of the anions, negligible temperature effects and quality of the treated water makes it an ideal choice for arsenic removal.

Keywords: As(V) removal, Modified Calcined Bauxite,Kinetics, Isotherms, Breakthrough Curve

? Peyre, V., Lakhal, A., Fronteau, A., Nzang-Emane, M. and Letellier, P. (2006), Kinetics and isotherms of adsorption of alkyldimethylamine oxide on a porous hydrophobic polymer: A thermodynamic approach to a Langmuir-like phenomenon. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **281** (1-3), 261-270.

Full Text: [2006\Col Sur A-Phy Eng Asp281, 261.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp281,%20261.pdf)

Abstract: We studied the adsorption of decyl-, dodecyl- and tetradecyldimethylamine oxide surfactants on porous beads of polystyrene divinylbenzene (Bio-beads SM2). The concentration of free surfactant is followed in situ using an ion-selective electrode. Isotherms for the three surfactants were determined using a batch method at 25°C. We tested various parameters for their influence on the adsorption kinetics: initial surfactant concentration (below and above the critical micellar concentration (CMC)), initial quantity of bead, temperature and surfactant chain length. The behaviour can be modelled using a generalised Langmuir kinetics approach that assumes systems do not possess adsorption sites. We used the same set of parameters for the isotherm and kinetics results. These parameters are linked to the parameters from the Langmuir equation and we discuss the validity of the model. Although the proposed model does not require any adsorption sites, the results from the model are similar to the Langmuir approach. Adsorption is shown to be due to hydrophobic interactions.

Keywords: Alkyldimethylamine oxide; Adsorption; Biobeads; Kinetics; Langmuir

? Hossain, M.M., Suzuki, T. and Kato, T. (2006), Effect of an amino acid on the surface phase behavior of n-hexadecyl phosphate in Gibbs adsorption layers. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **284-285**, 119-124.

Full Text: [2006\Col Sur A-Phy Eng Asp284, 119.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp284,%20119.pdf)

Abstract: Interaction of an amino acid, L-arginine (L-arg) with the Gibbs monolayers of n-hexadecyl phosphate (n-HDP) has been studied by measuring surface pressure (π)–time (t) isotherms with a film balance and observing monolayer morphology with a Brewster angle microscopy (BAM). In the aqueous solution of the mixtures of the components, L-arg acts as a cation (L-arg+) and forms salt with n-HDP. Accordingly, the Gibbs monolayers of n-HDP experience a dramatic change in its phase behavior in the presence of L-arg. The monolayers of n-HDP show a first-order gas-intermediate (G-I) phase transition followed by an unusual second-order I-liquid condensed (LC) phase transition at 15 °C. In contrast to the pure system, the mixed monolayers show a first-order G-liquid expanded (LE) phase transition at zero surface pressure, which is followed by another first-order LE–LC phase transition at a certain higher surface pressure at the same temperature. With increasing the concentration of L-arg in the mixtures containing the same concentration of n-HDP, the critical surface pressure (πc) necessary for the G-LE phase transition remains constant while that of the LE–LC (πc(LE–LC)) phase transition increases linearly up to a composition of 1:2 of n-HDP and L-arg. A further increase in the concentration of L-arg allows the πc(LE–LC) to increase slowly. All of these results are explained by considering the formation of mono- and di-L-arg salts in the mixed systems.

Keywords: Gibbs Monolayers, Phase Transition, Brewster Angle Microscopy, N-Hexadecyl Phosphate, L-Arginine

? Klučáková, M. and Pekař, M. (2006), New model for equilibrium sorption of metal ions on solid humic acids. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **286** (1-3), 126-133.

Full Text: [2006\Col Sur A-Phy Eng Asp286, 126.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp286,%20126.pdf)

Asbtract: Experimental results of sorption kinetics and equilibrium are compared with traditional Langmuir theory. Although, equilibrium data for sorption of metal ions on solid humic acids can be fitted relatively precisely by Langmuir isotherm, its utilization is connected with some inaccuracies, because it does not take into account the production of hydrogen ions during reactions of metal ions with acidic functional groups on the surface of humic particles. The new type of adsorption isotherm, respecting the nature of surface chemical interactions, was proposed for adsorption of metal ions on solid humic acids and proved experimentally. The new model devises binding sites in humic acids into two parts: acidic functional groups, which split of hydrogen ions during surface reaction in adsorption and other binding sites as e.g. aromatic structures, which are not able to change pH value in system. Obtained results are in very good agreement with proposed isotherm. One of the most important advantages of the model is that computed adsorption coefficients are not dependent on pH value as well as adsorption and desorption rate constants obtained from kinetic equation. The isotherm proposed in this article is derived for adsorption of bivalent cations, but it can be modified for ions of other positive valency.

Keywords: Solid Humic Acids, Kinetics, Equilibrium Sorption, Adsorption Isotherm

? Bou-Maroun, E., Goetz-Grandmont, G.J. and Boos, A. (2006), Sorption of europium(III) and copper(II) by a mesostructured silica doped with acyl-hydroxypyrazole derivatives: Extraction, kinetic and capacity studies. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **287** (1-3), 1-9.

Full Text: [2006\Col Sur A-Phy Eng Asp287, 1.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp287,%201.pdf)

Abstract: The solid-liquid extraction of copper(II) and europium(III) by a mesostructured silica doped with two 4-acyl-5-hyroxy-pyrazole: 1-phenyl-3-methyl-4-stearoyl-5-pyrazolone (HPMSP) with one chelating head and 1, 12-bis(1’-phenyl-3’-methyl-5’-hydroxy-4’-pyrazolyl) (HL-10-LH) with two chelating heads has been studied. The solid-liquid extraction occurs at a weaker pH than in liquid-liquid extraction. A theoretical model is used to determine the stoichiometries of the extracted complexes in the doped silica. Some extracted complexes found are comparable to those obtained in solvent extraction Cu(PMSP)(2), CuL-10-L) and Eu(PMSP)(3). The complex formed in the doped silica between HL-10-LH and Eu is the same as the one formed in micellar extraction. Kinetics sorption were also studied at 25°C. The best fit is obtained with the pseudo-second order model. Extraction capacity of the doped materials is determined and comparable to the extraction capacity of europium by HL-10-LH solubilized in cetyltrimethylammonium bromide micelles. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Actinides, Acyl-Hydroxy-Pyrazole, Adsorption, Americium, Capacity, Complexes, Copper, Doped Silica, Europium, Gel, Kinetics, Lanthanides, Liquid-Extraction, Model, Oxide, Preconcentration, Solid Phase Extraction, Solid-Phase Extraction, Sorption

? Bayramoğlu, G., Çelik, G. and Arıca, M.Y. (2006), Immunoglobulin G adsorption behavior of L-histidine ligand attached and Lewis metal ions chelated affinity membranes. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **287** (1-3), 75-85.

Full Text: [2006\Col Sur A-Phy Eng Asp287, 75.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp287,%2075.pdf)

Abstract: Immobilized metal affinity membranes were prepared by chelating Cu(II) and Fe(III) ions on poly(2-hydroxyethyl methacrylate-glycidyl methacrylate), poly(HEMA-GMA) membranes using l-histidine as a chelating ligand. To achieve this goal, the poly(HEMA-GMA) membrane was prepared via UV initiated photopolymerization. A spacer-arm (i.e., 1,6-diaminohexane) was introduced through the epoxy groups of the membrane (poly(HEMA-GMA)-SA). A chelating ligand (i.e., l-histidine amino acid) was covalently attached on the poly(HEMA-GMA) and/or poly(HEMA-GMA)-SA using glutaric dialdehyde as a coupling agent, poly(HEMA-GMA)-H and poly(HEMA-GMA)-SAH membranes, respectively. Then, Cu(II) and Fe(III) ions were chelated through poly(HEMA-GMA)-SAH membrane. The binding characteristics of human immunoglobulin G (IgG) to IMAC membranes and the selectivity of Cu(II) and Fe(III) ions to the IgG have been investigated from aqueous solution using l-histidine attached membrane (poly(HEMA-GMA)-SAH) as a control system. The experimental data was analyzed using two adsorption kinetic models, the pseudo-first-order and the pseudo-second-order, to determine the best-fit equation for the adsorption of IgG onto l-histidine incorporated and/or different metals ion immobilized affinity membranes. The first-order equation in the affinity membrane systems is the most appropriate equation to predict the adsorption capacity for all the tested adsorbents. Moreover, the effect of spacer-arm on the adsorption capacity was evaluated using poly(HEMA-GMA)-H membrane as a control system. The IgG binding order on the affinity membranes was poly(HEMA-GMA)-SAH-Cu(II) > poly(HEMA-GMA)-SAH-Fe(III) > poly(HEMA-GMA)-SAH > poly(HEMA-GMA)-H. Finally, the polarities and the surface free energies of the affinity membranes were determined by contact angle studies.

Keywords: Membrane, Affinity Chromatography, Metal Chelate, IgG, Adsorption, Contact Angle, Surface Interaction

? Shirvani, M., Shariatmadari, H., Kalbasi, M., Nourbakhsh, F. and Najafi, B. (2006), Sorption of cadmium on palygorskite, sepiolite and calcite: Equilibria and organic ligand affected kinetics. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **287** (1-3), 182-190.

Full Text: [2006\Col Sur A-Phy Eng Asp287, 182.pdf](2006/Col%20Sur%20A-Phy%20Eng%20Asp287,%20182.pdf)

Abstract: Quantity, affinity and rate of heavy metals retention by soil constituents can greatly influence the mobility and bioavailability of these metals in soil environments. Equilibrium and kinetic studies of cadmium (Cd) sorption on palygorskite, sepiolite and calcite minerals were carried out. Effects of low molecular weight organic acid anions, acetate and citrate, and siderophore desferrioxamine B (DFOB) on the Cd sorption rates were also investigated. Langmuir and Freundlich isotherms adequately fitted the equilibrium sorption data with r2 values > 0.89. Among the minerals studied, sepiolite showed the highest sorption capacity and chemical affinity for Cd. Uptake of Cd by the minerals was initially rapid and then slowly continued until approached a pseudo equilibrium. The time-dependent Cd sorption data were well-described by pseudo second-order (0.98 < r2 < 1), Elovich (0.84 < r2 < 0.99) and power function (0.80 < r2 < 0.98) kinetic models. Sepiolite and calcite possessed the highest and the lowest Cd sorption rate values, respectively. Acetate and citrate ligands generally induced decreases in the Cd retention rates; however, the inhibitory effect of citrate was more pronounced. The DFOB siderophore, on the other hand, enhanced the rate of Cd uptake by the sorbents. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Cd, Kinetic, Equilibrium, Desferrioxamin B, Citrate, Acetate, Hydroxamate Siderophores, Desferrioxamine B, Aqueous-Solutions, Polluted Soils, Metal Sorption, Adsorption, Acids, Minerals, Goethite, Availability

? Unuabonah, E.I., Olu-Owolabi, B.I., Adebowale, K.O. and Ofomaja, A.E. (2007), Adsorption of lead and cadmium ions from aqueous solutions by tripolyphosphate-impregnated Kaolinite clay. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **292** (2-3), 202-211.

Full Text: [2007\Col Sur A-Phy Eng Asp292, 202.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp292,%20202.pdf)

Abstract: The pretreatment of Kaolinite clay with tripolyphosphate (TPP) increased the cation exchange capacity (CEC) of Kaolinite clay from 13.45 meq/100 g to 128.7 meq/100 g. The equilibrium adsorption capacity of TPP–Kaolinite clay for Pb2+ and Cd2+ was 126.58 mg/g and 113.64 mg/g, respectively. The presence of Na- and Ca-electrolytes and with increase in their concentrations reduced the selectivity of TPP–Kaolinite clay for Pb2+ than Cd2+. TPP–Kaolinite clay showed higher selectivity for Pb2+ in the presence of these electrolytes and at all concentrations of these electrolytes used for the study. Binary mixtures of Pb2+ and Cd2+ in various concentrations caused a decrease in the adsorption capacity of TPP–Kaolinite for either metal ion. However, this may have caused the adsorption of Cd2+ onto high energy sites on the surface of the TPP–Kaolinite clay. Non-linear Chi-square model analysis of adsorption data using Langmuir, Langmuir–Freudlich, Freudlich, Toth and Temkin isotherms reveals that the adsorption of Pb2+ and Cd2+ by TPP–Kaolinite clay were best described by the Toth and Freudlich isotherms, respectively. At low concentrations (≤500 mg/L) the adsorption of these metal ions showed better fits to the five models with Langmuir–Freudlich and Freudlich isotherms giving the best fits for Pb2+ and Cd2+, respectively.

Keywords: Adsorbent, TPP–Kaolinite Clay, Metal Ions, Isotherms, Electrolytes, Adsorption

? Qadeer, R. (2007), Adsorption behavior of ruthenium ions on activated charcoal from nirtic acid medium. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **293** (1-3), 217-223.

Full Text: [2007\Col Sur A-Phy Eng Asp293, 217.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp293,%20217.pdf)

Abstract: The adsorption behavior of ruthenium ions onto activated charcoal has been studied in relation to equilibration time, ruthenium ions concentration and temperature from nitric acid solutions of 0.001, 0.01 and 0.1 M concentration as adsorptive medium. It was observed that low acid concentration favors the adsorption and the extent of ruthenium ions adsorption on activated charcoal lie in the order of: 0.001 M > 0.01 M > 0.1 M nitric acid solutions. The general ruthenium ions adsorption process is essentially independent of nitric acid solution concentration. However, variation in nitric acid solution concentration influences the amount of ruthenium ions adsorbed, which decreases with the increase in nitric acid solution concentration. The adsorption equilibrium is attained within 70 min and the ruthenium ions adsorption process is predominately by diffusion. The overall rate process appears to be influenced by both boundary layer diffusion and intraparticle diffusion, and the calculated values of intraparticle diffusion rate constant are 3×10-5 4×10-5 and 5×10-5 at 0.001, 0.01 and 0.1 M nitric acid solution, respectively. The adsorption isotherms for ruthenium ions are L2 type and the experimental adsorption data obtained were found to correlate well with the Langmuir and the Dubinin-Radushkevich isothermal equations. Values of adsorption energy, E-a, calculated from the DR isotherm, lies in the range of 5.27-5.50 kJ mol-1 indicate that the ruthenium ions adsorption process on activated charcoal is physical in nature and the change in nitric acid solution concentration does not influence the nature of the adsorption process. Increase in temperature induced a positive effect on ruthenium ions adsorption indicating an endothermic adsorption process. Thermodynamic parameters Delta G, Delta H and Delta S were computed from the equilibrium constant, K-C and is interpreted. (c) 2006 Published by Elsevier B.V.

Keywords: Ruthenium Ions, Adsorption, Activated Charcoal, Nitric Acid Solutions, Aqueous-Solutions, Heavy-Metals, Sorption, Adsorbents, Kinetics, Removal, Cadmium, Surface, Carbon, Water

? Ayoob, S., Gupta, A.K. and Bhakat, P.B. (2007), Performance evaluation of modified calcined bauxite in the sorptive removal of arsenic(III) from aqueous environment. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **293** (1-3), 247-254.

Full Text: [2007\Col Sur A-Phy Eng Asp293, 247.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp293,%20247.pdf)

Abstract: This research was aimed at evaluating the effectiveness of the adsorbent, modified calcined bauxite (MCB), in removing As(III) from aqueous environment by completely mixed batch reactor (CMBR) and continuous flow fixed bed studies. It was observed that an adsorbent dose of 5 g l−1 could effectively remove 99.2% and 93.4% of As(III), from initial concentrations of 1 and 2 mg l−1, respectively. The sorption kinetics was found to follow pseudo-second-order model. Freundlich isotherm model was well fitted to the experimental equilibrium data rendering a maximum adsorption capacity of 1.362 mg g−1. The sorption process was found unaffected by temperature variations. The removal of As(III) was observed almost consistent over a pH range of 2–8, producing effluent within pH range of 6–7.5. It appears that the mechanism of arsenic removal is dependent on pH, surface charge of the adsorbent and nature of the As(III) speciation. The fixed bed study performed in a 20 mm diameter column at a feed flow rate of 8 ml min−1, demonstrated that an adsorbent bed depth of 10 cm could effectively treat 428 bed volumes of As(III) spiked influent water with 1 mg l−1 concentration, before the attainment of breakthrough. Logit method was used to evaluate the column parameters, adsorption rate constant and adsorption capacity co-efficient.

Keywords: Adsorption, Arsenite, Breakthrough Curve, Isotherms, Kinetics

? Bayramoğlu, G., Şenkal, F.B., Çelik, G. and Arıca, M.Y. (2007), Preparation and characterization of sulfonyl-hydrazine attached poly(styrene-divinylbenzene) beads for separation of albumin. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **294** (1-3), 56-63.

Full Text: [2007\Col Sur A-Phy Eng Asp294, 56.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp294,%2056.pdf)

Abstract: Novel sulfonyl-hydrazine carrying poly(styrene-divinylbenzene), poly(S-DVB)-S-NH2 ion-exchange beads (size between 210 and 425 μm) were prepared via suspension polymerization and, were first used as an ion-exchange support for adsorption of human serum albumin (HSA) from aqueous solution. The influence of pH, equilibrium time, ionic strength and initial albumin concentration on the adsorption capacity of the poly(SDVB)-S-NH2 ion-exchange beads has been investigated in a batch system and the unmodified poly(S-DVB) beads were used as control system. Maximum HSA adsorption onto poly(S-DVB)-S-NH2 ion-exchange beads was found to be 63.05 mg/g at pH 7.0. The experimental equilibrium data for HSA adsorption onto poly(S-DVB)-S-NH2 beads was well described by the Langmuir isotherm model. Kinetic parameters of this adsorption system were also analyzed for HSA adsorption onto beads and, the first-order rate equations were favorable. Finally, the poly(S-DVB)-S-NH2 beads was used for the purification of HSA from whole human serum and, the purity of the eluted HSA from the beads was determined as 89% by HPLC from single step purification protocol. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Poly(Styrene-Divinylbenzene) Beads, Hydrazine, Suspension Polymerization, Adsorption, Human Serum Albumin, Kinetic Parameters, Fiber Affinity Membranes, Protein Adsorption, Immunoglobulin-G, Binary-Mixture, Gamma-Globulin, Serum-Albumin, Metal-Ions, Lysozyme, Chromatography, Dye

? Namasivayam, C. and Prathap, K. (2007), Adsorptive removal of silica onto ‘waste’ Fe(III)/Cr(III) hydroxide: Kinetics and isotherms. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **295** (1-3), 55-60.

Full Text: [2007\Col Sur A-Phy Eng Asp295, 55.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp295,%2055.pdf)

Abstract: Removal of silica from aqueous solution by industrial solid ‘waste’ Fe(III)/Cr(III) hydroxide was investigated. Initial pH has no effect on the adsorption of silica in the pH range 4.0-10.0 studied. First, second order and Elovich kinetic models were used to study the adsorption process. The adsorption system followed second order and Elovich kinetics. Langmuir and Freundlich isotherms have been employed to analyze the adsorption equilibrium data. Adsorption process followed Langmuir isotherm. The Langmuir adsorption capacity (Q(0)) was found to be 12.25 mg g-1. Freundlich constants k(f) and n were found to be 2.44 and 2.74, respectively. Silica adsorption in the presence of vanadate, phosphate and selenite was decreased whereas molybdate, thiocyanate, chloride, nitrate and sulfate have shown negligible effect. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Equilibrium, Capacity, Chloride, Equilibrium, Fe(III), Cr(III) Hydroxide, Foreign Ions, Freundlich, Freundlich Constants, Goethite, Industrial, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Models, Molybdate, Nitrate, pH, Phosphate, Range, Removal, Silica, Sorption, Sulfate, Vanadate, Waste, Water

? Oguz, E. (2007), Equilibrium isotherms and kinetics studies for the sorption of fluoride on light weight concrete materials. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **295** (1-3), 258-263.

Full Text: [2007\Col Sur A-Phy Eng Asp295, 258.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp295,%20258.pdf)

Abstract: The sorption kinetics of F- on light-weight concrete materials have been investigated at different pHs, agitation rates and temperatures of solution. The pseudo second-order kinetic model was successfully applied in the removal of fluoride ions from synthetic solution. The optimum values of k(ads) for pH (6.9), temperatures (333 K) and agitation rate (235 rpm) were obtained as 0.300, 0.255 and 0.147 g mg-1 min-1, respectively. The equilibrium time of sorption studies using jar tests was defined as 60 min. The surface area of light weight concrete was 22 m2 g-1. The experimental results have been analyzed using Freundlich, Langmuir, Brunatter, Emet and Teller (BET) and Dubinin-Radushkevich (D-R) sorption isotherm models. From D-R sorption isotherm, the mean energy of sorption was defined as 8.68 kJ mol-1. The sorption activation energy (Ea) was calculated using Arhenius equation. Thermodynamic parameters such as ΔH°, ΔS° and ΔG° were calculated from the slope and intercept of linear plot of In K-D against (1/T). The ΔH° and ΔG° values of fluoride sorption on light weight concrete materials show endothermic heat of sorption. But negative free energy value, indicating that the process of fluoride sorption is favored at high temperatures. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Activation Energy, Adsorption, Aqueous-Solution, Concrete, Donnan Dialysis, Drinking-Water, Energy, Equilibrium, Fluoride, Freundlich, Ions, Isotherm, Isotherm Models, Isotherms, K-D, Kinetic, Kinetic Model, Kinetics, Langmuir, Light, Materials, Model, Models, Parameters, pH, Phosphate, Pseudo-Second-Order, Removal, Sorption, Sorption Isotherm, Sorption Kinetics, Surface, Surface Area, Thermodynamic Parameters

? Şişmanoğlu, T. (2007), Removal of some fungicides from aqueous solution by the biopolymer chitin. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **297** (1-3), 38-45.

Full Text: [2007\Col Sur A-Phy Eng Asp297, 38.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp297,%2038.pdf)

Abstract: The adsorption of 4,4’-iso-propylidene diphenol (BPA), and diphenylolpropane 4,4’-dioxyaceticacid (BPAc) onto chitin has been investigated at 298.15 K. The uptake of BPA and BPAc from aqueous solutions has been determined by UV-visible spectroscopy. Adsorption isothermal data was interpreted by the Freundlich, Langmuir, BET, D-R and F-H equations. The constants of these equations have been determined. The rate of kinetic processes of BPA and BPAc onto chitin was described by using three kinetics adsorption models. The pseudo-first-order model and intraparticle diffusion were the best choice among the kinetic models to describe the adsorption behaviour of BPA and BPAc onto chitin. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Fungicides, Chitin, Adsorption Kinetics, Adsorption Isotherms, Metal-Ions, Adsorption, Kinetics, Equilibrium, Isotherms, Chitosan

? Bayramoğlu, G., Loğoğlu, E. and Arıca, M.Y. (2007), Cytochrome c adsorption on glutamic acid ligand immobilized magnetic poly(methylmethacrylate-co-glycidylmethacrylate) beads. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **297** (1-3), 55-62.

Full Text: [2007\Col Sur A-Phy Eng Asp297, 55.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp297,%2055.pdf)

Abstract: This work presents data on cytochrome c adsorption onto glutamic acid immobilized magnetic poly(methylmethacrylate-coglycidylmethacrylate), mp(GMA-MMA) beads which were synthesized from glycidylmethacrylate (GMA) and methylmethacrylate (MMA) in the presence of a cross-linker (i.e., ethyleneglycol dimethacrylate; EGDMA) via suspension polymerization. The epoxy groups of the mp(GMA-MMA) beads were converted into amino groups after reaction with ammonia and the aminated magnetic beads was activated with glutaric dialdhyde. It was then glutamic acid as an amino acid ligand covalently immobilized on the activated beads. The affinity mp(GMA-MMA)-A-GA beads were used in cytochrome c (Cytc) adsorption studies under defined pH, ionic strength or temperature conditions in a batch system using plain mp(GMA-MMA)-A beads as a control system. The maximum adsorption capacity of the mp(GMA-MMA)-A-GA affinity beads was found to be 140.3 mg g-1 beads and the affinity constant (K-d), evaluated by the Langmuir model, was 5.42×10-6 M. Adsorption capacity of the mp(GMA-MMA)-A-GA were decreased to Cytc by increasing the ionic strength adjusted with NaCl. Adsorption kinetic of Cytc onto magnetic affinity beads was analyzed with first-order and second-order kinetic equations. The first-order equation fitted well with the experimental data. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Magnetic Beads, Affinity Chromatography, Adsorption, L-Glutamic Acid, Cytochrome C, Fiber Affinity Membranes, Bovine Serum-Albumin, Protein Adsorption, Lysozyme Adsorption, Immunoglobulin-G, Gamma-Globulin, Chromatography, Purification, Dye, Nanoparticles

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Full Text: [2007\Col Sur A-Phy Eng Asp297, 105.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp297,%20105.pdf)

Abstract: Non-ionic surfactants have been adsorbed on bentonite (Iran) as a relatively good adsorbent in various temperatures (297-323 K). The experimental data obtained from non-ionic surfactants on bentonite have been fitted into the adsorption isotherm equations such as: Langmuir, Freundlich, Langmuir-Freundlich (Modified Langmuir), Hill, Redlich-Peterson, BET, Halsey, Harkins-Jura, Smith, Henderson, chaung-pfost, oswin, and some modified forms of these isotherms, and their goodness of fit have been compared. in addition, the data has been fitted into the modified bet isotherm which considers the dependency of sorption on the temperature. The correlation coefficient (r(2)) obtained by fitting the experimental data to the Modified Langmuir, Hill, Redlich-Peterson, BET and Modified BET isotherms have been favorably high. The thermodynamic data of Gibbs free energy (Delta G degrees), enthalpy (Delta H degrees) and entropy (Delta S degrees) terms have been determined for the non-ionic surfactant adsorption; the negative values of ΔG° obtained indicates that the non-ionic surfactant adsorption process is a spontaneous one. Finally, the intercalation of surfactant in the interlamellar space was followed by X-ray measurements. 0 2006 Elsevier B.V. All rights reserved.

Keywords: Non-Ionic Surfactant, Isotherm, Bentonite, Thermodynamic Parameters, Modified Langmuir, Modified BET, Linear Alkylbenzene Sulfonate, Aqueous-Solutions, Subsurface Remediation, Water-Interface, Triton X-100, Sorption, Behavior, Soils, Removal, Ethers

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Full Text: [2007\Col Sur A-Phy Eng Asp297, 240.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp297,%20240.pdf)

Abstract: 1,4-Diazabicycle [2.2.2] octane (dabco) silica prepared by grafting (GR-dabco) and sol-gel (SG-dabco) methods were used for removal of Cr(VI) species from aqueous solutions. Full 2(3) factorial designs with two pseudo-central points were carried out in order to achieve the best conditions of batch adsorption procedure for the Cr(VI) anion uptake by the adsorbents. In order to continue the optimizations, central composite surface design was also employed. These two independent statistical designs of experiments leaded to the following conditions: m = 30.0 mg of adsorbent; pH 6.0; t of contact of 180 min to guarantee the equilibration at higher adsorbate concentration. After achieving the best conditions for Cr(VI) adsorption, isotherms of this adsorbate on using the chosen adsorbents were obtained, which were fitted to non-linear Langmuir, Freundlich, and Sips isotherm models. The maximum sorption capacity for Cr(VI) anion adsorption was 63.86 and 79.82 mg g(-1) for using GR-dabco and SG-dabco, respectively. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Anion Adsorption, Aqueous Solutions, Aqueous-Solution, Araucaria-Angustifolia Wastes, Batch, Batch Adsorption, Batch Adsorption Procedure, Batch Conditions, Biosorption, Capacity, Chloride, Composite, Concentration, Cr(VI), Cr(VI) Adsorption, Design, Equilibration, Experiments, Freundlich, Grafting, Hexavalent Chromium, Hybrid Material, Isotherm, Isotherm Models, Isotherms, Langmuir, Methods, Models, Modified Silica Gel, Natural-Waters, pH, Procedure, Removal, Rights, Silica, Silica-Gel, Sol-Gel, Solutions, Sorption, Sorption Capacity, Species, Statistical Design, Statistical Design of Experiments, Surface, T, Uptake

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Full Text: [2007\Col Sur A-Phy Eng Asp298, 129.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp298,%20129.pdf)

Abstract: The sorption characteristics of Cu(II) in an insolubilized humic acid (IHA) mediated column system were investigated at various experimental conditions using a solid phase extraction (SPE) technique. Sodium form of the IHA (INaA) was used as solid phase and sorption behaviors were evaluated by using common adsorption isotherms as well as Scatchard plot analysis. Regeneration, loading, washing and stripping steps of SPE were carried out consecutively, and their progresses were monitored through breakthrough curves obtained from a continuous flow-through cell adapted UV-vis spectrophotometer. So, the breakthrough curves were used to visualize distribution of Cu(II) concentration between mobile phase and solid phase, and amount of the Cu(II) sorbed by INaA was obtained from AAS analysis of effluents collected during the stripping steps of particular run. Thus, from the obtained results, the sorption characteristics and usability of IHA as a solid phase for SPE of metal ions was evaluated in detail. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Insolubilization, Breakthrough Curve, Adsorption, Ion-Exchange, Complexation, Stripping, Scatchard Plot Analysis, Dubinin-Radushkevich, Affinity Chromatographic-Separation, Aqueous-Solution, Metal-Ions, Adsorption, Proteins, Behavior, Nickel, Ligand

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Full Text: [2007\Col Sur A-Phy Eng Asp299, 146.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp299,%20146.pdf)

Abstract: Physico-chemical investigation on adsorption of congo red, an anionic azo dye by chitosan hydrobeads has been carried out. Adsorption process has been found to be dependant on temperature with optimum activity at 30°C. Both ionic interaction as well as physical forces is responsible for binding of congo red with chitosan. Theoretical correlation of the experimental equilibrium adsorption data for congo red-chitosan hydrobeads system would be best explained by linearized form of Langmuir isotherm model. The kinetic results follow pseudo second-order rate equation. pH of the experimental solution influenced congo red adsorption inversely, and similar to 20.0% of the dye could be desorbed from the loaded beads by changing the pH of the solution to alkaline range (similar to pH 12.0). Both sodium chloride and sodium dodecyl sulfate significantly influenced the adsorption process. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activity, Adsorption, Adsorption Process, Aqueous-Solutions, Azo Dye, Azo Dyes, Beads, Binding, Binding Mechanism, Carcinogenic, Chitosan, Chitosan Hydrobeads, Chloride, Color Removal, Congo Red, Correlation, Cost, Dye, Dyestuffs, Effluents, Equilibrium, Interaction, Investigation, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Model, Natural Adsorbents, pH, Physical, Process, Pseudo-Second-Order, Range, Rate Equation, Removal, Sodium, Sodium Dodecyl Sulfate, Sulfate, Temperature, Textile, Textile Dye, Waste-Water, Zeta Potential

? Aravindhan, R., Fathima, N.N., Rao, J.R. and Nair, B.U. (2007), Equilibrium and thermodynamic studies on the removal of basic black dye using calcium alginate beads. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **299** (1-3), 232-238.

Full Text: [2007\Col Sur A-Phy Eng Asp299, 232.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp299,%20232.pdf)

Abstract: The potential use of calcium alginate beads for removal of dyes from colored effluents in dynamic batch mode has been studied. Basic black dye, which is one of the most commonly used dyes in leather industry, has been chosen for the study. The parameters that affect the dye adsorption such as contact time, initial concentration of dye, solution pH and temperature have been investigated and optimized conditions have been determined. Maximum adsorption capacity of 57.70 mg g−1 has been achieved at an initial concentration of 300 mg L−1, with 4 g L−1 of alginate dosage, at pH 4.0 and at room temperature (30 ± 1 °C). Adsorption isotherm studies clearly indicate that the Langmuir isotherm shows a better fit for adsorption of the dye by alginate beads, implying a homogeneous and monolayer binding surface. Kinetic data of adsorption of dye on to calcium alginate beads fits well to pseudo-second order kinetic model. The thermodynamic parameters such as ΔG°, ΔH° and ΔS° have been determined, which indicates a spontaneous endothermic adsorption process.

Keywords: Activated Carbon, Activation Energy, Adsorption, Adsorption Capacity, Adsorption Process, Affect, Alginate, Alginate Beads, Basic Black Dye, Beads, Binding, Calcium, Capacity, Concentration, Dosage, Dye, Dye Adsorption, Dyes, Effluent, Effluents, Equilibrium Isotherm, Gel Beads, Heavy-Metal Biosorption, Homogeneous, Ions, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Model, Monolayer, Parameters, pH, Pith, Process, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Room Temperature, Soils, Solution pH, Sorption, Surface, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2007\Col Sur A-Phy Eng Asp301, 85.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp301,%2085.pdf)

Abstract: A novel adsorbent was prepared by immobilizing Fe(III) onto collagen fiber matrix, and its adsorption to lysozyme was studied. Fe(III) was uniformly dispersed in collagen fibers mainly through chemical reaction and could endure the extraction of water. It was found that the Fe(III)immobilized collagen fiber (FICF) exhibited high adsorption capacity to lysozyme. The adsorption capacity was 395 mg/g at 303 K when initial concentration of lysozyme was 2.5 mg/mL. The adsorption capacity was significantly influenced by pH, and it reached a maximum value around pH 8.0. The adsorption capacity increased with the increase of temperature. The adsorption capacity of lysozyme remarkably decreased when the concentration of NaCl was increased from 0 to 0.25 mol/L. However, the adsorption capacity increased slightly as the concentration of NaCl was further increased. The adsorption isotherms can be described by the Langmuir equation. Further analysis indicated that the adsorption kinetic data can be well fitted by the pseudo-second-order rate model, and the adsorption capacities calculated by the model were consistent with those of the actual measurements. In addition, Fe(III)-immobilized collagen fiber presented excellent column adsorption kinetic properties and high binding capacity. The adsorption behavior of the column was almost unchanged in adsorption-desorption cycles. The purification of lysozyme from chicken egg white powder by using FICF was investigated. The purity of lysozyme obtained was 100%, and recovery extent of lysozyme was 70.5%. (C) 2006 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Behavior, Adsorption Capacities, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetic, Adsorption-Desorption, Adsorption-Desorption Cycles, Analysis, Behavior, Binding, Binding Capacity, Capacity, Chemical, Collagen, Collagen Fiber, Column, Column Adsorption, Concentration, Dye, Extraction, Fe(III), Fibers, Immobilization, Immobilized Nickel Iminodiacetate, Ion-Exchange, Isotherms, Kinetic, Langmuir, Langmuir Equation, Lysozyme, Measurements, Membranes, Metal Affinity-Chromatography, Model, Nacl, Particles, pH, Powder, Properties, Protein Adsorption, Pseudo Second Order, Pseudo-Second-Order, Purification, Rate Model, Reaction, Recovery, Separation, Temperature, Water

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Full Text: [2007\Col Sur A-Phy Eng Asp301, 214.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp301,%20214.pdf)

Abstract: This study involved the investigation of enhancement of chromium biosorption capacity of dead *Aspergillus niger* fungal biomass by pretreatment and its use in a column mode. Cetyl trimethyl ammonium bromide (CTAB) pretreatment exhibited maximum chromium removal. An initial factorial design of experiments showed that factors such as pH of the solution, temperature and biomass mass were important. The kinetics of biosorption of chromium was found to follow Ho pseudo-second order reaction. Isotherm studies conducted at 5±2, 15±2, 22±2, and 30±2°C provided maximum biosorption capacities of 14.5, 15.2, 10.6, and 11.6 mg/g, respectively. The Freundlich isotherm model was found to describe biosorption. Thermodynamic studies indicated that the biosorption reaction was spontaneous and exothermic in nature. Reusability of biomass was examined by the desorption studies, in which NaOH eluted 90% chromium. Data from a column study using CTAB pretreated biomass immobilized in polysulfone matrix followed Yan’s model and the adsorption capacity of the biomass was found to be less than the adsorption capacity obtained in the batch study. Fourier transform infrared spectroscopy analysis indicated that in addition to various functional groups present on the cell wall, the contribution of amino groups towards the biosorption process was evident. (C) 2007 Published by Elsevier B.V.

Keywords: Adsorption, Adsorption Capacity, Ammonium, Analysis, Aqueous Solutions, Aspergillus, *Aspergillus niger*, Batch, Batch Study, Biomass, Biosorption, Biosorption Capacities, Biosorption Capacity, Capacity, Cell Wall, Chromium, Chromium Biosorption, Chromium Removal, Column, Column Studies, Column Study, Cr(VI), Ctab, Dead Fungal Biomass, Design, Desorption, Desorption Studies, Exothermic, Factorial Design, Fourier Transform Infrared Spectroscopy, Freundlich, Freundlich Isotherm, Functional, Functional Groups, Fungal, Fungal Biomass, Groups, Heavy-Metals, Hexavalent Chromium, Immobilized, Infrared Spectroscopy, Investigation, Ions, Isotherm, Isotherm Model, Isotherms, Kinetics, Model, Order, pH, Polysulfone, Pretreated, Pretreatment, Process, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Reaction, Removal, Rhizopus-Arrhizus, Solutions, Sorption, Sorption, Spectroscopy, Temperature, Waste-Water, Wastewaters

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Full Text: [2007\Col Sur A-Phy Eng Asp301, 224.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp301,%20224.pdf)

Abstract: Adsorption studies have been carried out on a newly synthesized tin(IV) phosphate (SnP), a non-fibrous ion exchanger, for alkaline earths and heavy metal ions in different acidic media. Effect of anionic (SDS, SDBS), cationic (CTAB, DPC) and nonionic (TX-100) surfactants has also been studied on its adsorption behaviour. It has been observed that the micelles of anionic and cationic surfactants increase the adsorption of heavy metals [except Hg(II) in SDS] while adsorption of alkaline earths [except Sr(II) in CTAB] remains unaffected. The micelles of nonionic surfactants also increase the adsorption of alkaline earths and heavy metals. These Studies indicate the potential of the material for the removal of ionic pollutant species from aqueous media effectively. (C) 2006 Elsevier B.V. All rights reserved.

Keywords: Non-Fibrous Ion Exchanger, Surfactants, Micelles, Adsorption, Pollution Control, Sodium Dodecyl-Sulfate, Aqueous-Solutions, Micelles, Association, Chloride, Growth, Salts

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Full Text: [2007\Col Sur A-Phy Eng Asp302, 75.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp302,%2075.pdf)

Abstract: Removal of Ni(II) from aqueous solutions by sorption onto Na-rectorite was investigated under ambient conditions. Experiments were carried out as a function of mass content, pH, ionic strength and temperature. The results indicated that the sorption of Ni(II) was strongly dependent on pH value and ionic strength. Sorption of Ni(II) increased with increasing pH and decreasing ionic strength. The sorption of Ni(II) on Na-rectorite was mainly dominated by cation exchange at acidic conditions, whereas surface complexation was the main sorption mechanism at neutral to alkaline pH values. The effect of temperature on Ni(II) sorption on Na-rectorite was negligible at low pH (similar to pH < 6), whereas the effect of temperature was obvious at pH > 6. The thermodynamic parameters (ΔH, ΔS, and ΔG) for Ni(II) sorption onto Na-rectorite were calculated from the temperature dependence, and the results suggested that the sorption reaction was endothermic. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Aqueous Solutions, Cation, Cation Exchange, Chelating Resin, Complexation, Endothermic, Fulvic-Acid, Function, Heavy-Metal Ions, Humic-Acid, Ionic Strength, Kinetic Dissociation, Mechanism, MX-80 Bentonite, Na-Rectorite, Ni(II), pH, pH Dependence, Ph Value, Removal, Rights, Solution, Solutions, Sorption, Sorption Mechanism, Static Magnetic-Field, Strength, Surface, Surface Complexation, Surface-Chemistry, Temperature, Thermodynamic, Thermodynamic Parameters, Value

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Full Text: [2007\Col Sur A-Phy Eng Asp302, 449.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp302,%20449.pdf)

Abstract: The adsorption kinetics of Th(IV) on oxidized multi-wall carbon nanotubes (MWCNTs) was investigated at initial Th(IV) concentrations 32.32 and 64.64 mu mol/L. The kinetic process was described by a pseudo-second-order rate model very well. The adsorption thermodynamics of Th(IV) on oxidized MWCNTs was carried out at 293±2, 303±2, and 323±2 K, respectively, and the thermodynamic parameters, such as equilibrium constant (K-0), standard free energy changes (ΔG°), standard enthalpy change (ΔG°) and standard entropy change (ΔH°), were obtained. The Langmuir model described the data better than the Freundlich isotherm model. Desorption studies indicated that Th(IV) adsorption was reversible and Th(IV) ions could be desorbed from the surface of carbon nanotubes by adjusting the pH values. Oxidized MWCNTs may be a promising candidate for the preconcentration and solidification of Th(IV), or its analogue actinides from large volumes. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Aqueous-Solutions, Carbon, Carbon Nanotubes, Concentrations, Desorption, Desorption Studies, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Constant, Free Energy, Freundlich, Freundlich Isotherm, Hydrogen-Storage, Ions, Isotherm, Isotherm Model, Kinetic, Kinetics, Langmuir, Langmuir Model, Model, Parameters, pH, pH Values, Preconcentration, Process, Pseudo Second Order, Pseudo-Second-Order, Purification, Rate, Rate Model, Red Mud, Removal, Reversible, Room-Temperature, Solidification, Standard, Surface, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Thorium(IV), Water, Zinc(II)

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Full Text: [2007\Col Sur A-Phy Eng Asp306, 95.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp306,%2095.pdf)

Abstract: The interaction of phenol and aniline with the surface of highly microporous ash-free carbon was systematically studied in aqueous solutions in the pH range 3-11 under oxic conditions. The irreversible acid/base response obtained by continuous cyclic fitration in a CO2-free medium can be governed by porosity-controlled diffusion, multi-step surface reactions involving oxygen trapped in the micropores, or incomplete equilibrium. Phenol and ani line are adsorbed most strongly in unbuffered conditions. Due to competitive adsorption of water and the buffer ions only part of the surface area is utilized. According to thermal desorption measurements, physisorption takes place in the whole pH range studied. Chemisorption was detected only when electrostatic interaction is possible. Thermal desorption removes only part of the adsorbed species, leaving behind a morphologically and chemically modified surface. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Thermal Analysis, Surface Properties, Dubinin-Radushkevich Equation, Continuous pK Distribution, Stable Numerical-Solution, Surface-Chemistry, Aqueous-Solutions, Irreversible Adsorption, Integral-Equation, Mechanism, Pyrolysis, Capacity

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Full Text: [2007\Col Sur A-Phy Eng Asp307, 45.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp307,%2045.pdf)

Abstract: In the present study, activated clay was used as adsorbent for the kinetics of 2,4,6-trichlorophenol (TCP) adsorption from aqueous solution in a batch system. Experiments were carried out as a function of solution pH (2-12), solute concentration (30-220 mg/L), and temperature (30-50°C). The equilibrium adsorption data of TCP on activated clay were analyzed by Langmuir, Freundlich and Temkin isotherm models. The results indicate that the Freundlich model provides the best correlation of the experimental data. 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 adsorption of TCP onto activated clay. Isotherms have also been used to obtain the thermodynamic parameters such as free energy. enthalpy and entropy of adsorption. Adsorption of TCP is exothermic reaction with ΔH°at -9.37 kJ/mol. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4.6-Trichlorophenol, Activated Clay, Activated Clays, Adsorbent, Adsorption, Adsorption From Aqueous Solution, Adsorption Isotherm, Aqueous Solution, Aqueous-Solution, Batch, Batch System, Carbon, Cationic Surfactant, Chlorophenols, Clay, Concentration, Concentrations, Correlation, Diffusion, Diffusion Models, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Adsorption, Exothermic, Experimental, Experimental Data, Fly-Ash, Free Energy, Freundlich, Freundlich Model, Function, Intraparticle Diffusion, Isotherm, Isotherm Models, Kinetic, Kinetic Models, Kinetics, Langmuir, Model, Models, Parameters, pH, Phenol, Pseudo Second Order, Pseudo-Second-Order, Reaction, Removal, Solute Concentration, Solution pH, Sorption, Temkin Isotherm, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2007\Col Sur A-Phy Eng Asp307, 128.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp307,%20128.pdf)

Abstract: Palm shell activated carbon (AC) was impregnated with low (LMW) and high molecular weight (HMW) polyethyleneimine (PEI) via batch adsorption. The maximum amount of LMW PEI adsorbed on AC was determined to be approximately 425 mg/g carbon while the maximum adsorbed HMW PEI was 2.8 mg/g carbon. The LMW PEI adsorption data fitted the Langmuir isotherm better than the Freundlich isotherm. The PEI impregnated AC were characterized via nitrogen adsorption, scanning electron microscopy, elemental analysis, thermogravimetric, Fourier transform infra red and pH drift analyses. Only LMW PEI could be successfully impregnated as monolayers on the surface of the micropores. This impregnation leads to drastic reduction of surface area and pore volume whereas impregnation of HMW PEI does not significantly affect the physical characteristics of the AC. LMW PEI impregnation appears to enhance Cd2+ adsorption capacity of the AC while HMW PEI impregnation is found to have an opposite effect. This result shows that LMW PEI impregnation technique may have the potential to improve the batch adsorption capacity of AC for other transition metal ion adsorption as well. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Capacity, Analysis, Aqueous-Solutions, Batch, Capacity, Carbon, Cd2+, Characterization, Chloride, Copper, Cyanide, Freundlich, Freundlich Isotherm, Impregnation, Ions, Isotherm, Langmuir, Langmuir Isotherm, Nitrogen, Palm Shell, Palm Shell Activated Carbon, pH, Polyethyleneimine, Pore, Pore Volume, Reduction, Removal, Surface Area, Surface Modification, Volume, Waste, Water, Weight

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Full Text: [2007\Col Sur A-Phy Eng Asp308, 1.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp308,%201.pdf)

Abstract: Adsorption kinetics of nitrate from aqueous solutions onto modified wheat residue was studied. The wheat residue was modified by epichlorohydrin in the presence of pyridine and the adsorption kinetics was investigated in batch experiment. The results showed the modified wheat residue had great anion adsorbing capacity, the zeta potentials of RWR and MWR were -35 mV and +40 mV, the maximum adsorption capacity of RWR and MWR were 0.02 mmol g-1 and 2.08 mmol g-1, respectively. And also, the adsorption can reached equilibrium in 20 min, the adsorption data fit Freundlich isotherm model. The kinetic data were fitted using the pseudo-first-order equation, the pseudo-second-order equation and the intra-particle diffusion model. The results showed that the pseudo-second-order equation and the intra-particle diffusion model generated the best agreement with the experimental data for the adsorption systems. The intra-particle diffusion was the main rate-controlling step. With the increasing initial concentration, the rate constant of pseudo-second-order equation decreased and rate constant of intra-particle diffusion model increased. The adsorption kinetic analyses could be of a great practical value for the technological applications of nitrate removal from aqueous solutions. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Kinetic, Adsorption Kinetics, Adsorption Systems, Anion, Anion-Exchangers, Applications, Aqueous Solutions, Batch, Batch Experiment, Capacity, Concentration, Diffusion, Diffusion Model, Epichlorohydrin, Equilibrium, Experiment, Experimental, Experimental Data, Freundlich, Freundlich Isotherm, Intra Particle Diffusion, Intra-Particle Diffusion, Intra-Particle Diffusion Model, Intraparticle, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherm Model, Kinetic, Kinetics, Model, Modified, Modified Wheat Residue (MWR), Nitrate, Nitrate Removal, Phase, Pseudo Second Order, Pseudo-First-Order, Pseudo-First-Order Equation, Pseudo-Second-Order, Pseudo-Second-Order Equation, Pyridine, Rate, Rate Constant, Raw Wheat Residue (RWR), Reactive Dyes, Removal, Residue, Solutions, Value, Wheat, Zeta Potentials

? Castelijns, H.J., Huinink, H.P. and Zitha, P.L.J. (2007), Characterization of interfacial effects during reactive transport with MRI methods. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **309** (1-3), 151-158.

Full Text: [2007\Col Sur A-Phy Eng Asp309, 151.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp309,%20151.pdf)

Abstract: The alkoxysilane tetramethylorthosilicate (TMOS) is soluble and chemically stable in oil. Nevertheless, when a mixture of oil and TMOS is brought into contact with water, the compound is transferred from the oil phase into the water phase where it undergoes hydrolysis and, subsequently, the products of the hydrolysis condense into a gel. The coupled mass transfer and gelation processes give rise to an intriguing motion of the inter-face between the oleic and the aqueous phases. This phenomenon was analyzed in detail both theoretically and experimentally. The theory was developed assuming quasi-static conditions and provides a non-linear second-order boundary value problem, which was treated numerically. The experiments were done using magnetic resonance imaging (MRI) to quantify the fluids in the oil and water phases and capture the interface profiles between the oil and the water phases at time intervals. The mass transfer is complete after several hours. An excellent fit of the theoretical interface profiles to the experimental ones at various times reveals that the interfacial tension increases gradually during the extent of the mass transfer. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption-Kinetics, Alkylphosphine Oxides, Boundary, Drop, Effects, Experimental, Experiments, Gel, Gelation, Hydrolysis, Imaging, Interface, Interfacial Tension, Liquid Interfaces, Magnetic, Magnetic Resonance, Magnetic Resonance Imaging, Mass, Mass Transfer, Mass-Transfer, Methods, Mixture, Mixtures, Motion, MRI, Non-Linear, Nonlinear, Oil, Products, Profiles, Reactive Transport, Resonance, Second Order, Systems, Tension, Theory, Time, Transfer, Transport, Two-Phase System, Value, Water, Water, Hexane Interface

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Full Text: [2007\Col Sur A-Phy Eng Asp310, 20.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp310,%2020.pdf)

Abstract: The sorption of Methyl Orange by chitosan crosslinked particles was approached using equilibrium and kinetic analyses at different pH’s. Besides the standard pseudo-order analysis normally effectuated (i.e. pseudo-first order and pseudo-second order), a novel approach involving a pseudo-nth-order kinetics was used, n being determined via non-linear regression, using the Levenberg–Marquardt method. Zeta potential measurements indicated that electrostatic interactions were important for the sorption process. Regarding equilibrium experiments, data were well fitted to a hybrid Langmuir–Freundlich isotherm. Considering the kinetics of sorption, although a pseudo-nth-order description yielded good fits, a kinetic equation involving diffusion–adsorption phenomena was found to be more consistent, in terms of a physicochemical description of the sorption process.

Keywords: Acid Dyes, Adsorption Behavior, Analysis, Anionic, Anionic Dye, Aqueous-Solution, Beads, Chitosan, Crosslinked, Dye, Electrostatic, Electrostatic Interactions, Equilibrium, Experiments, Hybrid, Interactions, Isotherm, Kinetic, Kinetic Equation, Kinetics, Kinetics of Sorption, Langmuir-Freundlich, Langmuir-Freundlich Isotherm, Measurements, Metal-Ions, Method, Methyl Orange, Model, Non-Linear, Non-Linear Regression, Nonlinear, Nonlinear Regression, Order, Particles, Physicochemical, Polyelectrolyte Complexes, Potential, Process, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Reactive Dye, Regression, Removal, Sorption, Sorption Isotherm, Sorption Kinetics, Standard

? Bayramoğlu, G., Ekici, G., Beşirli, N. and Arıca, M.Y. (2007), Preparation of ion-exchange beads based on poly (methacrylic acid) brush grafted chitosan beads: Isolation of lysozyme from egg white in batch system. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **310** (1-3), 68-77.

Full Text: [2007\Col Sur A-Phy Eng Asp310, 68.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp310,%2068.pdf)

Abstract: Poly(methacrylic acid) brush grafted crosslinked-chitosan (chitosan-g-poly(MAA)) beads were prepared in two sequential steps: in the first step, chitosan beads were prepared by phase-inversion technique and then were crosslinked with epichlorohydrin under alkaline condition; in the second step, the graft copolymerization of methacrylic acid onto the chitosan beads was initiated by ammonium persulfate (APS) under nitrogen atmosphere. The chitosan-g-poly(MAA) beads were first used as an ion exchange support for adsorption of lysozyme (LYZ) from aqueous solution. The influence of pH, equilibrium time, ionic strength and initial LYZ concentration on the adsorption capacity of the chitosan-g-poly(MAA) ion-exchange beads has been investigated in a batch system. Maximum LYZ adsorption onto chitosan-g-poly(MAA) beads was found to be 65.7 mg/g at pH 6.0. The experimental equilibrium data obtained LYZ adsorption onto chitosan-g-poly(MAA) ion-exchange beads fitted well to the Langmuir isotherm model. Kinetics parameters of this adsorption system were also analyzed by using the equilibrium experimental data. The result of kinetic analyzed for LYZ adsorption onto ion-exchange beads showed that the second order rate equation was favourable. Finally, the chitosan-g-poly(MAA) ion-exchange beads were used for the purification of LYZ from egg white in batch system and the purity of the eluted LYZ from ion-exchange chitosan-g-poly(MAA) beads was determined as 94% by HPLC from single step purification. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Adsorption, Adsorption Capacity, Alkaline, Ammonium, Aps, Aqueous Solution, Atmosphere, Batch, Batch System, Beads, Capacity, Cellulose Fibers, Chitosan, Chitosan Beads, Chitosan-G-Poly(MAA) Beads, Concentration, Condition, Copolymerization, Crosslinked, Dye, Egg White, Epichlorohydrin, Equilibrium, Equilibrium Data, Equilibrium Time, Experimental, Experimental Data, Graft, Graft Copolymerization, Grafted, Hplc, Influence Of Ph, Ion, Ion Exchange, Ion-Exchange, Ion-Exchange Chromatography, Ionic Strength, Isotherm, Isotherm Model, Kinetic, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Langmuir-Isotherm, Lysozyme, Membranes, Metal Affinity-Chromatography, Methacrylic Acid, Microspheres, Model, Nitrogen, Order, Parameters, Persulfate, pH, Poly(Acrylic Acid), Protein-Binding, Purification, Rate, Rate Equation, Second Order, Separation, Strength, Support, Thermodynamic Parameters, Time

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Full Text: [2007\Col Sur A-Phy Eng Asp311, 180.pdf](2007/Col%20Sur%20A-Phy%20Eng%20Asp311,%20180.pdf)

Abstract: Mutual effect of nickel(II) and oxyethylated higher fatty alcohols CnH2n+1O(C2H4O)mH (nonionic surfactants ALM-10 at n of 12-14, m similar to 10 and OS-20 at n similar to 18, m similar to 20) on kinetics and equilibrium of their cosorption, needed for designing the industrial adsorption columns, has been investigated to establish the adequacy of polyacrylic acid-functionalized cation exchanger Duolite ES-468 for the treatment of nickel plating rinse water in closed loop systems. Mutual effect depends on the length of hydrophobic chain (number of carbon atoms in alkyl tail n) and the length of hydrophilic chain (oxyethylation degree, number Of -C2H4O- head groups m in the molecule of nonionic surfactant), and is affected by the solution acidity. External mass transfer of ALM-10 through the liquid film, surrounding the bead of cation exchanger, proceeds faster than that of OS-20, although is slower than that of nickel(II).

Mutual interference with the external mass transfer, arising from the simultaneous film diffusion of not only nickel(II) free cations and ALM-10 free molecules but also their associates, has been observed. although the action of nickel(II) onto the external mass transfer of os-20, having the oxyethylation degree and mean molecular mass twice as high as those of ALM-10, was insignificant.

Effective intraparticle diffusivity (D-ef), determined using Vermeulen model, valid for the whole range of the fractional attainment of equilibrium, is considerably higher for OS-20 than that for ALM-10. The action of nickel(II) promotes the intraparticle diffusion of ALM-10 but hinders that of OS-20. Intraparticle diffusion of nickel(II) is enhanced greatly by the action of ALM-10 and OS-20. Kinetic curves refer to the monolayer sorption, corresponding to Lagergren pseudo-first-order kinetic equation; equilibrium specific sorption (a(eq)) of nickel(II) and nonionic surfactants, predicted using Lagergren model, corresponds to that, determined experimentally.

On increasing the solution ph from 3 to 5 the sorption of nonionic surfactant, proceeding by hydrogen bonding of oxygen in -C2H4O- head groups with hydrogen in protonated carboxyl groups decreases, whereas the sorption of nickel(II), proceeding mostly by ion exchange, increases. a(eq) of ALM-10, having length of alkyl tail and degree of oxyethylation twice as low as those of OS-20, is higher, and at low concentration (C < 0.5C(0)) breakthrough the break point occurs later than that of OS-20. The action of nickel(II) results in an increase in a(eq) for both ALM-10 and OS-20.

Duolite ES 468 cation exchanger is applicable for recycling wastewater, containing nonionic surfactant and nickel(II), including nickel plating rinse water, preventing pollution of environment with heavy metal(II) and nonionic surfactant, and reducing water consumption. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Nonionic Surfactant, Nickel(II), Cation Exchanger, Cosorption Kinetics, Equilibrium, Aqueous-Solution, Sorption, Removal, Water

? Kara, H., Ayyildiz, H.F. and Topkafa, M. (2008), Use of aminoprophyl silica-immobilized humic acid for Cu(II) ions removal from aqueous solution by using a continuously monitored solid phase extraction technique in a column arrangement. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **312** (1), 62-72.

Full Text: [2008\Col Sur A-Phy Eng Asp312, 62.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp312,%2062.pdf)

Abstract: Humic acid (HA) which originated from Leonardite was purified and immobilized onto aminoprophyl silica (APS). Afterwards, the remaining amino groups on the silica are successfully end-capped using acetic anhydride in DMF media and this material was used for Cu(II) ions removal from aqueous solution by using continuously solid phase extraction (SPE) technique in a column arrangement. The sorption characteristics of Cu(II)-immobilized humic acid (ImHA) system were investigated at various experimental conditions, and output was observed by a UV detector. All solid phase extraction (SPE) steps were monitored through breakthrough curves used to visualize distribution of Cu(II) concentration between mobile phase and solid phase. In addition to this, the solutions collected from stripping steps were analyzed in atomic absorption spectrophotometry (AAS) and the amount of adsorbed Cu(II) ions was calculated. It was found that there was a high correlation (R2 = 1) between the peak area and AAS data of stripping steps. Sorption characteristics were evaluated by using Freundlich, Langmuir, and Dubinin-Radushkevich (D-R) adsorption isotherms, as well as by Scatchard plot analysis. Thus, the sorption characteristics and usability of ImHA as a solid phase for SPE of Cu(II) ions was evaluated in detail. From the obtained results, it was seen that sorption mechanism of Cu(II) fits to Langmuir model on a large scale, sorption was thought to be localized. From D-R isotherm mean free energy of sorption (E) was calculated (17.68 kJ mol-1), and it was deduced that chemical interactions were more effective than physical interactions for Cu(II). This investigation provides a new, environmentally friendly and cost-effective possibility to remove Cu(II) ions from aqueous solution by using the new APS-ImHA material. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Immobilized Humic Acid, Solid Phase Extraction, Breakthrough Curves, Copper, Ion-Exchange, Adsorption Isotherms, Freundlich, Langmuir, Scatchard, Plot Analysis Dubinin-Radushkevich, Heavy-Metals, Fulvic-Acid, Sorption, Biosorption, Complexes, Copper, Water, Lead, Dissociation, Equilibrium

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Full Text: [2008\Col Sur A-Phy Eng Asp312, 131.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp312,%20131.pdf)

Abstract: Carbon molecular sieves (CMS) have been prepared from locally available palm shell of Tenera type by a thermal treatment technique involving carbonization followed by steam activation and benzene deposition technique. Carbonization of the dried palm shells was done at 900 degrees C for duration of 1 h followed by steam activation at 830 degrees C for 30-420 min to achieve activated carbons with different degree of burn-offs. The highest micropore volume of activated carbon obtained at 53.2% burn-off was found suitable to be used as a precursor for CMS production. Subsequent benzene deposition onto activated samples at temperature range from 600 to 900 degrees C for various benzene concentrations have resulted in a series of CNIS with different kinetic selectivities. The molecular sieving behaviour of the CNIS products was assessed by kinetic adsorption isotherms of O-2, N-2, CO2 and CH4 at room temperature. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Benzene, Benzene Deposition, Bituminous Coal, Burn-Off, Carbon, Carbon Molecular Sieves, Carbonization, Carbons, Co2, Coke Deposition, Duration, Isotherms, Kinetic, Kinetic Adsorption, Kinetics, Methane, Micropore Volume, Molecular Sieves, N2, O-2, Palm Shell, Pore-Size, Precursor, Production, Pyrolysis, Separation, Temperature, Thermal Treatment, Treatment, Volume

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Full Text: [2008\Col Sur A-Phy Eng Asp313, 292.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp313,%20292.pdf)

Abstract: Ordered nanoporous carbons (CMK-3) with submicron-scale particle size were functionalized with carboxymethylated polyethyleneimine (CMPEI) as a new uranium loading material to increase uranium adsorption capacity, and characterized by Fourier transform-infrared spectroscopy (FT-IR) and powder X-ray diffraction (XRD). The adsorption isotherm of uranvl ions on the functionalized carbons was examined and evaluated using the Langmuir adsorption isotherm model. It was found that the adsorption of uranyl ions on the functionalized carbons follows the Langmuir isotherm model. The maximum uranium adsorption capacity of the adsorbent by the Langmuir model was calculated to be 151.5 mg U/g adsorbent. The loading stability of uranium on the adsorbent was examined at pH 4. It was observed that about 30% of uranium was released from CMPEI/CMK-3 within a day, however, uranium contents almost linearly decreased with a low desorption rate from I to 20 days. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Nanoporous Carbons, Uranium Loading, Functionalized Carbons, Carboxymethylated Polyethyleneimine (CMPEI), Uranyl Ions, Silica-Gel, Polyethyleneimine, Removal, Extraction, Polymers

? Hameed, B.H., Mahmoud, D.K. and Ahmad, A.L. (2008), Sorption of basic dye from aqueous solution by pomelo (*Citrus grandis*) peel in a batch system. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **316** (1-3), 78-84.

Full Text: [2008\Col Sur A-Phy Eng Asp316, 78.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp316,%2078.pdf)

Abstract: A new, low-cost, locally available sorbent, pomelo (Citrus grandis) peel (PP), was tested for its ability to remove basic dye (Methylene blue) from aqueous solutions. Adsorption equilibrium and kinetics of Methylene blue (MB) from aqueous on PP were studied in a batch process. The equilibrium data were analyzed using the Langmuir, Freundlich, and Temkin isotherm models. Sorption equilibrium studies demonstrated that the biosorption followed Langmuir isotherm model. The monolayer adsorption capacity was 344.83 mg/g at 30°C. Kinetic analyses were conducted using pseudo-first-, second-order and intraparticle diffusion models. It was found that the sorption kinetics of MB on PP obeyed pseudo-second-order sorption kinetics. The results in this study indicated that pomelo peel was an attractive candidate for removing MB from aqueous solutions. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous Solutions, Ash, Basic Dye, Biosorption, Capacity, Diffusion, Dye, Equilibrium, Equilibrium, Fiber, Isotherm, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Methylene Blue, Methylene-Blue Biosorption, Model, Models, Monolayer, Peat, Pomelo Peel, Removal, Rights, Solution, Sorption, Violet

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Full Text: [2008\Col Sur A-Phy Eng Asp316, 297.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp316,%20297.pdf)

Abstract: Two silica based hybrid materials containing the chelating Si - O - (CH2)3 - NH - R - NH2 group, where R is - (CH2)3 - or - (CH2)6 - designed as AAH Si and AAD Si, respectively, were obtained with almost similar organic content, by using the sol-gel method under the same experimental conditions. The adsorbent materials were characterized by FTIR spectroscopy and N2 adsorption - desorption isotherms. The adsorbent materials were employed for Pb(II) uptaking using batch adsorption procedure. Kinetic studies were carried-out, and showed that the metal uptake followed better the pseudo-second order kinetic model. The pseudo-second order constant rate obtained by using a 20.0 mg l-1 Pb(II) were 0.0117 and 0.0252 g mg-1 min-1 for AAH Si and AAD Si, respectively. Equilibrium adsorption isotherms were obtained. The values were fitted to non-linear Langmuir, Freundlich, Sips and Redlich - Peterson isotherm models. With exception of Freundlich isotherm, all the models were suitably fitted. The maximum adsorption capacity for Pb(II) using AAH Si and AAD Si were 36.64 and 30.27 mg g-1, respectively. The higher adsorption capacity for AAH Si could be attributed mainly to the larger pore diameter and pore volume and higher surface area. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solutions, Atomic-Absorption-Spectrometry, Capacity, Desorption, Equilibrium, Experimental, Freundlich Isotherm, FTIR, Grafted Silica-Gel, Hybrid Xerogel, Isotherm, Isotherms, Kinetic, Langmuir, Lead(II), Metal, Metal Uptake, Metal-Ion Collector, Model, Models, Non-Linear Equilibrium Isotherm Fitting, Organofunctionalized Silica, Pb(II), Polysilsesquioxanes, Pseudo-Second Order, Rights, Silica, Sol-Gel, Sorption Capacity, Spectroscopy, Statistical Design, Waters

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Full Text: [2008\Col Sur A-Phy Eng Asp317, 71.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp317,%2071.pdf)

Abstract: Adsorption of Fe(III), Co(II) and Ni(II) from aqueous solution on kaolinite and montmorillonite, intercalated with zirconium oxychloride (ZrOCl2 center dot 8H2O)Si investigated in this work. The study is carried out under different environmental conditions obtained by varying pH, concentration of the metal ions, amount of adsorbent, interaction time and temperature. The adsorption is rapid with equilibrium approaching within 300 min for Fe(III), 240 min for Co(II) and 180 min for Ni(II). Second order kinetics gives a better explanation of the rate processes and ZrO-montmorillonite has a larger adsorption capacity than that of ZrO-kaolinite for all the metal ions. The Langmuir monolayer capacity also shows big differences between ZrO-kaolinite and ZrO-montmorillonite, the average values for ZrO-kaolinite and ZrO-montmorillonite being 9.7 and 23.8 mg g-1 with respect to Fe(III), 9.6 and 22.8 mg g-1 for Co(II), and 8.8 and 22.0 mg g-1 for Ni(II), respectively. ZrO-kaolinite interacts endothermically with Co(II) while all the other interaction, are exothermic. The results have shown good potentiality for ZrO-clays to be used as adsorbents for Fe(III), Co(II), and Ni(II) ions in aqueous medium. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Aqueous Solution, Capacity, Chemical Activation, Co(II) and Ni(II), Copper, Environmental, Equilibrium, Explanation, Fe(III), Heavy-Metal, Interaction, Ions, Kaolinite, Kinetic-Models, Kinetics, Langmuir, Metal, Metal Ions, Monolayer, Montmorillonite, Ni(II), pH, Pillared Clays, Removal, Rights, Solution, Sorption, Synthesis Parameters, Temperature, Thermodynamics, Waste-Water, Work, Zro-Clay

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Full Text: [2008\Col Sur A-Phy Eng Asp317, 164.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp317,%20164.pdf)

Abstract: The potential of titanate nanotubes (TNT) to remove basic dye (Basic Violet 3, BV3) from aqueous solution through a cation exchange mechanism was investigated. TNT was prepared via a hydrothermal treatment of TiO2 powders in a 10 M NaOH solution at 150°C for 24 h, and subsequently washed with HCl aqueous solution of different concentrations. Effects of the remnant sodium contents on the microstructures of TNT were characterized with transmission electron microscopy (TEM), X-ray diffraction (XRD), and nitrogen adsorption-desorption isotherms. It was found that if the sodium did not undergo complete proton exchange, the removal of sodium increased the specific surface area and pore volume of the TNT. When the sodium content of the TNT was approximately 0 wt.% (after a nearly-complete proton exchange), the nanotubular structure of the titanates might be destroyed, accompanied by a sharp decrease in the specific surface area and pore volume. Effects of the alteration of microstructures, induced by the acid washing process, on the BV3 removal performance of TNT were discussed. Moreover, the removal mechanisms of basic dye from aqueous solution onto TNT were examined with the aid of model analyses of the adsorption equilibrium and kinetic data of BV3. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Basic Dye, Cation Exchange, Methylene-Blue, Montmorillonite, Photocatalytic Activity, Removal, Rice Husk, Sodium, Sorption, Surface, Titanate Nanotubes, Waste-Water

? Gök, Ö., Özcan, A., Erdem, B. and Özcan, A.S. (2008), Prediction of the kinetics, equilibrium and thermodynamic parameters of adsorption of copper(II) ions onto 8-hydroxy quinoline immobilized bentonite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **317** (1-3), 174-185.

Full Text: [2008\Col Sur A-Phy Eng Asp317, 174.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp317,%20174.pdf)

Abstract: In this study, the chelating agent of 8-hydroxy quinoline (HQ) was firstly used for the immobilization of bentonite and then it was used for the adsorption of copper(II) ions from aqueous solutions. The parameters of pH, contact time, adsorbent and initial copper(II) ions concentrations and temperature were investigated in the adsorption experiments. The surface characterization of both natural- and HQ-immobilized bentonite was undertaken using FTIR spectroscopic technique. The XRD, elemental and thermal analyses were also carried out to observe the intercalation of HQ between bentonite layers. The kinetic parameters were calculated from the experimental data and it was shown that they could be fitted well to the pseudo- second-order kinetic model. The adsorption data obtained were well described by the Langmuir adsorption isotherm model. The maximum adsorption capacity was found to be 56.55 mg g-1 from the Langmuir isotherm model at 50°C. The thermodynamic parameters such as Delta G degrees, which are all negative, indicated that the adsorption of copper(II) ions onto HQ-bentonite is spontaneous and the positive value of ΔH° (+17.18 kJ mol-1) shows that the adsorption is physical in nature. The results show that HQ-immobilized bentonite is the effective adsorbent for the removal of heavy metal contaminants. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Aqueous Solutions, Aqueous-Solutions, Bentonite, Capacity, Characterization, Copper, Copper(II), Cu(II), Desorption Characteristics, Equilibrium, Experimental, Experiments, FTIR, Heavy Metal, Heavy-Metal Cations, Immobilization, Immobilized, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Metal, Model, Natural Zeolites, pH, Removal, Rights, Sepiolite, Surface Modification, Temperature, Thermodynamic Parameters, XRD

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Full Text: [2008\Col Sur A-Phy Eng Asp317, 277.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp317,%20277.pdf)

Abstract: The surface of coir pith, an agricultural solid waste, was modified using a cationic surfactant hexadecyltrimethylammonium bromide. Adsorption of two dyes namely Direct Red 12B (acidic dye) and Rhodamine B (basic dye) on surfactant-modified coir pith has been investigated in a series of batch adsorption experiments. Effects of process variables such as contact time, concentration of the dyes, adsorbent dose, temperature and pH have been studied to understand the kinetic and thermodynamic parameters of the process. Kinetics of adsorption obeyed second order rate equation. Equilibrium adsorption data were fitted into the Langmuir, Freundlich and Dubinin and Radushkevich isotherms and the system followed all the three-adsorption isotherms. It was found that modified coir pith yields adsorption capacity of 76.3 mg g-1 and 14.9 mg g-1 for Direct Red 12B and Rhodamine B, respectively. Chemisorption might be responsible for the uptake of dyes. The adsorbent was also tested for the removal of dyes from synthetic effluent. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Agricultural Solid Waste, Basic Dye, Basic-Dyes, Behavior, Capacity, Carbon, Coir Pith, Dye, Dyes, Equilibrium, Experiments, Freundlich, Isotherms, Kinetic, Kinetics, Langmuir, pH, Removal, Rights, Sorption, Surfactant, Temperature, Thermodynamic Parameters, Water

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Full Text: [2008\Col Sur A-Phy Eng Asp317, 344.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp317,%20344.pdf)

Abstract: Nitrilotriacetic acid (NTA) adsorption onto sawdust activated carbon was studied. The adsorption process was highly pH dependent and has been explained on the basis of pH(zpc) and speciation of NTA in aqueous solution. In order to optimize the adsorption process, effect of pH, contact time, adsorbent dose, and ionic strength were studied using batch experiments. Equilibrium studies were per-formed to evaluate the adsorption capacity and adsorption energy of SDAC for the removal of NTA from aqueous phase. Langmuir model best describes the equilibrium adsorption data than Freundlich model. Ionic strength also played an important role in the process of adsorption and lower ionic strength favoured NTA adsorption. The mechanism of NTA adsorption onto SDAC was explained by inner sphere mechanism. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Nitrilotriacetic Acid, Adsorption, Activated Carbon, Sawdust, Steam Pyrolysis, Coir Pith Carbon, Heavy-Metals, Solid-Waste, Removal, Water, Equilibrium, Organics, Anions, Charge, Oxide

? Tan, I.A.W., Ahmad, A.L. and Hameed, B.H. (2008), Enhancement of basic dye adsorption uptake from aqueous solutions using chemically modified oil palm shell activated carbon. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **318** (1-3), 88-96.

Full Text: [2008\Col Sur A-Phy Eng Asp318, 88.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp318,%2088.pdf)

Abstract: The effect of hydrochloric acid (HCl) treatment of activated carbon prepared from oil palm shell on Methylene blue (MB) adsorption was investigated. The Fourier transform infrared spectroscopy (FTIR) measurements showed that the surface chemistry of the activated carbon was influenced by the acidic treatment. Adsorption equilibrium data were fitted to the Langmuir, Freundlich and Dubinin-Radushkevich isotherm models. The equilibrium data for both the untreated and HCl-treated activated carbons were best represented by the Langmuir isotherm. The adsorption capacity of HO-treated activated carbon was 303.03 mg/g, which was 24.24% higher compared to the untreated activated carbon. The kinetic data were found to follow closely the pseudo-second-order model for both activated carbons. Various thermodynamic parameters such as standard enthalpy (Delta H degrees), standard entropy (Delta S degrees) and standard free energy (Delta G degrees) were evaluated. The adsorption of MB on the HCl-treated activated carbon was found to be endothermic in nature and was favoured by using a higher solution pH. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Acid Treatment, Activated Carbon, Activated Carbons, Adsorption, Aqueous Solutions, Basic Dye, Capacity, Carbon, Chemistry, CO2 Gasification, Dye, Endothermic, Entropy, Equilibrium, Equilibrium, Fiber, Freundlich, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Methylene Blue, Methylene-Blue Adsorption, Model, Models, Oil Palm Shell Activated Carbon, pH, Phosphoric-Acid, Pore, Pseudo-Second-Order Model, Removal, Rights, Sawdust, Solution, Spectroscopy, Standard, Surface Chemistry, Thermodynamic, Thermodynamic Parameters, Treatment, Waste-Water

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Full Text: [2008\Col Sur A-Phy Eng Asp318, 169.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp318,%20169.pdf)

Abstract: In this work, mesoporous silica (MCM-41) was modified by triethanolamine (TEA) by a wet impregnation method. The structure and morphology of modified MCM-41 particles were characterized by X-ray diffraction, N-2 adsorption/desorption, Fourier-transform infrared spectra, scanning electron microscopy, particle size analyzer and thermogravimetric analysis. The results show that the interior channels of MCM-41 are modified by TEA without destroying its mesoporous structure. Further, pure MCM-41 and TEA-modified particles were adopted as dispersed phase in silicone oil for electrorheological (ER) investigation. The TEA-MCM-41 (modified with 7 wt.% TEA)-based ER fluid with a volume fraction of 5% exhibits stronger ER activity than pure MCM-41 fluid. The possible mechanism related to dielectric properties is also provided. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Analysis, Behavior, Channels, Conducting Polypyrrole, Dielectric Properties, Electrorheological Fluid, Impregnation, Liquid, MCM-41, Mechanism, Mesoporous Silica, Microscopy, Modified, Nanocomposite, Particles, Polyaniline, Silica, Suspensions, Triethanolamine, X-Ray Diffraction

? Zhang, S.Q. and Hou, W.G. (2008), Adsorption behavior of Pb(II) on montmorillonite. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **320** (1-3), 92-97.

Full Text: [2008\Col Sur A-Phy Eng Asp320, 92.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp320,%2092.pdf)

Abstract: The present work investigated the adsorption and desorption behaviors of Pb(II) on montmorillonite. The adsorption experiments were carried out using batch process. The results show that the adsorption is dependent on the pH value of the medium, and the uptake of Pb(II) increases with the pH increasing in the pH range of 2.0-10.0. The adsorption kinetics is in better agreement with pseudo-second order kinetics, and the adsorption data is a good fit with Langmuir isotherm. The presence of EDTA may result in a decrease of the amount of Pb(II) adsorbed. The presence of electrolyte and EDTA may enhance the desorption of Pb(II) ions adsorbed. The adsorption mechanism of Pb(II) on montmorillonite may be explained in two aspects: the chemical binding between Pb(II) ions and surface hydroxyl groups; and the electrostatic binding between Pb(II) ions and the permanent negatively charged sites of montmorillonite. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Adsorption Mechanism, Aqueous-Solutions, Batch Process, Behavior, Complexation, Desorption, EDTA, Experiments, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lead, Lead(II), Mechanism, Mechanisms, Montmorillonite, Oxide-Solution Interfaces, Pb(II), Pb(II) Ions, Peat, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Rights, Sorption, Work

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Full Text: [2008\Col Sur A-Phy Eng Asp320, 161.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp320,%20161.pdf)

Abstract: This research focuses on removal of Fe(III) from aqueous solution using chitosan-magnetite nanocomposites as potential sorbent. The presence of nanosized magnetic particles within the nanocomposites was confirmed by TEM and SAED analysis. The particles with diameter 508 mu m and 84 mu m, follow Frendlich sorption isotherm at 30°C, and the Frendlich constants (K-P, 1/n) have been found to be 5.974 mg g-1, 2.66 and 35.98 mg g-1, 1.385, respectively. Out of various kinetic models, the experimental data for dynamic uptake of Fe(III) is best fitted on ‘pseudo-second order’ kinetic model. The linear nature of plots between log (% sorption) and log (time) is indicative of intra-particle diffusion. For the particles with diameters 508 mu m and 84 mu m, the value of k(id) was found to be 1.78 mg l-1 min-0.5 and 2.13 mg l-1 min-0.5. The sorption mean free energy from the Dubinin-Radushkevic isotherm was found to be 7.04 kJ mol-1 indicating chemical nature of sorption. The increase in chitosan content in sorbent particles is found to enhance the Fe(III) uptake. The various thermodynamic parameters have also been evaluated. Finally, the presence of Cu2+ ions in the sorbate is found to decrease the uptake of Fe(III). (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Analysis, Aqueous Solution, Aqueous Solutions, Chitosan, Cu2+, Diffusion, Enhancement, Experimental, Fe(III), FTIR, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Iron, Iron(III), Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Magnetic, Magnetic Particles, Model, Models, Nanocomposites, Particles, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Research, Rights, Solution, Sorbate, Sorbent, Sorption, Sorption Isotherm, TEM, Thermodynamic, Thermodynamic Parameters

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Full Text: [2008\Col Sur A-Phy Eng Asp320, 275.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp320,%20275.pdf)

Abstract: This study looked into the theoretical basis of the most commonly used pseudo-second-order kinetic equation for adsorption. It was demonstrated that the pseudo-second-order kinetic equation for adsorption indeed is in line with the universal rate law for a chemical Reaction, while the same principle can also be applied to the pseudo-first-order kinetic equation for adsorption. This in turn offers a theoretical basis for the pseudo-second-order equation. If the second-order equation is applicable, the rate of adsorption was found to be subject to a second-order rate law with respect to the availability of adsorption sites on the surface of adsorbent rather than adsorbate concentration in bulk solution as proposed in the literature. Based on the rate law for the second-order adsorption process, the original complex second-order kinetic equation can be transformed to a simple hyperbolic form with clearly defined mathematical structure: *Qt* = *Q*e(*t*/*t* + *t*r) in which *t*r is relaxation time representing time required for adsorption to reach half-saturation state of adsorbent under given experimental conditions, i.e., *Qt* = 0.5*Q*e.

Keywords: Adsorbent, Adsorption, Availability, Biosorption, Experimental, Kinetic, Law, Literature, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Law, Relaxation, Rights, Second Order, Second-Order, Second-Order Equation, Second-Order Kinetics, Solution, Structure

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Full Text: [2008\Col Sur A-Phy Eng Asp322, 47.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp322,%2047.pdf)

Abstract: Batch adsorption experiments were carried out for the removal of Methylene blue (MB) cationic dye from its aqueous solution using chitosan-g-poly(acrylic acid)/montmorillonite (CTS-g-PAA/MMT) nanocomposites as adsorbent. The factors influencing adsorption capacity of the nanocomposite such as initial pH value (pH(0)) of the dye solution, MMT content (wt%), weight ratio (wr) of AA to CTS and adsorption temperature (T) were investigated. The results showed that the wr of AA to CTS of the nanocomposites have great influence on adsorption capacities and introducing a small amount of MMT Could improve adsorption ability of the CTS-g-PAA. The adsorption behaviors of the nanocomposite showed that the adsorption kinetics and isotherms were in good agreement with pseudo-second-order equation and the Langmuir equation, respectively, and the maximum adsorption capacity is 1859 mg/g for CTS-g-PAA/MMT with wt% of 30% and wr of 7.2:1. The desorption studies revealed that the nanocomposite provided the potential for regeneration and reuse after MB dye adsorption. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Characteristics, Adsorption Kinetics, Anionic Dyes, Aqueous Solution, Bagasse Fly-Ash, Capacity, Cationic Dye, Chitosan, Clay, CT, Desorption, Desorption Studies, Dye, Dye Adsorption, Equilibrium, Experiments, Isotherms, Kinetics, Langmuir, Langmuir Equation, Methylene Blue, Montmorillonite, Na+-Montmorillonite, Nanocomposite, Nanocomposites, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Regeneration, Removal, Rights, Small, Solution, Sorption, Superadsorbent Nanocomposite, Temperature, Waste-Water

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Full Text: [2008\Col Sur A-Phy Eng Asp324, 28.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp324,%2028.pdf)

Abstract: The objective of this work is to investigate the effects of pH and ionic strength on the adsorption capacity for fulvic acid (FA) by chitosan hydrogel beads. The results indicated that the sorption amount increased with decreasing pH and increasing ionic strength concentration. The sorption isotherms were well described by using non-linear Langmuir, Freundlich and Redliche-Peterson equation. The adsorption kinetics of FA onto chitosan hydrogel beads could be described by pseudo-second-order rate model. The extent of FA removal in the presence of other ions decreases in the order Cal2+ > Mg2+ > Na+ approximate to K+ and Cl- > NO3- > CO32-, FTIR along with XPS analyses revealed the amine groups on the beads were involved in the sorption of FA and the organic complex between the protonated amino groups and FA was formed after FA uptake. Sorption mechanisms including electrostatic interaction and surface complexation were found to be involved in the complex sorption of FA on the chitosan hydrogel beads. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Kinetics, Aqueous-Solutions, Beads, Capacity, Chitosan, Chitosan Hydrogel Bead, Complexation, Dye, Freundlich, FTIR, Fulvic Acid, Humic-Acid, Hydrogel, Interaction, Ionic Strength, Isotherms, Kinetics, Langmuir, Mechanisms, Model, Natural Organic-Matter, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Ray Photoelectron-Spectroscopy, Removal, Removal, Rights, Sorption, Sorption Isotherms, Surface Complexation, Surface Interaction, Work, XPS

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Full Text: [2008\Col Sur A-Phy Eng Asp328, 40.pdf](2008/Col%20Sur%20A-Phy%20Eng%20Asp328,%2040.pdf)

Abstract: A comparison between linear least-squares method and non-linear regression method of the widely used pseudo-second-order kinetic model, for the sorption of Hg(II) onto dead biomass of marine Aspergillus niger was examined. Four pseudo-second-order kinetic linear equations are discussed. 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 linear kinetic model has the highest coefficient of determination. Results show that the non-linear method may be a superior way to obtain the kinetic parameters. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aspergillus Niger, Biomass, Carbon, Comparison, Fresh-Water Algae, Hg(II), Ions, Kinetic, Kinetic Model, Kinetic Models, Kinetic Parameters, Linear Method, Linear Regression, Malachite Green, Marine Aspergillus Niger, Mercury, Methods, Model, Models, Non-Linear Method, Non-Linear Regression, Nonlinear Regression, Pithophora sp., Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Pseudo-Second-Order Kinetics, Regression, Rights, Sorption

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Full Text: [2009\Col Sur A-Phy Eng Asp335, 181.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp335,%20181.pdf)

Abstract: The ability of dried yeast Saccharomyces biomass to remove Cu(II) ions from aqueous solutions was investigated by using of batch techniques. The influence of different parameters on copper uptake by dried yeast, such as initial Cu(II) concentration, initial pH of solution and temperature, was studied. The Freundlich, Langmuir, Redlich-Peterson and Sips isotherms were applied to the obtained experimental data. According to Langmuir isotherm the maximum adsorption capacity of investigated non-living biomass was found to be 2.59 mg/g. The thermodynamic parameters (e.g. free energy and enthalpy) were calculated and discussed. The adsorption of Cu(II) onto the dried cells of *Saccharomyces cerevisiae* is an endothermic process and become more favorable with the increasing of temperature in pH range from 3 to 4. Optimization studies by means of response surface methodology were carried out, which resulted in improvement of the efficiency of sorption removal by using of biomass. The removal efficiency of real wastewater originating from electroplating industry which contains Sn(II) ions was determined and compared with synthetic wastewater obtained in laboratory. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption Isotherm, Aqueous-Solutions, Bakers-Yeast, Biosorption, Heavy Metals, Heavy-Metals, Lead Ions, Metal-Ions, pH, Removal, Response Surface Methodology (RSM), Saccharomyces-Cerevisiae, Sorption, Trace Enrichment, Waste Beer Yeast

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Full Text: [2009\Col Sur A-Phy Eng Asp337, 141.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp337,%20141.pdf)

Abstract: A crystalline organic-inorganic composite exchanger, acrylamide stannic silicomolybdate was synthesized at pH 0.63. The ion exchange capacity of the material was improved from 0.40 to 1.64 meq/g in comparison to its inorganic Counterpart, stannic silicomolybdate. The FTIR, XRD and thermal studies were conducted to understand the nature of the material. Distribution coefficient studies of the metal ions on this material were performed in polar solvents such as trichloroacetic acid, formic acid, acetic acid and dimethylsulfoxide to know the ion exchange behavior and selectivity for different ions. On the basis of distribution coefficient Studies, several binary separations of metal ions viz. Cd2+-Pb2+, Cd2+-Cu2+, Al3+-Pb2+, Al3+-Cu2+, Zn2+-Pb2+, Zn2+-Cu2+ was achieved quantitatively on acrylamide stannic silicomolybdate columns. Pb2+ and Cu2+ were selectively removed from synthetic mixtures containing Cu2+, Mg2+, Cd2+, Hg2+, Zn2+ and Ba2+ and Pb2+, Hg2+, Cd2+, Ba2+, Mg2+ and Ba2+ respectively. The quantitative separation of Cu2+ and Zn2+ were also achieved on commercially available pharmaceutical formulation I-Vit. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Synthesis, Characterization, Acrylamide Stannic Silicomolybdate, Separations, Selective Membrane-Electrode, Cation-Exchanger, Phosphate, Cd(II), Hg(II)

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Full Text: [2009\Col Sur A-Phy Eng Asp337, 164.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp337,%20164.pdf)

Abstract: We investigated arsenic sorption mechanisms onto laterite iron concretions (LIC) using electrophoretic mobility (EM) measurements, attenuated total reflectance-Fourier transform infrared spectroscopy (ATR-FTIR) and surface complexation modeling. Competitive sorption experiments were also conducted in the presence of phosphate and sulfate, as these compounds may interfere with arsenic sorption in waters from sulfide mining waste and ore stock piles. Electrophoretic mobility measurement results indicate that arsenic sorption lowered the point of zero charge of the LIC at pH 3-10. This observation implies both As(III)and As(V) form inner-sphere complexes on the LIC. The FTIR studies suggest that both As(III) and As(V) also form inner-sphere complexes with LIC. Arsenic sorption onto LIC was modeled by surface complexation modeling using the generalized composite approach. The model assumes that all mineral phases contributing to sorption are represented by one type of surface group. Adsorption edge experimental data was used to verify model performance. Arsenic(III) sorption onto LIC, which is markedly reduced by increasing ionic strength, was modeled using the triple-layer model, while As(V) sorption onto LIC was modeled using both the diffuse and the triple-layer models. The presence of phosphate reduces the amount of both As(V) and As(III) sorbed. while sulfate only reduces adsorption of As(III). Published by Elsevier B.V.

Keywords: Adsorption, As(III), As(V), Atr-FTIR, Em, Ghana, Goethite, Laterite, Laterite Iron Concretion, Nanocrystalline Titanium-Dioxide, Oxidation, Oxides, Phosphate, Removal, Sorption, Sulfate, Surface Complexation Model, Vibrational Spectroscopy, Water Interface

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Full Text: [2009\Col Sur A-Phy Eng Asp337, 185.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp337,%20185.pdf)

Abstract: Modeling of aluminum sorption on natural oxide was studied to show the efficacy of sorption modeling in disclosing the possible sequestration mechanism(s). In this study, sorption of AI(III) on natural oxide was studied, and the resulting sorption data were fitted to the derived unsteady- and steady-state models. The well-known Langmuir-Freundlich, Langmuir, Freundlich, and linear isotherm models were also extracted from kinetic expressions, and it was shown that they are established on the same basis and hence they do not help to significantly enhance or multiply the information extracted from any one of the models. The applied kinetic modeling was based on the presumptions that the sorption process is reversible and that both adsorption and desorption may follow any rate order. The derived models, without any simplification, had more successful fit to the sorption data than those of the long-familiar adsorption models, possibly because of the abundance of the model parameters. Both the reversible and pseudo-second-order kinetic models fitted well to the experimental data of kinetic studies with similar success on the basis of R-2. The fitting of the sorption equilibrium data to the general isotherm model, the model form without any simplification, suggested that the adsorption-rate order for the entire test range varied between 1.9530 and 1.3588, whereas the desorption-rate order varied between 0.6411 and 0.4861. Studies on both kinetic and isotherm model fitting, together with the observed changes in ionic strength, pH, and enthalpy at sorption, implied that ion-exchange might have been an effective process contributing to Al(III) removal, with physisorption probably contributing to the removal to a small extent, although the claims still remain indecisive. Both the pore-size distribution of the sorbent and intraparticle diffusion model together confirmed that interparticle (external film) diffusion was negligible, even as intraparticle diffusion was effectively occurring through macro- and mesopores. It was concluded that the main difference between the discussed isotherm models originates from the assumptions made and their success to fit the experimental data is largely dependent upon the number of model parameters, the order of which, in descending number of parameters. can be classified as general model, the Langmuir-Freundlich model, the Langmuir model. the Freundlich model and linear model. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biosorption, Freundlich Isotherm Model, Ions, Kinetic, Langmuir Isotherm Model, Linear Isotherm Model, Mathematical Modeling, Metals, Seeds, Sorption Mechanism

? Sheng, G.D., Wang, S.W., Hu, J., Lu, Y., Li, J.X., Dong, Y.H. and Wang, X.K. (2009), Adsorption of Pb(II) on diatomite as affected via aqueous solution chemistry and temperature. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **339** (1-3), 159-166.

Full Text: [2009\Col Sur A-Phy Eng Asp339, 159.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp339,%20159.pdf)

Abstract: To better understand the application of diatomite as an adsorbent for the removal of Pb(II) from heavy metal-contaminated water, in this paper, diatomite was used to adsorb Pb(II) from aqueous Solution under various conditions. The results demonstrated that the adsorption of Pb(II) was strongly dependent on ionic strength at pH < 7.0, outer-sphere surface complexation or ion exchange may be the main adsorption mechanism of Pb(II) on diatomite at low pH values. No drastic difference of Pb(II) adsorption was observed at pH > 7.0, and the adsorption at high pH values was mainly dominated via inner-sphere Surface complexation. The presence of HA/FA showed great influence on Pb(II) adsorption on diatomite. The adsorption of Pb(II) on diatomite was dependent on foreign ions (herein K+ Na+, ClO4-, NO3- and Cl-) in solution at pH < 8.0, and was independent of foreign ions at pH > 8.0. The thermodynamic parameters (i.e., ΔH°, ΔS°, ΔG°) were evaluated from the temperature dependent adsorption isotherms. The results indicated that the adsorption process of Pb(II) on diatomite was spontaneous and endothermic in nature. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Carbon Nanotubes, Diatomite, Fulvic-Acid, Heavy-Metals, Ionic-Strength, Isotherms, Low, Mechanism, MX-80 Bentonite, Nuclear-Magnetic-Resonance, Pb(II), pH, Removal, Soil Humic-Acid, Sorption, Surface Complexation, Thermodynamic Data

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Full Text: [2009\Col Sur A-Phy Eng Asp340, 143.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp340,%20143.pdf)

Abstract: Equilibrium, kinetics and thermodynamic aspects of sorption of Promethazine hydrochloride (PHCl) onto iron rich smectite (IRS) from aqueous Solution were investigated. The effect of pH on sorption of PHCl onto IRS was also found out. Experimental data were evaluated by using Langmuir, Freundlich and Dubinin-Raduschkevich (DR) isotherm equations. Freundlich and DR equations provided better compatibility than Langmuir equation. Besides, it was determined that the maximum sorption of PHCl takes place at about pH 5. From kinetic studies, it was obtained that sorption kinetics follow pseudo-second-order kinetic model for PHCl sorption onto IRS. When thermodynamic studies are concerned, the values of activation energy (E-a), ΔG, ΔH and ΔS were obtained. ΔG values are in the range of -8.84 and -9.45 kJ mol-1 indicating spontaneous nature of physisorption. The negative value of the ΔH (-3.20 kJ mol-1) indicates exothermic nature of adsorption. FTIR analysis and SEM observations of IRS and PHCl adsorbed IRS were also carried out. Sorption experiments indicate that IRS may be used effectively for the adsorption of PHCl. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: 6 Carbonaceous Materials, Adsorption, Adsorption Equilibrium, Aqueous-Solution, Drug, Drug Absorption, Dye, Kinetics, Langmuir, Montmorillonite, pH, Prednisolone, Promazine Absorption, Promethazine Hydrochloride, Removal, Single Model, Smectite, Sorption

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Full Text: [2009\Col Sur A-Phy Eng Asp342, 76.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp342,%2076.pdf)

Abstract: A composite spherical adsorbent was prepared with ammonium molybdophosphate (AMP), sodium alginate (NaALG), and calcium chloride. Scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) were used to characterize the composite adsorbent. The adsorption of rubidium and cesium ions onto the composite adsorbent in aqueous solutions was investigated comprehensively by varying the initial metal ion concentration, pH, ionic strength, and temperature. The adsorption kinetics of both rubidium and cesium was described by the first-order and second-order kinetic models. The second-order rate constant and the initial adsorption rate increase with increasing temperature. In general, the equilibrium adsorption amount of both rubidium and cesium increases with the increase in initial metal ion concentration, but decreases with increasing ionic strength and temperature. Maximum adsorption of rubidium and cesium Occurs in the solution with an equilibrium pH Value of 3.5-4.5. Under similar conditions, cesium shows a higher adsorption amount than rubidium. The composite adsorbent is easy to prepare and highly porous. It has a fast adsorption rate and ail adsorption capacity of 0.58 and 0.69 mmol g-1 for rubidium and cesium, respectively. The composite adsorbent is effective for the adsorption of rubidium or cesium ions from Solutions containing some other alkali metal ions, Such as sodium ions. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Rubidium, Cesium, Adsorption, Ammonium Molybdophosphate, Composite Adsorbent, Adsorption Kinetics, Exchanger, Chloride, Equilibrium, Sorption, Removal, Silica, Water, Acid, Sediments, Behavior

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Full Text: [2009\Col Sur A-Phy Eng Asp345, 231.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp345,%20231.pdf)

Abstract: Cloud point extraction (CPE) was carried out to extract malachite green (MG) from aqueous solution and shrimp samples using a series of polyethylene glycol (PEG) surfactants: PEG10000, PEG6000, PEG2000 and PEG600. The adsorption mechanism between PEG micelles and MG molecules was studied. The data of equilibrium concentrations and adsorption amounts in the four PEG-MG systems followed the Langmuir type isotherm. On some assumptions, a developed Langmuir isotherm was used to calculate the feed surfactant concentration required for the removal of MG up to an extraction efficiency of 90%. The calculated PEG concentrations were used in CPE process, and other influence factors on phase behavior were investigated. Under the optimal conditions, recoveries of MG were 82.16-92.41% in aqueous solution and 78.16-86.54% in shrimp samples. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Behavior, Adsorption Mechanism, Aqueous Solution, Aqueous-Solution, Assumptions, Behavior, Chrysoidine Dye, Cloud Point Extraction, Concentration, Data, Efficiency, Equilibrium, Extraction, Feed, Isotherm, Langmuir, Langmuir Isotherm, Malachite Green, Mechanism, Mg, Micelles, Phase, Phenol, Polyethylene, Polyethylene Glycol, Procedure, Removal, Rights, Separation, Solubilization, Solution, Surfactant, Surfactants, Systems

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Full Text: [2009\Col Sur A-Phy Eng Asp346, 83.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp346,%2083.pdf)

Abstract: The removal of Remazol Red 3BS (C.I. 239) dye by HMS ordered mesoporous silica, aminopropyl-modified HMS (HMS-NH2) and beta-cyclodextrin-modified HMS (HMS-CD) materials was studied in the present work. The modified materials were functionalized in situ by adding the organic modifiers (3-aminopropyltriethoxysilane and a silylated derivative of MCT-beta-CD) in the synthesis mixture and using dodecylamine as the mesopore structure directing agent. The successful incorporation of aminopropyl groups in HMS-NH2 and of cyclodextrin moieties in HMS-CD was verified by means of FT-IR spectroscopy, elemental analysis and N-2 porosimetry. The HMS-CD material exhibited significantly higher adsorption capacity compared to that of the HMS-NH2 material, while the parent HMS mesoporous silica showed negligible adsorption capability. The maximum adsorption capacities obtained (at the optimum pH 2) on the basis of the Langmuir analysis were 0.28 mmol/g for HMS-CD and 0.14 mmol/g for HMS-NH2. It Was shown that the HMS-CD sorbent can be effectively regenerated by the surfactant-enhanced regeneration method using SDS and that can be reused without significant loss of its adsorption capabilities. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Capability, Adsorption Capacities, Adsorption Capacity, Aminopropyl-Modified Silica, Analysis, Aptes, Aqueous Solutions, Azo Dyes, Azo-Dye, Beta-Cyclodextrin, Beta-Cyclodextrin (CD), Capacity, Cyclodextrin, Dye, FT-IR, FTIR, FTIR Spectroscopy, HMS, HMS Mesoporous Silica, In Situ, Langmuir, Mesopore, Mesoporous, Mesoporous Silica, Modified, N2, N2, Organic, Organic-Dye Adsorption, pH, Reactive Dyes, Regeneration, Remazol Red, Removal, Rights, SDS, Silica, Silicas, Solutions, Sorbent, Sorption, Spectroscopy, Structure, Synthesis, Template, Thermodynamics, Work

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Full Text: [2009\Col Sur A-Phy Eng Asp348, 100.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp348,%20100.pdf)

Abstract: A laboratory batch study has been performed to study the effect of various physic-chemical factors such as initial metal ion concentration, solution pH, and amount of adsorbent, contact time and temperature on the adsorption characteristics of zinc (Zn2+) metal ions onto kaolin. It has been found that the amount of adsorption of zinc metal ion increases with initial metal ion concentration, contact time, 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 kaolin is a two steps process: a very rapid adsorption of zinc metal ion to the external surface is followed by possible slow decreasing intra-particle diffusion in the interior of the adsorbent which has also been confirmed by intra-particle diffusion model. The equilibrium time is found to be in the order of 60 min. Overall the kinetic studies showed that the zinc adsorption process followed pseudo-second-order kinetics among pseudo-first-order and intra-particle diffusion model. The different kinetic parameters including rate constant are determined at different initial metal ion concentration, solution pH, amount of adsorbent and temperature respectively. The equilibrium adsorption results are analyzed by both Langmuir and Freundlich models to determine the mechanistic parameters associated with the adsorption process. The value of separation factor, R-L from Langmuir equation also gives an indication of favorable adsorption. Finally thermodynamic parameters are determined at three different temperatures and it has been found that the adsorption process is exothermic due to negative ΔH° accompanied by decrease in entropy change and Gibbs free energy change (ΔG°). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Aqueous Solution, Bagasse, Batch, Batch Study, Cadmium, Characteristics, China-Clay, Clay, Clay Mineral, Concentration, Diffusion, Diffusion Model, Energy, Entropy, Equilibrium, Exothermic, Experiments, Freundlich, Gibbs Free Energy, Heavy-Metals, Indication, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Kaolin, Kinetic, Kinetic Model, Kinetic Parameters, Kinetic Studies, Kinetics, Langmuir, Langmuir Equation, Metal, Metal Ion, Metal Ions, Model, Models, pH, Porous-Media, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rate Constant, Removal, Rights, Separation, Solution, Sorption, Surface, Temperature, Thermodynamic, Thermodynamic Parameters, Value, Waste, Water, Zinc, Zinc Adsorption, Zn2+

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Full Text: [2009\Col Sur A-Phy Eng Asp348, 164.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp348,%20164.pdf)

Abstract: In this paper, two charge-neutral and poorly water-soluble bactericides (BC), hexaconazole and triadimenol, were first encapsulated in micelles derived from anionic surfactant, calcium dodecylbenzenesulfonate (DBS), and then were successfully intercalated into the gallery of Mg-Al layered double hydroxides (LDHs) by using ion exchange, coprecipitation and reconstruction methods, respectively, to obtain BC-LDHs nanohybrids. The loading amounts of hexaconazole-LDHs nanohybrids are obviously higher than those of triadimenol-LDHs nanohybrids. The release kinetics of bactericides from the nanohybrids was investigated. It was found that the bactericide release kinetic processes of the nanohybrids can be described with pseudo-second-order model. The initial release rates and equilibrium percent releases of the nanohybrids are obviously dependent of synthesis methods. The nanohybrids can well control the release of bactericides, showing they are a potential pesticide control led-release formulation. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Anion-Exchange, Atrazine, Bactericide, Behavior, Calcium, Control, Controlled Release Formulation, Coprecipitation, Derivatives, Equilibrium, First, Formulation, Formulations, Herbicides, Hexaconazole, Hydrotalcite-Like Compounds, Ion Exchange, Ion-Exchange, Kinetic, Kinetics, Layered Double Hydroxides, Loading, Methods, Metribuzin, Micelles, Model, Nanohybrids, Pesticide, Pesticide Control, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rates, Reconstruction, Release, Rights, Surfactant, Synthesis, Triadimenol

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Full Text: [2009\Col Sur A-Phy Eng Asp349, 61.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp349,%2061.pdf)

Abstract: Ordered thiol-functionalized microporous silica with BET surface area 1136.64 m2/g and high thiol group density was prepared by co-condensation of 3-mercaptopropyltrimethoxysilane and tetramethoxysilane in the hydroalcoholic medium with cetyltrimethylammonium bromide. These samples were characterized through BET analysis, XRD, TEM, IR and Raman spectroscopy, Si-29 NMR and elemental analysis. The sorption behaviors and mechanisms of Pb2+ and Cd2+ on the samples were studied. The maximum sorption amounts of Pb2+ and Cd2+ were 130 and 39 mg/g, respectively. Freundlich isotherm was proved to describe the sorption data better than Langmuir isotherm and pseudo second order kinetic model could fit the sorption kinetic processes well. The pH and electrolyte NaNO3 influenced the sorption of Pb2+ and Cd2+ on the samples significantly. According to hard and soft acids and bases theory and the information analyzed from XPS, the sorption mechanisms could be explained as primary chemical adsorption and secondary physical adsorption. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Acids, Adsorbents, Adsorption, Analysis, Application, BET, BET Surface Area, Bromide, Cd2+, Characterization, Chemical, Data, Freundlich, Freundlich Isotherm, Functionalization, Heavy-Metal Ions, Information, IR, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Mechanisms, Mesoporous Silica, Mesostructured Silica, Model, Molecular-Sieves, NMR, Pb2+, pH, Physical, Primary, Pseudo Second Order, Pseudo-Second-Order, Raman, Raman Spectroscopy, Ray Photoelectron-Spectroscopy, Rights, Second Order, Second-Order, Silica, Sorption, Sorption Mechanisms, Spectroscopy, Surface, Surface Area, Tem, Theory, Thiol, Wormhole Framework Structures, XPS, XRD

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Full Text: [2009\Col Sur A-Phy Eng Asp349, 90.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp349,%2090.pdf)

Abstract: The sorption of Se(IV) on TiO2 (anatase) was investigated as functions of contact time, pH, ionic strength, solid-to-liquid ratio (m/V) and Se(IV) concentration by using a batch sorption method. It was found that the sorption kinetics of Se(IV) can be described by a pseudo-second-order model. Both the amount of Se(IV) sorbed at equilibrium and the pH of aqueous solution affect the rate constant of Se(IV) sorption on anatase. The results at sorption equilibrium indicate that Se(IV) sorption is pH-dependent and insensitive to ionic strength. A constant capacitance model was used to quantitatively interpret Se(IV) sorption on anatase. Inner-sphere surface complexes, equivalent to SSeO3- and equivalent to S2SeO3, were considered. (C) 2009 Elsevier B. V. All rights reserved.

Keywords: Aluminum, Anatase, Anion Adsorption, Aqueous Solution, Batch, Complexation, Concentration, Equilibrium, Exchange, Functions, Hematite, Ionic Strength, Kinetics, Model, Modeling, Montmorillonite, Oxides, Oxyanions, pH, pH-Dependent, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Constant, Rights, Se(IV), Selenate, Selenite Adsorption, Solution, Sorption, Sorption Kinetics, Strength, Surface, Surface Complexation, Surface Complexes, TiO2, X-Ray-Absorption

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Full Text: [2009\Col Sur A-Phy Eng Asp349, 195.pdf](2009/Col%20Sur%20A-Phy%20Eng%20Asp349,%20195.pdf)

Abstract: The adsorption of Cu(II) from aqueous solution to GMZ bentonite was studied using batch technique under ambient conditions. Removal percentage (%) and distribution coefficient (K-d) were determined as a function of contact time, pH, ionic strength and temperature. The adsorption of Cu(II) on GMZ bentonite increased with increasing pH gradually at pH < 6.5, and maintained high level at pH > 6.5. At pH < 6.5, the removal percentage of Cu(II) was the highest at ionic strength of 0.001 M NaNO3 and was the lowest at ionic strength of 0.1 M NaNO3. The presence of complementary cations depressed the adsorption of Cu(II) on bentonite in the order of Li+ > Na+ > K+ at pH < 6.5. The adsorption isotherms were simulated by the Langmuir, Freundlich, and Dubinin-Radushkevich (D-R) models very well. The thermodynamic parameters (i.e., Delta H-0, Delta S-0 and Delta G(0)) for the adsorption of Cu(II) were determined from the temperature dependent isotherms at 293.15, 313.15 and 333.15 K, respectively, and the results indicated that the adsorption reaction was favored at higher temperature. The results suggest that GMZ bentonite is a suitable material as an adsorbent for preconcentration and immobilization of Cu(II) from aqueous solution. Crown Copyright (C) 2009 Published by Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Aqueous Solution, Batch, Bentonite, Carbon Nanotubes, Complementary, Copper Ions, Cu(II), Distribution, Distribution Coefficient, Equilibrium, Foreign Ions, Freundlich, Fulvic-Acids, Function, Gmz Bentonite, Immobilization, Ionic Strength, Ions, Isotherms, Langmuir, Model, Models, Na+, Pb(II), pH, Preconcentration, Removal, Rights, Solution, Sorption, Strength, Temperature, Thermodynamic, Thermodynamic Data, Thermodynamic Parameters, Thermodynamics, Water

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Full Text: [2010\Col Sur A-Phy Eng Asp353, 189.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp353,%20189.pdf)

Abstract: This paper presents the adsorption kinetics and equilibrium of a CO2 foaming agent onto Berea sandstone and the adsorption effect on its foam stability. Results show that the adsorption of the foaming agent onto sandstone takes about 1 week to reach equilibrium and the adsorption process is well fit by a pseudo-second-order kinetic model. The adsorption kinetics coefficient decreases with the increase of initial concentration and their relationship is well fitted by two straight lines. The adsorption density increases with surfactant concentration and their relationship is well fitted by Freundlich isotherm model rather than Langmuir isotherm model. The foam stability of the effluent foam agent that flowed through sandstone is much weaker than that of the same concentration of fresh foaming agent that was not exposed to sandstone. It is suggested that the chromatographic adsorption should be considered when optimizing the compositions of a good foaming agent. In addition, the transport mechanisms of the foam agent through sandstone were elucidated by comparing the adsorption kinetics of the foam agent on five non-porous minerals common in sandstone with that on porous sandstone and through the sandstone pore microstructure analysis. Published by Elsevier B.V.

Keywords: Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Analysis, Aqueous-Solutions, Calcium Lignosulfonate, CO2, CO2 Foam, Concentration, Desorption, Equilibrium, Foam, Foam Stability, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanisms, Media, Microstructure, Minerals, Model, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Sandstone, Stability, Surfactant, Transport, Water

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Full Text: [2010\Col Sur A-Phy Eng Asp357, 105.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp357,%20105.pdf)

Abstract: A novel class of alumina/silica-transition metal based materials has been synthesized via sol-gel method. The materials exhibit Type I adsorption/desorption isotherms with the pores mainly in the range 10-20 angstrom. The pore size, surface area and the pore volume are strongly correlated with the size of the alkylamine template employed. The versatile synthesis method allows for the control of the porosity of the materials via varying Al/Si ratios, transition metal content, the amount of water employed for the hydrolysis as well as thermal treatment. The materials were characterized by N-2 physisorption, solid state NMR methods, TGA, magnetic measurements and TEM. The relationship between the transition metal and the alumina/silica matrix has been clarified by these studies. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Supermicroporous Silica, Porous Alumina, Porous Alumina/Silica Composites, Transition Metal, BET Surface Area, Controlled Porosity, Paramagnetic Silica-Based Materials, Tin NMR, Baeyer-Villiger Reaction, Solid-State NMR, Silica-Based Materials, Mesoporous Materials, Molecular-Sieves, Magnetic-Susceptibility, Relaxation, Zeolites, Si-29, Adsorption, Oxidation

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Full Text: [2010\Col Sur A-Phy Eng Asp361, 180.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp361,%20180.pdf)

Abstract: A novel carboxylate functionalized graft copolymer (PGTDC-COOH) based on TiO2-densified cellulose (TDC) was prepared by grafting poly(methacrylic acid) onto TDC in the presence of N,N’-methylenebisacrylamide (MBA) as a cross-linking agent and Mn(IV)-citric acid as an initiator system. Adsorbent was characterized using FTIR, SEM, XRD, TG-DTG, BET-N-2 adsorption measurements, Boehm and potentiometric titrations. The adsorption efficiency of PGTDC-COOH for uranium(VI) from aqueous solutions was examined by batch experiments. The optimum pH was found to be 6.0. Kinetic studies show that the uptake was rapid and equilibrium was established in 1 h. The sorption process follows the pseudo-second-order kinetic model. Langmuir analysis showed that the surface of the adsorbent is uniform and homogeneous in respect to sorption and energy. The adsorption equilibrium constant and maximum adsorption capacity were evaluated to be 0.074 L/mg and 99.4 mg/g, respectively. Utility of the adsorbent was tested by removing U(VI) from simulated nuclear industry wastewater. The possibility of metal recovery from spent adsorbent was investigated using HCl solutions with different concentrations and greater than 96.0% recovery was achieved with 0.1 M HCl. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Equilibrium, Adsorption Isotherm, Analysis, Aqueous Solutions, Batch, Batch Experiments, Capacity, Cellulose, Characterization, Copolymer, Crosslinking, Densified Cellulose, Desorption, Efficiency, Energy, Equilibrium, Experiments, Extraction, FTIR, Graft, Graft Copolymers, Grafting, Kinetic, Kinetic Model, Kinetic Studies, Langmuir, Mechanisms, Metal, Model, pH, Polymers, Preconcentration, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Recovery, Removal, Rights, SEM, Separation, Solutions, Sorption, Sorption Process, Surface, Synthesis, U(VI), Uptake, Uranium(VI), Wastewater, XRD

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Full Text: [2010\Col Sur A-Phy Eng Asp362, 140.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp362,%20140.pdf)

Abstract: Activated coke (AC) was studied to adsorb organic pollutants from coking wastewater. This study initially focused on the sorption kinetics and equilibrium sorption isotherms of AC for the removal of chemical oxygen demand (COD) from coking wastewater. UV-vis spectra and gas chromatograph/mass spectroscopy (GC/MS) were used to detect the changes of coking wastewater quality. The surface morphology of AC before and after adsorption was observed using environmental scanning electron microscope (ESEM). The results showed that when the dose of AC was 200 g L-1, 91.6% of COD and 90% of color could be removed after 6 h of agitation at 40 degrees C. The kinetics of adsorption of COD from coking wastewater onto AC was fit to the pseudo-second order model. The intraparticle diffusion of COD onto AC was identified to be the rate limiting step. The adsorption of COD onto AC was enhanced with an increase of temperature, indicating that the adsorption process would be a chemical adsorption rather than a physical one. Redlich-Peterson gave a better fit to all adsorption isotherms than the Langmuir and Freundlich, which might simulate the adsorption of high concentration of organic pollutants in coking wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Coke, Adsorption, Adsorption Isotherms, Agitation, Aqueous-Solution, Carbon, Changes, Chemical, Chemical Oxygen Demand, Cod, Coking Wastewater, Concentration, Degradation, Demand, Diffusion, Environmental, Environmental Scanning, Equilibrium, Esem, Fly-Ash, Freundlich, Intraparticle Diffusion, Isotherms, Kinetics, Kinetics of Adsorption, L1, Langmuir, Model, Morphology, Organic, Organic Pollutants, Oxidation, Oxygen, Physical, Pollutants, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Quality, Rate Limiting Step, Reactors, Redlich-Peterson, Removal, Rights, Sorption, Sorption Isotherms, Sorption Kinetics, Spectroscopy, Surface, Temperature, Thermodynamics, Wastewater, Wastewater Quality

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Full Text: [2010\Col Sur A-Phy Eng Asp363, 1.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp363,%201.pdf)

Abstract: Spongelike porous MnFe2O4 (SPM) was synthesized by a sol-gel method with egg white. The obtained SPM was characterized and applied for the removal of methylene blue (MB) from aqueous solution in the batch system. The morphologies of SPM were spongelike porous bulks and the pore size could be controlled by the dosage of egg white. SPM showed good magnetic property at room temperature. In addition, SPM was suitable for adsorption due to its porous structure and high BET surface areas. The pseudo-second-order model described the adsorption kinetics well. FT-IR analysis suggested that -N+(CH3)2 of MB cations and the Fe-O bond of SPM were responsible for good adsorption. The adsorption equilibrium data fit Langmuir isotherm equation well with a maximum MB adsorption capacity of 20.67 mg/g. Moreover, SPM could be separated conveniently under a magnetic field (recovery ratio >98%) and reused seven cycles keeping a high activity (>96%). MB removal efficiencies of the last three cycles (99.5%) were even higher than that of the first four cycles. The results suggested that the SPM was a promising reusable adsorbent to remove MB form wastewater. (C) 2010 Published by Elsevier B.V.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Property, Aqueous-Solution, Composite, Dye, Equilibrium, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Magnetism, Methylene-Blue, MnFe2O4, Nanoparticles, Oxidation, Sol-Gel, Spongelike Porous, Synthesis, Water

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Full Text:[2010\Col Sur A-Phy Eng Asp366, 50.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp366,%2050.pdf)

Abstract: Mg2Al layered double hydroxide (Mg2Al LDH) samples intercalated with diethylenetriaminepentaacetic acid (DTPA) (Mg2Al-DTPA LDH in short) were prepared by co-precipitation and well characterized by XRD, SEM, TEM, IR and XPS. The sorption behaviors and mechanisms of Pb2+ on the samples were studied in detail while Mg2Al-Cl LDH as a reference. The maximum sorption amounts were about 170 and 40 mg/g for Mg2Al-DTPA LDH and Mg2Al-Cl LDH, respectively. Langmuir isotherm was proved to describe the sorption data better and pseudo-second order kinetic model could fit the sorption kinetic processes better for both LDHs samples. The mechanisms of Pb2+ sorption on Mg2Al-DTPA LDH can be explained by Pb-DTPA chelating while that for Mg2Al-Cl LDH is primary surface-induced precipitation. The Mg2Al-DTPA LDH could provide a potential remedy for heavy metal contamination in soils and water. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Anions, Aqueous-Solution, Chelating-Agents, Contamination, Coprecipitation, Data, Diethylenetriaminepentaacetic Acid, Double Hydroxide, DTPA, Heavy Metal, Hydrotalcite, IR, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Layered Double Hydroxide, Lead, Lead Ion, Mechanisms, Metal, Metal-Ions, Model, Pb(II), Pb2+, Potential, Precipitation, Primary, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Reference, Removal, Rights, SEM, Soils, Sorption, Surface, Systems, Tem, Water, XPS, XRD

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Full Text: [2010\Col Sur A-Phy Eng Asp366, 88.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp366,%2088.pdf)

Abstract: As a result of the cross-linking process between sodium alginate, Aluminium pillared clay (Al-Mont-PILC) or surfactant-modified pillared clay (CTAB-Al-Mont-PILC) and divalent cation (Ca2+), gel-like beads were obtained under different ratios of PILCs vs. alginate. Experimental ratios (pillared clay/alginate: w/w) increased to a maximum of 3.5 to 4. The results of SEM analysis revealed that surface morphology changes by introducing Al-Mont-PILC and CTAB-Al-Mont-PILC. Structural modifications were evaluated using FTIR and thermal analysis. In agreement with previous works the pseudo-second order model equation fit well with the kinetics data. Diffusion coefficients were calculated using the Linear Adsorption Model: the D-eff obtained in this study (3-7 10-6 cm2/s) are within the ranges reported in other works on inorganic pollutants or phenol diffusion in biopolymers. Adsorption isotherms of pentachlorophenol and safranine were analyzed using non-linear regression technique. Langmuir isotherms fit well with the results obtained for the sorption of safranine whereas the Freundlich isotherms was more in accordance with the pentachlorophenol sorption. A decrease of 35 to 40% in sorption capacity was observed for pentachlorophenol when the initial pH increased from 5.3 to 8. Modification of the biopolymers by introduction of pillared clays resulted in an enhancement of the adsorption capacity. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetics, Alginate, Aluminium, Analysis, Aqueous Solutions, Beads, Biopolymers, Capacity, Cation, Cationic Dye, Changes, Characterization, Chlorinated Phenols, Chromium Sorption, Clay, Clays, Crosslinking, Data, Degradation, Diffusion, Diffusion Mechanisms, Dye, Encapsulation, Equilibrium, Freundlich, FTIR, Isotherms, Kinetics, Langmuir, Langmuir Isotherms, Model, Modification, Montmorillonite, Morphology, Non-Linear Regression, Nonlinear Regression, Organic Pollutants, Particles, Pesticides, pH, Phenol, Pillared Clay, Pillared Clays, Pollutants, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Regression, Removal, Rights, SEM, Sodium, Solutions, Sorption, Sorption Capacity, Surface, Thermal Analysis

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Full Text: [2010\Col Sur A-Phy Eng Asp367, 85.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp367,%2085.pdf)

Abstract: A novel nano-adsorbent is fabricated by the surface modification of Fe3O4 nanoparticles (MNP) with carboxymethyl-beta-cyclodextrin (CM-beta-CD) and the feasibility of employing these nano-adsorbents for removal of methylene blue (MB) from aqueous solutions are investigated. CMCD-MNP(C) and CMCD-MNP(P) are fabricated by grafting CM-beta-CD on the surface of magnetite by covalent bonding via carbodiimide method (two-steps method) and by co-precipitation method (one-step method), respectively. Analyses by TEM and VSM reveal that both CMCD-MNP(C) and CMCD-MNP(P) are superparamagnetic with mean diameter of about 12 nm. The CM-beta-CD grafting is confirmed by FTIR. TGA and zeta potential measurement. The TGA results show that CM-beta-CD grafted onto CMCD-MNP(C) and CMCD-MNP(P) is 4.7 and 12 wt%, respectively. The adsorption of MB on both adsorbents is found to be dependant on pH, and initial MB concentration. Almost constant MB removal is found in the pH range of 4-10 and more MB is adsorbed at pH similar to 12. The kinetic data for MB adsorption is found to follow a pseudo-second-order kinetic model. The equilibrium data in aqueous solutions are well represented by the Langmuir isotherm model. The adsorption capacities of methylene blue onto CMCD-MNP(P) and CMCD-MNP(C) are found to be 277.8 and 140.8 mg/g, respectively and the negative value of free energy changes indicates the spontaneous nature of adsorption. The adsorbed MB can be desorbed by using methanol solution containing acetic acid. in addition, adsorption mechanism of MB is studied through FTIR analysis. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Capacities, Adsorption Mechanism, Adsorption Properties, Analysis, Aqueous Solutions, Aqueous-Solutions, Beta-Cyclodextrin, Changes, Concentration, Coprecipitation, Data, Desorption, Dye, Energy, Equilibrium, Fe3O4, Feasibility, FTIR, FTIR Analysis, Grafted, Grafting, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Magnetic, Magnetic Nanoparticles, Magnetite, MB, Measurement, Mechanism, Methanol, Methylene Blue, Model, Modification, Nanoparticles, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solution, Solutions, Sorption, Spectroscopy, Starch-Based Polymers, Surface, Surface Modification, Synthesis, TEM, TGA, Value, Waste, Water, Zeta Potential

? Anirudhan, T.S., Rijith, S. and Tharun, A.R. (2010), Adsorptive removal of thorium(IV) from aqueous solutions using poly(methacrylic acid)-grafted chitosan/bentonite composite matrix: Process design and equilibrium studies. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **368** (1-3), 13-22.

Full Text: [2010\Col Sur A-Phy Eng Asp368, 13.pdf](2010/Col%20Sur%20A-Phy%20Eng%20Asp368,%2013.pdf)

Abstract: A novel composite matrix, poly(methacrylic acid) -grafted composite/bentonite (PMAA-g-CTS/B) was prepared through graft copolymerization react ion of methacrylic acid and chitosan in the presence of bentonite and N,N’-methylenebisacrylamide as cross linker. The composite was well characterized using FTIR, XRD, XPS, SEM, TG/DTG, surface area analyzer and zeta potential measurements. The adsorption behavior of the composite towards thorium(IV) from water and sea water was studied under varying operating conditions of pH, concentration of Th(IV), contact time, and temperature. The effective range of pH for the removal of Th(IV) was 5.0-6.0. Kinetic data followed a pseudo-second-order model. The equilibrium data were correlated with the Langmuir isotherm model. The equilibrium Th(IV) sorption capacity was estimated to be 110.5 mg/g at 30ºC. For the quantitative removal of 100 mg/LTh(IV) from 1.0 L simulated sea water, a minimum adsorbent dosage of 2.0 g PMAA-g-CTS/B was required. Adsorption-desorption experiments over four cycles illustrate the feasibility of the repeated uses of this composite for the extraction of Th(IV) from aqueous solutions. Counter current process design was done by using operational lines. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Behavior, Aqueous Solutions, Behavior, Bentonite, Capacity, Chitosan, Chitosan, Bentonite Composite, Composite, Concentration, Copolymerization, Data, Design, Desorption, Equilibrium, Equilibrium Studies, Experiments, Extraction, Feasibility, FTIR, Graft, Graft Copolymerization, Grafted, Isotherm, Isotherm Model, Kinetic, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Matrix, Minimum, Model, Operating Conditions, pH, Potential, Process Design, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, SEM, Solutions, Sorption, Sorption Capacity, Surface, Surface Area, Temperature, Thorium(IV) Adsorption, Uranium(VI), Water, XPS, XRD, Zeta Potential

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Full Text: [2011\Col Sur A-Phy Eng Asp375, 42.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp375,%2042.pdf)

Abstract: Adsorption kinetics of hemimellitic and trimellitic acids at a fixed initial concentration of 0.30 mM onto alpha-alumina surfaces were carried out in batch method in the presence of 0.05 mM NaCl(aq) at pH 5 and 288.15, 298.15, 303.15, and 313.15 K. The experimental data were significantly better fitted to pseudo-second-order kinetic equation of non-linear form in the entire time duration. The state of equilibration time of benzenetricarboxylic acids at 298.15 K follows the sequence: hemimellitic acid < trimellitic acid < trimesic acid. Adsorption isotherms of hemimellitic and trimellitic acids were carried out at 298.15 K, pH 5-10, and 0.05 mM NaCl(aq) by varying acid concentration. The adsorption data were fitted to Langmuir adsorption model. Adsorption density of benzenetricarboxylic acids follows the sequence: trimesic acid < trimellitic acid < hemimellitic acid. Comparison of the adsorption densities of benzenetricarboxylic acids with dihydroxybenzoic and monohydroxybenzoic acids indicates that (i) in benzenetricarboxylic acids the position and equally the number of -COOH groups, (II) the two phenolic -OH groups at any two position in the benzene ring of dihydroxybenzoic acids, and (iii) the phenolic -OH groups at ortho position in the benzene ring of monohydroxybenzoic acids are the governing parameters for yielding higher adsorption density onto a-alumina surface. Exception is the 2,4-dihydroxybenzoic acid amongst dihydroxybenzoic acids series, which yields highest adsorption density due to ortho and para position of the phenolic -OH groups. The thermodynamic data indicate that the adsorption process is spontaneous for both the systems. The magnitude of shifting of v(s)(-COO-) and vas(-COO-) after adsorption of trimellitic and hemimellitic acids onto a-alumina surface indicate that both acids form outer-sphere surface complexes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Alpha-Alumina, Aluminum-Hydroxide, Aqueous-Medium, Dihydroxybenzoic Acid, Dissolved Organic-Matter, Hemimellitic Acid, Kinetics, Kinetics, Langmuir, Liquid-Solid Interface, Nom Adsorption, pH, Phenolic Groups, Surface Complexation, Surface Complexation, Thermodynamic, Trimellitic Acid, Trimesic Acid, Water Interface

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Full Text: [2011\Col Sur A-Phy Eng Asp377, 156.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp377,%20156.pdf)

Abstract: Lysozyme (LYZ) adsorption onto poly(glycidylmethacrylate)-grafted cellulose having sulfonate functional group (PGMA-g-Cell-SO3H) was investigated. PGMA-g-Cell-SO3H was prepared by graft copolymerization of glycidylmethacrylate (GMA) onto cellulose in the presence of ethyleneglycoldimethacrylate as cross linker using alpha,alpha’-azobisisobutyronitrile as initiator followed by the introduction of sulfonic acid groups through ring opening reaction of epoxide group in grafted GMA with sodium sulfite-isopropanol-water mixture. The adsorbent was characterized by means of FTIR, SEM, XRD and BET analysis. The maximum value of LYZ adsorption was found to be 74.93 and 96.21 mg/g for an initial concentration of 150 and 200 mg/L, respectively, at pH 6.0. The batch adsorption process followed pseudo-second-order kinetics and the equilibrium was achieved within 3 h. The kinetic data were also analyzed using external and intraparticle diffusion models. The intraparticle mass transfer diffusion model gave a better fit to the experimental data. Equilibrium isotherm data were well fitted with the Langmuir isotherm with maximum adsorption capacity of 141.67 mg/g at 30ºC. Thermodynamic study revealed an endothermic adsorption process. All of the adsorbed LYZ was eluted completely by 0.2 M CH3COOH solution. Results obtained from repeated adsorption/desorption process showed that PGMA-g-Cell-SO3H can be used for the separation of LYZ from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Cellulose, Cytochrome-C, Desorption, Equilibrium, Ftir, Graft Copolymerization, Immobilization, Ion-Exchange, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Lysozyme, Membrane Affinity-Chromatography, pH, Protein Adsorption, Purification, Removal, Separation, Strength, Surfaces, Thermodynamic

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Full Text: [2011\Col Sur A-Phy Eng Asp377, 330.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp377,%20330.pdf)

Abstract: In the present work, carbon fiber, polyethersulphone and polyphenylence sulfide were the material choice. By a solution and suspension impregnation technique and hot-pressing process, a unidirectional laminates was produced. The values of Interlaminar Shear Strength (ILSS) showed PPS widen the scope of shaping temperature without negative effect upon the interface binding force among the CF and resins. The moisture gain curves of composites by different matrix were compared with those of the neat resins in order to determine the interface combination status during moisture sorption process. The results proved PPS reduced water absorption by weakening the polarity of benzene and forming compact structure by crystallization. The difference in absorption heat of two kinds of matrix and composites suggested that the interface play an important role during the diffusion procession. Comparing to the pseudo-first-order model, the pseudo-second-order model is in excellent agreement with the experimental data of the composite consist of hybrid resins. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Carbon, CF, Interface, Kinetic, PES, PPS, Resin, Resins, Sorption, Thermodynamics, Water Diffusion

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Full Text: [2011\Col Sur A-Phy Eng Asp377, 379.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp377,%20379.pdf)

Abstract: The molecularly imprinted polymer (MIP) on the surface of carbon microspheres (CMSs), which were modified by acid and silylation treatment, was obtained by using dibenzothiophene (DBT) as template, methacrylic acid as functional monomer, ethylene glycol dimethacrylate as cross-linking agent and azoisobutyronitrile as initiator. Field emission scanning electron microscopy, Fourier transformation infrared spectroscopy and thermogravimetry were used to characterize the structure and morphology of the MIP-CMSs. The adsorption isotherm and kinetics of DBT on MIP-CMSs were investigated. The preliminary results show that MIP-CMSs possessed good recognition toward DBT, that is, the adsorption equilibrium time was about 5 h and the equilibrium adsorption amount was 0.595 mmol/g. The mechanism for adsorption of DBT onto MIP-CMSs was found to follow Langmuir isotherm and pseudo second order model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Carbon Microspheres, Dibenzothiophene, Electron Microscopy, Equilibrium, Isotherm, Kinetics, Lagergren’s Pseudo Second Order Model, Langmuir, Langmuir Isotherm, Stationary Phases, Surface Molecularly Imprinted Polymer

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Full Text: [2011\Col Sur A-Phy Eng Asp379, 102.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp379,%20102.pdf)

Abstract: Mesoporous magnesium oxide microspheres were prepared by a simple precipitation and calcination method using sodium poly (4-styrenesulfonate) (PSS) as structure-directing agent. The as-prepared samples were characterized by X-ray diffraction (XRD), field-emission scanning electron microscopy (FE-SEM), nitrogen adsorption-desorption isotherms and Fourier transform infrared (FTIR) spectroscopy. Adsorption of phosphate onto the as-prepared samples from aqueous solutions was investigated and discussed. The pore structure and SEM analyses indicate that MgO microspheres are composed of at least three levels of hierarchical porous organization: small mesopores (ca. 2-5 nm), large mesopores (ca. 10-50 nm) and macropores (50-250 nm). The equilibrium adsorption data of phosphate on the as-prepared samples were analyzed by Langmuir and Freundlich models, suggesting that the Langmuir model provides the better correlation of the experimental data. The adsorption capacities for removal of phosphate were determined using the Langmuir equation and found to be 3.17 and 75.13 mg/g for MgO samples prepared in pure water and in the presence of 1.0 g/L PSS, respectively. Adsorption data were modeled using the pseudo-first-order, pseudo-second-order and intra-particle diffusion kinetics equations. The results indicate that pseudo-second-order kinetic equation and intra-particle diffusion model can better describe the adsorption kinetics. The as-prepared mesoporous MgO microspheres are found to be effective adsorbent for the removal of phosphate from aqueous solutions as a result of their unique porous structures and high specific surface areas. (C) 2010 Elsevier ay. All rights reserved.

Keywords: Adsorption, Adsorption Affinity, Adsorption Kinetics, Dewatered Alum Sludge, Electron Microscopy, Equilibrium, Freundlich, FTIR, Furnace Slag, Isotherms, Kinetic, Kinetics, Langmuir, Layered Double Hydroxides, Macro-, Mesoporous Titania, Magnesium-Oxide, Mesoporous, Metal-Oxides, MgO, MgO Microspheres, Nutrients Removal, Phosphate, Phosphorus Removal, Photocatalytic Activity, Surface, Waste-Water

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Full Text: [2011\Col Sur A-Phy Eng Asp380, 143.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp380,%20143.pdf)

Abstract: The sorption behaviors of carboxymethyl cellulose (CMC) for methylene blue (MB) were investigated in this work. The experimental results indicated that the sorption capacity increased from 50 mg g-1 for unmodified cellulose (UmC) to more than 300 mg g-1 for CMC. The most favorable sorption of MB was observed at an alkaline condition. The sorption isotherms closely followed the Langmuir mode, and the sorption kinetics was in agreement with the pseudo-second order equation. The results from the batch experiments illuminated that the sorption mechanism was ion-exchange controlled process. In fixed-bed tests, CMC also exhibited high efficiency for removal for MB, in which sorption behaviors followed Thomas model. Desorption of the dye from the MB-sorbed CMC (MBsCMC) indicated that MBsCMC was stable, and MB was seldom released at neutral and alkaline conditions. Furthermore, a more efficient method for reuse of the disused sorbents was tried. MBsCMC was employed for removal of methyl orange (MO) in a secondary sorption at neutral or alkaline conditions. The maximal MO uptake of MBsCMC was over 100 mg g(-1), which was much higher than those of CMC and UmC. It was indicated that MBsCMC was efficient in sorption of MO for the electrostatic interaction between MO and MBsCMC, and secondary sorption was an appropriate way for reuse of this kind of disused sorbents. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Carboxymethyl Cellulose, Cellulose, Degradation, Desorption, Dye, Equilibrium, Ion Exchange, Isotherms, Kinetics, Langmuir, Mechanism, Metal Sorption, Methyl Orange, Methylene Blue, Removal, Rice Straw, Secondary Sorption, Sorption, Sorption Behavior, Sorption Isotherms, Thomas Model, Waste

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Full Text: [2011\Col Sur A-Phy Eng Asp381, 99.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp381,%2099.pdf)

Abstract: The adsorption of exopolysaccharides (EPS) on silver nanoparticles (SNPs) was influenced by pH, salt concentration, and zeta potential. In this paper, SNPs were stabilized using exopolysaccharides (EPS) produced by Aeromonas punctata as the capping agent. The effects of EPS concentration on the adsorption was studied by UV-visible absorption spectra. During interaction, a decrease in absorbance at plasmon peak of SNPs (425 nm) was observed till 50 mg/L of EPS, beyond that a blue shift towards 411 nm was observed. The capping of SNPs by EPS was confirmed by Fourier Transform Infrared Spectroscopy. The adsorption of EPS on nanoparticles was found to be strongly dependent on zeta potential. The equilibrium adsorption data fitted well by Langmuir isotherm compared to Freundlich curve. The kinetics of adsorption was fitted by pseudo-second-order. Desorption of EPS from SNPs was observed at alkaline pH 12. The stabilized silver nanoparticles could be more amenable towards applications in biotechnology and bioengineering. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Kinetics, Chromatography, Desorption, EPS, Exopolysaccharides, Kinetics, Langmuir Isotherm, Nanostructures, Pseudo-Second-Order, Silver Nanoparticles, Sorption, Stabilized Silver, Zeta Potential

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Full Text: [2011\Col Sur A-Phy Eng Asp384, 9.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp384,%209.pdf)

Abstract: Humic acid (HA) was immobilized onto surfactant-modified zeolite (SMZ) which was prepared by the loading of cetylpyridinium bromide (CPB) onto natural zeolite. The adsorption behavior of Cu(II) from aqueous solution onto HA-immobilized SMZ (HA-SMZ) was investigated. HA-SMZ exhibited higher adsorption efficiency for Cu(II) than SMZ. The adsorption efficiency of Cu(II) onto HA-SMZ increased with the increase of solution pH from 3 to 7. The adsorption kinetic of Cu(II) onto HA-SMZ was discussed using the pseudo-first-order, pseudo-second-order and intra-particle diffusion models, and the pseudo-second-order model provided the best correlation of the experimental data. The equilibrium adsorption data of Cu(II) onto HA-SMZ were analyzed by the Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherm models, and the experimental data fitted well with all the isotherm models. Thermodynamic parameters such as Gibbs free energy change, enthalpy change and entropy change were calculated, and the results showed that the adsorption of Cu(II) onto HA-SMZ was feasible, spontaneous and endothermic in nature. The calculated activation energy of adsorption for Arrhenius equation, mean free energy of adsorption for D-R isotherm and Gibbs free energy change showed that the adsorption of Cu(II) onto HA-SMZ not only involves a chemical adsorption process, but also involves an ion exchange process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous Solution, Bentonite, Composite, Copper, Copper Ion, Cu(II), Diffusion, Equilibrium, Freundlich, Heavy-Metals, Humic Acid, Ion Exchange, Ion-Exchange, Isotherm, Kinetic, Kinetics, Langmuir, Natural Zeolite, pH, Removal, Surfactant-Modified Zeolite, Thermodynamic, Thermodynamic Parameters, Water, Zeolite

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Full Text: [2011\Col Sur A-Phy Eng Asp387, 43.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp387,%2043.pdf)

Abstract: The biosorption of phosphate from aqueous solutions using Fe(III)-treated Staphylococus xylosus cells was investigated. Langmuir and Freundlich isotherm models were applied to describe the adsorption equilibrium and found that Langmuir isotherm model fitted the equilibrium data better than Freundlich isotherm model. The biosorption capacity of Fe(III)-treated biomass for phosphate was found to be 70.92 mg/g at optimum conditions of pH 3.0, biomass concentration 0.5 g/L and equilibrium phosphate-biomass time 60 min respectively. The sorption efficiency at initial phosphate concentration of 50 mg/L was not influenced upon addition of SO(4)(2-), Cl(-), CO(3)(2-), NO(3)(-), Mg2+ and Ca2+ ions from 0 to 800 mg/L, whereas under the same conditions, phosphate sorption was increased with increase in concentration of Fe2+ ions. The kinetic models showed that phosphate sorption followed pseudo-second order kinetics. The calculated thermodynamic parameters indicated the spontaneous, exothermic and feasible nature of phosphate biosorption process. Phosphate was completely desorbed from 2.0 g/L of phosphate-loaded biomass using 0.14 M HCl and Fe(III)-treated biomass exhibited almost the same uptake capacities up to three subsequent biosorption/desorption cycles. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Arsenic Removal, Biosorption, Chromium, Common Ions, Desorption, Desorption, Dyes, Equilibrium, Fly-Ash, Freundlich, Freundlich Isotherm, Goethite, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, pH, Phosphate, Pseudo Second Order, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Uptake, Waste, Water

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Full Text: [2011\Col Sur A-Phy Eng Asp387, 50.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp387,%2050.pdf)

Abstract: Adsorption kinetics and isotherms and the surface complexation of 3,4-dihydroxybenzoic acid (3,4-DHBA) and catechol at the alpha-alumina/electrolyte interface were investigated. The state of equilibrium for adsorption of 3,4-DHBA onto α-alumina surface at pH 5 was attained at 120 min, whereas it was 90 min for catechol, but at pH 10 the state of equilibrium for the both the systems was same (similar to 60 min). The pseudo-second-order kinetic equation of nonlinear form (Eq. (3)) fits the experimental kinetic data significantly better than the linear form (Eq. (2)) in the entire time duration. The adsorption density of 3,4-DHBA onto the a-alumina surfaces at pH 10 and at similar experimental conditions is equivalent to catechol. DRIFT spectra indicate that 3,4-DHBA forms both outer- and inner-sphere complexes and catechol forms bidentate mononuclear complex with the α-alumina surface. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 3,4-Dihydroxybenzoic Acid, Adsorption, Adsorption Kinetics, Adsorption Kinetics And Isotherms, Alpha-Alumina, Aluminum-Hydroxide, And Isotherms, Aqueous-Solution, Atr-FTIR, Carboxylic-Acids, Catechol, Complexation, Drift Spectra, Equilibrium, Isotherms, Kinetic, Kinetics, Natural Organic-Matter, Nom, Nonlinear, Oxides, pH, Phenolic-Acids, Pseudo Second Order, Surface Complexation

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Full Text: [2011\Col Sur A-Phy Eng Asp388, 59.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp388,%2059.pdf)

Abstract: A removal of Cu2+ ions from aqueous solutions onto hydrogels of chitosan. itaconic and methacrylic acid has been investigated using batch adsorption technique. The extent of adsorption was investigated as a function of pH, adsorbent dose, initial metal ion concentration, contact time and temperature. The FIR spectra showed that -NH2, -OH and -COOH groups are involved in the Cu2+ ions adsorption. The surface topography changes were observed by AFM, where the phase images indicated that sorption takes place on the surface of the hydrogel and in the bulk. Pseudo-first order, pseudo-second order and intraparticle diffusion models were analyzed and showed that the Cu2+ ions adsorption followed pseudo-second order kinetics. The equilibrium data were analyzed using Langmuir, Freundlich and Redlich-Peterson isotherms and the best interpretation was given by Redlich-Peterson. The adsorption capacity was found to be 122.59 mg/g, based on the non-linear Langmuir isotherm. Based on the separation factor. R(L), the Cu2+ ion adsorption is favorable, while the low activation energies indicate physisorption. Desorption experiments, done with a nitric acid, showed that the investigated hydrogels could be reused without significant losses of the initial properties even after three adsorption-sorption cycles. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activation, Adsorption, Adsorption Isotherm, Afm, Aqueous-Solution, Ca-Alginate, Cd(II) Ions, Copper, Cross-Linked Chitosan, Cu2+ Adsorption, Cu(II) Ions, Desorption, FTIR, Heavy-Metal Ions, Hydrogel, Isotherm, Kinetic Model, Kinetics, Langmuir, pH, Removal, Sorption, Waste-Water

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Full Text: [2011\Col Sur A-Phy Eng Asp389, 12.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp389,%2012.pdf)

Abstract: Fe-doped sulfated titania (FST) photocatalysts with high photocatalytic activity were prepared from industrial titanyl sulfate solution and characterized using N2 adsorption-desorption technique. Adsorption kinetics and mechanism of methylene blue onto FST samples were studied at different temperatures (298, 303 and 308 K). The kinetic experimental data appropriately correlate with the pseudo-second order model. The overall rate of the adsorption process appears to be influenced by both boundary layer diffusion and intraparticle diffusion. The low adsorption activation energy (in the range of 15.59-19.31 kJ mol-1) suggests that the adsorption of methylene blue onto FST samples was conformed to the physisorption mechanism. With calcination temperature increases from 400 to 600 degrees C, sulfur species gradually decomposes and desorbs from the surface of FST samples, which can enhance the affinity between methylene blue and FST samples. Moreover, the specific surface decreases and the pore volume and pore diameter increase with rise in calcining temperature. All these have a significant influence on the adsorption properties of FST samples. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activation, Adsorption, Adsorption Kinetics, Aqueous-Solution, Ash, Behavior, Dioxide, Fe-Doped Sulfated Titania, Ions, Kinetics, Methylene Blue, Models, Photocatalysis, Removal, Sorption, Tio2

? Sun, J., Rao, S.Q., Su, Y.J., Xu, R.R. and Yang, Y.J. (2011), Magnetic carboxymethyl chitosan nanoparticles with immobilized metal ions for lysozyme adsorption. *Colloids and Surfaces A-Physicochemical and Engineering Aspects*, **389** (1-3), 97-103.

Full Text: [2011\Col Sur A-Phy Eng Asp389, 97.pdf](2011/Col%20Sur%20A-Phy%20Eng%20Asp389,%2097.pdf)

Abstract: Nearly monodispersed and functional carboxymethyl chitosan nanoparticles (Fe3O4 (PEG + CM-CTS)) (about 15 nm) which prepared by chemical coprecipitating were treated with Zn (II), Cu (II) and Fe (III) ions solutions to obtain immobilized metal affinity magnetic nanoparticles (IMAN) (short as Fe3O4 (PEG + CM-CTS) @ Zn (II), Fe3O4 (PEG + CM-CTS) @ Cu (II) and Fe3O4 (PEG + CM-CTS) @ Fe (III) nanoparticles). The presented synthetic technology is simple, cost effective and allows to preparing the high-quality superparamagnetic IMAN in a large scale. The as-prepared nanoparticles were conveniently applied for lysozyme adsorption. In lysozyme adsorption study, the results obtained emphasize the role of pH and ionic strength in governing the extent and mechanism of affinity interactions which using IMAN as the carriers. The adsorption kinetic models (the pseudo-second-order) were used to analyze the experimental data, the results indicated that the pseudo-second-order equation is the appropriate equation to predict the adsorption capacity of lysozyme for these three tested magnetic carriers. The adsorption equilibrium of lysozyme onto the IMAN fitted well with the Langmuir model. The maximum equilibrium adsorption capacity of the Fe3O4 (PEG + CM-CTS) @ Zn (II), Fe3O4 (PEG + CM-CTS) @ Cu (II) and Fe3O4 (PEG + on-as) 0 Fe (III) nanoparticles were calculated to be 200 mg/g, 185.19 mg/g and 232.56 mg/g, respectively. Fluorescence analysis demonstrated that Fe3O4 (PEG + CM-CTS) @ Zn (II) and Fe3O4 (PEG + cm-cm) @ Fe (III) nanoparticles may not cause the conformational change and denaturation for the lysozyme, but the lysozyme which desorbed from Fe3O4 (PEG + CM-CTS) @ Cu (II) underwent some subtle change in comparison with the original lysozyme. These results are expected to open up a new application of superparamagnetic nanoparticles as well as a new possibility for the lysozyme separation. Additionally, it is worth noting that, since the preparation, surface functionality and affinity separation process of the magnetic nanoparticles is low cost, nontoxic and reusable, the application of the superparamagnetic nanoparticles may find much potential in protein separation and purification. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Affinity-Chromatography, Carboxymethyl Chitosan, Enrichment, Immobilized Metal Affinity Magnetic Nanoparticles, Langmuir, Lysozyme, Membrane Chromatography, Metal Ions, Methacrylate), Microspheres, Nanospheres, Particles, pH, Protein Purification, Proteins, Purification, Separation

# Title: Colloids and Surfaces B-Biointerfaces

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Materials Science, Biomaterials: Impact Factor 1.325, 6/15 (2004); Impact Factor 1.588, 7/15 (2005); Impact Factor 2.109, 6/16 (2007); Impact Factor 2.600, 9/25 (2009)

Ju, Y.H., Chen, T.C. and Liu, J.C. (1997), A study on the biosorption of lindane. *Colloids and Surfaces B-Biointerfaces*, **9** (3-4), 187-196.

Full Text: [C\Col Sur B-Bio9, 187.pdf](C/Col%20Sur%20B-Bio9,%20187.pdf)

Abstract: Equilibrium adsorption of lindane by Gram negative bacteria (*Escherichia coli*, *Zoogloea Ramigera*) and Gram positive bacteria (Bacillus megaterium, Bacillus subtilis) was investigated. Adsorption isotherms can be interpreted in terms of the Freundlich model. Lindane biosorption by all four bacteria increases as ionic strength increases. Higher bioconcentration factor (BCF) under lower pH was observed. No general trend of the temperature effect on biosorption was found. Zeta potentials of bacteria at pH 7 were measured and correlated with lindane adsorption. The cell wall was treated with ethylenediaminetetraacetic acid (EDTA) and its effect on the biosorption of lindane was investigated. A bacterial adherence to hydrocarbon (BATH) (%) test was also conducted to measure the relative hydrophobicity of bacteria. It is proposed that both van der Waals forces and hydrophobic interaction contribute to the biosorption reaction. (C) 1997 Elsevier Science B.V.

Keywords: Adsorption, Adsorption Isotherms, Bacillus Subtilis, Bacteria, Bioconcentration, Biomass, Biosorption, Chlorinated Phenols, Desorption, EDTA, Elsevier, Environment, Equilibrium, Escherichia Coli, Freundlich, Hydrophobicity, Interaction, Isotherms, Lindane, Model, Organic Pollutants, Pesticides, pH, Photogeneration, Photoimageable Polymer, Polymeric Amine, Positive, Quantum Yield, Science, Sorption, Temperature, Water

Murray, B.S. and Cros, L. (1998), Adsorption of β-lactoglobulin and β-casein to metalsurfaces and their removal by a non-ionic surfactant, as monitored via a quartz crystal microbalance. *Colloids and Surfaces B-Biointerfaces*, **10** (4), 227-241.

Full Text: [C\Col Sur B-Bio10, 227.pdf](C/Col%20Sur%20B-Bio10,%20227.pdf)

Abstract: The use of a quartz crystal microbalance apparatus has been explored as a means of monitoring protein adsorption at the solid-liquid interface in real time. Gold-water and hydrophobic gold-water interfaces were studied, with adsorbed films of pure samples of the milk proteins beta-casein and beta-lactoglobulin. Adsorbed protein surface concentrations calculated from the observed frequency shifts and the Sauerbrey equation were higher by factor of 2 to 3 compared with results from other common techniques. This suggested that the frequency shifts were not only due to the adsorbed protein amount, but also to changes in protein hydrodynamic layer thickness. At neutral pH, for both beta-casein and beta-lactoglobulin, the results could be sensibly modelled in terms of a protein-rich inner layer close to the surface and a more diffuse outer layer extending into the bulk aqueous phase. The water-soluble surfactant octaethylene glycol n-dodecylether (C12E8) was added to pre-adsorbed protein films and then the systems were rinsed with buffer to try to remove adsorbed protein. Proteins adsorbed on the gold surface appeared to be more difficult to remove by this procedure-particularly for beta-lactoglobulin, possibly due to the formation of covalent bonding between protein sulphydryl groups and the gold surface. On hydrophobic gold surfaces, proteins appeared to be removed more easily, though not necessarily completely, owing to the greater affinity of the surfactant for the hydrophobic gold surface. Adsorption of a cationic gelatin onto the hydrophobic gold surface at pH7 indicated the formation of a relatively thick adsorbed “surface gel” layer, with large amounts of entrapped water. Addition of beta-lactoglobulin to a 24-hour-old gelatin film indicated the formation of an even thicker film—probably due to the formation of an electrostatic complex between the oppositely charged proteins at this pH.

Öztürk, A., Artan, T. and Ayar, A. (2004), Biosorption of nickel(II) and copper(II) ions from aqueous solution by *Streptomyces coelicolor* A3(2). *Colloids and Surfaces B-Biointerfaces*, **34** (2), 105-111.

Full Text: [C\Col Sur B-Bio34, 105.pdf](C/Col%20Sur%20B-Bio34,%20105.pdf)

Abstract: The biosorption of nickel(II) and copper(II) ions from aqueous solution by dried Streptomyces coelicolor A3(2) was studied as a function of concentration, pH and temperature. The optimum pH range for nickel and copper uptake was 8.0 and 5.0, respectively. At the optimal conditions, metal ion uptake was increased as the initial metal ion concentration increased up to 250 mg l-1. At 250 mg l-1 copper(II) ion uptake was 21.8% whereas nickel(II) ion uptake was found to be as high as 7.3% compared to those reported earlier in the literature. Metal ion uptake experiments were carried out at different temperatures where the best ion uptake was found to be at 25 degreesC. The characteristics of the adsorption process were investigated using Scatchard analysis at 25 degreesC. Scatchard analysis of the equilibrium binding data for metal ions on S. coelicolor A3(2) gave rise to a linear plot, indicating that the Langmuir model could be applied. However, for nickel(II) ion, divergence from the Scatchard plot was evident, consistent with the participation of secondary equilibrium effects in the adsorption process. Adsorption behaviour of nickel(II) and copper(II) ions on the S. coelicolor A3(2) can be expressed by both the Langmuir and Freundlich isotherms. The adsorption data with respect to both metals provide an excellent fit to the Freundlich isotherm. However, when the Langmuir isotherm model was applied to these data, a good fit was obtained for the copper adsorption only and not for nickel(lI) ion. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Streptomyces Coelicolor A3(2), Biosorption, Scatchard Analysis, Adsorption Isotherms, Heavy-Metal Biosorption, Waste Biomass, Marine-Algae, Removal, Sorption, Binding, Cells, Bioaccumulation, Vulgaris, Bacteria

? Panda, G.C., Das, S.K., Chatterjee, S., Maity, P.B., Bandopadhyay, T.S. and Guha, A.K. (2006), Adsorption of cadmium on husk of Lathyrus sativus: Physico-chemical study. *Colloids and Surfaces B-Biointerfaces*, **50** (1), 49-54.

Full Text: [2006\Col Sur B-Bio50, 49.pdf](2006/Col%20Sur%20B-Bio50,%2049.pdf)

Abstract: Adsorption of cadmium(II) from aqueous solution by low-cost biosorbents was investigated. Husk of Lathyrus sativus (HLS) was found to be the most efficient in this respect and removed similar to 95% of the metal. The influence of pH, temperature. contact time and metal ion concentration on the adsorption process by HLS was studied. Hydrogen ion concentration of the solution greatly influenced the process with an optimum at pH 5.0-6.0, whereas temperature had no significant effect. The process was very fast and more than 90% of the total adsorption took place within the first 5 min and was found to follow pseudo-second order rate kinetics. The adsorption data can better be explained by Langmuir isotherm model and the calculated maximum adsorption capacity was 35 mg/g of HLS at pH 5.0 and 30°C. Scanning electron micrographs showed that cadmium was present as micro precipitate on the surface of the adsorbent. Cadmium replaced Calcium of the biomass as revealed from the EDX analysis indicating that the adsorption proceeds through ion exchange mechanism. Cadmium could be desorbed from the loaded biomass by lowering pH similar to 1.0 with mineral acid. (C) 2006 Elsevier B.V. All rights reserved.

Keywords: Lathyrus Sativus, Sorption, Isotherin, Sem-Edx, Desorption, Affinity Chromatographic-Separation, Aqueous-Solutions, Biosorption, Ions, Equilibrium, Proteins, Chitosan, Kinetics, Metals, Cd(II)

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Full Text: [2006\Col Sur B-Bio52, 89.pdf](2006/Col%20Sur%20B-Bio52,%2089.pdf)

Abstract: In order to elucidate the potential mechanisms involved in the biosorption of metal ions, atomic force microscopy (AFM) and Fourier transform infrared (FT-IR) spectroscopy were used to characterize the interaction between Pb2+ and Bacillus cereus. AFM imaging of the biomass surfaces exposed to different concentrations of lead ions solution showed a major morphological change occurred after Pb2+ biosorption. The FT-IR spectra indicated the binding characteristics of the lead ions involved the carboxyl, hydroxyl and amino groups in the biomass. Equilibrium biosorption experiments of Pb2+ were carried out to investigate the effects of pH values and the Initial metal concentrations. The experimental isotherm data were then modeled using Langmuir, Freundlich, and Redlich-Peterson isotherm equations. As a result, the Redlich-Peterson model yielded the best fit of experimental data. Kinetics experiments showed the biosorption was a rapid process and the pseudo-second-order model was successfully applied to predict the rate constant of biosorption. (c) 2006 Elsevier B.V. All rights reserved.

Keywords: Biosorption, Lead, Bacillus Cereus, AFM, FT-IR, Atomic-Force Microscopy, Chemical-Equilibrium Model, Brown Seaweed Biomass, Saccharomyces-Cerevisiae, Adsorption-Isotherm, Metal Adsorption, Aqueous-Solution, Heavy-Metals, Cadmium, Binding

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Full Text: [2007\Col Sur B-Bio57, 135.pdf](2007/Col%20Sur%20B-Bio57,%20135.pdf)

Abstract: Husk of Lathyrus sativus (HLS) has been found to be a good sorbent for the removal of nickel(II) from its aqueous solution. The adsorption process depends on pH of the solution with an optimum at 5.0, and follows Langmuir isotherm model (correlation coefficient 0.998). Initial adsorption rate is very fast and reaches equilibrium following pseudo-second order kinetics within 60 min. Amino, carboxyl, hydroxyl and phosphate groups of the biomass are involved in chemical interaction with nickel ions as revealed from SEM-EDX and FTIR studies. Chemical modifications of the functional groups of the biosorbent show that amino groups contribute largely (similar to 57%) for the binding of nickel ions and probably undergo chelation through dative bond formation. HLS biomass has been found to adsorb both nickel and cadmium equally from their mixed solution to the extent of similar to 70% indicating the importance of this sorbent in industrial effluent treatment. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Process, Adsorption Rate, Aqueous Solution, Aqueous-Solution, Binding, Binding Mechanism, Biomass, Biosorbent, Biosorption, Cadmium, Carboxyl, Cations, Chelation, Chemical, Chitin, Chlorella-Vulgaris, Copper, Correlation, Effluent, Effluent Treatment, Equilibrium, Formation, FTIR, Functional, Functional Groups, Groups, Hydroxyl, Importance, Industrial, Industrial Effluent, Interaction, Isotherm, Isotherm Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Langmuir-Isotherm, Mechanism, Model, Nickel, Nickel Ions, Nickel(II), Order, pH, Phosphate, Process, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, SEM-EDX, Sorbent, Sorption, Treatment

? Das, S.K. and Guha, A.K. (2007), Biosorption of chromium by *Termitomyces clypeatus*. *Colloids and Surfaces B-Biointerfaces*, **60** (1), 46-54.

Full Text: [2007\Col Sur B-Bio60, 46.pdf](2007/Col%20Sur%20B-Bio60,%2046.pdf)

Abstract: The manuscript describes removal of chromium from aqueous solution by biomass of different moulds and yeasts. The biomass of *Termitomyces clypeatus* (TCB) is found to be the most effective of all the fungal species tested. The sorption of hexavalent chromium by live TCB depends on the pH of the solution, the optimum pH value being 3.0. The process follows Langmuir isotherm (regression coefficient 0.998, chi(2)-square 5.03) model with uniform distribution over the surface which gets strong support from the X-ray elemental mapping of chromium adsorbed biomass. The amino, carboxyl, hydroxyl, and phosphate groups of the biomass are involved in chemical interaction with the chromate ion forming a cage like structure depicted by scanning electron microscopic (SEM) and Fourier transform infrared spectroscopic (FTIR) results. Desorption and FTIR studies also exhibited that Cr6+ is reduced to trivalent chromium on binding to the cell surface. The level of chromium concentration present in the effluent of tannery industries’ is reduced to a permissible limit using TCB as adsorbent. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Sorption, Termitomyces Clypeatus, Fesem, FTIR, Chromium, Isotherm Model, Hexavalent Chromium, Rhizopus-Arrhizus, Waste-Water, Heavy-Metals, Adsorption, Removal, Cr(Vi), Recovery, Biomass, Spectroscopy

? Hossain, K.Z., Monreal, C.M. and Sayari, A. (2008), Adsorption of urease on PE-MCM-41 and its catalytic effect on hydrolysis of urea. *Colloids and Surfaces B-Biointerfaces*, **62** (1), 42-50.

Full Text: [2008\Col Sur B-Bio62, 42.pdf](2008/Col%20Sur%20B-Bio62,%2042.pdf)

Abstract: Pore-expanded MCM-41 (PE-MCM-41) silica exhibits a unique combination of high specific surface area (ca. 1000 m2/g), pore size (up to 25 nm) and pore volume (up to 3.5 cm3/g). As such, this material is highly suitable for the adsorption of large biomolecules. The current study focused primarily on the application of PE-MCM-41 material as suitable host for urease (nickel-based large metalloenzyme) in controlled hydrolysis of urea. Urease adsorbed on PE-MCM-41, regular MCM-41 and silica gel (SGA) were used as catalysts for urea hydrolysis reaction. adsorption studies of urease on these materials from aqueous solution at ph 7.2 revealed that the adsorption capacity of PE-MCM-41 (102 MG/G) is significantly higher than that of MCM-41 (56 MG/G) and SGA (21 mg/g). The equilibrium adsorption data were well fitted using the Langmuir-Freundlich model. Furthermore, the kinetic study revealed that the uptake of urease follow the pseudo-first order kinetics. The in vitro urea hydrolysis reaction on pristine urease and different urease-loaded catalysts showed that the rate of hydrolysis reaction is significantly slower on U/PE-MCM-41 compared to that of bulk urease and urease on MCM-41 and SGA. This technique could be an alternative means to the use of urease inhibitors to control the ammonia release from urea fertilizer. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Urease, Adsorption, Mesoporous Silica, Urea, Langmuir-Freundlich Isotherm, Expanded Mesoporous Silica, Jack-Bean Urease, Molecular-Sieves, Pore-Size, Heavy-Metals, Waste-Water, Immobilization, Enzyme, CO2, Hydroxyapatite

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Full Text: [2008\Col Sur B-Bio62, 97.pdf](2008/Col%20Sur%20B-Bio62,%2097.pdf)

Abstract: The present study explores the ability and the comparison of living and non-living ureolytic mixed culture (UMC) to remove Ni(II) from aqueous solution. Time dependency experiments for the Ni(II) uptake showed that adsorption equilibrium was reached almost I 10 and 60 min after addition Ni(II) of 100 mg/L. The kinetic data were analyzed in term of pseudo-first-order and pseudo-second-order expressions. Ni(II) sorption of living UMC was appropriate with pseudo-first-order kinetic (k1 = 2.15 h-1, R2 = 0.93) while non-living UMC sorbed Ni(II) with respect to second-order kinetics (k2 = 1.64 g/mg h, R2 = 0.98). Also, comparison between the biosorption capacity of untreated living and non-living biomass was conducted for removal of Ni(II). The biosorption process was investigated in equilibrium batch tests for Langmiur, Freundlich and Temkin isotherm models. The data pertaining to the sorption dependence upon Ni(II) ion concentration ranged from 5 to 320 mg/L could be fitted to a Freundlich isotherm model. The capacity constants K of Freundlich model for living and non-living UMC were 1.55 and 0.38 mg/g, respectively; the affinity constants I In were 0.47 and 0.75, respectively. Based on the results, the UMC appear to be a potential biosorbent for removal of Ni(II) from wastewater. (c) 2007 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adsorption, Adsorption Equilibrium, Aqueous Solution, Aqueous Solutions, Biomass, Biosorbent, Biosorption, Capacity, Comparison, Culture, Dependency, Equilibrium, Experiments, Freundlich, Freundlich Isotherm, Heavy-Metal Biosorption, Ions, Isotherm, Isotherm Model, Kinetic, Kinetics, Lead, Living, Model, Models, Ni(II), Nickel, Nickel(II), Non-Living, Potential, Removal, Rights, Second-Order Kinetics, Solution, Sorption, Ureolytic, Waste-Water, Wastewater

? Majumdar, S.S., Das, S.K., Saha, T., Panda, G.C., Bandyopadhyoy, T. and Guha, A.K. (2008), Adsorption behavior of copper ions on *Mucor rouxii* biomass through microscopic and FTIR analysis. *Colloids and Surfaces B-Biointerfaces*, **63** (1), 138-145.

Full Text: [2008\Col Sur B-Bio63, 138.pdf](2008/Col%20Sur%20B-Bio63,%20138.pdf)

Abstract: Mucor rouxii biomass (MRB) was found to be most potent sorbent for the removal of copper from its aqueous solution. Maximum adsorption was noted within pH range 5.0-6.0, and the process follows Langmuir adsorption isotherm (r2 = 0.998). Adsorption process is very fast initially and reaches equilibrium very quickly following pseudo second order rate kinetics. Amino, carboxyl and phosphate groups present on the cell surface of the biomass are involved in chemical interaction with copper ion as revealed from FTIR and SEM-EDX study and also by blocking experiments. Both SEM and AFM micrographs revealed the formation of metal nanostructure on the biomass surface due to copper adsorption. Biomass surface modification indicates the major involvement of amino functional group for the binding probably through the chelation. Copper ion can be eluted from the adsorbed biomass with 0.1 M hydrochloric acid. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Afm, Analysis, Aqueous Solution, Behavior, Bioaccumulation, Biomass, Biosorption, Biosorption, Cadmium, Chelation, Copper, Copper Adsorption, Equilibrium, Experiments, FTIR, Functional Group, Interaction, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lead, Mechanism, Metal, Modification, Mucor Rouxii, pH, Phosphate, Recovery, Removal, *Rhizopus-Arrhizus* Biomass, Rights, SEM, SEM-EDX, Solution, Surface Modification

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Full Text: [2008\Col Sur B-Bio63, 170.pdf](2008/Col%20Sur%20B-Bio63,%20170.pdf)

Abstract: Industrial wastewaters containing heavy metals pose a major environmental problem that needs to be remedied. The present study reports the ability of two non-living (dried) fresh water algae, Oedogonium sp. and Nostoc sp. to remove lead(II) from aqueous solutions in batch system under varying range of pH (2.99-7.04), contact time (5-300 min), biosorbent dose (0.1-0.8 g/L), and initial metal ion concentrations (100 and 200 mg/L). The optimum conditions for lead biosorption are almost same for the two algal biomass Oedogonium sp. and Nostoc sp. (pH 5.0, contact time 90 and 70 min, biosorbent dose 0.5 g/L and initial Pb(II) concentration 200 mg/L) however, the biomass of Oedogonium sp. was found to be more suitable than Nostoc sp. for the development of an efficient biosorbent for the removal of lead(II) from aqueous solutions, as it showed higher values of qe adsorption capacity (145.0 mg/g for Oedogonium sp. and 93.5 mg/g for Nostoc sp.). The equilibrium data fitted well in the Langmuir isotherms than the Freundlich isotherm, thus proving monolayer adsorption of lead on both the algal biomass. Analysis of data shows that the process involves second-order kinetics and thermodynamic treatment of equilibrium data shows endothermic nature of the adsorption process. The spectrum of FTIR confirms that the amino and carboxyl groups on the surface of algal biomass were the main adsorption sites for lead removal. Both the biosorbents could be regenerated using 0.1 mol/L HCl solution, with upto 90% recovery. The biosorbents were reused in five biosorption-desorption cycles without a significant loss in biosorption capacity. Thus, this study demonstrated that both the algal biomass could be used as an efficient biosorbents for the treatment of lead(II) bearing wastewater streams. © 2008 Elsevier B.V. All rights reserved.

Keywords: Biosorption, FTIR, Kinetics, Lead(II), Nostoc sp., Oedogonium sp.

? Gupta, V.K. and Rastogi, A. (2008), Biosorption of lead(II) from aqueous solutions by non-living algal biomass *Oedogonium* sp. and *Nostoc* sp.: A comparative study. *Colloids and Surfaces B-Biointerfaces*, **64** (2), 170-178.

Full Text: [2008\Col Sur B-Bio64, 170.pdf](2008/Col%20Sur%20B-Bio64,%20170.pdf)

Abstract: Industrial wastewaters containing heavy metals pose a major environmental problem that needs to be remedied. The present study reports the ability of two non-living (dried) fresh water algae, Oedogonium sp. and Nostoc sp. to remove lead(II) from aqueous solutions in batch system under varying range of pH (2.99-7.04), contact time (5-300 min), biosorbent dose (0.1-0.8 g/L), and initial metal ion concentrations (100 and 200 mg/L). The optimum conditions for lead biosorption are almost same for the two algal biomass Oedogonium sp. and Nostoc sp. (pH 5.0, contact time 90 and 70 min, biosorbent dose 0.5 g/L and initial Pb(II) concentration 200 mg/L) however, the biomass of Oedogonium sp. was found to be more suitable than Nostoc sp. for the development of an efficient biosorbent for the removal of lead(II) from aqueous solutions, as it showed higher values of q(e) adsorption capacity (145.0 mg/g for Oedogonium sp. and 93.5 mg/g for Nostoc sp.). The equilibrium data fitted well in the Langmuir isotherms than the Freundlich isotherm, thus proving monolayer adsorption of lead on both the algal biomass. Analysis of data shows that the process involves second-order kinetics and thermodynamic treatment of equilibrium data shows endothermic nature of the adsorption process. The spectrum of FTIR confirms that the amino and carboxyl groups on the surface of algal biomass were the main adsorption sites for lead removal. Both the biosorbents could be regenerated using 0.1 mol/L HCl solution, with upto 90% recovery. The biosorbents were reused in five biosorption-desorption cycles without a significant loss in biosorption capacity. Thus, this study demonstrated that both the algal biomass could be used as an efficient biosorbents for the treatment of lead(II) bearing wastewater streams. (c) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Algae, Aqueous Solutions, Batch System, Biomass, Biosorbent, Biosorbents, Biosorption, Biosorption-Desorption, Cadmium(II), Capacity, Cell-Walls, Copper, Development, Endothermic, Environmental, Equilibrium, Freundlich, Freundlich Isotherm, FTIR, Heavy Metals, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherms, Lead, Lead Removal, Lead(II), Marine-Algae, Metal, Metal-Ions, Metals, Monolayer, Needs, Non-Living, Nostoc sp., Oedogonium sp., Pb(II), pH, Recovery, Removal, Rights, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Sorption, Thermodynamic, Treatment, Waste, Wastewater, Water

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Full Text: [2008\Col Sur B-Bio65, 25.pdf](2008/Col%20Sur%20B-Bio65,%2025.pdf)

Abstract: Adsorption thermodynamic characteristic and kinetics of dissolved chromium from aqueous solutions onto humic acids (HAs) were studied. The results showed that the Freundlich isotherm model described the equilibrium data well. The negative ΔG° confirmed the spontaneity of adsorption process. The positive ΔH° and ΔS° proved the endothermic nature and irreversibility of the sorption. Furthermore, the adsorption process followed the pseudo-second-order equation. With increasing initial concentration of Cr(VI), the adsorption rate constant decreased while the maximum adsorption capacity increased. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Rate, Aqueous Solutions, Capacity, Chromium, Complexes, Cr(VI), Dissolved Chromium, Endothermic, Equilibrium, Fractions, Freundlich, Freundlich Isotherm, Humic Acids, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Studies, Kinetics, Model, Pseudo Second Order, Pseudo-Second-Order, Rate Constant, Rights, Soil, Sorption, Substances, Thermodynamic, Thermodynamics, Transport

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Full Text: [2008\Col Sur B-Bio65, 30.pdf](2008/Col%20Sur%20B-Bio65,%2030.pdf)

Abstract: The role of different functional groups (i.e. amino, carboxyl, hydroxyl as well as phosphate) and cell wall components (such as chitin, chitosan, glucan and phosphomannan) of Rhizopus oryzae on adsorption of rhodamine B is described. The functional groups were chemically modified to determine their contribution in the present adsorption process. Fourier transformed infrared spectroscopic (FTIR) study was used to characterize the modification of the functional groups due to chemical treatments. Carboxyl and amino groups were identified as most important moieties involved in the binding process. Different cell wall components were also isolated from the cell wall to explore their role involved in the binding process. Phosphomannan fraction adsorbed higher amounts of rhodamine B compared to the other cell wall components. Fluorescence microscopic images also supported the differential adsorption capacity of the various cell wall components. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Rhizopus Oryzae, Rhodamine B, Dye Adsorption, Chemical Modification, Cell Wall Components, Arrhizus Biomass, Color Removal, Metal-Ions, Biosorption, Mechanism, Decolorization, Technologies, Wastewaters, Biosorbents, Effluents

? Ngah, W.S.W., Hanafiah, M.A.K.M. and Yong, S.S. (2008), Adsorption of humic acid from aqueous solutions on crosslinked chitosan-epichlorohydrin beads: Kinetics and isotherm studies. *Colloids and Surfaces B-Biointerfaces*, **65** (1), 18-24.

Full Text: [2008\Col Sur B-Bio65, 18.pdf](2008/Col%20Sur%20B-Bio65,%2018.pdf)

Abstract: The adsorption of humic acid on crosslinked chitosan-epichlorohydrin (chitosan-ECH) beads was investigated. Chitosan-ECH beads were characterized by Fourier transform infrared spectroscopy (FTIR), surface area and pore size analyses, and scanning electron microscopy (SEM). Batch adsorption experiments were carried out and optimum humic acid adsorption on chitosan-ECH beads occurred at pH 6.0, agitation rate of 300 rpm and contact time of 50 min. Adsorption equilibrium isotherms were analyzed by Langmuir and Freundlich models. Freundlich model was found to show the best fit for experimental data while the maximum adsorption capacity determined from Langmuir model was 44.84 mg g-1. The adsorption of humic acid on chitosan-ECH beads was best described with pseudo-first-order kinetic model. For desorption study, more than 60% of humic acid could be desorbed from the adsorbent using 1.0 M HCl for 180 min. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Humic Acid, Chitosan-ECH Beads, Characterization, Kinetics, Isotherm, Desorption, Heavy-Metals, Fly-Ash, Sorption, Removal, Ions, Chitin, Equilibrium, Substances, Behavior, Carbon

? Kalavathy, H., Regupathi, I., Pillai, M.G. and Miranda, L.R. (2009), Modelling, analysis and optimization of adsorption parameters for H3PO4 activated rubber wood sawdust using response surface methodology (RSM). *Colloids and Surfaces B-Biointerfaces*, **70** (1), 35-45.

Full Text: [2009\Col Sur B-Bio70, 35.pdf](2009/Col%20Sur%20B-Bio70,%2035.pdf)

Abstract: Adsorption capacity of Cu2+ from aqueous solution onto (HPO4)-P-3 activated carbon using rubber wood sawdust (RSAC) was investigated in a batch system. Kinetic and isotherm studies were carried out, the thermodynamic parameters like standard Gibb’s free energy (ΔG°), enthalpy (ΔH°) and entropy (ΔS°) were evaluated. The pseudo-second-order model was found to explain the kinetics of Cu2+ adsorption most effectively. The process optimization was performed through Central Composite Rotary Design using response surface methodology (RSM) by Design Expert Version 5.0.7 (STAT-EASE Inc., Minneapolis, USA). An initial concentration of 35 rng L-1, temperature of 26 °C, carbon loading of 0.45 g (100 mL)-1, adsorption time 208 min and pH of 6.5 was found to be the optimum conditions for the maximum uptake of copper ions of 5.6 mg g-(1) in batch mode. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous-Solution, Biomass, Biosorption, Carbon, Copper, Copper Removal, H3PO4 Activated Rubber Wood Sawdust, Heavy-Metals, Kinetics, Optimization, Polymer-Assisted Ultrafiltration, Pseudo Second Order, Response Surface Methodology, Waste-Water

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Full Text: [2009\Col Sur B-Bio70, 46.pdf](2009/Col%20Sur%20B-Bio70,%2046.pdf)

Abstract: Kinetic and column adsorption of phosphate from aqueous solution using modified wheat residue (MWS) as an adsorbent were studied in a batch reactor. The respective characteristic rate constants and activation energy were presented after linear and non-linear fitting. In addition, the effects of influent concentration of phosphate and flow rates on the column adsorption were also investigated. The results showed that the adsorption process could reach equilibrium in 10-15 min, and the pseudo-second-order equation generated the best agreement with experimental data for adsorption systems. The activation energy was 3.39 kJ mol-1 indicating that the synthesis process was a physical adsorption. In the column tests, the increase of influent concentration and flow rate both decreased the breakthrough time, and the MWSS-packed column exhibited excellent phosphate removal from aqueous solution. These results provide strong evidence of the potential of MWS for the technological applications of phosphate removal from aqueous solutions. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Activation Energy, Adsorption, Adsorption Kinetics, Biosorption, Column Adsorption, Copper(II), Dye, Fixed-Bed Column, Lead(II), Liquid-Phase Adsorption, Modified Wheat Straw (MWS), Phosphate, Pseudo Second Order, Removal, Sorption

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Full Text: [2009\Col Sur B-Bio70, 232.pdf](2009/Col%20Sur%20B-Bio70,%20232.pdf)

Abstract: This study describes the use of banana peel, a commonly produced fruit waste, for the removal of Cr(VI) from industrial wastewater. The parameters pH, contact time, initial metal ion concentration, and temperature were investigated and the conditions resulting in rapid and efficient adsorption (95% within 10 min) were determined. The binding of metal ions was found to be pH dependent with the optimal sorption occurring at pH 2. The retained species were eluted with 5 ml of 2 M H2SO4. To elucidate the mechanism of the process, total amounts of chromium and Cr(VI) were analyzed using flame atomic absorption and Ultraviolet-visible (UV-Vis) spectroscopic techniques, respectively. The Langmuir and Dubinin-Radushkevich (D-R) isotherms were used to describe the partitioning behavior for the system at different temperatures. Kinetics and thermodynamics of Cr(VI) removal by banana peel were also studied. The influence of diverse ions on the sorption behavior revealed that only Fe(II) ions (of those tested) Suppressed the sorption of Cr(VI) ions to some extent. The method was applied for the removal of Cr(VI) from industrial wastewater. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Agricultural Waste, Aqueous-Solution, Banana Peel, Biomass, Biosorption, Cr(III), Cr(VI), Hexavalent Chromium, Preconcentration, Reduction, Removal, Sorption, Speciation, Wastewater

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Full Text: [2009\Col Sur B-Bio71, 248.pdf](2009/Col%20Sur%20B-Bio71,%20248.pdf)

Abstract: In the present study, Pb(II) removal efficiency of *Strychnos potatorum* seed powder (SPSP) from aqueous solution has been investigated. Batch mode adsorption experiments have been conducted by varying pH, contact time, adsorbent dose and Pb(II) concentration. Pb(II) removal was pH dependent and found to be maximum at pH 5.0. The maximum removal of Pb(II) was achieved within 360 min. The Lagergren first-order model was less applicable than pseudo-second-order reaction model. The equilibrium adsorption data was fitted to Langmuir and Freundlich adsorption isotherm models to evaluate the model parameters. Both models represented the experimental data satisfactorily. The monolayer adsorption capacities of SPSP as obtained from Langmuir isotherm was found to be 16.420 mg/g. The FTIR study revealed the presence of various functional groups which are responsible for the adsorption process. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Biomass, Biosorption, Copper, Fourier Transform Infrared Anaysis, Heavy-Metals, Ions, Isotherms, Lead(II), Removal, Seed Powder, Sorption, Strychnos potatorum, Waste

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Full Text: [2009\Col Sur B-Bio72, 295.pdf](2009/Col%20Sur%20B-Bio72,%20295.pdf)

Abstract: The biosorption behaviors and mechanisms of a novel exopolysaccharide (EPS), which is secreted by a mesophilic bacterium (namely Wangia profunda (SM-A87)) isolated from deep-sea sediment, for heavy metals Cu(II) and Cd(II) have been studied in this paper. The effects of SM-A87 EPS concentration, solution pH and ionic strength on the metal uptake were investigated by employing batch adsorption techniques, respectively. The optimum biosorption capacities were observed at pH 5.0 for Cu(II) with 48.0 mg/g and pH 6.0 for Cd(II) with 39.75 mg/g, respectively. Addition of salts decreased Cu(II) or Cd(II) uptake in the order of K+ < Na+ < Ca2+ Langmuir and Freundlich models were employed to describe the biosorption equilibrium data, indicating the favorable biosorption occurs and larger biosorption capacity and intensity for Cu(II) than for Cd(II). The biosorption kinetics for both metals can be well described by pseudo-second-order kinetic model, compared with pseudo-first-order and intraparticle diffusion kinetic models. The competitive biosorption was also studied, indicating that in two-component solution with different metal ratios, the selective biosorption of SM-A87 EPS for Cu(II) was much higher than for Cd(II). The Fourier transform infrared spectroscopy (FT-IR) analysis indicated possible functional groups (e.g., -OH, -COO and C-O-C) of SM-A87 EPS involved in metal biosorption process, which indicated the potential of using SM-A87 EPS as an effective sorbent for Cu(II) or Cd(II) removal from water. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adsorption, Analysis, Aqueous-Solutions, Bacterium, Batch, Batch Adsorption, Biosorbent, Biosorption, Biosorption Kinetics, Ca-Alginate, Cadmium(II), Capacity, Cd(II), Cd(II) Removal, Competitive, Competitive Biosorption, Concentration, COO, Copper(II), Cu(II), Data, Deep Sea, Diffusion, Equilibrium, Exopolysaccharides, Freundlich, FT-IR, FTIR, Functional Groups, Heavy Metals, Heavy-Metals, Hydrothermal Vent, Infrared Spectroscopy, Intraparticle Diffusion, Ionic Strength, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Mechanisms, Metal, Metal Uptake, Metals, Model, Models, Na+, pH, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Salts, Sediment, Solution, Sorbent, Spectroscopy, Strength, Techniques, Uptake, Wangia Profunda SM-A87, Water

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Full Text: [2009\Col Sur B-Bio73, 10.pdf](2009/Col%20Sur%20B-Bio73,%2010.pdf)

Abstract: The present article describes the adsorption behaviors of Cu2+ and Cd2+ on mercapto-acetic acid modified orange peel. The prepared adsorbents were characterized using Malvern Zetasizer, infrared spectrophotometer and infrared C-S analyzer. The effect of various parameters like solution pH, contact time, and initial metal ion concentration on adsorption efficiencies of these two metals were studied systematically by batch experiments. Adsorption isotherms of Cu2+ and Cd2+ on orange peel and mercapto-acetic acid modified orange peel were obtained and analyzed with Langmuir and Freundlich isotherm models. The rates of adsorption of Cu2+ and Cd2+ on both adsorbents were found to follow a pseudo-second order equation, indicating their chemical adsorption. Maximum adsorption capacities of Cu2+ and Cd2+ on the mercapto-acetic acid modified orange peel were found to be 70.67 and 136.05 mg/g, respectively. Adsorption-desorption studies showed that the mercapto-acetic acid modified orange peel could be used more than five cycles. This study demonstrated that, the waste orange peel after simple chemical treatment could be used as a potential adsorbent for toxic metals such as Cu2+ and Cd2+. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Isotherms, Aqueous Solution, Batch, Batch Experiments, Cadmium, Cd2+, Chemical, Concentration, Copper, Cu2+, Experiments, Freundlich, Freundlich Isotherm, Heavy-Metals, Isotherm, Isotherms, Langmuir, Mercapto-Acetic Acid, Mercaptoacetic Acid, Metal, Metals, Models, Modified, Orange Peel, pH, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rates, Recovery, Removal, Rights, Solution, Sorption, Toxic, Toxic Metals, Treatment, Waste, Waste-Water

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Full Text: [2009\Col Sur B-Bio73, 257.pdf](2009/Col%20Sur%20B-Bio73,%20257.pdf)

Abstract: The kinetic and thermodynamic adsorption and adsorption isotherms of Pb(II) and Cu(II) ions onto H2SO4 modified chitosan were studied in a batch adsorption system. The experimental results were fitted using Freundlich, Langmuir and Dubinin-Radushkevich isotherms; the Langmuir isotherm showed the best conformity to the equilibrium data. The pseudo-first order, pseudo-second order and intraparticle diffusion kinetic models were employed to analyze the kinetic data. The adsorption behavior of Pb(II) and Cu(II) was best described by the pseudo-second order model. Thermodynamic parameters such as free energy change (ΔGº), enthalpy change (ΔHº) and entropy change (ΔSº) were determined; the adsorption process was found to be both spontaneous and exothermic. No physical damage to the adsorbents was observed after three cycles of adsorption/desorption using EDTA and HCl as eluents. The mechanistic pathway of the Pb(II) and Cu(II) uptake was examined by means of Fourier transform infrared (FTIR) and Energy dispersive X-ray (EDX) spectroscopy. The equilibrium parameter (*R*L) indicated that chitosan-H2SO4 was favorable for Pb(II) and Cu(II) adsorption. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Behavior, Adsorption Isotherms, Adsorption Properties, Adsorption, Desorption, Aqueous-Solution, Batch, Batch Adsorption, Behavior, Chemical-Modification, Chitosan, Copper, Cu(II), Cu(II) Ions, Damage, Data, Desorption, Diffusion, EDTA, EDX, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Experimental, Freundlich, FTIR, Heavy-Metals, Intraparticle Diffusion, Ions, Isotherm, Isotherms, Kinetic, Kinetic Models, Langmuir, Langmuir Isotherm, Lead, Model, Models, Modified, Nickel Ions, Pb(II), Physical, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rights, Sorption, Spectroscopy, Thermodynamic, Thermodynamic Parameters, Thermodynamic Studies, Uptake, Waste-Water, X-Ray

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Full Text: [2009\Col Sur B-Bio73, 308.pdf](2009/Col%20Sur%20B-Bio73,%20308.pdf)

Abstract: Water-soluble colloidal manganese dioxide has been used to oxidize L-tyrosine in aqueous-acidic medium. The kinetics of the reaction was studied in the absence and presence of non-ionic surfactant (TX-100) using a spectrophotometric technique. As the reaction was fast under pseudo-first-order conditions ([L-tyrosine]>>[MnO2]), the rate constants as a function of [L-tyrosine], [MnO2], [HClO4] and temperature were obtained under second-order conditions. The rate of the reaction increased and decreased with the increase in [L-tyrosine] and [MnO2], respectively. Perchloric acid, sodium pyrophosphate and sodium fluoride showed catalytic effect. The effect of externally added manganese(II) sulphate is complex. It is not possible to predict the exact dependence of the rate constants on manganese(II) concentration, which has a series of reactions with other reactants. The reaction is inhibited by the non-ionic surfactant TX-100. Activation parameters have been evaluated using Arrhenius and Eyring equations. Based on observed kinetic results, a probable mechanism for the reaction has been proposed which corresponds to fast adsorption of the reductant and hydrogen ion on the surface of colloidal MnO2 followed by one-step two-electron transfer rate limiting process. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Adsorption, Amino-Acids, Catalyzed Oxidation, Cetylpyridinium Chloride, Colloidal MnO2, Concentration, Fluoride, Formic-Acid, Function, Hydrogen, Inhibition, Kinetic, Kinetics, Kinetics, L-Tyrosine, Lactic-Acid, Manganese, Manganese Dioxide, Manganese(II), Mechanism, Nonionic Surfactant, Oxidant, Permanganate Oxidation, Peroxomolybdate, Pseudo First Order, Pseudo-First-Order, Rate Constants, Rights, Second Order, Second-Order, Sodium, Surface, Surfactant, Temperature, Thioanisole, TX-100

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Full Text: [2009\Col Sur B-Bio74, 244.pdf](2009/Col%20Sur%20B-Bio74,%20244.pdf)

Abstract: In order to better understand the adsorption mechanism of chitosan-coated magnetic nanoparticles modified with alpha-ketoglutaric acid (alpha-KA-CCMNPs), the removal of Cu2+ by alpha-KA-CCMNPs from aqueous solution was investigated in a batch system at 18, 35 and 50°C. Different experimental approaches were applied to show mechanistic aspects, such as adsorption isotherms, kinetics and thermodynamics studies. Adsorption equilibrium studies showed that Cu2+ adsorption followed Langmuir model. The kinetics of the interactions was best described by pseudo-second-order mechanism. The thermodynamic parameters (ΔGº, ΔHº and ΔS º) analysis predicted that the adsorption process was strongly dependent on temperature of medium, and spontaneous and endothermic process. The XPS combined with FT-IR spectra revealed that N atom of -NH- group and O atom of carboxyl group in alpha-KA-CCMNPs coordinated with Cu2+. Experimental results from this study provide data that would be required if this heavy metal adsorption system was to be “scaled up” for industrial application. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Equilibrium, Adsorption Isotherms, Adsorption Mechanism, Analysis, Application, Aqueous Solution, Batch, Batch System, Biosorption, Copper, Cu(II), Cu2+, Data, Endothermic, Equilibrium, Equilibrium Studies, Experimental, FT-IR, FTIR, FTIR Spectra, Heavy Metal, Heavy-Metals, Ions, Isotherms, Kinetics, Kinetics And Thermodynamics, Langmuir, Langmuir Model, Lathyrus-Sativus, Magnetic, Magnetic Nanoadsorbent, Magnetic Nanoparticles, Mechanism, Metal, Metal Adsorption, Model, Modified, N, Nanoparticles, Nov, Pseudo Second Order, Pseudo-Second-Order, Removal, Rights, Sewage-Sludge, Solution, Sorption, Spontaneous, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, XPS

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Full Text: [2009\Col Sur B-Bio74, 260.pdf](2009/Col%20Sur%20B-Bio74,%20260.pdf)

Abstract: The biosorption of nickel(II) ions from aqueous solution by Acacia leucocephala bark was studied in a batch adsorption system as a function of pH, initial metal ion concentration, adsorbent dosage, contact time and temperature. The maximum Ni(II) adsorption was obtained at pH 5. Further, the biosorbents were characterized by Fourier Transformer Infrared Spectroscopy (FTIR). The experimental data were analysed using three sorption kinetic models viz., the pseudo-first- and second-order equations and the intraparticle diffusion model. Results show that the pseudo-second-order equation provides the best correlation for the biosorption process. The equilibrium nature of Ni(II) adsorption at different temperatures of 30, 40 and 50°C have been described by the Langmuir and Freundlich isotherm models. The equilibrium data fit well Langmuir isotherm. The monolayer adsorption capacity of A. leucocephala bark as obtained from Langmuir isotherm at 30°C was found to be 294.1 mg/g. The Chi-square (X-2) and Sum of the square errors (SSE) tests were also carried out to find the best fit adsorption isotherm and kinetic model. Isotherms have been used to determine thermodynamic parameters of the process, viz., free energy change (ΔGº), enthalpy change (ΔHº), and entropy change (ΔSº) were calculated indicating that this system was a spontaneous and endothermic process. Present investigation emphasized that A. leucocephala bark may be utilized as a low cost adsorbent for nickel removal. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Acacia Leucocephala Bark, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous Solution, Aqueous Solutions, Batch, Batch Adsorption, Biomass, Biosorbents, Biosorption, Capacity, Chi-Square, Concentration, Copper, Correlation, Cost, Data, Diffusion, Diffusion Model, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Studies, Errors, Experimental, Fly-Ash, Freundlich, Freundlich Isotherm, FTIR, Function, Intraparticle Diffusion, Intraparticle Diffusion Model, Investigation, Ions, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Low Cost Adsorbent, Metal, Metal Ion, Metal-Ions, Model, Models, Monolayer, Ni(II), Ni(II) Biosorption, Nickel, Nickel Removal, Nickel(II), NOV, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Removal, Rice-Husk, Rights, Second Order, Second-Order, Solution, Solutions, Sorption, Spontaneous, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2010\Col Sur B-Bio75, 93.pdf](2010/Col%20Sur%20B-Bio75,%2093.pdf)

Abstract: The adsorption kinetics of cellulase *Aspergillus niger* on a commercial activated carbon has been performed using a batch-adsorption technique The effect of various experimental parameters such as initial enzyme concentration, contact lime and temperature were investigated The pseudo-first-order and pseudo-second-order kinetic models were used to describe the kinetic data which shows that the adsorption of the enzyme followed the pseudo-second-order rate expression and the rate constants were evaluated The Langmuir and Freundlich adsorption isotherm models were applied to describe the equilibrium isotherms, and the isotherm constants were determined It was found that Langmuir model was mole suitable for our data The activation energy of adsorption was also evaluated for the adsorption of enzyme onto activated carbon. It was found 11 37 kJ mol-1 Thermodynamic parameters ΔG(0), ΔH-0 and ΔS-0 were calculated, indicating that this process can be spontaneous and endothermic The adsorption enthalpy and entropy were found 11.12 kJ mol-1 and 0 084 kJ mol-1 K-1. respectively At 30°C and at pH 48, 1 g activated carbon adsorbed about 1565 mg of cellulase, with a retention of 70% of the native enzyme activity up to five cycles of repeated batch enzyme reactions (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activation Energy, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solutions, Cellulase, Enzymatic-Hydrolysis, Enzymes, Equilibrium, Extraction, Fiber, Immobilization, Immobilization, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Membranes, Paper, Sorption, Thermodynamic, Waste-Water

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Full Text: [2010\Col Sur B-Bio75, 194.pdf](2010/Col%20Sur%20B-Bio75,%20194.pdf)

Abstract: In this paper the adsorption of amphiphilic phenothiazine drug Thioridazine hydrchloride (THCl) on Activated charcoal (AC) surface was studied in aqueous solutions The effects of different types of surfactants anionic sodium dodecylsulfate (SDS) and lithium dodecylsulfate (LIDS), cationic cetyltrimethyl ammonium bromide (CTAB) and nonionic TritonX-100 (TX-100) micelles on the adsorption were reported It was found that the Langmuir isotherm appears to fit the isotherm data better than the Freundlich isotherm The adsorption of THCl was reduced in the presence of cationic CTAB bearing the same charge as THCl while presence of SDS and LiDs did not change significantly adsorption capacity of THCl on AC except the shape of the isotherm The presence of TX-100 micelles significantly increased adsorption of THCl on AC. Kinetic measurements showed that the adsorption equilibrium of THCl was attained within 30 min in aqueous media while in the presence of 10 mM anionic micelles the adsorption equilibrium of THCl reached the equilibrium almost in 1 min 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 has been discussed The adsorption rate constants of THCl onto AC in the presence of anionic micelles are higher than in aqueous media for both kinetics models and the second-order model provides the best correlation of data in the absence and presence of micelles In order to gain further insight into the adsorption mechanism of THCl on AC, association of THCl with surfactants was also studied by absorption spectra. Binding constants of THCl to micelles were calculated by means of Benesi-Hildebrand Equation to provide more precise comparison of the effect of surfactants on the adsorption of THCl. (C) 2009 Elsevier B V All rights reserved.

Keywords: Activated Charcoal, Adsorption, Aqueous-Solution, Association, Basic-Dyes, CTAB, Diffusion, Equilibrium, Freundlich Isotherm, Interaction, Ionic Micelles, Iron Humate, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Phenothiazine Drugs, Solvent, Sulfate Micelles, Surfactant, Thioridazine, Thioridazine Hydrochloride, Water-Interface

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Full Text: [2010\Col Sur B-Bio76, 265.pdf](2010/Col%20Sur%20B-Bio76,%20265.pdf)

Abstract: The equilibrium and the kinetics of BSA adsorption onto specific surface area changed TiO2 by heat treatment were studied. The TiO2 was treated at 100 and 200ºC for 24 h. The specific surface areas of TiO2 characterized by BET method were measured as 48.9 m2/g and 53.0 m2/g for 100 and 200ºC, respectively. The adsorption rate and the equilibrium experiments were carried out at pH 4 for 40ºC. The rate kinetics for the adsorption of BSA was best fitted with the pseudo-first-order kinetic model. The equilibrium process was described by the Langmuir and Freundlich isotherm models. The adsorption capacities (Q(0)) calculated from the Langmuir isotherm model were 40.6 and 44.4 mg/g for heat-treated TiO2 at 100 and 200ºC, respectively. The adsorption of BSA increased with increasing surface area of TiO2. The zeta potential values of the 100- and 200ºC-treated TiO2 were found as -2.57 mV and 0.39 mV, respectively, showing that the interaction between TiO2 with BSA increased with increasing temperature of heat treatment for TiO2. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacities, Adsorption Isotherms, Adsorption Rate, Albumin, BET, Bovine, Bovine Serum Albumin, BSA, Copolymer, Equilibrium, Experiments, Freundlich, Freundlich Isotherm, Heat-Treatment, Interaction, Ionic-Strength, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, MAR, Model, Models, Nanoparticles, Particles, pH, Potential, Protein Adsorption, Pseudo First Order, Pseudo-First-Order, Rate Kinetics, Rights, Serum, Specific Surface, Specific Surface Area, Surface, Surface Area, Surface Areas, Temperature, TiO2, Titanium, Titanium Dioxide, Treatment, Zeta Potential, Zeta-Potentials

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Full Text: [2010\Col Sur B-Bio76, 279.pdf](2010/Col%20Sur%20B-Bio76,%20279.pdf)

Abstract: This study addresses removal of a basic dye, methylene blue, from aqueous Solutions by using dried Ulothrix sp. biomass as biosorbent. The effects of the initial dye concentration, contact time. temperature, solution equilibrium pH, biosorbent dosage, and mixing rate on biosorption of the dye have been investigated. It was found that 30 min is sufficient in order to reach adsorption equilibrium. The amount of methylene blue adsorbed onto Ulothrix sp. increased with increasing equilibrium pH and mixing rate, in contrary, it decreased with increasing temperature and sorbent dosage. The process followed the pseudo-second-order kinetic model. The isosteric enthalpy and entropy values were calculated as -11.8 kJ/mol and 37.5 J/(mol K). respectively. In addition, the results suggest that the physical interactions between sorbent particles and sorbate ions play an important role for the adsorption of methylene blue onto the biosorbent. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Algae, Aqueous Solution, Basic Dye, Batch, Biomass, Biosorbent, Biosorption, Biosorption Mechanism, Concentration, Dye, Dye Removal, Enthalpy, Entropy, Equilibrium, Fly-Ash, Green Algae, Heavy-Metal Biosorption, Ionic-Strength, Ions, Kinetic, Kinetic Model, Kinetic Studies, Liquid-Phase Adsorption, Mar, Methylene Blue, Methylene-Blue Biosorption, Mixing, Model, Particles, pH, Physical, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rice Husk, Rights, Role, Solution, Sorbate, Sorbent, Sorption, Sorption Kinetics, Temperature, Thermodynamics, Time, Ulothrix sp.

? Bhatnagar, A. and Minocha, A.K. (2010), Biosorption optimization of nickel removal from water using *Punica granatum* peel waste. *Colloids and Surfaces B-Biointerfaces*, **76** (2), 544-548.

Full Text: [2010\Col Sur B-Bio76, 544.pdf](2010/Col%20Sur%20B-Bio76,%20544.pdf)

Abstract: The present study was undertaken to evaluate the feasibility of Punica granatum (pomegranate) peel waste for the removal of nickel from water. Batch experiments were performed to study the biosorption of nickel on prepared pomegranate peel adsorbent. The sorption process was well explained with pseudo-second-order kinetic model. The maximum sorption capacity of pomegranate peel adsorbent for nickel removal was ca. 52 mg g−1. The sorption has been found to be endothermic and data conform to the Langmuir model. The Gibbs free energy was determined to be negative, indicating the spontaneous nature of the sorption process. The results of the present study suggest that pomegranate peel waste can be used beneficially for nickel removal from aqueous solution.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Aqueous-Solution, Biosorption, Capacity, Copper, Data, Endothermic, Energy, Equilibrium, Experiments, Feasibility, Gibbs Free Energy, Kinetic, Kinetic Model, Kinetic Modeling, Langmuir, Langmuir Model, Metals, Model, Ni(II), Nickel, Nickel Removal, Optimization, Peel Waste, Pomegranate Peel Adsorbent, Pomegranate Peel Waste, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Single, Solution, Sorption, Sorption Capacity, Sorption Process, Surface, Waste, Water

? Kalavathy, H., Karthik, B. and Miranda, L.R. (2010), Removal and recovery of Ni and Zn from aqueous solution using activated carbon from *Hevea brasiliensis*: Batch and column studies. *Colloids and Surfaces B-Biointerfaces*, **78** (2), 291-302.

Full Text: [2010\Col Sur B-Bio78, 291.pdf](2010/Col%20Sur%20B-Bio78,%20291.pdf)

Abstract: In the present study, the adsorption behavior of Ni and Zn from aqueous systems onto activated carbon prepared from *Hevea brasiliensis* sawdust has been attempted via batch and column mode studies under various operating conditions. The experimental data were fitted to various isotherm models. The maximum adsorption capacity of Ni and Zn were found to be 17.21 and 22.03 mg g-1, respectively, at 30ºC according to Langmuir model. Kinetic studies showed the adsorption process followed pseudo second-order rate model. Breakthrough curves were plotted for the adsorption of metal ions using continuous-flow column operation by varying the bed height, flow rate, initial metal ion concentration and temperature. At the end, an attempt has also been made to model the data generated from column studies using the empirical relationship based on Adam-Boharts model and Thomas model. The model constants were also evaluated. This has helped in ascertaining the practical applicability of the adsorbent. The column regeneration studies were carried out for three adsorption-desorption cycles. The elutant used for the regeneration of the adsorbent was 0.1 M H2SO4. On the basis of the results. ACHB can be economically and effectively used as an adsorbent for the removal of metal ions from wastewaters. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adam-Boharts Model, Adsorbent, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption-Desorption, Aqueous Solution, Batch, Batch And Column Mode, Batch And Column Studies, Behavior, Biosorption, Cadmium, Capacity, Carbon, Charcoal, Column, Column Regeneration, Column Studies, Concentration, Data, Equilibrium, Experimental, Flow, Flow Rate, Heavy Metals, Heavy-Metals, Ions, Isotherm, Kinetic, Kinetic Studies, Kinetics, Kinetics, Langmuir, Langmuir Model, Lead, Metal, Metal Ion, Metal Ions, Mode, Model, Models, Operating Conditions, Operation, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Recovery, Regeneration, Removal, Rights, Rubber Wood Sawdust, Sawdust, Second Order, Second-Order, Solution, Systems, Temperature, Thomas Model, Wastewaters

? Salehi, R., Arami, M., Mahmoodi, N.M., Bahrami, H. and Khorramfar, S. (2010), Novel biocompatible composite (Chitosan-zinc oxide nanoparticle): Preparation, characterization and dye adsorption properties. *Colloids and Surfaces B-Biointerfaces*, **80** (1), 86-93.

Full Text: [2010\Col Sur B-Bio80, 86.pdf](2010/Col%20Sur%20B-Bio80,%2086.pdf)

Abstract: In this paper, the preparation, characterization and dye adsorption properties of novel biocompatible composite (Chitosan zinc oxide nanoparticle) (CS/n-ZnO) were investigated. Zinc oxide nanoparticles were immobilized onto Chitosan. Physical characteristics of CS/n-ZnO were studied using Fourier transform infra-red (FT-IR), X-ray diffraction (XRD), scanning electron microscopy (SEM) and wavelength dispersive X-ray spectroscopy (WDX). Two textile dyes, Direct Blue 78 (DB78) and Acid Black 26 (AB26), were used as model compounds. The effect of CS/n-ZnO doses, initial dye concentration, salt and pH were elucidated at 20±1 degrees C. The isotherm and kinetics of dye adsorption were studied. The presence of functional groups such as hydroxyl, amino and carbonyl groups were detected. Results showed zinc oxide nanoparticles were immobilized onto Chitosan. The data were evaluated for compliance with the Langmuir, Freundlich and Tempkin isotherm models. It was found that AB26 and DB78 followed with Langmuir and Tempkin isotherms, respectively. In addition, adsorption kinetics of both dyes was found to conform to pseudo-second order kinetics. Based on the data of present investigation, one could conclude that the CS/n-ZnO being a biocompatible, eco-friendly and low-cost adsorbent might be a suitable alternative for elimination of dyes from colored aqueous solutions. (c) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Properties, Alternative, Aqueous Solutions, Aqueous-Solutions, Biocompatible, Characteristics, Characterization, Chitosan, Chitosan-Zinc Oxide Nanoparticle, Compliance, Composite, Concentration, Congo Red, Data, Dye, Dye Adsorption, Dye Adsorption Properties, Dyes, Electron Microscopy, Freundlich, FT-IR, FTIR, Functional Groups, Immobilized, Immobilized Titania Nanophotocatalysis, Investigation, Isotherm, Isotherm And Kinetics, Isotherms, Kinetics, Langmuir, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Model, Models, Nanoparticle, Nanoparticles, Novel Biocompatible Composite, Orange Peel, Oxide, pH, Pore Diffusion, Preparation, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Reactive Dyes, Rights, Salt, Scanning Electron Microscopy, SEM, Solutions, Spectroscopy, Textile Waste-Water, Visible-Light, X-Ray, X-Ray Diffraction, XRD, Zinc

? Salehi, R., Arami, M., Mahmoodi, N.M., Bahrami, H. and Khorramfar, S. (2011), Novel biocompatible composite (Chitosan-zinc oxide nanoparticle): Preparation, characterization and dye adsorption properties. *Colloids and Surfaces B-Biointerfaces*, **82** (1), 71-80.

Full Text: [2011\Col Sur B-Bio82, 71.pdf](2011/Col%20Sur%20B-Bio82,%2071.pdf)

Abstract: The potential of chitosan, a fishery waste-based material, as a soil amendment to clean-up metal contaminated soil was investigated. Chitosan was treated using glutaraldehyde (GLA), epichlorohydrin (ECH) and ethylene glycol diglycidyl ether (EGDE) as cross-linking reagents to enhance its chemical stability in acidic media and to improve its physical properties. Cross-linking treatment had significant effects on chitosan surface area, pore diameter, surface morphology and crystallinity. Interaction with Ag(I), Pb(II) and Cu(II) decreased the crystallinity of the materials and changed their surface morphology significantly. FTIR analysis confirmed that N and O atoms served as binding sites for the metal ions. Chitosan and treated chitosans were able to bind metal ions, even in the presence of K+, Cl− and NO3−, which are dominant ions in soil. Therefore, remediation of metal contaminated soil using chitosan and cross-linked treated chitosans as soil amendments is feasible.

Keywords: Contaminated Soil, Soil Amendment, Chitosan, Cross-Linked Chitosans, Characterisation

? Awwad, N.S., Gad, H.M.H., Ahmad, M.I. and Aly, H.F. (2010), Sorption of lanthanum and erbium from aqueous solution by activated carbon prepared from rice husk. *Colloids and Surfaces B-Biointerfaces*, **81** (2), 593-599.

Full Text: [2010\Col Sur B-Bio81, 593.pdf](2010/Col%20Sur%20B-Bio81,%20593.pdf)

Abstract: A biomass agricultural waste material, rice husk (RH) was used for preparation of activated carbon by chemical activation using phosphoric acid. The effect of various factors, e.g. time, pH, initial concentration and temperature of carbon on the adsorption capacity of lanthanum and erbium was quantitatively determined. It was found that the monolayer capacity is 175.4 mg g-1 for La(III) and 250 mg g-1 for Er(III). The calculated activation energy of La(III) adsorption on the activated carbon derived from rice husk was equal to 5.84 kJ/mai while it was 3.6 kJ/mol for Er(III), which confirm that the reaction is mainly particle-diffusion-controlled. The kinetics of sorption was described by a model of a pseudo-second-order. External diffusion and intra-particular diffusion were examined. The experimental data show that the external diffusion and intra-particular diffusion are significant in the determination of the sorption rate. Therefore, the developed sorbent is considered as a better replacement technology for removal of La(III) and Er(III) ions from aqueous solution due to its low-cost and good efficiency, fast kinetics, as well as easy to handle and thus no or small amount of secondary sludge is obtained in this application. (C)2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activation, Activation Energy, Adsorption, Adsorption Capacity, Agricultural, Agricultural Waste, Application, Aqueous Solution, Bagasse, Biomass, Capacity, Carbon, Charcoal, Chemical, Chemical Activation, Concentration, Data, Date Pits, Diffusion, Dye, Efficiency, Energy, Equilibrium, Erbium, Experimental, Heavy-Metal, Ions, Kinetics, Lanthanum, Low Cost, Model, Monolayer, pH, Phosphoric Acid, Preparation, Pseudo Second Order, Pseudo-Second-Order, Recovery, Removal, RH, Rice, Rice Husk, Rice-Husk, Rights, Sludge, Small, Solution, Sorbent, Sorption, Technology, Temperature, Treatment, Waste, Waste-Water

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Full Text: [2010\Col Sur B-Bio81, 620.pdf](2010/Col%20Sur%20B-Bio81,%20620.pdf)

Abstract: Gymnogongrus torulosus adsorption efficiency for cadmium(II), copper(II), lead(II) and zinc(II) were studied in batch mode in different acidic conditions. The adsorbent removal efficiency was determined as a function of contact time, initial metal ions concentration, pH and temperature. G. torulosus was characterized by SEM, water adsorption surface area and EDS. The Langmuir, Freundlich, Dubinin-Radushkevich and Temkin models have been applied and results showed that the biosorption process was better described by the Langmuir model. Kinetic experiments demonstrated that fast metal uptakes follow a pseudo-second-order kinetic model and that intra-particle diffusion and/or chemisorption were the rate-limiting steps. Experimental results show that G. torulosus isotherm followed the biosorption series, Cu > Cd > Zn similar to Pb. Biosorption capacities were affected by solution parameters. The maximum metal uptake (*q*max) increased with increasing pH. The affinity constant, q(max), and the pseudo-second-order kinetic constants were calculated for the adsorption of all studied metals onto G. torulosus. The Gibbs free energy of the adsorption process as well as the process enthalpy and entropy were calculated from experimental results. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Algae, Aqueous-Solutions, Batch, Batch Mode, Biomass *Sargassum sp*, Biosorption, Black Gram, Cadmium, Cadmium(II), Cd, Chemisorption, Concentration, Copper, Copper(II), Cu, Diffusion, EDS, Efficiency, Energy, Enthalpy, Entropy, Experimental, Experiments, Extracellular Polymers, Freundlich, Function, Gibbs Free Energy, Gymnogongrus Torulosus, Heavy-Metal Biosorption, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Lead, Lead(II), Marine Macroalgae, Metal, Metal Ions, Metal Removal, Metal Uptake, Metals, Mode, Model, Models, Pb, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Removal Efficiency, Rights, SEM, Solution, Sorption, Surface, Surface Area, Temkin, Temperature, Thermodynamics, Uptake, Waste Biomass, Water, Water Adsorption, Zinc, Zinc(II)

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Full Text: [2010\Col Sur B-Bio81, 476.pdf](2010/Col%20Sur%20B-Bio81,%20476.pdf)

Abstract: Isotherm curves for the biosorption of Cu(II), Cd(II) and Pb(II) by the biomass of five different cyanobacterial mats (Mat # 1-5) showed concave shape and plateau. Suitability of ten different isotherm models was evaluated for the equilibrium modeling of these isotherm curves, however, only the Toth model was found appropriate. Mat # 2 , dominated by Phormidium sp., was identified as an excellent metal biosorbent because: (i) the Toth estimated maximum biosorption capacity (mmol g(-1)) of Mat # 2 for Pb(II) (1.028), Cu(II) (0.696) and Cd(II) (0.549) was the highest among the tested mats and compares favourably with Langmuir estimated metal sorption capacity of many seaweeds, regarded as the best metal biosorbents, (II) Na+, K+ and Ca2+ did not substantially inhibit the biosorption of the test metals, (iii) and total metal sorption ability of Mat # 2 increased or remained unaffected in binary and ternary metal systems. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption-Isotherms, Binary-Systems, Biomass, Biosorbent, Biosorbents, Biosorption, Biosorption, Cadmium, Capacity, Cd(II), Cu(II), Cyanobacterial Mat, Equilibrium, Equilibrium Modeling, Extraction Algal Waste, Heavy-Metals, Isotherm, Isotherm Model, Isotherm Models, Langmuir, Metal, Metal Sorption, Metals, Model, Modeling, Models, Mono-Component, Multi-Metal System, Na+, Pb(II), Pithophora-oedogonia, Potential, Rights, Sargassum-Filipendula, Single Metal System, Sorption, Sorption Capacity, Sorption Potential, Systems

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Full Text: [2011\Col Sur B-Bio84, 221.pdf](2011/Col%20Sur%20B-Bio84,%20221.pdf)

Abstract: Cr(VI) is a major water pollutant from industrial effluent whose concentration is to be reduced within the permissible limit. Present study reports a systematic evaluation of six different natural adsorbents for the removal of Cr(VI) from aqueous solutions in batch process. The adsorption kinetic data were best described by pseudo-second order model. The values of mass transfer coefficient for Cr(VI) adsorption indicated that the velocity of the adsorbate transport from the bulk to the solid phase was quite fast. The effective diffusivity of Cr(VI) removal for all the adsorbents were of the order of 10-10 m2/s which suggested chemisorption of the process. The adsorption process was jointly controlled by film diffusion and intraparticle diffusion. Maximum monolayer adsorption capacities onto the natural adsorbents used were comparable to the other natural adsorbents used by other researchers. The thermodynamic studies and sorption energy calculation using Dubinin-Radushkevich isotherm model indicated that the adsorption processes were endothermic and chemical in nature. FT-IR studies were carried out to understand the type of functional groups responsible for Cr(VI) binding process. Desorption study was carried out with different concentration of NaOH solutions. Application study was carried out using electroplating industrial wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption-Kinetics, Agricultural Waste, Biosorption, Desorption, Diffusivity, Equilibrium, Exchange Resin, FT-IR, FTIR, Hexavalent Chromium, Industrial-Waste, Isotherm, Kinetic, Kinetics, Low-Cost Adsorbents, Mass Transfer Coefficient, Metal-Ions, Natural Adsorbents, Quercus-Ithaburensis, Rate Kinetics, Rice-Husk Ash, Sorption, Sorption Energy, Thermodynamic, Thermodynamics, Wastewater

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Full Text: [2011\Col Sur B-Bio84, 520.pdf](2011/Col%20Sur%20B-Bio84,%20520.pdf)

Abstract: Biosorption characteristics of Ananas comosus (pineapple) leaf powder was investigated for decolorizadon of Basic Green 4 (BG 4), a cationic dye from its aqueous solutions employing a batch experimental set-up. Parameters that influence the sorption process such as pH, biosorbent dosage, contact time, initial dye concentration and temperature were systematically studied. The optimum conditions for removal of BG 4 were found to be pH 9.0, contact time = 150 min, biosorbent dosage = 5.0 g L-1, initial dye concentration = 50 mg L-1. The temperature had a strong influence on the biosorption process. Further, the biosorbent was characterized by Fourier transform infrared (FTIR) spectroscopy, scanning electron microscopy (SEM) and Brunauer, Emmett, Teller (BET) surface area and pore size analysis. Experimental biosorption data were modeled by Langmuir, Freundlich and Dubinin-Radushkevich (D-R) isotherms. The biosorption process followed the Langmuir isotherm model with high coefficients of correlation (R-2 > 0.99) at different temperatures. The pseudo second order kinetic model fitted well in correlation to the experimental results. Activation energy of the biosorption process (Eo) was found to be 45.79 kJ mol-1 by using the Arrhenius equation, indicating chemisorption nature of BG 4 sorption onto pineapple leaf powder. Thermodynamic parameters suggest that the biosorption process is spontaneous and exothermic in nature. Overall, the present findings suggest that this environmentally friendly, efficient and low-cost biosorbent may be useful for the removal of BG 4 from aqueous media. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activation Energy, Adsorption, Aqueous Solution, Basic Green 4, Biosorbent, Biosorption, Cationic Dye, Dye, Electron Microscopy, Equilibrium, Equilibrium Data, Freundlich, FTIR, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Malachite-Green, Nonlinear Methods, pH, Pineapple Leaf Powder, Removal, Sorption, Tamarind Fruit Shell, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2011\Col Sur B-Bio85, 316.pdf](2011/Col%20Sur%20B-Bio85,%20316.pdf)

Abstract: Biosorption of lead ions onto Enteromorpha prolifera has been investigated. The physico-chemical properties of the biosorbent were characterized by thermal stability, zeta potential, and Boehm titration methods. Batch adsorption experiments were carried out to examine the effect of various parameters such as initial pH, particle size, adsorbent dosage, ionic strength, time, and temperature on biosorption. The kinetic studies showed that the adsorption process was very fast and equilibrium was reached after about 60 min of contact. The pseudo-first-order Lagergren equation, pseudo second-order rate equation, and second-order rate equation were used to describe the kinetic adsorption process. Thermodynamic parameters were determined at three different temperatures. The negative values of free energy change indicated the spontaneous nature of adsorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Algae Gelidium, Aqueous-Solution, Batch, Batch Adsorption, Biosorbent, Biosorption, Brown-Algae, Carbon Nanotubes, Composite-Material, Enteromorpha Prolifera, Equilibrium, Green-Algae, Kinetic, Lead, Metal-Ions, pH, Pseudo Second-Order Kinetic Model, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2011\Col Sur B-Bio88, 697.pdf](2011/Col%20Sur%20B-Bio88,%20697.pdf)

Abstract: Biosorption of Cu(II) by Tamarindus indica seed powder (TSP) was investigated as a function of temperature in a batch system. The Cu(II) biosorption potential of TSP increased with increasing temperature. The rate of the biosorption process followed pseudo second-order kinetics while the sorption equilibrium data well fitted to the Langmuir and Freundlich isotherm models. The maximum monolayer Cu(II) biosorption capacity increased from 82.97 mgg-1 at 303K to 133.24 mg g-1 at 333 K. Thermodynamic study showed spontaneous and endothermic nature of the sorption process. Isosteric heat of sorption, determined using the Clausius-Clapeyron equation increased with increase in surface loading showing its strong dependence on surface coverage. The biosorbent was characterized by scanning electron microscopy (SEM), surface area and porosity analyzer, X-ray diffraction (XRD) spectrum and Fourier transform infrared (FTIR) spectroscopy. The results of FTIR analysis of unloaded and Cu(II)-loaded TSP revealed that -NH2, -OH, -C=H and C-O functional groups on the biosorbent surface were involved in the biosorption process. The present study suggests that TSP can be used as a potential, alternative, low-cost biosorbent for removal of Cu(II) ions from aqueous media. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Aspergillus-Niger, Biosorption, Copper(II) Ions, Cu(II), Equilibrium, Fruit Shell, FTIR, Isosteric Heat Of Sorption, Isotherm, Isotherms, Kinetics, Langmuir, Low-Cost Adsorbent, Metal Removal, Rice Husk, *Tamarindus Indica* Seed Powder, Thermodynamic, Thermodynamics, Waste-Water

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Full Text: [2012\Col Sur B-Bioi90, 197.pdf](2012/Col%20Sur%20B-Bioi90,%20197.pdf)

Abstract: Graphene was prepared using a modified Hummers’ method. The physico-chemical properties of graphene were characterized by TEM. BET specific surface area, FTIR, Raman and XRD measurements. The effect factors including pH, contact time, temperature and dosage on the adsorption properties of methylene blue onto graphene were investigated. The experimental data of isotherm followed the Langmuir isotherm model better than the Freundlich model. The maximum adsorption capacity obtained from Langmuir isotherm equation at 293 K was 153.85 mg/g, indicating graphene is a good adsorbent for the adsorption of MB. The kinetic study illustrated that the adsorption of methylene blue onto graphene fit the pseudo second-order model. The thermodynamic parameters indicated that the adsorption of methylene blue onto graphene was an endothermic and spontaneous process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Properties, Batch, BET, Dye, Equilibrium, Freundlich, FTIR, Graphene, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Methylene Blue, Nanosheets, Oxide, pH, Removal, Sheets, Temperature, Thermodynamic, Thermodynamics

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? Camps, D. (2008), Limits of bibliometrics indicators in biomedical scientific research evaluation. *Colombia Medica*, **39** (1), 74-79.

Full Text: [2008\Col Med39, 74.pdf](2008/Col%20Med39,%2074.pdf)

Abstract: The use of bibliometrics indicators to study research activity is based on which the scientific publications are essential product of this activity, and provide information about the research process, its volume, evolution, visibility and structure. So, they allow to value the scientific activity, and influences (or impact) of the work and the sources. The bibliometrics studies, altogether with other indicators, allows an objective quantification of the knowledge, and are harnessed by the present explosion of the knowledge and its compilation in bibliographical data bases.

Keywords: Activity, Bibliometrics, Biomedical, Data, Evaluation, Evolution, Explosion, Impact, Impact Factor, Impact Factors, Indicators, Influences, Information, Journals, Knowledge, Latin America, Objective, Process, Publication, Publications, Quantification, Research, Research Evaluation, Science, Scientific Publications, Scientific Research, Sources, Structure, Value, Visibility, Volume, Work

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Engineering, Chemical: Impact Factor 0.843, 59/116 (2008); Impact Factor 1.130, 53/128 (2009)

Materials Science, Textiles: Impact Factor 0.843, 3/16 (2008); Impact Factor 1.130, 3/19 (2009)

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Full Text: [2002\Col Tec118, 256.pdf](2002/Col%20Tec118,%20256.pdf)

Abstract: Textile wastewater presents a challenge to conventional physico-chemical and biological treatment methods. Liquid-phase adsorption has been shown to be highly efficient for the removal of dyes and other organic matters from process or waste effluent, Many different types of adsorbent are used to remove colour from wastewater among which the most widely used material is activated carbon. Since activated carbon is expensive and necessitates regeneration, attempts have been made to substitute alternatives that are biodegradable, low cost and/or waste materials. This article presents the investigations carried out by numerous researchers on the use of different kinds of adsorbents and their adsorption capacities for the removal of specific dyes from textile wastewater.

Keywords: Textile Waste-Water, Intraparticle Diffusion-Processes, Spent Bleaching Earth, Cationic Cyanine Dye, Palm-Fruit Bunch, Color Removal, Activated Carbon, Reactive Dyes, Fly-Ash, Natural Adsorbents

? Tsui, L.S., Roy, W.R. and Cole, M.A. (2003), Removal of dissolved textile dyes from wastewater by a compost sorbent. *Coloration Technology*, **119** (1), 14-18.

Full Text: [2003\Col Tec119, 14.pdf](2003/Col%20Tec119,%2014.pdf)

Abstract: The objective of this study was to evaluate the potential for treating dye-contaminated waste streams by sorption using compost as a low-cost sorbent. A mature, thermophilic compost sample was used to sorb Cl Acid Black 24, Cl Acid Orange 74, Cl Basic Blue 9, Cl Basic Green 4, Cl Direct Blue 71, Cl Direct Orange 39, Cl Reactive Orange 16 and Cl Reactive Red 2 from solution using a batch-sorption method. With the exception of the two reactive dyes, the sorption kinetics were favourable for a continuous-flow treatment process with the compost-dye mixtures reaching a steady state within 3-5 h. Based on limited comparisons, the affinity of the compost for each dye appeared to be competitive with other non-activated carbon sorbents. The results suggest that additional research on using compost as a sorbent for dye-contaminated solutions is warranted.

Keywords: Aqueous-Solutions, Color Removal, Sunflower Stalks, Adsorption, Adsorbents, Water, Equilibrium, Effluents, Dyestuffs

? El-Shishtawy, R.M., Youssef, Y.A., Ahmed, N.S.E. and Mousa, A.A. (2004), Acid dyeing isotherms of cotton fabrics pretreated with mixtures of reactive cationic agents. *Coloration Technology*, **120** (4), 195-200.

Full Text: [2004\Col Tec120, 195.pdf](2004/Col%20Tec120,%20195.pdf)

Abstract: Reactive cationic agents, phenylmonochlorotriazinyl and epoxypropyl, are used for cotton pretreatment using a pad-dry-curing technique. The dyeability of cationised cotton fabrics using Cl Acid Red 1, determined spectrophotometrically for the residual dyebath, has been dependent on the cationic agent concentration and the appropriate mixture used. Comparative sorption isotherms, rate of dyeing at different temperatures, standard affinity, entropy and heat of dyeing for three different pretreated fabrics have been calculated and discussed. The equilibrium data obtained were fitted by the Langmuir isotherm model, allowing the corresponding sorption parameters to be determined.

Keywords: Direct Dyes, Behavior, Dyeability, Equilibria

? Uğurlu, M., Gürses, A. and Doğar, Ç. (2007), Adsorption studies on the treatment of textile dyeing effluent by activated carbon prepared from olive stone by ZnCl2 activation. *Coloration Technology*, **123** (2), 106-114.

Full Text: [2007\Col Tec123, 106.pdf](2007/Col%20Tec123,%20106.pdf)

Abstract: This study aimed to investigate the removal of a reactive dye from aqueous solution by adsorption. Activated carbon prepared from olive stone, an agricultural solid by-product, was used as adsorbent. Different amounts of activating agent (ZnCl2) and adsorbent particle size were studied to optimise adsorbent surface area. The adsorption experiments were conducted at different process parameters such as adsorbent dose, temperature, equilibrium time and pH. The experimental results showed that at equilibrium time 120 min, optimum pH ranged between 3 and 4, and adsorbent dosage was 2.0 G 200 Ml-1. While the kinetic data support pseudo-second order, a pseudo-first order model shows very poor fit. Adsorption isotherms were obtained at three different temperatures (288, 298 and 308 K). The fitness of adsorption data to the Langmuir and Freundlich isotherms was investigated. In addition, the thermodynamic parameters such as isosteric enthalpy of adsorption (Delta H-ads)(y), isosteric entropy of adsorption (Delta S-ads)(y) and free energy of adsorption Delta G(ads)(0) were calculated. BET surface area measurements were made to reveal the adsorptive characteristics of the produced active carbon. The surface area of the activated carbon produced with 20% w/w ZnCl2 solution was 790.25 m2 g-1.

Keywords: Aqueous-Solutions, Methylene-Blue, Reactive Dyes, Agricultural Residues, Removal, Waste, Kinetics, Cadmium, Zinc, Mechanism

? Khorramfar, S., Mahmoodi, N.M., Arami, M. and Gharanjig, K. (2010), Equilibrium and kinetic studies of the cationic dye removal capability of a novel biosorbent *Tamarindus indica* from textile wastewater. *Coloration Technology*, **126** (5), 261-268.

Full Text: [2010\Col Tec126, 261.pdf](2010/Col%20Tec126,%20261.pdf)

Abstract: In this paper, the use of tamarind hull biosorbent (Tamarindus indica) has been investigated to remove cationic dyes from textile eflluent. Basic Violet 6 and Basic Red 18 were used as cationic dye models. The surface characteristics of tamarind hull were investigated using Fourier Transform-infrared and scanning electron microscopy. The influence of process variables such as adsorbent dosage, initial dye concentration and pH were studied. The presence of fuctional groups such as hydroxy and amine groups onto the tamarind hull surface were proved by Fourier Transform-infrared analysis. Data were evaluated for compliance with the Langmuir and Freundlich isotherm models. The results indicated that the data for adsorption of Basic Violet 6 and Basic Red 18 onto tamarind hull fitted well with the Freundlich isotherm model. Also, the adsorption kinetics of Basic Violet 6 and Basic Red 18 on biosorbent was studied. The rates of sorption were found to conform to pseudo-second-order kinetics with good correlation. Results indicated that tamarind hull could be used as a biosorbent to remove cationic organics from contaminated watercourses.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Kinetics, Agricultural Solid-Waste, Analysis, Aqueous-Solutions, Basic Red 18, Biosorbent, Cationic Dye, Cationic Dyes, Characteristics, Compliance, Concentration, Correlation, Data, Dye, Dye Removal, Dyes, Electron Microscopy, Equilibrium, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Fruit Shell, Immobilized Titania Nanophotocatalysis, Isotherm, Isotherm Model, Isotherm Models, Kinetic, Kinetic Studies, Kinetics, Langmuir, Methylene-Blue, Model, Models, Orange Peel, Organics, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rates, Removal, Scanning Electron Microscopy, Sorption, Sorption Isotherms, Surface, Textile Wastewater, Wastewater

? Ouazene, N. and Lounis, A. (2012), Adsorption characteristics of CI Basic Blue 3 from aqueous solution onto Aleppo pine-tree sawdust. *Coloration Technology*, **128** (1), 21-27.

Full Text: [2012\Col Tec128, 21.pdf](2012/Col%20Tec128,%2021.pdf)

Abstract: Aleppo pine-tree sawdust, a forest waste abundantly available in Algeria, was used for the adsorption of CI Basic Blue 3 from an aqueous solution. The effects of adsorbent dosage, pH, adsorbate concentration and contact time were studied. The equilibrium adsorption data were analysed by Langmuir, Freundlich and Temkin isotherm models. It was found that the Langmuir isotherm fitted well to the observed data for CI Basic Blue 3 adsorption onto Aleppo pine-tree sawdust based on the correlation coefficient R2 and four different error functions for the non-linear regression. The adsorption capacity of Aleppo pine-tree sawdust for CI Basic Blue 3 was determined with the Langmuir model and was found to be 65.36 mg g-1 at 293 K. The adsorption kinetic data were modelled using the pseudo-first-order, pseudo-second-order and intraparticle diffusion kinetic equations. It was seen that the pseudo-second-order equation could describe the adsorption kinetics and intraparticle diffusion was not the sole rate-controlling factor. The results indicated that Aleppo pine-tree sawdust is an attractive alternative for removing cationic dyes from wastewater.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Biosorption, Concentration, Dye, Equilibrium, Freundlich, Isotherm, Isotherm Models, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Methylene-Blue, pH, Removal, Sawdust, Streptomyces-Rimosus, Thermodynamics, Wastewater, Wood Sawdust

# Title: Colorectal Disease

Full Journal Title: Colorectal Disease

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Toorenvliet, B.R., Swank, H., Schoones, J.W., Hamming, J.F. and Bemelman, W.A. (2010), Laparoscopic peritoneal lavage for perforated colonic diverticulitis: A systematic review. *Colorectal Disease*, **12** (9), 862-867.

Full Text: [2010\Col Dis12, 862.pdf](2010/Col%20Dis12,%20862.pdf)

Abstract: Aim This systematic review aimed to evaluate the efficacy, morbidity and mortality of laparoscopic peritoneal lavage for patients with perforated diverticulitis. Method We searched PUBMED, EMBASE, Web of Science, the Cochrane Library and CINAHL databases, Google Scholar and five major publisher websites without language restriction. All articles which reported the use of laparoscopic peritoneal lavage for patients with perforated diverticulitis were included. Results Two prospective cohort studies, nine retrospective case series and two case reports reporting 231 patients were selected for data extraction. Most (77%) patients had purulent peritonitis (Hinchey III). Laparoscopic peritoneal lavage successfully controlled abdominal and systemic sepsis in 95.7% of patients. Mortality was 1.7%, morbidity 10.4% and only four (1.7%) of the 231 patients received a colostomy. Conclusion There have been no publications of high methodological quality on laparoscopic peritoneal lavage for patients with perforated colonic diverticulitis. The published papers do, however, show promising results, with high efficacy, low mortality, low morbidity and a minimal need for a colostomy.

Keywords: Anastomosis, Case Reports, Case Series, Cochrane, Cohort Studies, Colonic, Complicated Diverticulitis, Databases, Disease, Diverticulitis, Efficacy, Embase, Generalized Peritonitis, Google Scholar, Hartmann Procedure, J-Surg 2008, Laparoscopy, Management, Morbidity, Mortality, Papers, Peritoneal Lavage, Peritonitis, Practice Parameters, Primary Resection, Publications, Pubmed, Review, Science, Sigmoid Diverticulitis, Systematic, Systematic Review, Web of Science, Websites

? Nielsen, M.B., Laurberg, S. and Holm, T. (2011), Current management of locally recurrent rectal cancer. *Colorectal Disease*, **13** (7), 732-742.

Full Text: [2011\Col Dis13, 732.pdf](2011/Col%20Dis13,%20732.pdf)

Abstract: Aim A review of the literature was undertaken to provide an overview of the surgical management of locally recurrent rectal cancer (LRRC) after the introduction of total mesorectal excision (TME). Method A systematic literature search was undertaken using PUBMED, EMBASE, Web of Science and Cochrane databases. Only studies on patients having surgery for their primary tumour after 1995, or if more than half of the patients were operated on after 1995, were considered for analysis. Studies concerning only palliative treatments were excluded. Results A total of 19 studies fulfilled the inclusion criteria. Locally recurrent rectal cancer still occurred in 5-10% of the patients and was a major clinical problem, due to severe symptoms and poor survival. In most studies, 40-50% of all patients with LRRC could be expected to undergo surgery with a curative intent and of those, 30-45% would have R0 resection. Thus, only 20-30% of all patients with LRRC would have a potentially curative operation. The postoperative complication rate varied considerably, from 15 to 68%. The rate of re-recurrence varied from 4 to 54% after curative surgery. The 5-year overall survival varied between 9 and 39% and the median survival between 21 and 55 months. Conclusion Compared with previous studies, the proportion of potentially curative resections seems to have increased, probably due to improved staging, neoadjuvant treatment and increased surgical experience in dedicated centres, which has resulted in a tendency to improved survival.

Keywords: Abdominoperineal Resection, Analysis, Cancer, Cochrane, Colorectal-Cancer, Databases, Intraoperative Radiation-Therapy, Literature, Locally Recurrent Rectal Cancer, Management, Multidisciplinary Team, Outcome, Overview, Pelvic Recurrence, Preoperative Radiotherapy, Primary, PUBMED, Quality-of-Life, Radical Resection, Rectal Cancer, Review, Science, Surgery, Surgical, Surgical Speciality, Survival, Symptoms, Systematic, TME, Total Mesorectal Excision, Treatment, Web of Science

? Papaioannou, D., Cooper, K.L., Carroll, C., Hind, D., Squires, H., Tappenden, P. and Logan, R.F. (2011), Antioxidants in the chemoprevention of colorectal cancer and colorectal adenomas in the general population: A systematic review and meta-analysis. *Colorectal Disease*, **13** (10), 1085-1099.

Full Text: [2011\Col Dis13, 1085.pdf](2011/Col%20Dis13,%201085.pdf)

Abstract: Aim Antioxidants, such as vitamin A, C and E, selenium and beta-carotene, have been proposed as possible agents in the chemoprevention of colorectal cancer and have been the subject of recent trials and reviews. This review aimed to assess the present evidence on the effect of antioxidants on the incidence of colorectal neoplasms in the general population. Method A systematic review of randomized controlled trials was undertaken comparing antioxidants alone or in combination with other agents vs placebo. The following databases were searched for published and unpublished literature: Cochrane Library, MEDLINE, PreMEDLINE, CINAHL, EMBASE, Web of Science, and Biological Abstracts and Research Registers. Studies were quality appraised and extracted. Meta-analysis was performed. Results Twelve studies were identified as relevant. In the nine comparing antioxidants with no antioxidants (n = 148 922), there was no difference in the incidence of colorectal cancer [relative risk (RR) 1.00, 95% confidence interval (CI) 0.88-1.13]. One study assessed the effect of antioxidants on adenoma formation (n = 15 538) and did not demonstrate a statistically significant effect (RR 1.47, 95% CI 0.97-2.23). Of 14 discrete analyses for different combinations of antioxidants, only one reported a statistically significant increase in relative risk of adenoma formation in participants receiving vitamin E (RR 1.74, 95% CI 1.09-1.79, P = 0.02) or vitamin E plus beta-carotene (RR 1.63, 95% CI 1.01-2.63, P = 0.04). Effectiveness did not seem to differ between healthy populations, participants with cardiovascular risk factors or populations exposed to smoking or asbestos. Conclusion The review demonstrates that antioxidants (vitamin A, C and E, selenium and beta-carotene), as single agents, in combination with other antioxidants or in combination with other agents, are not effective in the chemoprevention of colorectal neoplasia in the general population. This questions their involvement in future randomized controlled trials of chemoprevention in colorectal cancer.

Keywords: Adenoma, Adenomas, Beta-Carotene Supplementation, Cancer, Cardiovascular, Cardiovascular Risk, Cardiovascular-Disease, Chemoprevention, Cochrane, Colorectal Cancer, Databases, Effectiveness, Embase, Folic-Acid, Incidence, Involvement, Literature, Long-Term Supplementation, Medline, Meta Analysis, Meta-Analysis, Neoplasia, Neoplasms, Placebo-Controlled Trial, Primary Prevention, Randomized Controlled Trials, Randomized Controlled-Trial, Relative Risk, Research, Review, Risk, Risk Factors, Science, Selenium, Selenium Supplementation, Services-Task-Force, Smoking, Systematic, Systematic Review, Vitamin E, Vitamin-E, Web of Science

? Swank, H.A., Eshuis, E.J., Ubbink, D.T. and Bemelman, W.A. (2011), Is routine histopathological examination of appendectomy specimens useful? A systematic review of the literature. *Colorectal Disease*, **13** (11), 1214-1221.

Full Text: [2011\Col Dis13, 1214.pdf](2011/Col%20Dis13,%201214.pdf)

Abstract: Aim Histopathological examination of the appendix after appendectomy is routinely performed. The object of this systematic review is to determine whether routine histopathological examination of the appendix is justified. Method PubMed, EMBASE, Web of Science and the Cochrane library were searched without language restriction up to 1 October 2009. All articles that reported on the incidence of histopathologically proven aberrant appendiceal pathology were included. Results Nineteen case series reported the incidence of a benign neoplasm [0.5%, weighted mean (WM)], malignant neoplasm (0.2%, WM) and other pathology (0-14%). Nine articles reported the sensitivity of the intra-operative findings to detect aberrant diagnoses. Parasitic infection was detected in 0-19%, endometriosis in 0% and granulomatosis in 0-11% of cases. Five articles addressed the consequences of aberrant pathology. Most patients with parasite infection, granulomatosis and malignant neoplasms underwent additional investigation or treatment, in contrast to patients with a benign neoplasm. Conclusion The incidence of unexpected findings in appendectomy specimens is low and the intra-operative diagnosis alone appears insufficient for identifying unexpected disease. The benefit of histopathology is studied inadequately. From the present available evidence, routine histopathology cannot be judged as useless.

Keywords: Acute Appendicitis, Appendix, Appendixes, Carcinoid-Tumors, Case Series, Cochrane, Diagnosis, Disease, Embase, Incidence, Infection, Literature, Low, Neoplasms, Pathology, Patients, Pubmed, Review, Routine, Science, Sensitivity, Specimens, Surgical Pathology, Systematic, Systematic Review, Treatment, Web of Science

# Title: Colour Chemistry – Synthesis, Properties and Applications of Organic Dyes and Pigments

? Zollinger, H. (1987), Colour Chemistry – Synthesis, Properties and Applications of Organic Dyes and Pigments. VCH Publishers, New York, pp 92-100.

# Title: Colourage

Full Journal Title: Colourage

ISO Abbreviated Title: Colourage

JCR Abbreviated Title: Colourage

ISSN: 0010-1826

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Language:

Publisher: Colour Publ Private Ltd, Bombay

Publisher Address:

Subject Categories:

: Impact Factor

McKay, G., Otterburn, M.S., Poosunthornsri, P. and Sweeney, A.G. (1980), Factors affecting the rate acid dye removal from effluent using activated carbon. *Colourage*, **27** (3), 3-5.

McKay, G. (1981), Methods of color removal from effluent. *Colourage*, **28** (14), 6-8.

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McKay, G. (1982), Intraparticle diffusion and surface mass transfer processes during colour removal from effluent by carbon adsorption. *Colourage*, **29** (25), 11-16.

Keywords: Adsorption

McKay, G. and Al-Duri, B. (1988), Activated carbon for removal of basic dye from effluent. *Colourage*, **35** (20), 24-28.

McKay, G. and Al-Duri, B. (1989), External mass transport during the adsorption of basic dyes onto carbon. *Colourage*, **36** (13), 15-21.

Keywords: Adsorption

McKay, G. and Al-Duri, B. (1989), Intraparticle diffusion processes during the adsorption of basic dyes onto carbon. *Colourage*, **36** (13), 23-28.

Keywords: Adsorption

? Dilling, P. and Eicke, H. (1990), Adsorption of Lignosulfonates to disperse dye substrates. *Colourage*, **37** (6), 37-47.

Keywords: Adsorption

? Burkinshaw, S.M. (1991), The adsorption of a synthetic tanning agent on Nylon 6.6. *Colourage*, **38** (7), 51-56.

Keywords: Adsorption

? Mishra, G. and Tripathy, M. (1993), A critical review of treament for decolorization of textile effluent. *Colourage*, **40**, 35-38.

? Kumar, K.V. and Bhagavanulu, D.V.S. (2003), Surface mass transfer during the adsorption of basic dye onto fly ash. *Colourage*, L(12), 37-42.

# Title: Combustion and Flame

Full Journal Title: [Combustion and Flame](http://www.sciencedirect.com/science/journal/00102180)

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Subject Categories:

Thermodynamics

Energy & Fuels Engineering: Impact Factor 1.426, / (2002)

Engineering, Chemical: Impact Factor 1.338, 9/110 (1999); Impact Factor 1.560, 8/110 (2000); Impact Factor123 (2001); Impact Factor 1.426, 10/126 (2002)

McKay, G., Norrie, K.M., Poots, V.J.P. and Tumer, J.M.C. (1975), Diffusion processes in the slow oxidation of isobutane. *Combustion and Flame*, **25** (2), 219-227.

Full Text: [1960-80\Com Fla25, 219.pdf](1960-80/Com%20Fla25,%20219.pdf)

Abstract: The slow oxidation of isobutane has been investigated in a static system at 300 °C and 330 °C in the presence of the diluents nitrogen and carbon dioxide. Product analysis by means of gas chromatography shows that the main primary products are ethylene, propylene, isobutene, acetaldehyde, propylene oxide, isobutene oxide, propionaldehyde, isobutyraldehyde, acetone, and t-butanol, with trace amounts of acrolein, methyl oxetane and methacrolein. A mechanism is proposed for the formation and distribution of products based on diffusional studies. The reaction scheme involves a deactivation step whereby vibrationally-excited butylperoxy radicals can undergo deactivation by collision with surrounding gas molecules.

McKay, G. and Aga, J.A. (1981), Product formation in the slow oxidation of isobutane. *Combustion and Flame*, **40** (2), 221-224.

Full Text: [1981\Com Fla40, 221.pdf](1981/Com%20Fla40,%20221.pdf)

Simons, G.A. (1983), Enhanced char reactivity via a tailored pore structure. *Combustion and Flame*, **50** (3), 275-285.

Full Text: [1983\Com Fla50, 275.pdf](1983/Com%20Fla50,%20275.pdf)

Wu, C.Y. and Biswa, P. (1993), An equilibrium analysis to determine the speciation of metals in an incinerator. *Combustion and Flame*, **93** (1-2), 31-40.

Full Text: [1993\Com Fla93, 31.pdf](1993/Com%20Fla93,%2031.pdf)

Abstract: An equilibrium analysis is carried out to determine the speciation of metals among their various forms in an incinerator. The Gibbs free energy of the system is minimized by the method of element chemical potentials combined with atom population constraints using a thermodynamic equilibrium computer code. Ninety-one compounds of six metallic species-arsenic, cadmium, chromium, lead, mercury, and tin-are analyzed in this study. The effect of temperature and chlorine content on the speciation is established. The effect of combustion of hydrocarbon fuels on the equilibrium calculations is also evaluated.

Keywords: Waste Incineration, Hazardous-Waste

Heist, D.K., Ravichanran, M. and Gouldin, F.C. (1994), Experimental and numerical study of an incinerator-related and furnace-related flow. *Combustion and Flame*, **99** (2), 339-346.

Full Text: [1994\Com Fla99, 339.pdf](1994/Com%20Fla99,%20339.pdf)

Abstract: The results of an experimental and computational study of the flow over a separation-inducing corner formed by a surface-mounted, triangular obstacle located close to a 90 degrees turn are presented. The study was undertaken as part of a process to develop and validate numerical simulation methods for predicting incinerator and furnace flows, and the flow configuration studied is characteristic of such devices. The predictions from FEM simulations based on the standard k-epsilon turbulence model are compared with results from two-component LDV measurements from a water tunnel experiment. In the numerical simulations, two different outflow boundary conditions are used, one being the stress-free outflow condition and the other making use of special outflow elements. The results from the numerical simulation with the special outflow elements are in better agreement with the experimental results than those from the simulation with the stress-free outflow boundary condition. With the special outflow elements, the mean velocities and the gradients of the mean vertical velocity are well predicted. In the region separating the recirculation zone from the freestream where turbulent transport is most important, good agreement between the experiment and the special outflow elements simulation is achieved for the turbulent kinetic energy.

Keywords: Shear-Layer, Simulation, Models

Linak, W.P., Srivastava, R.K. and Wendt, J.P.L.W. (1995), Sorbent capture of nickel, lead and cadmium in a laboratory swirl flame incinerator. *Combustion and Flame*, **100** (1-2), 241-250.

Full Text: [C\Com Fla100, 241.pdf](C/Com%20Fla100,%20241.pdf)

Abstract: The in situ capture of toxic metals by sorbents was investigated in a small semi-industrial scale 82 kW research combustor. Metals considered were nickel, lead, and cadmium. These metals were introduced into the system as aqueous nitrate solutions, sprayed down the center of a natural gas flame, supported on a variable swirl burner. Kaolinite, bauxite, and hydrated lime were injected along the centerline in the postflame, near the peak system temperature. Measurements of both the submicron aerosol size distribution and the size segregated particulate composition in the exhaust allowed the effects of sorbent injection to be ascertained, both with and without the presence of chlorine. Lead and cadmium could be almost completely scavenged by kaolinite, which formed melted particles. Bauxite, which did not melt, was exceedingly effective in capturing cadmium. However, chlorine inhibited metal capture in these instances. Hydrated lime also captured cadmium to form a eutectic melt, and this process was slightly enhanced by chlorine. Nickel alone did not significantly vaporize and was not captured by kaolinite. However, in the presence of chlorine, nickel did vaporize and was effectively captured. These results are interpreted and compared to bench scale results in the literature. Two mechanisms, or scenarios, for toxic metal capture are presented.

Keywords: Wastes, Mechanisms, Removal

Kim, S., Shin, D. and Choi, S. (1996), Comparative evaluation of municipal solid waste incinerator designs by flow simulation. *Combustion and Flame*, **106** (3), 241-251.

Full Text: [C\Com Fla106, 241.pdf](C/Com%20Fla106,%20241.pdf)

Abstract: Flow simulations have been carried out to evaluate the effects of combustion chamber design and air/combustion gas flow configuration on the overall performance of municipal solid waste incinerators. Computational results show velocity and temperature fields in the entire region of flow passage. Local recirculations and uneven distributions of how velocity and temperature should be minimized and mixing is to be enhanced. Two parameters are proposed to help quantify the overall flow condition. The degree of mixing of different species, which enter the incinerator from the air and combustion gas inlets, is represented by the mixing parameter alpha. Here, alpha is calculated on the nodal points. The probability distribution of alpha in the entire computational domain is used for comparative evaluation of incinerator designs. The thermal decomposition parameter beta is calculated by integrating the kinetic rates along the trajectory of a fluid element. This parameter represents the portion of the unreacted materials among the total pollutants released from the bed. By employing these parameters, various incinerator design alternatives can be quantitatively analyzed from two principal viewpoints, i.e., the effectiveness in mixing and the thermal decomposition of pollutants.

? Perger, T., Kovács, T., Turányi, T. and Treviño, C. (2005), Determination of the adsorption and desorption parameters for ethene and propene from measurements of the heterogeneous ignition temperature. *Combustion and Flame*, **142** (1-2), 107-116.

Full Text: [2005\Com Fla142, 107.pdf](2005/Com%20Fla142,%20107.pdf)

Abstract: If a cold catalyst is exposed to a mixture of fuel + oxygen, the surface coverage of the catalyst can be dominated by either the fuel or the oxygen, depending on the actual catalyst and the composition of the gaseous mixture. If the temperature is increased, heterogeneous ignition occurs; the ignition temperature is influenced by the adsorption and desorption properties of both the fuel and the oxygen. Based on the equations for the heat balance, expressions have been derived for calculating the ignition temperature from the parameters of the experimental setup and the adsorption and desorption parameters of the fuel and the oxygen. These expressions can also be used to evaluate measured ignition temperatures to determine unknown adsorption and desorption parameters, such as the pre-exponential factor *A*D and activation energy *E*D for the desorption of the dominant surface species, the ratio of the sticking coefficients, and the ratio of the adsorption orders of the fuel and oxygen. This latter approach was used to evaluate measurements made by Cho and Law for the catalytic ignition of ethene and propene on polycrystalline platinum. The following parameters were determined by means of nonlinear least-squares fitting: *E*D(C2H4/Pt)=136±21 kJ/mol, *E*D(C3H6/Pt)=161±53 kJ/mol, *S*C2H4,0/*S*O2,0=15.6±1.9, *S*C3H6,0/*S*O2,0=11.9±1.7. Using a previously determined value for the sticking coefficient of O2, the values *S*C2H4,0=0.38±0.08 and *S*C3H6,0=0.29±0.06 were obtained. These error limits refer to a confidence level of 0.95. Experimental ignition temperatures could be reproduced assuming second order adsorption of ethene and propene on a surface of Pt.

Keywords: Heterogeneous Ignition, Adsorption Kinetics, Activation Energy of Desorption, Sticking Coefficient, Polycrystalline Platinum, Alkenes, Oxygen

# Title: Combustion Science and Technology

Full Journal Title: [Combustion Science and Technology](http://www.informaworld.com/smpp/title~content=t713456315~db=all)

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Subject Categories:

Thermodynamics Energy & Fuels Engineering: Impact Factor

Engineering, Chemical: Impact Factor 0.604, 43/110 (2000); Impact Factor 0.606, 54/123 (2001)

? Smith, A.H. and Goeden, H.M. (1990), Health risk assessment of incinerator air emissions incorporating background ambient air data. *Combustion Science and Technology*, **74** (1-6), 51-61.

Full Text: Com Sci Tec74, 51.pdf

? Ravichandran, M. and Gouldin, F.C. (1992), Numerical-simulation of incinerator overfire mixing. *Combustion Science and Technology*, **85** (1-6), 165-185.

Full Text: Com Sci Tec85, 165.pdf

Abstract: Recognizing the benefits of optimizing the design and operation of the overfire processes in mass burn incinerators, the potential for numerical simulation of overfire mixing using 2-D isothermal flow studies is explored. A finite difference method (FD) and a finite element method (FEM) are applied to the solution of model equations incorporating simplifications typically employed in utility furnace simulations. Mesh stability of the FD and the FEM solutions is studied. The FEM appears better equipped to deal with the discretization challenges posed by incinerator configurations than FD. Sensitivity of the FEM solutions to boundary conditions as well as artificial stability enhancing measures is studied. The effect of jets on flow characteristics such as separation and size/strength of the recirculation zones is studied using the FEM simulations. Lastly, the interaction between jet streams and grate streams as well as the interaction of opposing jets is studied using tracers to mark individual streams.

Keywords: Flows

? Cook, C.A., Cundy, V.A., Sterling, A.M., Lu, C., Montestruc, A.N., Leger, C.B. and Jakway, A.L. (1992), Estimating dichloromethane evolution rates from a sorbent bed in a field-scale rotary kiln incinerator. *Combustion Science and Technology*, **85** (1-6), 217-241.

Full Text: Com Sci Tec85, 217.pdf

Abstract: Estimates of dichloromethane evolution rates from the bed of a field-scale rotary kiln are provided during several modes of operation. The calculations of evolution rates are based on stoichiometry and combustion measurements; assumptions that are necessary due to practical limitations imposed on the experiments are discussed in detail in the paper. A sensitivity analysis of the calculation procedure is also discussed. Mass closures have been shown to range from 65 to 110% depending on the operating condition. Given the uncertainties associated with field-scale testing, these closures are quite remarkable. The calculation technique has also provided insight into the distribution of flow at the exit of the kiln under the different operating conditions that were studied. While most of these results are in agreement with previous empirical observations, others will require further study to determine whether the differences noted are an artifact of the calculation procedure. Although many uncertainties remain in describing the processes that occur during rotary kiln incineration, the results of this work assist in providing a much needed base of information for model development and validation.

Keywords: Transient Puffs, In-Depth, Desorption, Simulator, Contaminants, Dynamics, Xylene, Wastes, Packs, Soils

? Demarini, D.M., Williams, R.W., Perry, E., Lemieux, P.M. and Linak, W.P. (1992), Bioassay-directed chemical-analysis of organic extracts of emissions from a laboratory-scale incinerator: Combustion of surrogate compounds. *Combustion Science and Technology*, **85** (1-6), 437-453.

Full Text: Com Sci Tec85, 437.pdf

Abstract: A prototype/laboratory-scale rotary kiln (73 kW, 250000 Btu/h) was used to examine the chemical composition and biological effects of the emissions produced when the kiln was operated under suboptimal conditions resulting from batch charging. The surrogate wastes evaluated were polyethylene (PE), polyvinylchloride (PVC), toluene (TOL), carbon tetrachloride (CCl4), PE + PVC, and TOL + CCl4. The dichloromethane-extractable organics from particles (collected on filters) and semi-volatiles (collected on XAD-2 resin) were evaluated for mutagenic activity using the Salmonella (Ames) mutagerticity assay in strain TA98 (+ S9). The mutagenic potencies (revertants/microgram of extractable organics) of the emissions ranked as follows: PE > TOL > PE + PVC > TOL + CCl4. The organic extracts from the PVC and CCl4 emissions were not mutagenic. The mutagenic emission factors (revertants/kilogram of fuel or /megajoule of heat) for the TOL or PE emissions were similar to those for municipal waste combustors; those for PE + PVC or TOL + CCl4 were similar to those for oil or coal burned in industrial and utility boilers and power plants. These results suggest that the mutagenic emission factors may depend as much or more on the operating conditions of the incinerator than on the feed stock. Extracts were fractionated by high pressure liquid chromatography (HPLC), and each HPLC fraction was evaluated for mutagenic activity using strain TA98 (+ S9) in a microsuspension mutagenicity assay. Bioassay-directed chemical analysis was performed by subjecting selected mutagenic fractions to analysis by mass spectrometry. Various PAHs were identified in mutagenic fractions of the PE emissions. This study illustrates the value of performing both chemical and biological analyses of chemically complex combustion emissions in order to characterize the potential health effects of such mixtures.

Keywords: Complex Mixtures, Mutagenicity, Rotary-Kiln Incineration, High Pressure Liquid Chromatography, Hazardous Waste Incineration, Complex-Mixtures, Liquid Wastes, Batch Incineration, Mutagenic Activity, Prophage-Lambda, Transient Puffs, Air Particles, Rotary Kilns, Fractionation, Induction

? Ravichandran, M. and Gouldin, F.C. (1993), Residence time calculations using the numerical-simulation of incinerator flows. *Combustion Science and Technology*, **91** (4-6), 257-269.

Full Text: Com Sci Tec91, 257.pdf

Abstract: The value of knowing residence time distributions (RTD’s) in mass bum incinerators and the serious limitation imposed by the use of gas volume-flow rate based average residence time with regard to these incinerators are recognized. The utility for understanding macromixing of having detailed RTD-information about the incinerator overfire region is demonstrated by estimating RTD’s using transient numerical simulation of tracer injection into the 2-D, isothermal flow field of a typical mass bum incinerator configuration. Several numerical experiments are conducted to determine the effect of overfire jets on the RTD’s of tracer flows introduced into different grate streams. The results indicate that valuable diagnostic information on the state of mixedness in the overfire region can be extracted from these RTD’s by mapping them onto a macromixing scale whose extremes are the RTD of a plug flow and that of a stirred tank. Further, they not only underscore the critical role played by jets in achieving desirable states of macromixing in the overfire region but also point to the significance of the geometry effects. Lastly, the opportunity created by the RTD studies for experimental validation of incinerator overfire mixing simulations is identified.

? Nasserzadeh, V., Swithenbank, J. and Jones, B. (1993), Effect of high-speed secondary air-jets on the overall performance of a large MSW incinerator with a vertical shaft. *Combustion Science and Technology*, **92** (4-6), 389 et seq.

Full Text: Com Sci Tec92, 389.pdf

Abstract: This paper discusses a number of proposed design modifications and changes in operational conditions which have a major influence on the overall performance of the Sheffield municipal solid waste incinerator plant. This 35 MW unit incorporates a heat recovery system for district heating. Four different secondary air injection systems and various primary air distribution patterns along the grate were investigated using computational fluid dynamics in an attempt to eliminate the existing slagging problems and at the same time obtain optimum combustion conditions which would minimise potential emissions of toxic pollutants and reduce maintenance costs at the plant. The modelling work showed that the use of four tangential high speed secondary air jets together with optimising the primary air distribution along the grate, produces substantially longer residence times, improves the temperature profile at the exit, reduces the concentration of toxic pollutants and increases the combustion efficiency of the incinerator. The novel feature of the proposed secondary air injection system is the formation of a large size and significantly strong recirculation zone located above the burning refuse bed, in the middle of the furnace shaft. The presence of this strong recirculation zone improves the overall performance of the incinerator due to intensive mixing of the hot gaseous products (CO, volatile matter and hydrocarbons) evolving from the refuse bed with the combustion air supplied as the secondary air, and thereby greatly improves the gas phase combustion and helps to reduce emissions of chlorinated organic compounds; i.e. Dioxins.

Results obtained to date clearly demonstrate that the proposed secondary air injection system has excellent potential to help satisfy all the requirements for the emission levels and gas residence times specified by the EC Directives for municipal incinerators with a vertical radiation shaft. The principal conclusion reached from this modelling study is that upgrading of the existing municipal solid waste incinerators to meet some current environmental criteria can often be achieved with modification of the present conventional secondary air jet system designs together with the optimisation of the plant overall performance as a function of key process operating variables.

? Lancia, A., Musmarra, D., Pepe, F. and Volpicelli, G. (1993), Adsorption of mercuric-chloride vapors from incinerator flue-gases on calcium hydroxide particles. *Combustion Science and Technology*, **93** (1-6), 277-289.

Full Text: Com Sci Tec93, 277.pdf

Abstract: The adsorption of mercuric chloride vapours on a fixed bed of calcium hydroxide fine particles has been experimentally studied. The study has been conducted at laboratory scale using simulated flue gases, constituted of mercuric chloride vapours in nitrogen, which have been in contact with a Ca(OH) 2 fixed bed. The effect of the bed temperature, the inlet HgCl2 concentration, and the relative gas-solid velocity on the HgCl2 removal efficiency has been studied. The experimental results indicated that high removal efficiencies of up to 95% can be obtained. The bed temperature has been found to be the most relevant parameter particularly as the experimental results show that the lower the bed temperature, the higher the removal efficiency. Moreover, the removal efficiency increases when the HgCl2 concentration in the inlet gas increases and when the relative gas-solid velocity decreases. A model based on a simplified expression of the Freundlich adsorption isotherm has been proposed, which is able to describe quite accurately the dependence of HgCl2 removal efficiency on the parameters investigated.

Keywords: Mercuric Chloride, Adsorption, Municipal Solid Wastes, Incineration

? Linak, W.P., Srivastava, R.K. and Wendt, J.O.L. (1994), Metal aerosol formation in a laboratory swirl flame incinerator. *Combustion Science and Technology*, **101** (1-6), 7-27.

Full Text: Com Sci Tec101, 7.pdf

Abstract: Experiments were performed on an 82kW (280,000 Btu/hr) refractory-lined horizontal tunnel combustor to examine the aerosol particle size distribution (PSD) produced by simulated nickel, cadmium, and lead wastes injected into an incineration environment. Metal constituents in the form of aqueous solutions of nickel, cadmium, and lead nitrates were introduced as secondary sprays within a swirl stabilized natural gas diffusion flame. Aerosol size distributions were measured at stack locations using a differential mobility particle sizer and a cascade impactor as functions of combustor temperature and waste chlorine content. Cadmium and lead produced emissions of submicron metal aerosols with mass mean diameters of approximately 0.2 µm. These submicron aerosol PSDs are consistent with a mechanism of metal vaporization followed by nucleation, condensation, and coagulation prior to sampling. Nickel also formed submicron particles, but the PSD was not generally consistent with a vaporization mechanism. With chlorine present, the PSDs for all three metals were similar in shape, and could be interpreted in light of the effect of chlorine to enhance and prolong the presence of metals in the vapor phase, and leading to the sampling of a less mature aerosol than that seen under baseline conditions. The effect of chlorine on nickel partitioning was particularly significant, and is consistent with vapor pressure predictions.

Keywords: Particle Formation, Dynamics, Mechanisms, Emissions, Wastes

? Fontijn, A., Blue, A.S., Narayan, A.S. and Bajaj, P.N. (1994), Gas-phase oxidation-kinetics of toxic metals at incinerator temperatures: The reactions of chromium atoms with HCl, N2O, Cl2, and O2. *Combustion Science and Technology*, **101** (1-6), 59-73.

Full Text: Com Sci Tec101, 59.pdf

Abstract: The need for kinetic data on individual reactions to develop combustion control strategies for alleviation of toxic metal species production is discussed. In this work such data are obtained at realistic incinerator temperatures. Measurements on the Cr + HCl reaction, made by both the High-Temperature Fast-Flow Reactor(HTFFR), and Metals High-Temperature Photochemistry (Metals-HTP) techniques, are found to be in good agreement. The other reactions were studied by the Metals-HTP technique only. These techniques are briefly described. The N2O and Cl2 results are compatible with O and Cl abstraction, respectively, while the HCl mechanism needs further study. These three reactions are independent of pressure. The previously studied O2 reaction involves a pressure-independent abstraction, and a pressure-dependent addition component. The following rate coefficient expressions in cm3 molecule-1s-1 were obtained: Cr + HCl k(811-1449 K) = 1.6×10-12 (T/K)(0.74) exp(-5802 K/T); Cr + Cl2 k(277-344 K) = 2.1×10-11 (T/K)(0.69) exp(-396 K/T); Cr + N2O k(278-1150 K) = 2.2×10-12 (T/K)(0.55) exp(-2851 K/T). The data from the latter reaction agree well with measurements elsewhere at the temperature extremes to yield an overall recommendation of k(278-2570 K) = 3.2×10-12 T-0.50 exp(-2605 K/T)cm3 molecule-1s-1; this temperature dependence is shown to be in good agreement with that predicted by a recently developed semi-empirical theoretical method.

Keywords: Toxic Cr Compounds, Oxidation, Incineration, High-Temperature Kinetics, Exothermic Homologous Reactions, Activation Barriers, Series, Waste, Mechanism, AlCl

Tanada, T.N., Velazquez, J., Hemmi, N. and Cool, T.A. (1994), Surrogate detection for continuous emission monitoring by resonance ionization. *Combustion Science and Technology*, **101** (1-6), 333-348.

Full Text: Com Sci Tec101, 333.pdf

Abstract: New measurements of resonance ionization detection limits are presented for seven species, of high thermal stability, which are potentially useful surrogates for continuous emission monitoring of incinerator effluent. Resonance ionization detection limit data are now available for 20 aliphatic and aromatic compounds; eight of these compounds have sub part-per-billion detection limits. These eight also exhibit selectivities exceeding 10 (3) when detected in the presence of a “soup” of chemically similar interferant species likely to be present in stack gas samples. Preliminary measurements indicate that detection limits, obtained under ideal conditionsin a helium carrier gas, are also approached under adverse sampling conditions tested with synthetic “soups”. The implications of these measurements on the selection of surrogates and the prospects for repetitive on-line hazardous emissions monitoring are discussed.

? Heist, D.K., Ravichandran, M. and Gouldin, F.C. (1994), Incinerator related flows: An experimental and numerical studyof turbulent-flow over an obstacle. *Combustion Science and Technology*, **101** (1-6), 425-441.

Full Text: Com Sci Tec101, 425.pdf

Abstract: To study the suitability of numerical simulations for predicting incinerator-related flows, an experimental and computational study of an obstacle flow with some of the features of incinerator flows is performed. Results of LDV measurements from a water channel experiment on the flow over a triangular obstacle and from a concurrent FEM simulation using the standard k-epsilon turbulence model are compared. The reattachment length predicted by the computations agrees to within 3% with the experimentally determined value. The mean velocity profiles and the shapes of the turbulent kinetic energy profiles show good agreement. A more realistic model of the flow in an incinerator is studied briefly and provides information on the appropriate choice of outflow boundary conditions for computing flows in truncated domains. The standard k-epsilon model was found to be useful in making predictions of separated flows with similarities to those found in incinerators. Special exit boundary conditions which allow for a pressure variation independent of the viscous normal stresses were found to predict realistic outflow velocity profiles.

Keywords: Backward-Facing Step, Boundary-Layer, Prediction, Simulation, Surface, Models

? Larsen, F.S., Silcox, G.D. and Keyes, B.R. (1994), The development of a thermal-treatment assessment procedure for soils contaminated with hydrocarbons. *Combustion Science and Technology*, **101** (1-6), 443-459.

Full Text: Com Sci Tec101, 443.pdf

Abstract: Hydrocarbon evolution from a montmorillonite clay-soil was studied at three scales and at temperatures ranging from 300 to 650°C in order to develop a thermal treatment assessment procedure for contaminated soils in rotary kilns. The two components of the assessment procedure included experimental evaluation of the soil at bench- or pilot-scale in conjunction with data fitting using an appropriate mathematical desorption model. The results of the experiments have been embodied in the model which can be used for scaling and correlative purposes. Performing experiments at three scales permitted a clear delineation of intraparticle and interparticle effects and it also allowed the testing of the model’s ability to correctly scale results. In addition to reactor size, the key parameters examined included hydrocarbon volatility, temperature, moisture levels, and soil particle size.

The three experimental facilities included a 0.6-by-0.6 m, natural gas-fired, batch, pilot-scale rotary kiln, a 6 mm outside diameter, single particle reactor (SPR), and a 10-by-10 cm bench-scale rotary reactor (BSRR). Porous soil particles ranging in diameter from 0.4 to 7 mm were tested in the kiln and the SPR. The single particle studies showed decreasing desorption times with decreasing radius in agreement with an intraparticle, diffusion-limited process. The kiln results showed no effect of particle size over the range of sizes studied suggesting that interparticle mass transfer resistances were controlling in a bed of particles.

The hydrocarbons included toluene, naphthalene, and n-hexadecane and their concentrations were each roughly 0.05 weight percent, on a dry basis. The ease with which they were removed from the soil decreased in the order given. Increasing the reactor temperature increased the desorption rates for all three compounds with the adsorption isotherm constants showing temperature dependencies that agreed with the van’t Hoff equation. Desorption rates showed no dependence on the presence or absence of other hydrocarbons. Moisture, at concentrations ranging from 5 to 9 weight percent, had a large effect on the desorption rate of all compounds studied.

The rate of toluene evolution in the kiln was accelerated while the rate of hexadecane evolution was slowed. Intermediate results were obtained with naphthalene. The rate of total hydrocarbon desorption from dry soils in the kiln was well correlated by a penetration model which used a distribution of heats of desorption. The desorption rate was first order with respect to individual and total hydrocarbon concentrations.

Keywords: Rotary Kiln Incineration, Rates

? Schenck, H.W., Wendt, J.O.L. and Kerstein, A.R. (1996), Mixing characterization of transient puffs in a rotary kiln incinerator. *Combustion Science and Technology*, **116** (1-6), 427-453.

Full Text: Com Sci Tec116, 427.pdf

Abstract: The mixing between transient puffs of evaporating waste and main burner flue gas in a rotary kiln incinerator was studied through cold flow model experiments and computer simulations. The experiments consisted of the temporary release of a particle laden stream into a cross flow, and the subsequent visualization of the concentration field using laser sheets or laser lines. Quantitative data, including average concentration and concentration fluctuation profiles, were obtained from video frames by digital image analysis. The experiments were compared to a computer simulation model, based on the linear eddy modeling technique. Model results agreed very well with experimental data, if a recirculation zone was explicitly accounted for. This study suggests that gas phase unmixedness is a likely explanation for failure modes in rotary kiln incineration. Insufficient macro-mixing (controlled by transient evaporation and large scale motion) is more important than local unmixedness (governed by fine scale turbulence and molecular diffusion), although both processes play a role. Linear eddy model simulations also showed that low resolution measurements of mixing with large Schmidt numbers (i.e. for particles) can be interpreted as fully resolved mixing with Schmidt number equal to unity (i.e. for gases).

Keywords: Incineration, Mixing, Turbulence, Flow Visualization, Linear Eddy Modeling, Turbulent Transport, Liquid Wastes, Batch Incineration, In-Depth, Jet, Emissions, Simulator, Sorbent

? Linak, W.P., Ryan, J.V. and Wendt, J.O.L. (1996), Formation and destruction of hexavalent chromium in a laboratory swirl flame incinerator. *Combustion Science and Technology*, **116** (1-6), 479-498.

Full Text: Com Sci Tec116, 479.pdf

Abstract: The partitioning of chromium (Cr) in combustion systems was investigated theoretically and experimentally. Theoretical predictions were based on chemical equilibrium, and suggested that hexavalent chromium [Cr(VI)] was favored by the presence of chlorine (Cl), and diminished by the presence of sulfur (S). Experimental studies employed a 59 kW laboratory-scale combustor with a swirling natural gas diffusion flame through which aqueous Cr solutions were sprayed. Three types of experimental data were obtained. First, and most important, the overall Cr(VI) fraction of the total Cr in the exhaust was measured as a function of initial Cr valence [trivalent(III) or hexavelent], and Cl and S concentrations. Second, the size segregated distribution of Cr(VI) in the exhaust was explored for the Cr(III) waste feed with and without Cl and S. Third, the influence of waste feed Cr valence on the exhaust aerosol particle size distribution was determined. Analytical determinations of Cr(VI) and total Cr are described.

Results show that, for the high temperature, highly turbulent, gas-phase incinerator conditions examined, the relative ratio of Cr(VI)/total Cr is unaffected by the initial Cr valence of the waste, and ranged from near zero to approximately 8%, depending on the presence of S or Cl. Cl addition increased the fraction of Cr(VI) found in small particles (smaller than approximately 1.1 µm) from approximately 30 to 70%. In contrast to the chemical analysis, the particle size distribution (PSD) measurements indicate that the initial form of the Cr waste does influence the resultant PSD. This mechanism is not well understood, but a possible explanation is that at combustion temperatures the Cr speciation chemistry is equilibrium controlled, while the PSD is determined by the aerosol dynamics which are dependent on physical transformations and specific chemical pathways.

Keywords: Waste Incineration, Chromium Speciation, Hexavalent Chromium, Metal Transformations, Metals

? Chun, P. and Hall, M.J. (1996), Sorbent capture of lead and barium in a bench-scale incinerator combusting simulated waste lubricating oil. *Combustion Science and Technology*, **116** (1-6), 517-539.

Full Text: Com Sci Tec116, 517.pdf

Abstract: The burning of simulated waste lubricating oils containing lead or barium, and the fate of these metals in the presence of sorbents during combustion were investigated in a 13 kW horizontal combustor. An organometallic, lead(II) ethylhexanoate or barium naphthenate, mixed with heptane was burned with air yielding between 15 and 300 ppm, of the metal in the gases. Sorbent (kaolinite or hydrated lime) was introduced upstream of the reaction zone. Samples of lead or barium collected without sorbent injection showed the metals’ particle size distributions in the submicron range.

A computer code, MAEROS2, was adapted to predict lead oxide particle size distribution for similar combustor conditions and compared with experimental results of Linak et al. (1995). The sorbents were effective in scavenging lead. With kaolinite sorbent, lead concentrations were inversely proportional to particle diameter. Even with sorbent, the barium was found predominantly in the submicron size range suggesting little adsorption.

Keywords: Incineration, Heavy Metals, Sorbents, Fly-Ash, Trace

? Oser, H., Thanner, R. and Grotheer, H.H. (1996), Jet-REMPI for the detection of trace gas compounds in complex gas mixtures, a tool for kinetic research and incinerator process control. *Combustion Science and Technology*, **116** (1-6), 567-582.

Full Text: Com Sci Tec116, 567.pdf

Abstract: Flame optimization in incinerators is achievable by feedback control via kinetic modelling and on-line monitoring. On-line monitoring for process control requires a fast, selective and sensitive analytical device. In this paper a REMPI (Resonance Enhanced Multi Photon Ionization) mass spectrometer is presented which combines high sensitivity with very low cross-sensitivity. Consequently, it should be a valuable tool for both kinetic research and for on-line investigation. The sensitivity of the instrument has been increased by shifting the ionization regime dose to the continuous portion (“jet”) of the sample beam as opposed to the more conventional ionization within the molecular beam. A further gain in sensitivity was achieved by increasing the ionization volume which was made possible by a complete re-design of the ion source. A very low base-line level is achieved by using a geometry which prevents secondary ionization by the collision of ions/electrons with surfaces.

These improvements result in an excellent performance from our apparatus which is demonstrated by the dichlorotoluene and naphthalene spectra which were obtained under a variety of conditions. For naphthalene we have now a detection limit of 5 ppt (mole fraction) for a S/N = 1. Further developments of the technique are discussed.

Keywords: Photo Ionization, Molecular Beam, TOF Mass Spectrometer, Analysis of Trace Gas Compounds, On-Line Monitoring of Chlorinated Hydrocarbons, Resonant 2-Photon Ionization, Beam-Mass-Spectrometry, Hydrocarbons

? Gutmark, E.J., Parr, T.P., Wilson, K.J., Yu, K.H., Smith, R.A., Hanson Parr, D.M. and Schadow, K.C. (1996), Compact waste incinerator based on vortex combustion. *Combustion Science and Technology*, **121** (1-6), 333-349.

Full Text: [1996\Com Sci Tec121, 333.pdf](1996/Com%20Sci%20Tec121,%20333.pdf)

Abstract: Active control of fluid dynamics has been used to enhance mixing in incinerator afterburner experiments in order to increase the DRE of a waste surrogate. Experiments were conducted in two stages: a detailed study of the concept of utilizing vortex combustion for incineration in a small scale flame burning gaseous fuel and an extension to a more practical system using liquid fuel with significantly higher heat release.

The open loop active control system is based on the concept of combustion in periodic axisymmetric vortices. Acoustic excitation is used to stabilize coherent Vortices in the air flow. Acoustic excitation and automotive fuel injectors, were used to control gaseous or liquid fuel injection, respectively, such that the fuel is introduced into the air vortices at the right time during their formation. It is shown that this control methodology leads to improved waste destruction. A gaseous fueled actively controlled 4.5 kW incinerator was able to surpass 99.997% DRE (destruction and removal efficiency) even when the waste surrogate (gaseous benzene) constituted 66% of the total fuel content. Parameters found critical to maintenance of high DRE in the gaseous fuel/waste tests were the fraction of circumferentially entrained air and the phasing angle of fuel injection with respect to the air vortex roll-up.

The control methodologies studied using gaseous fuel and waste were extended to liquid afterburner/incinerator of 56 kW energy release. The DRE for liquid benzene exceeded 99.999% in this system when combustible to air ratio was kept below 0.91. Again, the use of synchronous fuel injection into coherent air vortices was found to be critical to maintaining high DRE. Even more crucial was good atomization of the liquid fuel/waste mixture.

Keywords: Vortex, Dre, Liquid Benzene, Waste Surrogate, Mixing Layers

# Title: Commonwealth and Comparative Politics

Full Journal Title: [Commonwealth and Comparative Politics](http://www.informaworld.com/smpp/title~content=t713720447~db=all)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Pierson, C. (2003), Learning from labor? Welfare policy transfer between Australia and Britain. *Commonwealth and Comparative Politics*, **41** (1), 77-100.

Full Text: [2003\Com Com Pol41, 77.pdf](2003/Com%20Com%20Pol41,%2077.pdf)

Abstract: In the emergent literature of social policy transfer, very considerable attention has been directed to the processes of policy exchange between North America and the UK. This paper reports the findings of an investigation into the processes of policy transfer between Australia and the UK under the auspices of the Australian Labor Party in the early 1990s. Particular attention is given to the raft of policies promoting more active labour markets and the reform of student funding. Evidence is found of a real, though qualified impact of Australian policy-making mediated by the very different institutional contexts in Australia and Britain.

Keywords: Policy Transfer, Social Policy, Australia, UK

# Title: Communication Research

Full Journal Title: [Communication Research](http://crx.sagepub.com/archive/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Borgman, C.L. and Paisley, W. (1989), Bibliometric methods for the study of scholarly communication: Preface. *Communication Research*, **16** (5), 581-582.

Full Text: [1989\Com Res16, 581.pdf](1989/Com%20Res16,%20581.pdf)

Keywords: Bibliometric

? Borgman, C.L. (1989), Bibliometrics and scholarly communication: Editor’s introduction. *Communication Research*, **16** (5), 583-599.

Full Text: [1989\Com Res16, 583.pdf](1989/Com%20Res16,%20583.pdf)

Abstract: In recent years there has been a resurgence of interest both in scholarly communication as a research area and in the application of bibliometrics as a research method. This special issue attempts to review current research that applies bibliometric techniques to research questions in scholarly communication. We consider scholarly communication to be the study of how scholars in any field use and disseminate information through formal and informal channels, whereas bibliometrics is the application of mathematics and statistical methods to books and other media of communication. We propose a matrix for the intersection of these two topics of variables studied (producers, artifacts, and concepts of communication) by research questions asked (characterizing scholarly communities, evolution of scholarly communities, evaluation of scholarly contributions, and the diffusion of ideas). Research in these areas is reviewed, and articles in this issue are set in the context of the matrix. Reliability and validity issues in the application of bibliometrics are reviewed briefly.

Keywords: Bibliometrics

? Lievrouw, L.A. (1989), The invisible college reconsidered: Bibliometrics and the development of scientific communication-theory. *Communication Research*, **16** (5), 615-628.

Full Text: [1989\Com Res16, 615.pdf](1989/Com%20Res16,%20615.pdf)

Abstract: In this article, the relationship of bibliometric techniques (especially citation analysis) to communication theory and research is examined, using the invisible college as the principal example. The invisible college is used because it is the best-known model of scientific communication, and because it is based in bibliometric studies of science. As such, the invisible college is typical of constructs that describe processes yet are founded on the study of structures; the ambiguity surrounding the use of the term is symptomatic of the confounding of structure and process in the study of scholarly communication. A revised definition of the invisible college is proposed that reemphasizes its fundamentally communicative nature, and issues for future theory building in scientific communication are suggested.

Keywords: Bibliometrics

? Miyamoto, S., Midorikawa, N. and Nakayama, K. (1989), A view of studies on bibliometrics and related subjects in Japan. *Communication Research*, **16** (5), 629-641.

Full Text: [1989\Com Res16, 629.pdf](1989/Com%20Res16,%20629.pdf)

Abstract: This article surveys studies on bibliometrics and related subjects in Japan. Reviewed articles are classified according to the following categories: (a) studies on bibliometrics—including bibliometric laws, citation studies, scientific communication, and software tools for bibliometrics; and (b) application of bibliometrics—including policies for scientific research, bibliometrics and information retrieval, and databases in oriental languages. An interesting characteristic in the Japanese studies is that databases of texts in oriental languages such as Japanese and Chinese have been developed. Applications of fuzzy set theory to document retrieval using bibliometric techniques are also observed. We emphasize the models and methods used in common between bibliometrics and other fields of sciences.

Keywords: Bibliometrics

? Paisley, W. (1989), Bibliometrics, scholarly communication, and communication-research. *Communication Research*, **16** (5), 701-717.

Full Text: [1989\Com Res16, 701.pdf](1989/Com%20Res16,%20701.pdf)

Abstract: Only a few studies in communication research have focused on bibliometrics or scholarly communication per se, but these concepts are closely tied to strong traditions of communication research in content analysis and organizational communication. Bibliometric studies are becoming common in several fields of science because of the number and accessibility of electronic databases as well as the development of conceptual frameworks in which bibliometric measures are indicative of social processes such as the evolution of scientific specialties and the diffusion of innovations. Research on scholarly communication, and more narrowly on scientific communication, is receiving growing attention because of the problems and costs of disseminating information to scientists, practitioners, and policymakers. With its focus on informal and formal communication processes, this research clearly falls within the province of communication research. However, many of the studies have been conducted by information scientists with a practical need to improve scientific information systems. Communication researchers are beginning to apply bibliometric methods to topics ranging from political communication to the new media. Bibliometrics and the study of scholarly communication present an opportunity for communication researchers and information scientists to collaborate in an area of common interest.

Keywords: Bibliometrics

? Zollars, C. (1994), The perils of periodical indexes - Some problems in constructing samples for content-analysis and culture indicators research. *Communication Research*, **21** (6), 698-716.

Full Text: [1994\Com Res21, 698.pdf](1994/Com%20Res21,%20698.pdf)

Abstract: This article is about a topic neglected in the social science literature on content analysis and culture indicators methodology-problems in using periodical indexes to construct research samples. The author briefly identifies and discusses reasons why article headlines located through indexes’ subject categories can prove to be misleading indicators and then turn to the methodological difficulties arising from historical and idiosyncratic changes in index subject category headings and subheadings-difficulties particularly relevant to longitudinal research. The author argues that researchers using an index’s subject categories should test not only for category longevity but also for category coherence and consistency over time. The use of oversampling, cross-references, and other devices is suggested as a means to correct or compensate for hidden inaccuracies in index classification and to construct purposive samples for analytic comparisons.

Keywords: Content Analysis, Indexes, Indicators, Literature, Periodical, Research, Researchers

# Title: Communication Theory

Full Journal Title: Communication Theory

ISO Abbreviated Title: Commun. Theory

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

White, W.J. (2001), A communication model of conceptual innovation in science. *Communication Theory*, **11**, 290-314.

Full Text: [2001\Com The11, 290.pdf](2001/Com%20The11,%20290.pdf)

# Title: Communications of the ACM

Full Journal Title: [Communications of the ACM](http://portal.acm.org/toc.cfm?id=J79&type=periodical&coll=GUIDE&dl=GUIDE&CFID=100178140&CFTOKEN=68272877)

ISO Abbreviated Title:

JCR Abbreviated Title:

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Full Text: [1994\Com ACM37, 21.pdf](1994/Com%20ACM37,%2021.pdf)

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Full Text: [2004\Com ACM47, 98.pdf](2004/Com%20ACM47,%2098.pdf)

Keywords: Articles, Journals

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Keywords: Plagiarism, Science

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Full Text: [2005\Com ACM48, 13.pdf](2005/Com%20ACM48,%2013.pdf)

Keywords: Self-Plagiarism

? Neville, C.W. (2005), Beware the consequences of citing self-plagiarism. *Communications of the ACM*, **48** (6), 13.

Full Text: [2005\Com ACM48, 13.pdf](2005/Com%20ACM48,%2013.pdf)

Keywords: Self-Plagiarism

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Full Text: [2011\Com ACM54, 141.pdf](2011/Com%20ACM54,%20141.pdf)

Keywords: Google Scholar, Scopus

# Title: Communications in Soil Science and Plant Analysis

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Dalal, R.C. (1974), Desorption of soil phosphate by anion-exchange resin. *Communications in Soil Science and Plant Analysis*, **5** (6), 531-538.

Full Text: [1960-80\Com Soi Sci Pla Ana5, 531.pdf](1960-80/Com%20Soi%20Sci%20Pla%20Ana5,%20531.pdf)

Abstract: Kinetics of phosphate desorption from twenty soils by anion-exchange resin were not satisfactorily explained by either film diffusion (or ion exchange mechanism) mechanism or particle diffusion mechanism. Eut the phosphate desorption process was adequately explained by a two-constant rate equation. The two constants, the coefficient term (i.e., rate factor) and the constant term (i.e., solution P initially) were significantly correlated with amorphous Al; rate factor increased and solution P decreased with the increase in amorphous Al among the soils. Thus, influence of amorphous Al in P availability from soils must be considered.

Keywords: Desorption, Diffusion, Rate Factor

Notes: highly cited

? Goldberg, S. and Sposito, G. (1985), On the mechanism of specific phosphate - adsorption by hydroxylated mineral surfaces - A review. *Communications in Soil Science and Plant Analysis*, **16** (8), 801-821

Full Text: [1985\Com Soi Sci Pla Ana16, 801.pdf](1985/Com%20Soi%20Sci%20Pla%20Ana16,%20801.pdf)

Abstract: The mechanism of specific phosphate adsorption by hydroxylatedmineral surfaces comprises two aspects: the phosphatehydroxylsurface reaction and the configuration of the adsorbed phosphate ion. Evidence pointing to ligand exchange as the mechanism of the phosphate-surface hydroxyl reaction include kinetics of adsorption and desorption; hydroxyl ion release; infrared spectroscopy, and stereochemical calculations. Datapertaining to the coordination of adsorbed phosphate on hydroxylatedmineral surfaces have not been conclusive overall. Isotopic exchange experiments and studies of desorption kineticsdo not provide definitive information on surface coordination. Measurements of hydroxyl ion release and crystallographic calculations provide support for the existence of both monodentate andbidentate surface complexes of phosphate ions. Infrared spectroscopic investigations suggest a binuclear complex ondried, phosphated goethite. However, these studies cannot beextrapolated automatically to soil minerals, since the addition of water favors formation of a monodentate surface complex. Further research is needed to establish the configuration of adsorbed phosphate ions.

Keywords: Adsorption, Mechanism, Mineral, Phosphate, Surfaces

? Mitsios, J., Dimirkou, A., Ioannou, A., Paschalidis, C. and Doula, M. (1994), The sorption isotherms of potassium. *Communications in Soil Science and Plant Analysis*, **25** (9-10), 1373-1386.

Full Text: [1994\Com Soi Sci Pla Ana25, 1373.pdf](1994/Com%20Soi%20Sci%20Pla%20Ana25,%201373.pdf)

Abstract: The one- and two-surface Langmuir, the Freundlich and the Temkin isotherms were fitted to potassium sorption data for Alfisol Haploxeralf at pH range of 4.0 to 8.0. Each was found to describe potassium sorption data with comparable success, with the Freundlich model being slightly superior. The effect of pH on the potassium adsorption was studied and Langmuir, Freundlich and Temkin isotherms were converted to pH-dependent forms. The amount of adsorbed potassium increased as pH and initial concentration increased. From the Landmuir isotherm, the maximum amount (Xm) that can be sorbed in a monolayer was estimated. It is noteworthy that the maximum amount (Xm) of K increases by increasing pH. The four isotherms were transformed into pH-dependent forms.

Keywords: Freundlich, Sorption, Temkin, Two-Surface Langmuir

Bierman, P.M. and Rosen, C.J. (1994), Sewage sludge incinerator ash effects on soil chemical properties and growth of lettuce and corn. *Communications in Soil Science and Plant Analysis*, **25** (13), 2409-2437.

Full Text: [1994\Com Soi Sci Pla Ana25, 2409.pdf](1994/Com%20Soi%20Sci%20Pla%20Ana25,%202409.pdf)

Abstract: Incineration reduces sewage sludge volume, but management of the resulting ash is an important environmental concern. A laboratory incubation study and greenhouse pot experiments with lettuce (Lactuca sativa L.) and corn (Zea mays L.) were conducted to examine the potential for recycling elements in sewage sludge incinerator ash in agricultural systems. Ash rates in both the laboratory and greenhouse were 0, 0.95, 3.8, 15.2, and 61.0 g/kg soil (Typic Hapludoll). Ash was also compared to equivalent rates of citrate soluble P from superphosphate fertilizer in a soil-less growth medium. During soil: ash incubation, Olsen P and DTPA extractable copper (Cu), zinc (Zn), cadmium (Cd), and lead (Pb) increased with incubation time at the higher ash rates. Release rates diminished rapidly, however, and the limited release of these elements after 280 days was associated with decreasing pH. In the greenhouse, ash amendment increased extractable soil P, plant tissue P, and the growth of lettuce and com. Ash was a less effective P source than superphosphate fertilizer in the soil-less growth medium and Olsen P levels were more consistent with these differences than Bray P. Ash increased extractable soil levels and plant tissue concentrations of calcium (Ca), magnesium (Mg), sodium (Na), Cu, and Zn, but extractable soil manganese (Mn) and plant tissue Mn decreased. Ash increased soil pH and extractable SO4-S. DTPA extractable Cd and Pb increased, but chromium (Cr) and nickel (Ni) decreased. Lettuce accumulated higher amounts of these trace metals than com, but tissue concentrations were at control levels or below detection limits in both crops.

Keywords: Nitrogen

Taylor, R.W., Hassan, K., Mehadi, A.A. and Shuford, J.W. (1995), Kinetics of zinc sorption by soils. *Communications in Soil Science and Plant Analysis*, **26** (11-12), 1761-1771.

Full Text: [C\Com Soi Sci Pla Ana26, 1761.pdf](C/Com%20Soi%20Sci%20Pla%20Ana26,%201761.pdf)

Abstract: The rate of zinc (Zn) sorption from solution onto solid surfaces is a dynamic factor that directly or indirectly regulates the amount of Zn in solution at any given time. To understand the pattern of Zn sorption and the soil characteristics affecting it, the kinetics of Zn sorption by twelve Alabama soils were studied using five equations (Elovich, zero-, first-, second-, third-order, and parabolic diffusion). The time required to reach the equilibrium state was 24 h. The Elovich equation was superior in fitting the data. The choice of the Elovich equation over the others was based on the higher coefficient of determination (R2), lower standard error of estimate (SE) over the whole isotherm, and the close values for both the measured and predicted Zn sorbed at different time intervals. Elovich parameters were regressed against some soil properties to identify soil properties that were related to Zn sorption. The regression equations indicated that cation exchange capacity, organic matter, and clay content were the main soil properties contributing to the Zn sorption process in these soils.

Keywords: Elovich Equation, Phosphate, Release, Models

Simonne, E.H., McCrimmon, J.N., Scoggins-Mantero, H.L., Mills, H.A. and Cresman, III, C.P. (1995), Adjustments of sufficiency ranges of selected ornamentals and Turfgrasses for assessing nitrogen with Dumas-N data. *Communications in Soil Science and Plant Analysis*, **26** (13-14), 2243-2251.

Full Text: [1995\Com Soi Sci Pla Ana26, 2243.pdf](1995/Com%20Soi%20Sci%20Pla%20Ana26,%202243.pdf)

Abstract: With recent advances in nitrogen (N) analyzers, the Dumas method may replace the Kjeldahl method for the routine diagnosis of N in plants. Since these two methods recover different N fractions and no conversion factor is available to convert Dumas N (Dn) to Kjeldahl N (Kn) data, Kn: Dn ratios were determined for selected ornamentals (anthurium, Anthurium andraeanum Linden; orchid spp. Cattleya, Dendrobium, Oncidium, Phalaenopsis, and Vanda; leatherleaf fern, Rumohra adiantiformis (G. Forst) Ching; tree fern, Asparagus densiflorus (kunth) Jessop) and turfgrasses (creeping bentgrass, Agrostis palustris Huds. cv. Penncross; bermudagrass, Cynodon dactylon L.). Samples were dried at 70°C for 72 hr and ground to pass a 20-mesh sieve. Kn was determined by colorimetry after digestion of 0.4 g of tissue using a CuSO4/TiO/K2SO4 catalyst and 10 mL of H2SO4 at 450°C for 2 hr. Dn was determined using 0.2 g of sample and a LECO FP-428 N Analyzer. Over the 0.4-6.6% N range, Dn was a good predictor of Kn; Kn = 0.90 Dn + 0.09 (R2 = 0.93, p-model<0.01, n = 397 obs.). The Kn: Dn ratio was significantly (p<0.01), affected by plant type (Kn: Dn = 0.85, 0.92, 0.99, and 1.00 for anthurium, turfgrasses, orchid and fern, respectively). The more practical way to use the ratios in routine interpretation was to adjust existing sufficiency ranges with the inverse of these ratios. Adjusted sufficiency ranges (in %N) were 4.9-6.6 for creeping bentgrass, 2.4-4.4 for bermudagrass, and 1.9-3.6 for anthurium. Existing sufficiency ranges for orchid and fern need not be adjusted for Dumas N.

Keywords: Plant, Kjeldahl, Soil, Digestion, Samples

? Ioannou, A., Dimirkou, A. and Theodoropoulou, E. (1996), Phosphate sorption by hematite and kaolinite-hematite (k-h) system as described by isotherms. *Communications in Soil Science and Plant Analysis*, **27** (5-8), 1925-1947.

Full Text: [1996\Com Soi Sci Pla Ana27, 1952.pdf](1996/Com%20Soi%20Sci%20Pla%20Ana27,%201952.pdf)

Abstract: The sorption of phosphate (P) by synthetic hematite and kaolinite-hematite (k-h) system was investigated under conditions of varying pH (4.0, 5.0, 6.0, 7.0, 8.0, and 9.0) and equilibrating solution composition. Sorption experiments were carried out in background solution of six different initial phosphate (P) concentrations (40-444 mmol kg-1).The experimental data were fitted to Langmuir, Freundlich, Temkin, Gouy Chapman, and Sposito isotherms. Each model was found to describe sorption data with comparable success, with the two surface Langmuir for hematite and Freundlich for kaolinite-hematite models being slightly superior. The amount of P sorbed increased as initial P concentration increased and pH values decreased. The amount of P sorbed by kaolinite-hematite (k-h) system is always less than that of hematite.

Keywords: Adsorption, Freundlich, Goethite, Sorption, Temkin

? Yuan, G. and Lavkulich, L.M. (1997), Sorption behavior of copper, zinc, and cadmium in response to simulated changes in soil properties. *Communications in Soil Science and Plant Analysis*, **28** (6-8), 571-587.

Full Text: [1997\Com Soi Sci Pla Ana28, 571.pdf](1997/Com%20Soi%20Sci%20Pla%20Ana28,%20571.pdf)

Abstract: Environmental changes and management practices which alter soil properties may affect the capacity of soils to sorb trace metals, such as copper (Cu), zinc (Zn), and cadmium (Cd), and thus influence the bioavailability and leach ability of the metals. Two agricultural soils were treated to partially oxidize organic matter and to decrease soil pH for evaluating the effects of acidification and organic matter oxidation on trace metal sorption onto soils. For the one soil with a pH value of 6.74 and organic carbon (C) content of 46.9 g.kg-1, loss of 11% of its organic matter reduced by 97, 72, and 62% the original sorption capacity for Cu, Zn, and Cd, respectively, while the corresponding values caused by acidifying the soil one pH-unit were 32, 16, and 29%. For the another soil with a pH of 4.69 and organic C content of 16.3 g.kg-1, a decrease in pH by one unit resulted in a loss of 43, 21, and 52% of the sorption capacity for Cu, Zn, and Cd, respectively.

Keywords: Heavy-Metals, Adsorption, Acid, pH, Accumulation, Manganese, Lead

? Karimian, N. and Ahangar, A.G. (1998), Manganese retention by selected calcareous soils as related to soil properties. *Communications in Soil Science and Plant Analysis*, **29** (9-10), 1061-1070.

Full Text: [1998\Com Soi Sci Pla Ana29, 1061.pdf](1998/Com%20Soi%20Sci%20Pla%20Ana29,%201061.pdf)

Abstract: Calcareous soils often need supplemental manganese (Mn) to support optimum plant growth, but some reports show that the apparent recovery of applied Mn is very low in such soils, i.e., nearly all of the applied Mn is retained in the soil. This experiment was conducted to find the relationship between the retained Mn and selected properties of calcareous soils. Eleven surface (0-20 cm) soil samples with pH ranging from 7.7 to 8.1 and calcium carbonate equivalent (CCE) ranging from 20 to 50% were used in the Mn adsorption study. Two-gram subsamples of each soil were equilibrated with 20 mt of 0.01M CaCl2 solutions initially containing 10 to 200 mg Mn L-1. The Mn that disappeared from solution (after 6 h shaking at 25°C) was considered as adsorbed (retained) Mn. The adsorption data showed a highly significant fit to Freundlich and also to the two-surface Langmuir adsorption isotherms. The coefficients of both isotherms showed significant positive correlations with cation exchange capacity (CEC), organic matter (OM), and CCE of the soils indicating that OM and calcium carbonate are the sites of Mn retention in calcareous soils. Comparison of the adsorption data of this experiment with those of plant Mn uptake of the same soils (published earlier) shows that as the Langmuir second surface adsorption maxima (maximum retention capacity) of the soils increase the plant Mn concentration and uptake decrease.

Keywords: Adsorption, Calcium Carbonate Equivalent, Cation Exchange Capacity, Chemical-Properties, Equation, Freundlich, Organic Matter, Two-Surface Langmuir, Zinc

? Shuman, L.M. (1998), Effect of organic waste amendments on cadmium and lead in soil fractions of two soils. *Communications in Soil Science and Plant Analysis*, **29** (19-20), 2939-2952.

Full Text: [1998\Com Soi Sci Pla Ana29, 2939.pdf](1998/Com%20Soi%20Sci%20Pla%20Ana29,%202939.pdf)

Abstract: Certain organic soil amendments have been found to ameliorate metal toxicity to plants. A study was undertaken to determine the effects of organic amendments on cadmium (Cd) and lead (Pb) distribution among soil fractions. Two soils (fine-textured and coarse-textured) were amended with five organic waste materials or commercial humic acid (HA) with and without 5 mg Cd kg(-1) or 300 mg Pb kg(-1), incubated, and fractionated using a sequential extraction technique. The added Cd and Pb were found mainly in the organic matter (OM) fraction, although significant amounts were in the exchangeable (EXC) fraction for the sandy Norfolk soil. Spent mushroom compost (SMC) and HA lowered Cd in the EXC fraction for both soils and raised Cd in the OM fraction for the sandy Norfolk soil. The SMC and HA lowered Pb in the EXC and OM fractions and raised Pb in the manganese oxide (MnO), amorphous Fe oxide (AFeO) and the crystalline Fe oxide (CFeO) fractions. Poultry-litter amendment caused higher Cd and Pb in the EXC fraction for the sandy soil. It was concluded from these studies that certain organic amendments like the SMC will lower Cd and Pb availability by redistribution the metals from the EXC and/or the OM fraction to less available fractions. Other amendments have little affect on Cd and Pb distribution, or for sandy soils, poultry litter can cause higher Cd and Pb in the more available fraction presumably due to the formation of soluble organic complexes.

Keywords: Poultry Litter Extract, Metal Movement, Sewage-Sludge, Zinc, Mobility, pH, Zn, Cd, Pb, Adsorption

? Kithome, M., Paul, J.W. and Kannangara, T. (1999), Adsorption isotherms of ammonium on coir. *Communications in Soil Science and Plant Analysis*, **30** (1-2), 83-95.

Full Text: [1999\Com Soi Sci Pla Ana30, 83.pdf](1999/Com%20Soi%20Sci%20Pla%20Ana30,%2083.pdf)

Abstract: Coir (coconut mesocarp pith) is the fibrous material that constitutes the thick mesocarp (middle layer) of the coconut fruit (Cocos nucifera L.). It has ion-exchange and gas adsorption properties that can be utilized to adsorb the important plant nutrient N in its NH4+ and, or NH3 form, protecting it from losses such as during composting of N-rich wastes. The NH4+ adsorption process and the pH buffering capacity of the coir were studied to quantify its effectiveness as an NH4+ adsorbent. The one- and two-surface Langmuir, van Bemmelen-Freundlich, Temkin, and first-order models were fitted to the NH4+ sorption data at an equilibrium pH range of 4.6 to 5.1. Each model was found to describe the NH4+ sorption data with comparable success (r2 greater than or equal to 0.88), with the Langmuir and Temkin being superior (r2 greater than or equal to 0.99). Although the equilibrium pH did not change much after adding buffers of pH 4 to 7 to the coir, there was a consistent increase in the amounts of NH4+-N sorbed with increasing pH, as estimated using the two-surface Langmuir model. The estimated amounts of NH4+-N sorbed were 516 mmol kg-1 at pH 4.6, 521 mmol kg-1 at pH 4.63, 571 mmol kg-1 at pH 4.88, and 573 mmol kg-1 at pH 5.1. The coir showed a good buffering ability at pH range 3.7 to 10.4. The coir buffer strength, defined as the amount of OH- required to increase pH by one unit, was 11.3 cmol kg-1 for the pH range 3.7 to 8.4, and 22.1 cmol kg-1 for the pH range 8.4 to 10.4. The high CEC, surface area, and buffer strength of the coir indicated its high ability to retain cations and buffer against pH change.

Keywords: Commonly Used Isotherms, Exchange, Greece, Peat, Phosphate Sorption, Soils, Temkin, Two-Surface Langmuir

Schalscha, E.B., Escudero, P., Salgado, P. and Ahumada, I. (1999), Chemical forms and sorption of copper and zinc in soils of central Chile. *Communications in Soil Science and Plant Analysis*, **30** (3-4), 497-507.

Full Text: [1999\Com Soi Sci Pla Ana30, 497.pdf](1999/Com%20Soi%20Sci%20Pla%20Ana30,%20497.pdf)

Abstract: Soil samples from a field irrigated with untreated industrial and municipal wastewater for several decades and from a field not receiving wastewater (control) were analyzed for total copper (Cu) and zinc (Zn) and for the amount of these elements removed in sequential extractions with MgCl2, NaOAc, NH2OH. HCl, 6H2O2-HNO3-NH4OAc, and HNO3-HF-HCl. Organically-bound Cu forms predominated in the wastewater-affected soil while in the control soil both residual and organic forms yielded the same proportion of Cu. Distribution of Zn was different in the diverse fractions, and in the polluted soil the reducible and the residual forms predominated while in the control soil the residual form accounted for the highest proportion of recovered Zn. Sequential extraction of Cu from a copper sulfate-treated soil incubated for 32 days at constant temperature resulted in the same proportional distribution of Cu forms in the polluted soil. In the control soil the oxidizable form decreased and the residual one increased noticeably. The two-surface Langmuir adsorption model was used to adjust data and to interpret Cu and Zn adsorption by soils excepting Cu sorption by the polluted soil, where the one-surface model was applied.

Keywords: Adsorption, Cadmium, Fractionation, Heavy-Metals, Nickel, Sediments, Speciation, Trace-Metals, Two-Surface Langmuir

? Kithome, M., Paul, J.W., Lavkulich, L.M. and Bomke, A.A. (1999), Effect of pH on ammonium adsorption by natural zeolite clinoptilolite. *Communications in Soil Science and Plant Analysis*, **30** (9-10), 1417-1430.

Full Text: [1999\Com Soi Sci Pla Ana30, 1417.pdf](1999/Com%20Soi%20Sci%20Pla%20Ana30,%201417.pdf)

Abstract: Clinoptilolite, a zeolite mineral with a high cation exchange capacity and surface area, has ion-exchange properties that can be utilized to adsorb NH4+, protecting it from losses during composting of N-rich animal manures. Ammonium adsorption by the natural zeolite clinoptilolite was studied to ascertain the effectiveness of the zeolite as an NH4+ adsorbent at pH 4, 5, 6, and 7. The NH4+ adsorption data were fitted to the one- and two-surface Langmuir, Freundlich, and Temkin isotherms. All models described the NH4+ adsorption data successfully (r2 greater than or equal to 0.939). The one-surface Langmuir, Freundlich, and Temkin were converted to pH-dependent forms. The amount of NH4+ adsorbed increased as pH and initial NH4+ concentration increased. From the one-surface Langmuir isotherm, the NH4+ adsorption capacity (X-m) of the zeolite increased linearly with pH (r2 = 0.994), and was estimated to be 9,660 mg N kg-1 at pH 4, 11,220 mg N kg-1 at pH 5, 12,720 mg N kg-1 at pH 6, and 13,830 mg N kg-1 at pH 7. The adsorption of higher amounts of NH4+ with increasing pH and initial NH4+ concentration is an important characteristic of the zeolite that can be beneficial to minimizing N-losses via NH3 volatilization during composting of N-rich animal manures.

Keywords: Cation Exchange Capacity, Equation, Freundlich, Phosphate Adsorption, Soils, Sorption, Temkin, Two-Surface Langmuir

Shen, S.Y., Taylor, R.W., Bart, H. and Tu, S.I. (1999), Equilibrium and spectroscopic studies of lead retention in smectite. *Communications in Soil Science and Plant Analysis*, **30** (19-20), 2711-2730.

Full Text: [1999\Com Soi Sci Pla Ana30, 2711.pdf](1999/Com%20Soi%20Sci%20Pla%20Ana30,%202711.pdf)

Abstract: Heavy metal pollution of soils and water is a serious environmental problem. Sorption onto solid surfaces from aqueous solutions is an important process influencing transport and accumulation of heavy metals in the environment. Lead (Pb) sorption in smectite SWy-2 was investigated by equilibrium sorption studies, coupled with spectroscopic methods. The isotherm and pH-edge of lead sorption in the smectite were measured in batch experiments. The sorption isotherms under uncontrolled pH were best-fitted with the Langmuir equation, while those with a fixed pH 5.5 were best-fitted with the Freundlich equation. The pH-edge of lead sorption shifted to a higher pH as the Pb concentration increased. The ionic strength only affected Pb sorption in the low pH range. The effects of associated nitrate and perchlorate anions were significant only for the Pb sorption at high Pb concentration (>2 mM). FTIR and XRD spectroscopies were performed with oriented clay samples. In the infrared spectra, a peak with a maximum near 1398 cm-1 and a shoulder centered near 1470 cm-1 was significant for the samples treated with >1 mM Pb at pH >5.6. This peak may be composed of several IR bands, including an OH bending band from Pb hydroxides and CO32-stretching bands from Pb carbonates. The basal spacing of Pb-treated smectites increased with increasing Pb content in the clay and correlated well with the intensity of OH bending band (around 1621 cm-1) of adsorbed water. The increase of basal spacing at low pH (pH <3.3) was poorly correlated with the intensity of water OH bending band. The comprehensive studies provided many evidences for revealing the structure of various lead complexes on clay surfaces.

Keywords: Metal-Ions, Adsorption, Montmorillonite, Complexation

Choudhury, A.T.M.A. and Khanif, Y.M. (2000), Copper adsorption behavior of three Malaysian rice soils. *Communications in Soil Science and Plant Analysis*, **31** (5-6), 567-579.

Full Text: [2000\Com Soi Sci Pla Ana31, 567.pdf](2000/Com%20Soi%20Sci%20Pla%20Ana31,%20567.pdf)

Abstract: Copper (Cu) deficiency exists in different rice growing areas of Malaysia. A study on Cu adsorption was carried out in three Malaysian rice soils (Idris, Tebengau, and Kangar series) using six levels of Cu (0, 100, 200, 300, 400, and 500 µg g-1). The data on Cu adsorption were fitted into Langmuir, Freundlich, and Temkin equations. Adsorption data were also correlated with pH, cation exchange capacity, and organic matter content of the soils. The effect of Cu addition on redox potential (Eh) of the soils was also measured. The Eh values were correlated with equilibrium solution Cu concentrations. Copper adsorption increased gradually with increasing level of added Cu in all the soils. The rate of increase was the highest in Kangar series followed by Tebengau and Idris, respectively. Correlation between Cu adsorption and pH was significant (r = 0.772) whereas correlation of adsorption with either organic matter content or cation exchange capacity was nonsignificant. Copper adsorption in two soils (Idris and Tebengau) fitted Langmuir, Freundlich, and Temkin equations whereas Cu adsorption in the Kangar soil fitted Freundlich and Temkin equations. Redox potential (Eh) of the soils increased gradually with increasing level of added Cu. The rate of increase was the highest in Idris followed by Kangar and Tebengau soils, respectively. The relationship between equilibrium solution Cu concentration and redox potential was significant. The results of this study indicated that copper adsorption is mainly dependent on soil pH. In soils with higher adsorption capacity, more Cu fertilizer may be needed to get immediate crop response.

Keywords: Zinc, Sorption

? Fontes, M.P.F., de Matos, A.T., da Costa, L.M. and Neves, J.C.L. (2000), Competitive adsorption of zinc, cadmium, copper, and lead in three highly-weathered Brazilian soils. *Communications in Soil Science and Plant Analysis*, **31** (17-18), 2939-2958.

Full Text: [2000\Com Soi Sci Pla Ana31, 2939.pdf](2000/Com%20Soi%20Sci%20Pla%20Ana31,%202939.pdf)

Abstract: Equilibrium adsorption experiments on zinc (Zn), cadmium (Cd), copper (Cu), and lead (Pb) were conducted in three horizons of two Ultisols and one Oxisol with and without liming, from Vicosa-MG (Brazil). Equilibrium solutions were applied as a “cocktail” containing 700 mg L-1 of Zn, 20 mg L-1 of Cd, 200 mg L-1 of Cu, and 300 mg L-1 of Pb and its dilutions of 1: 5 and 1: 20. After shaking, the mixture was centrifuged, the supernatant collected and the pH and the concentrations of metals in the mixture were determined. Soil order, soil horizon, and liming had significant effects on the metal adsorption. Some important changes in the adsorption characteristics of the metals, especially in Zn and Cd, were observed due to competition between the different cations present in the solution. Also, desorption of Zn and Cd was observed with an increasing concentration of the solution. The adsorption data for Zn and Cd did not fit the linear, Langmuir, Freundlich, and Temkin isotherm. equations for most situations, as these equations do not consider the possibility of a decrease in the amount of metal adsorbed with increasing metal competition for the adsorption sites. Due to the competition with other metals, the equations, which offered the best fit for Zn and Cd, were quadratic polynomial models. On the other hand, for Cu and ph, the equations, which showed the best fit were linear, Langmuir, and Temkin, for different situations. The reasons for this behavior were related to the strong competitive forces for the adsorption sites presented by these two metals.

Keywords: Solute Transport, United-States, Heavy-Metals, Models, Retention, Sorption, pH

de Kreij, C. and Van Leeuwen, G.J.L. (2001), Growth of pot plants in treated coir dust as compared to peat. *Communications in Soil Science and Plant Analysis*, **32** (13-14), 2255-2265.

Full Text: [C\Com Soi Sci Pla Ana32, 2255.pdf](C/Com%20Soi%20Sci%20Pla%20Ana32,%202255.pdf)

Abstract: Coir dust has been introduction in Dutch horticulture, however, in some crops problems have arisen. Growth was restricted. Substrate and plant analysis revealed deficiencies of both calcium (Ca) and magnesium (Mg). This was linked to the high potassium (K) and sodium (Na) content and the adsorption of Ca and Mg to the coir. It was proposed that in coir, where the Na and K contents are low and no adsorption occurred of Ca and Mg, growth of plants should be better than or equal to peat, the standard substrate. To prove this a trial has been conducted with four types of pot plants. Coir was washed with a Ca and Mg containing solution to leach excess K and Na and this material is referred to as ‘treated’ coir dust. Growth of Begonia, Dendranthema, and Schefflera in ‘treated’ coir dust was equal to that in peat. Kalanchoe showed a stronger vegetative growth in coir dust than in peat. Growers should avoid the risk of Ca and, or Mg deficiency and use the ‘treated’ coir dust.

Keywords: Adsorption, Media

Han, F.X. and Banin, A. (2001), Fractional loading isotherm of heavy metals in an arid-zone soil. *Communications in Soil Science and Plant Analysis*, **32** (17-18), 2691-2708.

Full Text: [C\Com Soi Sci Pla Ana32, 2691.pdf](C/Com%20Soi%20Sci%20Pla%20Ana32,%202691.pdf)

Abstract: Environmental problems associated with heavy metals in agricultural soils are increasing as a result of reuse of reclaimed sewage water for irrigation, disposal of wastewater sludge and municipal refusal, application of animal waste and atmospheric fallout. The fractional loading isotherm, proposed here, depicts relationships of heavy metals between the total input and individual solid-phase fractions in contaminated soils by combining isotherm and selective sequential dissolution techniques. The redistribution and transformations of copper (Cu), chromium (Cr), nickel (Ni), and zinc (Zn) in an arid-zone soil were demonstrated through the fractional loading isotherm. The results showed that linear adsorption model better described fractional adsorption data than Freundlich model, and these metals retained in all solid-phase fractions were characterized by linear partitioning behavior under the loading levels used in the present experiments. Fractional loading isotherms not only effectively depicted the transformation direction and pathways, but also reflected effects of the nature of the metals and time period. Compared to the traditional isotherm, fractional loading isotherm is more informative in exploring the adsorption and binding mechanisms, mobility and (bio)availability of metals in the solid-phase components of contaminated soils.

Keywords: Long-Term Transformations, Sludge-Treated Soils, Sewage-Sludge, Trace-Metals, Sequential Extraction, Manganese-Oxide, Zinc, Cadmium, Sorption, Redistribution

Maftoun, M., Karimian, N. and Moshiri, F. (2002), Sorption characteristics of copper(II) in selected calcareous soils of Iran in relation to soil properties. *Communications in Soil Science and Plant Analysis*, **33** (13-14), 2279-2289.

Full Text: [C\Com Soi Sci Pla Ana33, 2279.pdf](C/Com%20Soi%20Sci%20Pla%20Ana33,%202279.pdf)

Abstract: The Langmuir, Freundlich, and Temkin isotherms were fitted to copper (Cu) adsorption data of 20 highly calcareous soils of Fars Province, ranging widely in relevant physical and chemical characteristics. One-gram samples of each soil were equilibrated for 24h with 30mL of 0.01M CaCl2 containing 50 to 500 mg Cu L-1. The amount of Cu retained by soil solids was calculated based on the difference between the initial and equilibrium Cu concentrations. The Cu adsorption data showed a highly significant fit to the Freundlich, Temkin, and linear form of Langmuir adsorption isotherms. The fit to Langmuir and Temkin equations were, however, closer than that of Freundlich. Adsorption maxima (b) calculated from Langmuir isotherm was positively correlated with clay, cation exchange capacity (CEC), and calcium carbonate equivalent (CCE), whereas, Langmuir bonding energy coefficient (K) was related only to clay. Organic matter (OM), clay, and CEC were found to have a significant relationship with Freundlich coefficients (n and k). Temkin coefficients (k1 and k2) were positively correlated to CEC and clay. The distribution coefficient (i.e., maximum buffering capacity) was also highly significantly correlated with CEC and clay. It is concluded that the sites of Cu retention in the calcareous soils are clay, OM, and calcium carbonate.

Keywords: Adsorption Characteristics, Zinc Adsorption, Cadmium, ACID

? Maftoun, M., Rassooli, F., Nejad, Z.A. and Karimian, N. (2004), Cadmium sorption behavior in some highly calcareous soils of Iran. *Communications in Soil Science and Plant Analysis*, **35** (9-10), 1271-1282.

Full Text: [2004\Com Soi Sci Pla Ana35, 1271.pdf](2004/Com%20Soi%20Sci%20Pla%20Ana35,%201271.pdf)

Abstract: Cadmium (Cd) sorption by selected calcareous soils with a wide range of soil physical and chemical properties was investigated. Two-gram samples of each soil were equilibrated for 24h with 40mL 0.01 M CaCl2 containing 5 to 500 mg Cd L-1. The Cd sorption data well fits to Freundlich, two-surface Langmuir and Temkin adsorption isotherms. However, the fit to Langmuir adsorption model was closer than that of Freundlich or Temkin. The Freundlich coefficient (k) was significantly correlated with cation exchange capacity (CEC), calcium carbonate equivalent (CCE), and clay content (Clay). The slope in the first surface was greater than that of the second surface, indicating a higher rate of Cd sorption at low Cd equilibrium concentrations and a proportionally smaller increase in Cd retention at higher initial Cd solution concentrations. Stepwise regression analysis indicated that 67% of the variation in the adsorption maxima of the second Surface (b(2),) was due to the combined effect of CEC and CCE. Temkin adsorption coefficients, namely k(1) was significantly related to CEC and h(2) was positively correlated with CEC. CCE, and clay content.

Keywords: Acid, Calcium Carbonate Equivalent, Cation Exchange Capacity, Clay, Copper, Freundlich, Lead, Metals, Organic Matter, pH, Phosphate Adsorption, Retention, Temkin, Two-Surface Langmuir, Zinc

Pardo, M.T. (2004), Cadmium sorption-desorption by soils in the absence and presence of phosphate. *Communications in Soil Science and Plant Analysis*, **35** (11-12), 1553-1568.

Full Text: [C\Com Soi Sci Pla Ana35, 1553.pdf](C/Com%20Soi%20Sci%20Pla%20Ana35,%201553.pdf)

Abstract: Batch experiments were carried out to determine the effect of phosphate anion (P) on the sorption-desorption of cadmium (Cd). The soils selected for the study were two kaolinitic Alfisols and two Andisols, which differ in their variable charge components. At the natural soil pH, Cd sorption in the absence of P was related to the net negative surface charge of the soils. Sorption of P increased the negative charge of the soils but the increase per unit amount of P added decreased with increasing P sorption. Both pH and soil characteristics influence the effect of P on Cd reactions. In the Alfisols, P and Cd were sorbed in similar amounts and the effect of increasing P rates on Cd sorption-desorption reactions was negligible. In the allophanic Andisols, whose capacity to bind P exceeds several times their capacity to retain Cd, the sorption of Cd was clearly enhanced with increasing P rates. In these soils, two distinct effects of P addition on Cd retention were observed. The first one arose from variations in the soil-suspension pH and the concomitant changes in soil surface charge. The second effect was directly related to the amount of sorbed P. Most of the Cd sorbed in the four soils was strongly bonded. In the Andisols, increasing P sorption on the surfaces restricted Cd desorption.

Keywords: Andisols, Alfisols, Heavy Metals, Surface Charge, Ionic-Strength, New-Zealand, Adsorption, pH, Zinc, Goethite, Surface, Plants, Charge, Cd

? Covelo, E.F., Couce, M.L.A. and Vega, F.A. (2004), Competitive adsorption and desorption of cadmium, chromium, copper, nickel, lead, and zinc by humic umbrisols. *Communications in Soil Science and Plant Analysis*, **35** (19-20), 2709-2729.

Full Text: [2004\Com Soi Sci Pla Ana35, 2709.pdf](2004/Com%20Soi%20Sci%20Pla%20Ana35,%202709.pdf)

Abstract: The objective of this study was the evaluation of the selectivity sequences of adsorption and retention of cadmium (Cd), chromium (Cr), copper (Cu), nickel (Ni), lead (Pb), and zinc (Zn) in four Humic Umbrisols from the province of Pontevedra, Spain. The characteristics of the surface horizons of the soils showed significant differences in the components and properties that influence adsorption capacity and mobility of metals and, therefore, their retention by the soils. The most adsorbent and retentive soil after desorption has the highest content of manganese (Mn), iron (Fe), and aluminum (M) oxides. The least adsorbent has the lowest content of oxides and organic matter. The metal adsorbed in greater amount by the soils was Pb, followed by Cu and Cr, which competed favorably for adsorption sites with Cd, Ni, and Zn. After desorption, Cr is the most retained metal. The greater retention of Cr seems to indicate that the relation charge-to-radius is the most influential factor in the retention of this element. In general, the properties and components of the soils have more influence on the adsorption and retention of the metals than the properties of the metallic ions.

Keywords: Soil, Cadmium, Chromium, Copper, Nickel, Lead, Zinc, Distribution Coefficients, Selectivity Sequence, Manganese, Aluminum, Heavy-Metals, Distribution Coefficients, Soils, Zn, Cd, Sorption, Oxide, Pb, Ni, Co

? Arora, S. and Chahal, D.S. (2007), Comparison of kinetic models for boron adsorption in alluvium-derived soils of Punjab, India. *Communications in Soil Science and Plant Analysis*, **38** (3-4), 523-532.

Full Text: [2007\Com Soi Sci Pla Ana38, 523.pdf](2007/Com%20Soi%20Sci%20Pla%20Ana38,%20523.pdf)

Abstract: The understanding of the boron (B) adsorption mechanism on soil materials is vital because plants respond primarily to the B activity in soil solution. Batch studies were conducted to investigate the adsorption behavior of B in 21 surface soils representing major soil series of Punjab. The soils varied widely in their properties. Six mathematical models (viz., zero order, first order, second order, Elovich, power function, and parabolic diffusion) were used to describe B adsorption. The B adsorption pattern was characterized by an initial fast reaction followed by a slow process, and it was complete in 24 h of equilibrium. The B equilibrium concentration was negatively correlated with clay content (r = -0.911\*\*), organic carbon (OC) (-0.541\*), and cation exchange capacity (CEC) (- 0.540\*) and positively with sand content (r = 0.706\*\*). The Elovich equation was best to describe the rate of B adsorption followed by the power function.

Keywords: Activity, Adsorption, Adsorption Mechanism, Behavior, Boron, Capacity, Carbon, Cation Exchange Capacity, Clay, Concentration, Desorption, Diffusion, Elovich Equation, Elovich Model, Equation, Equilibrium, India, Kinetic, Kinetic Models, Kinetics, Materials, Mathematical Models, Mechanism, Models, OC, Organic, Organic Carbon, Phosphate, Plants, Power Function, Properties, Punjab, Punjab Soils, Reaction, Sand, Soil, Soils, Sorption, Surface, Surface Soils

? John, K.S., Venugopal, V.K. and Saraswathi, P. (2007), Yield maximization in cassava through a systematic approach in fertilizer use. *Communications in Soil Science and Plant Analysis*, **38** (5-6), 779-794.

Full Text: [2007\Com Soi Sci Pla Ana38, 779.pdf](2007/Com%20Soi%20Sci%20Pla%20Ana38,%20779.pdf)

Abstract: Maximum yield research (MYR) and maximum economic yield systems (MEY) are important under the present situation of increased demographic changes, which have reduced the per capita availability of both land and food. Among root and tuber crops, cassava is found in a variety of production systems and performs well under various levels of management from low-input to high-input systems. A systematic approach in fertilizer use involves the determination and elimination of soil nutrient constraints for balanced supply of all potentially deficient essential nutrients for sustainable high yield. In the systematic approach of determining optimal fertilizer for cassava (Manihot esculenta Crantz) in a Typic Kandiustult soil of Kerala, India, studies on critical levels of nutrients, original nutritional status of the soil, its sorption capacity, and greenhouse/screenhouse nutrient survey were carried out. The critical levels of phosphorus (P) and potassium (K) were determined as 8.23 and 43.5 mu g g(-1) respectively. The preliminary analysis of the soil of the experimental site revealed the overall fertility status as very poor. The sorption studies conducted for P, K, copper (Cu), zinc (Zn), manganese (Mn), sulfur (S), and boron (B) indicated P, K, S, and B were limiting in this particular soil. The quantities of these nutrients needed to optimize the soil nutrient status were determined from the preliminary soil analysis, critical levels of nutrients, and sorption curves and found to be 136 mu g mL(-1) P, 0.338 meq 100 mL(-1) K, 20 mu g mL(-1) S, and 6.025 mu g mL(-1) B, respectively. From the greenhouse nutrient survey, N, P, K, and calcium (Ca) were seen as limiting nutrients for this soil; therefore the optimum treatment for cassava was fixed as N-P-K at 100:300:300 kg ha(-1), respectively. Field experiments were conducted for two seasons with different levels of the optimum treatment using a short duration (6-7 months) cassava variety, Sree Vijaya. The optimum treatment gave a yield of 43.41 t ha(-1), whereas the yield under the existing practice recommendations was 20-25 t ha(-1). Economic analysis showed this optimum treatment as the best in terms of highest gross return (Rs 1,31,125/-), net return (Rs 83,150/-), added return (Rs 70,178/-), added profit (Rs 56,142/-), and benefit cost ratio (BCR) (2.73).

Keywords: Analysis, Calcium, Capacity, Copper, Critical Levels, Cu, Economic Analysis, Experimental, Fertilizer Optimization, Field, Field Experimentation, Greenhouse, Screenhouse Nutrient Survey, India, Management, Manihot-Esculenta, Nutrients, Phosphorus, Potassium, Practice, Preliminary Soil Analysis, Ratio, Recommendations, Research, Soil, Sorption, Sulfur, Survey, Systematic, T, Treatment, Zinc

# Title: Community Dental Health

Full Journal Title: Community Dental Health

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Subject Categories:

Dentistry, Oral Surgery & Medicine: Impact Factor 0.805, / (2001)

Public, Environmental & Occupational Health: Impact Factor 0.805, / (2001)

? Loh, T. (1996), Thirty-eight years of water fluoridation: The Singapore scenario. *Community Dental Health*, **13** (2), 47-50.

Abstract: The high caries rate in Singapore school children was of great concern to dental administrators. Remedial measures alone were not the solution. The success of water fluoridation in Grand Rapids, USA and in Brantford, Canada in reducing dental caries in children in the early 1950s prompted Singapore to introduce fluoride into its drinking water. Singapore is the first country in Asia to institute a comprehensive fluoridation programme which covers 100 per cent of the population. The water was fluoridated at 0.7 ppm fluoride using sodium silicofluoride. The ten year study on the effects of water fluoridation in Singapore showed a decrease in caries prevalence in the children. In the permanent dentition the reduction was 52.3 per cent for Chinese and 31 per cent for Malays in the 7 to 9 year old age group. A similar trend was observed in the mixed dentition in which the decrease was 32.5 per cent for Chinese and 30.6 per cent for Malays. Because of the availability and use of other fluoride products, dental fluorosis was observed in children in later years. Although the decline in dental caries after 10 years of water fluoridation was not comparable to those achieved in other countries, this study further documents water fluoridation as the most cost-effective public health measure for the prevention of dental caries.

? Hillier, S., Inskip, H., Coggon, D. and Cooper, C. (1996), Water fluoridation and osteoporotic fracture. *Community Dental Health*, **13** (2), 63-68.

Abstract: Osteoporotic fractures constitute a major public health problem. These fractures typically occur at the hip, spine and distal forearm. Their pathogenesis is heterogeneous, with contributions from both bone strength and trauma. Water fluoridation has been widely proposed for its dental health benefits, but concerns have been raised about the balance of skeletal risks and benefits of this measure. Fluoride has potent effects on bone cell function, bone structure and bone strength. These effects are mediated by the incorporation of fluoride ions in bone crystals to form fluoroapatite, and through an increase in osteoblast activity. It is believed that a minimum serum fluoride level of 100 ng/ml must be achieved before osteoblasts will be stimulated. Serum levels associated with drinking water fluoridated to 1 ppm are usually several times lower than this value, but may reach this threshold at concentrations of 4 ppm in the drinking water. Animal studies suggest no effect of low-level (0-3 ppm) fluoride intake on bone strength, but a possible decrease at higher levels. Sodium fluoride has been used to treat established osteoporosis for nearly 30 years. Recent trials of this agent, prescribed at high doses, have suggested that despite a marked increase in bone mineral density, there is no concomitant reduction in vertebral fracture incidence. Furthermore, the increase in bone density at the lumbar spine may be achieved at the expense of bone mineral in the peripheral cortical skeleton. As a consequence, high dose sodium fluoride (80 mg daily) is not currently used to treat osteoporosis. At lower doses, recent trials have suggested a beneficial effect on both bone density and fracture. The majority of epidemiological evidence regarding the effect of fluoridated drinking water on hip fracture incidence is based on ecological comparisons. Although one Finnish study suggested that hip fracture rates in a town with fluoridated water were lower than those in a matching town without fluoride, a later study failed to show differences. Ecological studies from the United States and Great Britain have, if anything, revealed a weak positive association between water fluoride concentration and hip fracture incidence. Two studies examining hip fracture rates before and after fluoridation yielded discordant results, and are complicated by underlying time trends in hip fracture incidence. Only two studies have attempted to examine the relation between water fluoride concentration and fracture risk at an individual level. In one of these, women in a high fluoride community had double the fracture risk of women in a low fluoride community. In the other, there was no relationship between years of fluoride exposure and incidence of spine or non-spine fractures. In conclusion, the epidemiological evidence relating water fluoridation to hip fracture is based upon ecological comparisons and is inconclusive. However, several studies suggest the possibility of a weak adverse effect, which warrants further exploration. Data on the relationship between fluoride intake and hip fracture risk at the individual level, and data relating fluoridation to bone mineral density are required. Until these become available, the burden of evidence suggesting that fluoridation might be a risk factor for hip fracture is weak and not sufficient to retard the progress of the water fluoridation programme.

# Title: Community Dent Oral Epidemiol

Full Journal Title: Community Dentistry and Oral Epidemiology

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Subject Categories:

Dentistry, Oral Surgery & Medicine: Impact Factor, 1.196,

Public, Environmental & Occupational Health: Impact Factor, 1.196, 44/85

? Walvekar, S.V. and Qureshi, B.A. (1982), Endemic fluorosis and partial defluoridation of water supplies: A public health concern in Kenya. *Community Dentistry and Oral Epidemiology*, **10** (3), 156-160.

Full Text: [1982\Com Den Ora Epi10, 156.pdf](1982/Com%20Den%20Ora%20Epi10,%20156.pdf)

Abstract: Endemic fluorosis is a public health problem in many parts of Kenya due to high fluoride content in the drinking water. The Kenyan Government is committed to development of water sources with the object of supplying safe and sufficient water to the entire population by the year 2000. This water will contain high amounts of fluoride thereby increasing the incidence of severe endemic fluorosis in Kenya. Development of procedures for partial defluoridation should therefore be considered. Various defluoridation methods adopted in different places affected with endemic fluorosis are reviewed in the present article, with special reference to problems of operation and limitations in their application.

? Griffin, S.O., Gooch, B.F., Lockwood, S.A. and Tomar, S.L. (2001), Quantifying the diffused benefit from water fluoridation in the United States. *Community Dentistry and Oral Epidemiology*, **29** (2), 120-129.

Full Text: [2001\Com Den Ora Epi29, 120.pdf](2001/Com%20Den%20Ora%20Epi29,%20120.pdf)

Abstract: Objective: To estimate the total contribution of water fluoridation to caries reduction by including the benefit from the diffusion of: fluoride from fluoridated communities to surrounding nonfluoridated communities via the export of bottled beverages and processed foods. Methods: We analyzed data from the 1986-87 MDR Children’s Survey for 18 507 school children aged 6-17 years who had at least one permanent tooth and for whom a complete fluoride exposure history could be created. To measure water fluoridation exposure, we generated continuous and categorical exposure variables. Years of fluoridation exposure (YFE-continuous) measured the number of years the child lived at residences receiving fluoridated water. Lifetime fluoridation exposure (LFE-categorical) was high if the child lived at residences receiving fluoridated water more than 50% of his life and low, otherwise. We summed the proportion of state population receiving fluoridated water times the number of years the child had Lived in each state and then divided this value by the child’s age to measure diffusion exposure (DE). We grouped DE into three levels: low (DE<=0.25), medium (0.25<DE<0.55), and high (DE>=0.55). For each level of DE, we compared the age-adjusted mean DMFS for high and low LFE. In addition we used linear regression to measure the association between DMFS and YFE while controlling for DE, age, exposures to other fluoride sources, and sociodemographic variables. Reported results are significant at P<0.05. Results: Comparison of mean DMFS scores found that the direct benefit of water fluoridation (DMFSLFE=low DMFSLFE=high) was 1.44 surfaces among low DE children and 0 among high DE children. The diffused benefit (DMFSLFE=low, (DE=low) - DMFSLFE=low, (DE=high)) was 1.23 surfaces. The regression results were similar and indicated that the direct benefit would be 1.44 fewer DMFS for low DE children and the indirect benefit would be 1.09 fewer DMFS for high DE children. Conclusion: Failure to account for the diffusion effect may result in an underestimation of the total benefit of water fluoridation, especially in high diffusion exposure regions.

Keywords: Caries, Dmfs, Diffusion Effect, Halo Effect, Water Fluoridation, Dental Fluorosis, Caries

# Title: Communicable Disease and Public Health

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Language:

Publisher:

Publisher Address:

Subject Categories:

Impact Factor

? Shickle, D., Nolan Farrell, M.Z. and Evans, M.R. (1998), Travel brochures need to carry better health advice. *Communicable Disease and Public Health*, **1** (1), 41-43.

Full Text: [1998\Com Dis Pub Hea1, 41.pdf](1998/Com%20Dis%20Pub%20Hea1,%2041.pdf)

Abstract: Most people travelling abroad on holiday from the United Kingdom consult a travel brochure and book with a travel agent. Travel brochures are therefore potentially an important source of travel health advice. We assessed the quantity and quality of health advice of 143 travel brochures for 1994/5 winter and (1995), summer seasons available from a high street travel agent. Only 11% carried health information in a prominent location, 64% put health information at the end (often in small print), and 25% contained no health information at all. Much advice was superficial, and only a minority mentioned safe drinking water (24%), safe food (22%), or safe sex (3%). Better health advice more prominently displayed is needed in travel brochures. Public health practitioners should collaborate with travel companies and travel agents to improve the quality and quantity of health information provided to travellers.

? Willocks, L., Crampin, A., Milne, L., Seng, C., Susman, M., Gair, R., Moulsdale, M., Shafi, S., Wall, R., Wiggins, R. and Lightfoot, N. (1998), A large outbreak of cryptosporidiosis associated with a public water supply from a deep chalk borehole. Outbreak Investigation Team. *Communicable Disease and Public Health*, **1** (4), 239-243.

Full Text: [1998\Com Dis Pub Hea1, 239.pdf](1998/Com%20Dis%20Pub%20Hea1,%20239.pdf)

Abstract: Three hundred and forty-five confirmed cases were reported in a large waterborne outbreak of cryptosporidiosis in North Thames in the spring of 1997. The descriptive epidemiology, attack rates, a case control study, and the detection of oocysts in the water suggested strongly that the outbreak was associated with drinking unboiled tap water that originated from one deep chalk borehole. The 746,000 people living in the water distribution area were advised to boil their drinking water. Investigations did not reveal how oocysts entered the borehole. This is the first published report of a *Cryptosporidium* outbreak caused by filtered borehole water and we believe it to be the largest outbreak due to groundwater to have been reported. Borehole supplies are regarded as relatively pure sources of water and this outbreak has implications for the future monitoring and treatment of drinking water extracted from boreholes.

? Hunter, P.R. and Barrell, R.A. (1999), Microbiological quality of drinking water from office water dispensers. *Communicable Disease and Public Health*, **2** (1), 67-68.

Full Text: Com Dis Pub Hea2, 67.pdf

Abstract: A survey of the microbiological quality of water sampled from office dispensers in Merseyside found half of the samples to be either unsatisfactory (23/56) or unacceptable (5/56) in terms of guidelines from the Automatic Vending Association of Britain. Factors that appeared to be linked to unsatisfactory microbiological quality were time between filling and sampling and filling on site.

? Allen, K.W., Prempeh, H. and Osman, M.S. (1999), *Legionella* pneumonia from a novel industrial aerosol. *Communicable Disease and Public Health*, **2** (4), 294-296.

Full Text: [1999\Com Dis Pub Hea2, 294.pdf](1999/Com%20Dis%20Pub%20Hea2,%20294.pdf)

Abstract: After a worker from a plastics factory was diagnosed with *Legionella* pneumonia it was learnt that a retired employee at the factory had been in hospital with a serious chest infection six months before and *Legionella* pneumonia was diagnosed in retrospect from stored serum. The likeliest common source was a machine cooling system that took water from an uncovered water tank outdoors (from which *Legionella* *Pneumophila* was isolated) and which generated an aerosol through a crack in the flow meter sight, G.L., ass.

? Barrell, R.A., Hunter, P.R. and Nichols, G. (2000), Microbiological standards for water and their relationship to health risk. *Communicable Disease and Public Health*, **3** (1), 8-13.

Full Text: [2000\Com Dis Pub Hea3, 8.pdf](2000/Com%20Dis%20Pub%20Hea3,%208.pdf)

Abstract: Maintenance of the microbiological quality of water has been used as an important means of preventing waterborne disease throughout the twentieth century. The commonest microbiological tests done on water are for coliforms and *Escherichia coli* (or faecal coliform). This paper reviews the legislative and other guidance for microbial standards in drinking and bathing waters and considers evidence for the relationship between the microbiological quality of water and risk to human health. In the past measures of the microbiological quality of water correlated well with risks of acquiring gastrointestinal disease. More recent work suggests that gastrointestinal disease is more strongly associated with the presence of enterococci than of E. coli. New diseases such as cryptosporidiosis have been shown to cause outbreaks of waterborne disease when levels of conventional microbiological parameters are satisfactory. In response to this, and because of failure of prosecution in one outbreak, the United Kingdom (UK) Government has introduced new legislation that requires water providers to perform a risk assessment on their water treatment facilities and to implement continuous monitoring for *Cryptosporidium*. A new European directive on drinking water has been introduced and legislation on *Cryptosporidium* in drinking water has been proposed in the UK.

? Hunter, P.R. (2000), Advice on the response from public and environmental health to the detection of cryptosporidial oocysts in treated drinking water. PHLS Advisory Committee on Water and the Environment. *Communicable Disease and Public Health*, **3** (1), 24-27.

Full Text: [2000\Com Dis Pub Hea3, 24.pdf](2000/Com%20Dis%20Pub%20Hea3,%2024.pdf)

Abstract: New water quality regulations in the United Kingdom (UK) will lead to the regular sampling of water supplies for the presence of cryptosporidial oocysts. It is likely therefore that consultants in communicable disease control (CCDCs) and environmental health officers (EHOs) will be informed of the presence of oocysts in water supplies rather more often. These guidelines were developed, by an ad hoc working group of the PHLS Advisory Committee on Water and the Environment, to help CCDCs and EHOs respond to such reports. The implications for public health of oocysts in treated water supplies is still not fully understood. Nevertheless, on the basis of the available evidence, these guidelines suggest an approach to planning, to deciding what information is required on initial contact, and an approach to health risk assessment. The guidelines also suggest possible strategies for managing such situations. It is accepted, however, that the vast majority of reports of positive samples will require no intervention. It is essential that CCDCs and EHOs work well with their colleagues in the water companies in undertaking a health risk assessment and responding appropriately.

? O’Donnell, M., Platt, C. and Aston, R. (2000), Effect of a boil water notice on behaviour in the management of a water contamination incident. *Communicable Disease and Public Health*, **3** (1), 56-59.

Full Text: [2000\Com Dis Pub Hea3, 56.pdf](2000/Com%20Dis%20Pub%20Hea3,%2056.pdf)

Abstract: In late (1998), the water supply of 878 households was affected by possible sewage contamination. A notice was issued to advise residents of the need to boil their water. This provided an opportunity to assess to what extent the boil water notice led people to avoid activities that might put them at risk of waterborne infection. A postal questionnaire sent to 350 randomly selected households in the affected area asked about timing and mode of receipt of the notice, risk behaviour (boiling water, brushing teeth, washing dishes, drinks for pets, preparation of food), and subsequent changes in drinking water consumption habits. Eighty-one per cent of the households surveyed engaged in behaviour likely to increase the risk of waterborne infection. Comments were collected from consumers on how to improve the management of future water contamination incidents.

# Title: Comm Third Math-Phys Class Hung Acad Sci

(Comm. Third Math.-Phys. Class Hung. Acad. Sci.)

? Szabo, I. (1958), Adsorption of cations on humus preparations. [in Hungarian] *Comm. Third Math.-Phys. Class Hung. Acad. Sci.*, **8**, 393-402.

# Title: Comparative Biochemistry and Physiology C-Pharmacology Toxicology & Endocrinology

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Endocrinology & Metabolism: Impact Factor 1.241, / (1999); Impact Factor 1.249, / (2000)

Pharmacology & Pharmacy: Impact Factor 1.241, /181 (1999); Impact Factor 1.249, / (2000)

Toxicology Zoology: Impact Factor 1.241, / (1999); Impact Factor 1.249, / (2000)

? Rudolph, P.H. and Spaziani, E. (1991), Neurons demonstrable by nickel lysine backfilling of the optic peduncle in the crab cancer-antennarius. *Comparative Biochemistry and Physiology C-Pharmacology Toxicology & Endocrinology*, **99** (1-2), 179-184.

Full Text: Com Bio Phy C-Pha ToxEnd99, 179

Abstract: 1. Neuronal mapping studies were conducted in brain and eyestalks of the crab, Cancer antennarius, directed to finding the unit(s) that control neurosecretion of molt-inhibiting hormone (MIH). Control is known to be serotonergic.

2. Nine clusters of neuronal somata were identified in the brain by direct staining with Toluidine Blue. Eight clusters are bilaterally arranged and the ninth occurs in the protocerebrum.

3. Separately, nine groups of cell bodies on each side of the brain were demonstrable by nickel-lysine backfilling of an optic peduncle. In eight of the groups, most of a total of about 250 cells on each side have not previously been identified in decapod crustaceans.

4. Backfilling of an optic peduncle also localized two identifiable axon tracts that filled into the contralateral eyestalk through the brain. Both are associated with filled cells in the eyestalk medulla terminalis, and one projects branches into the m. interna. Neither showed anatomical connection with the neurosecretory X-organ, sinus gland complex.

5. Except for cells in the protocerebrum, none of the neural units that backfilled appear to correspond with cells previously shown to be serotonergic. Together, these observations indicate that serotonergic control of MIH secretion resides entirely within the ipsilateral eyestalk.

Keywords: Molt-Inhibiting Hormone, Eyestalk Ganglia, 5-Hydroxytryptamine, Release, System

? Zaporowska, H. and Wasilewski, W. (1991), Significance of reduced food and water-consumption in rats intoxicated with vanadium. *Comparative Biochemistry and Physiology C-Pharmacology Toxicology & Endocrinology*, **99** (3), 349-352.

Full Text: Com Bio Phy C-Pha ToxEnd99, 349

Abstract: 1. Male Wistar rats were given, for four weeks, a limited amount of food, or the amount of food and water equal to that consumed by rats drinking solely an aqeuous solution of ammonium metavanadate instead of water (AMV) of 0.3 mg V/cm3 concentration.

2. In rats with limited access to food but free access to water, a significant decrease of body weight increment was observed, together with an increase of the haemoglobin level and a decrease in the percentage of reticulocytes and polychromatophilic erythrocytes in the peripheral blood.

3. In the rats which did not receive food and water ad libitum a significant decrease of the body weight increment and an increase of the haemoglobin level were noted.

4. In animals drinking the aqueous AMV solution instead of water the body weight increment diminished significantly, and so did the erythrocyte count and haemoglobin level, whereas the percentage of reticulocytes and polychromatophilic erythrocytes increased in the peripheral blood.

Keywords: Long-Term Improvement, Glucose-Homeostasis, Vanadate Treatment, Diabetic Rats, Wistar Rats, Blood, Transferrin, Ferritin, Indexes

# Title: Comparative Biochemistry and Physiology C-Toxicology & Pharmacology

Full Journal Title: [Comparative Biochemistry and Physiology C-Toxicology & Pharmacology](http://www.sciencedirect.com/science/journal/15320456)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hermes-Lima, M., Alencastro, A.C.R., Santos, N.C.F., Navas, C.A. and Beleboni, R.O. (2007), The relevance and recognition of Latin American science. Introduction to the fourth issue of CBP-Latin America. *Comparative Biochemistry and Physiology C-Toxicology & Pharmacology*, **146**, 1-9.

Full Text: [2007\Com Bio Phy C-Tox Pha146, 1.pdf](2007/Com%20Bio%20Phy%20C-Tox%20Pha146,%201.pdf)

Abstract: Although the number of science and engineering (S&E) publications produced in Latin America grew exponentially over the past 15 years, the investment in science and the number of full time researchers did not grow at a comparable rate. Moreover, Latin American science is handicapped by constrained resources and access to information, higher costs of research, English-language barriers and brain-drain. One possible explanation for the observed rise in paper numbers, therefore, is that Latin American scientists have increased production, perhaps at the cost of quality. As an alternative, Latin America authors may have increased production while maintaining quality (e.g., through creativity, intense work and enhancement of international cooperation). Our aim is to verify which of these interpretations best applies for the field of comparative biochemistry and physiology (CBP). To achieve this goal, we compared the impact indicators of two randomly selected samples of authors (n = 20; all with 8 to 30 years of scientific production), one from Latin America and another from developed countries. For additional comparison, we included also a group of twelve highly cited and recognized CBP researchers. We used Hirsch’s indexes (h and m) as main indicators of performance, but compared also classical bibliometrie indexes such as total number of citations, total number of papers and the ratio of citation per paper (CpP). The mean of most indexes were not significantly different between the two groups of regular CBP researchers, except for CpP, which was 1.7-fold higher in authors from developed countries. As expected, both groups had mean indicators well below those from the sample of highly cited researchers (average h values for top and regular CBP researchers were 37.3±3.0 and 11.4±0.9, respectively). Considering that Hirsch’s indexes are more suitable indicators of performance than CpP, we conclude that Latin American CBP researchers, despite handicaps, perform similarly to those in developed countries. The forth special issue of Comparative Biochemistry and Physiology (“The Face of Latin American Comparative Biochemistry and Physiology”) celebrates, with 24 new manuscripts from Brazil, Mexico, Argentina and Chile, the diversity of biological science in Latin America. (c) 2007 Elsevier Inc. All rights reserved.

Keywords: Access, Access To Information, Alternative, Argentina, Barriers, Biochemistry, Biological, Brazil, Chile, Citation, Citations, Comparison, Cooperation, Cost, Costs, Creativity, Diversity, Engineering, Explanation, Field, Impact, Indicators, Information, International, International Cooperation, Latin America, Mexico, Papers, Performance, Physiology, Publications, Quality, Relevance, Research, Rights, Science, Scientific Production, Work

# Title: Comparative Immunology Microbiology and Infectious Diseases

Full Journal Title: Comparative Immunology Microbiology and Infectious Diseases

ISO Abbreviated Title: Comp. Immunol. Microbiol. Infect. Dis.

JCR Abbreviated Title: Comp Immunol Microb

ISSN: 0147-9571

Issues/Year: 4

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:

Immunology Microbiology Veterinary Sciences: Impact Factor

? Manandhar, R., Bettiol, S.S., Bettelheim, K.A. and Goldsmid, J.M. (1997), Isolation of verotoxigenic *Escherichia coli* from the Tasmanian environment. *Comparative Immunology Microbiology and Infectious Diseases*, **20** (3), 271-279.

Abstract: Growing concerns on the emergence of verotoxin producing *Escherichia coli* (VTEC) in Australia have focused our attention on the possible sources of VTEC within the island state of Tasmania. An analysis of 156 food samples and 194 water samples obtained from various areas revealed evidence of eight possible sources. Six strains, with serotypes Ont: Hnt, O86: H-, O88: H-, O126: H21 and 0134: H-, were isolated from water samples. Two VTEC of serotypes Ont: H8, O81: H-were isolated from raw meat samples. The waterborne isolates produced verocytotoxin, VT1, while both foodborne isolates were strong producers of VT2. Three VTEC isolates produced haemolysins, only one produced enterohaemolysin (EntHly) and the remaining were reported with alpha-haemoiysin (alpha-Hly) activity. An important feature in the majority of isolates from water was their lack of ability to ferment lactose these isolates are routinely overlooked in public health laboratories. Published by Elsevier Science Ltd.

# Title: Comparative Medicine

Full Journal Title: Comparative Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Smith, A.L. (2001), Laboratory Animal Medicine in a time of crisis. *Comparative Medicine*, **51** (4), 290.

# Title: Compare

Full Journal Title: Compare

ISO Abbreviated Title: Compare

JCR Abbreviated Title: Compare

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Persianis, P. (2000), Conflict between centrality and localism and its impact on knowledge construction and legitimation in peripheral universities: The case of the university of Cyprus. *Compare*, **30** (1), 35-51.

Full Text: [2000\Compare30, 35.pdf](2000/Compare30,%2035.pdf)

Abstract: This paper investigates the problem of knowledge production and legitimation at the University of Cyprus. The problem is examined against the background of extant theory on the relationships between universities of the ‘center’ and those of the ‘periphery’ and, more specifically, of the theory about the conflict between centrality and localism, as this is experienced by peripheral universities that aspire for centrality. The theory about the specific factors affecting higher education policy in small states also forms part of the theoretical framework of the paper. The University of Cyprus is proposed as a case study, as it differs in several important ways from the widely studied Asian and African universities.

# Title: Complementary Therapies in Medicine

Full Journal Title: [Complementary Therapies in Medicine](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6746&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=3281709&md5=14f5427d165c5bf9be288352a8f5ac32)

ISO Abbreviated Title: Complement. Ther. Med.

JCR Abbreviated Title: Complement Ther Med

ISSN: 0965-2299

Issues/Year: 4

Journal Country/Territory: England

Language: English

Publisher: Churchill Livingstone

Publisher Address: Journal Production Dept, Robert Stevenson House, 1-3 Baxters Place, Leith Walk, Edinburgh EH1 3AF, Midlothian, Scotland

Subject Categories:

Integrative & Complementary Medicine: Impact Factor 1.507, 1/9 (2002)

? Ernst, E. and White, A. (2000), The BBC survey of complementary medicine use in the UK. *Complementary Therapies in Medicine*, **8** (1), 32-36.

Full Text: [C\Com The Med8, 32.pdf](C/Com%20The%20Med8,%2032.pdf)

Abstract: Introduction: Recent data about the use of complementary and alternative medicine (CAM) by the general population exist for Australia and the USA, but not for the UK. This study aimed at providing such data. Design: Nationally representative random telephone survey. Setting and participants: 1204 British adults were interviewed. Results: 20% of the sample used CAM in the previous year. Herbalism, aromatherapy, homoeopathy, acupuncture/acupressure, massage and reflexology were the most popular treatment modalities. The main reasons for trying CAM were its perceived effectiveness, a positive inclination towards it, and its relaxing effects. On average, users spent pound 13.62±1.61 on CAM per month, which extrapolates to an annual expenditure of pound1.6 billion for the whole nation. Conclusions: It is concluded that CAM is prevalent in the UK. Therefore, its scientific validation has become an ethical imperative. (C) 2000 Harcourt Publishers Ltd.

Keywords: Alternative Medicine, Therapies

Thomas, K.J., Nicholl, J.P. and Coleman, P. (2001), Use and expenditure on complementary medicine in England: A population based survey. *Complementary Therapies in Medicine*, **9** (1), 2-11.

Full Text: [C\Com The Med9, 2.pdf](C/Com%20The%20Med9,%202.pdf)

Abstract: Objectives: Many claims are made that complementary medicine use is a substantial and growing part of health-care behaviour. Estimates of practitioner visits in the USA and Australia indicate high levels of use and expenditure. No reliable population-based estimates of practitioner use are available for the UK. Methods: In 1998, a previously piloted postal questionnaire was sent to a geographically stratified, random sample of 5010 adults in England. The questionnaire focuses on practitioner contacts, but also asked about the purchase of over-the-counter remedies. Additional information was requested on socio-demographic characteristics, perceived health, and recent NHS resource use. Information on use included reason for encounter, expenditure, insurance, and location of visit. Main outcome measures: Population estimates (by age group and sex) of lifetime use and use in the past 12 months for acupuncture, chiropractic, homoeopathy, hypnotherapy, medical herbalism, osteopathy. Estimates for two additional therapies (reflexology and aromatherapy), and homoeopathic or herbal remedies purchased over-the-counter. Estimates of annual out-of-pocket expenditure on practitioner visits in 1998. Results: A crude response rate of 60% was achieved (adjusted response rate 59%). Responders were order and more likely to be female than non-responders. Usable responses (n = 2669) were weighted using the age/sex profile of the sample frame. From these adjusted data we estimate that 10.6% (95% CI 9.4 to 11.7) of the adult population of England had visited at least one therapist providing any one of the six more established therapies in the past 12 months (13.6% for use of any of the eight named therapies, 95% CI 12.3 to 14.9). If all eight therapies, and self-care using remedies purchased over the counter are included, the estimated proportion rises to 28.3% (95% CI 26.6 to 30.0) for use in the past 12 months, and 46.6% (95% CI 44.6 to 48.5) for lifetime use. All types of use declined in older age groups, and were more commonly reported by women than men (P < 0, 0 I for all comparisons). An estimated 22 million visits were made to practitioners of one of the six established therapies in 1998. The NHS provided an estimated 10% of these contacts. The majority of non-NHS visits were financed through direct out-of-pocket expenditure. Annual out-of-pocket expenditure on any of the six more established therapies was estimated at <pound>450 million (95% CI 357 to 543). Conclusion: This survey has demonstrated substantial use of practitioner-provided complementary therapies in England in 1998. The findings suggest that CAM is making a measurable contribution to first-contact primary care. However, we have shown that 90% of this provision is purchased privately. Further research into the cost-effectiveness of different CAM therapies for particular patient groups is now urgently needed to facilitate equal and appropriate access via the NHS. (C) 2001 Harcourt Publishers Ltd.

Keywords: Alternative Medicine, United-States, Prevalence

? van Haselen, R. (2007), The h-index: A new way of assessing the scientific impact of individual CAM authors. *Complementary Therapies in Medicine*, **15** (4), 225-227

Full Text: [2007\Com The Med15, 225.pdf](2007/Com%20The%20Med15,%20225.pdf)

Keywords: h Index, h-index

? Hwang, D.S., Kim, H.K., Seo, J.C., Shin, I.H., Kim, D.H. and Kim, Y.S. (2011), Sympathomodulatory effects of Saam acupuncture on heart rate variability in night-shift-working nurses. *Complementary Therapies in Medicine*, **19** (S1), S33-S40.

Full Text: [2011\Com The Med19, S33.pdf](2011/Com%20The%20Med19,%20S33.pdf)

Abstract: Objective: We assessed the effects of Saam (traditional Korean) acupuncture on the autonomic nervous system in night-shift nurses using power-spectral heart-rate variability (HRV) analysis.

Methods: This study had a 2 x 4 cross-over design with a series of six (n = 1) controlled trials. Six night-shift nurses were randomly divided into two groups, and each nurse received four acupuncture treatments on the third day of night-shift work. One group started with Saam acupuncture (gallbladder jeonggyeok), while the other started with sham acupuncture. Saam acupuncture and sham acupuncture were applied in turn. HRV was measured before and after treatment. For statistical analysis, the results of the two groups were combined, and a Bayesian model was used to compare the changes; in HRV values before and after treatment, between Saam and sham acupuncture.

Results: As the ratio of low- to high-frequency power (LF/HF) for HRV increased on the third day of night-shift work in the pilot study, HRV measurements were made on the third day. Compared with sham acupuncture, Saam acupuncture reduced sympathetic activity; the overall median treatment effect estimate in LF normalised units decreased by -17.4 (confidence interval (CI): -26.67, -8.725) and that for LF/HF decreased by -1.691 (CI: -3.222, -0.3789). The overall median treatment effect estimate in HF normalised units increased by 17.41 (CI: 6.393, 27.13) with Saam acupuncture, suggesting an increase in parasympathetic activity.

Conclusion: Saam acupuncture may attenuate the imbalance between sympathetic and parasympathetic activities induced by night-shift work in nurses. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Autonomic Imbalance, Gallbladder Jeonggyeok, Heart Rate Variability, Hierarchical Bayesian Model, Night-Shift Work, Saam Acupuncture, Sleep-Deprivation, Spectral-Analysis, Mental Stress, Female Nurses, Modulation, Mechanisms, Responses, Failure, Workers, State

# Title: Complementary Therapies in Nursing and Midwifery

Full Journal Title: [Complementary Therapies in Nursing and Midwifery](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6747&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=3281709&md5=a7c40d5c287b3bc8789a3a770d2a01c3)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Weller, K. (2002), Visualising the body in art and medicine: A visual art course for medical students at King’s College Hospital in 1999. *Complementary Therapies in Nursing and Midwifery*, **8** (4), 211-216.

Full Text: [C\Com The Nur Mid8, 211.pdf](C/Com%20The%20Nur%20Mid8,%20211.pdf)

Abstract: For many centuries science and art have been studied as completely separate disciplines, and career paths likewise, have diverged. However, in recent years there has been a renewed cultural interest in art/science collaborations, coupled with the perception that a medical education which did not embrace the humanities ‘tended to brutalize and dehumanize’ (Weatherall, British Medical Journal 309 (1994) 1671–1672) future doctors. It was against this background of the growth of multi-disciplinary collaborative projects and a dissatisfaction with an ‘incomplete’ medical education, that an opportunity arose for a visual arts course to be set up at a London teaching hospital in 1999. The following dialogue sets out to explore the difficulties, the great joys and the emotions generated by a ‘Special Study Module’ created by both artists and clinicians.

# Title: Complexation Reaction in Aquatic Systems: An Analytical Approach

Ellis Horwood Ltd., Chichester, UK

? Buffle, J. (1988), *Complexation Reaction in Aquatic Systems: An Analytical Approach*. Ellis Horwood Ltd., Chichester, UK.

# Title: Composites Science and Technology

Full Journal Title: [Composites Science and Technology](http://www.sciencedirect.com/science/journal/02663538)

ISO Abbreviated Title: Compos. Sci. Technol.

JCR Abbreviated Title: Compos Sci Technol

ISSN: 0266-3538

Issues/Year: 16

Journal Country/Territory: England

Language: English

Publisher: Elsevier Sci Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, Oxon, England

Subject Categories:

Materials Science, Composites: Impact Factor 2.027, 1/21 (2006); Impact Factor 2.171, 1/21 (2007); Impact Factor 2.901, 1/22 (2009)

? Sanchez, F. and Ince, C. (2009), Microstructure and macroscopic properties of hybrid carbon nanofiber/silica fume cement composites. *Composites Science and Technology*, **69** (7-8), 1310-1318.

Full Text: [2009\Com Sci Tec69, 1310.pdf](2009/Com%20Sci%20Tec69,%201310.pdf)

Abstract: The effect of up to 2 wt% of “as received” carbon nanofiber (CNF) loading on the microstructural, physical, and mechanical (compressive and splitting tensile strengths) properties of hybrid CNF/silica fume cement composites has been studied. Silica fume (SF) facilitated CNF dispersion due to its small particle size and improved the interfacial interaction between the CNFs and the cement phases. The CNFs were found embedded as individual fibers throughout the paste and self-aggregated as clumps in pockets. Mechanically, the CNFs embedded in the paste and at the pocket edges acted to offset the effect of defects created by the pockets. The addition of CNFs promoted pore refinement of the composites and increased the pore volume in the 6-200 nm pore diameter range, ascribed in part to interstitial pores between the entangled CNFs. (c) 2009 Elsevier Ltd. All rights reserved.

Keywords: Carbon Fibers, Fiber/Matrix Bond, Mechanical Properties, Scanning Electron Microscopy (SEM), Nano-Structured Cement-Based Composites, Silica Fume, Dispersion, Concrete, Nanotube, Fibers, Pastes

# Title: Compost Science & Utilization

Full Journal Title: Compost Science & Utilization

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Anastasi, A., Varese, G.C., Casieri, L. and Marchisio, V.F. (2006), Basidiomycetes from compost and their dye degradation and enzyme activities. *Compost Science & Utilization*, **14** (4), 284-289.

Full Text: Com Sci Uti14, 284.pdf

Abstract: The degree of decolorization of Poly R-478, a highly recalcitrant anthraquinone dye, by three basidiomycetes belonging to Polyporales isolated from compost was investigated together with the enzymes involved. Decolorization tests in two liquid cultures, one with a simple mycelium inoculum, the other with an inoculum of mycelium grown on straw, resulted in 70% and 87% decolorization respectively in 7 days. However, the efficiency did not increase significantly in the presence of the lignocellulose substrate. The three strains produced laccase and/or manganese peroxidase activity during the decolorization, whereas lignin peroxidase activity was not observed. Previous growth on straw enhanced the synthesis of ligninolytic enzymes, though there was no correlation between enzyme activity and decolorization. The three fungi can be proposed as promising candidates for the treatment of colored industrial effluents and probably for soils contaminated by complex polymers, such as polycyclic aromatic hydrocarbons.

Keywords: White-Rot Fungi, Lignin-Modifying Enzymes, Textile Dyes, Trametes-Versicolor, Laccase Production, Industrial Dyes, Synthetic Dyes, Polymeric Dyes, Solid Medium, Decolorization

# Title: Comprehensive Evaluation of Economy and Society with Statistical Science

Full Journal Title: Comprehensive Evaluation of Economy and Society with Statistical Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hu, H. and Zeng, S.L. (2009), A study on the research performance evaluation model of university departments and its empirical research. *Comprehensive Evaluation of Economy and Society with Statistical Science*, 1101-1107.

Abstract: As the major source and the primary impetus behind the S&T innovation, colleges and universities play a distinctive and important role in the national innovation system. To evaluate the research performance based on scientometric and bibliometric methods is an important part of universities’ R&D management and also an essential aspect of the researches of scientometrics and bibliometrics. On the basis of the classification results of academic journals of Research Center for China Science Evaluation at Wuhan University, we define the non-academic journals and papers as the negative output (or input) indicators in assessing research performance; and the input-output indicators for the evaluation of research performance of universities are set up accordingly. The relative efficiency of research performance is evaluated with super-efficiency data envelopment analysis (SE-DEA) model, and the empirical study of 10 schools of a university is carried out with field survey data. The result shows that the assessment model based on SE-DEA not only can be used to evaluate the relative efficiency and the performance of research performance for different schools or universities, but also may be applied to set up the benchmark of R&D management for universities.

Keywords: Assessment, Benchmarking Management, Bibliometric, Bibliometrics, China, Classification, Data Envelopment Analysis, Efficiency, Evaluation, Indicators, Innovation, Innovation System, Journals, Methods, Model, Negative Output, Primary, R&D, R&D Management, Research, Research Performance, Science, Scientometrics, Size, Super-Efficiency Data Envelopment Analysis, System, Undesirable Factors, Units, Universities, University

# Title: Comprehensive Gerontology. Section A, Clinical and Laboratory Sciences

Full Journal Title: Comprehensive Gerontology. Section A, Clinical and Laboratory Sciences

ISO Abbreviated Title:

JCR Abbreviated Title: Compr Gerontol [A]

ISSN: 0902-0071

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Duplenko, Y. and Burchinsky, S.G. (1989), Quantitative analysis of current trends in the development of biology of aging: Scientometric and expert values. *Comprehensive Gerontology. Section A, Clinical and Laboratory Sciences*, **3** (Suppl), 23-27.

Abstract: Modern trends in the development of biology of aging have been assessed quantitatively by means of the scientometric and collective expert values methods as a part of the science-of-science analysis. The main regularities in the development of biology of aging during the period 1975 to 1985 are established and their comparative significance determined. The proposed complex approach as part of a science-of-science analysis allows an objective quantitation of the development dynamics of present basic research in gerontology.

Keywords: Aging, Analysis, Approach, Biology, Development, Dynamics, Gerontology, Methods, Research, Scientometric, Significance, Trends

# Title: Comprehensive Reviews in Food Science and Food Safety

Full Journal Title: Comprehensive Reviews in Food Science and Food Safety

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kroger, M. (2010), Editorial: Some thoughts on plagiarism. *Comprehensive Reviews in Food Science and Food Safety*, **9** (3), 259-260.

Full Text: [2010\Com Rev Foo Sci Foo Saf9, 259.pdf](2010/Com%20Rev%20Foo%20Sci%20Foo%20Saf9,%20259.pdf)

Keywords: Plagiarism

# Title: Comptes Rendus de l Academie Bulgare des Sciences

Full Journal Title: Comptes Rendus de l Academie Bulgare des Sciences

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tsekova, K., Ianis, M. and Ganeva, S. (2007), Biosorption of binary mixtures of copper and cobalt by Penicillium cyclopium biomass. *Comptes Rendus de l Academie Bulgare des Sciences*, **60** (1), 63-70.

Abstract: Biosorption of two metal ions Cu(II) and Co(II) in single component and binary systems by Penicillium cyclopium resting: cells was studied. Equilibrium batch sorption studies were carried out at 30°C and pH 5. The uptake of metals was very fast and the equilibrium was attained within 30 min. The adsorption of binary mixtures of heavy metals was found to be competitive type, where the copper ion sorption was more favourable than cobalt ions for this fungus. The pseudofirst and -second-order rate expressions were used to correlate the experimental data. Heavy metals uptake by fungal biomass was best described by pseudosecond-order rate model and the rate constant, the initial sorption rate and the equilibrium sorption capacity were reported.

Keywords: Adsorption, Batch, Batch Sorption, Binary Mixtures, Binary Systems, Biomass, Biosorption, Capacity, Cells, Cobalt, Copper, Copper Ion, Cu, Equilibrium, Equilibrium Sorption, Experimental Data, Fungal, Fungal Biomass, Fungus, Heavy Metals, Heavy-Metals, Ion, Ions, Kinetics, Metal, Metal Ions, Metals, Mixtures, Model, Penicillium, Penicillium Cyclopium, pH, Rate Constant, Rate Model, Second Order, Sorption, Sorption Capacity, Sorption Rate, Sorption Studies, Uptake

? Tsekova, K., Christova, D., Dencheva, V. and Ganeva, S. (2010), Biosorption of binary mixture of copper and cobalt by free and immobilized biomass of *Penicillium cyclopium*. *Comptes Rendus de l Academie Bulgare des Sciences*, **63** (1), 85-90.

Full Text: Com Ren Aca Bul Sci63, 85.pdf

Abstract: Batch sorption equilibrium experiments using free and immobilized in poly(vinyl alcohol) (PVA) hydrogel biomass of Penicillium cyclopium were carried out using binary mixture of corresponding metal ion solutions. Metal binding ability of the hybrid hydrogel for Cu(II) and Co(II) was determined by using atomic absorption spectrophotometer. The performance of free and immobilized biosorbent was evaluated by sorption kinetics and sorption capacities for different metal ions in the mixture. Immobilized system showed higher removal efficiency (expressed as mg metal ions removed per mg metal ions added) in comparison to the free cells system. The pseudo-second order kinetic model was applied to the experimental data and important kinetic parameters of the biosorption process were calculated. The data obtained are in agreement with the assumption that the external mass transfer limitation in the immobilized system can be neglected and the biosorption process is chemisorption controlled.

Keywords: Absorption, Alcohol, Aqueous-Solutions, Binding, Biomass, Biosorbent, Biosorption, Chemisorption, Co(II), Cobalt, Comparison, Copper, Cu(II), Data, Efficiency, Equilibrium, Experimental, Experiments, Heavy Metals, Hybrid, Hydrogel, Immobilized, Ions, Kinetic, Kinetic Model, Kinetic Parameters, Kinetics, Kinetics and Sorption, Limitation, Mass Transfer, Metal, Metal Ion, Metal Ions, Metal-Ions, Model, Penicillium Cyclopium, Performance, Polyvinyl-Alcohol) Membrane, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Removal Efficiency, Second Order Kinetics, Sludge, Solutions, Sorption, Sorption Kinetics, Zinc

# Title: Comptes Rendus de l Academie des Sciences Serie II Fascicule A-Sciences de la Terre et des Planetes

Full Journal Title: Comptes Rendus de l Academie des Sciences Serie II Fascicule A-Sciences de la Terre et des Planetes

ISO Abbreviated Title: Comptes Rendus Acad. Sci. Ser II-A

JCR Abbreviated Title: Cr Acad Sci II A

ISSN: 1251-8050

Issues/Year: 24

Journal Country/Territory: France

Language: English

Publisher: Editions Scientifiques Medicales Elsevier

Publisher Address: 23 Rue Linois, 75724 Paris Cedex 15, France

Subject Categories:

Geosciences, Interdisciplinary: Impact Factor

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Abstract: The November 26, 1999, Ambrym-Pentecost thrust-fault earthquake is the largest known earthquake to have occurred in the back-are compressive belt of the central part of the Vanuatu subduction zone. We report here the first data recorded by our local seismic and geodetic networks together with field observations collected on Pentecost and Ambrym in December 1999. The epicentre was located at the northern tip of Ambrym island (16.11 degrees S, 168.13 degrees E) at a depth of 18.75 km. Distribution of aftershocks recorded during the first nine hours already delineates a north-south trending, 100-km-long by 25-km-wide zone, from the south of Ambrym (16.5 degrees S) up to the northern part of Pentecost (15.5 degrees S), compatible with the magnitude of the main shock. The easternmost parr of Ambrym has been significantly uplifted. A white fringe of dead red algae indicates that the coseismic uplift which is around Im at the eastern tip of the island vanishes rapidly westward. Re-observation of the West Ambrym GPS site indicates a 35-cm eastward and 5-cm northward motion. These vertical and horizontal displacements in Ambrym can be explained by a large slip motion (4.5 m) along a shallow (0-15 km) west-dipping thrust fault plane trending north-south and emerging east of Ambrym and Pentecost islands. Tide gauge data on Efate (160 km away from the epicentre) and field observations relative to the associated tsunami favour a landslide contribution instead of 3 purely seismic origin. (C) 2000 Acadimie des sciences/Editions scientifiques el medicales Elsevier SAS.

Keywords: Seismicity, Tsunami, Vertical Motions, Red Algae, Coral, GPS, Vanuatu, New-Hebrides, Geodetic Measurements, Convergence, Tectonics, Region, Zone, Arc

# Title: Comptes Rendus de l Academie des Sciences de l URSS

Full Journal Title: Comptes Rendus de l Academie des Sciences de l URSS

ISO Abbreviated Title:

JCR Abbreviated Title:

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Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Liberman, A.L. (1941), Isotherm of heterogeneous catalytic reactions carried out under flow method conditions and a new method for determining the relative adsorption coefficients. *Comptes Rendus de l Academie des Sciences de l URSS*, **31**, 448-452.

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# Title: Comptes Rendus Biologies

Full Journal Title: [Comptes Rendus Biologies](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7241&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=f24db92e5ee11158edfcfef6ab6cb7aa)

ISO Abbreviated Title: C. R. Biol.

JCR Abbreviated Title: Cr Biol

ISSN: 1631-0691

Issues/Year: 12

Journal Country/Territory: France

Language: French

Publisher: Editions Scientifiques Medicales Elsevier

Publisher Address: 23 Rue Linois, 75724 Paris, France

Subject Categories:

Biology: Impact Factor 0.481 (2003)

Multidisciplinary Sciences: Impact Factor 0.481 (2003)

Ortu, E., David, F. and Caramiello, R. (2003), Man’s role in the vegetation history in the Ellero Valley (Maritime Alps, Italy). *Comptes Rendus Biologies*, **326** (7), 631-637.

Full Text: [C\Com Ren Bio326, 631.pdf](C/Com%20Ren%20Bio326,%20631.pdf)

Abstract: The pollen analysis of a sediment core from a peat bog (Rifugio Mondovi) at the mountain belt (1760 m) in the Ellero Valley (Italian Maritime Alps) shows the postglacial vegetation history. The sequence starts at 12000 BP during a peak of pine pollen; this first phase shows a low representation of birch and the presence of Tilia. Younger Dryas is characterised by increasing percentages of Artemisia, showing the presence of deciduous Quercus, fir and beech. Elm appears at the beginning of the Holocene during the second pine peak (9800 BP). A 3000- year hiatus is present. Sedimentation resumes at 6000 BP in a Rhododendron fir-wood. The present timberline at 1500 m, at the limit of the beech wood, is a result of the decline of the fir- wood at 2600 13P, which allowed an expansion of beech. During this period, there was a continual increase in Gramineae and deciduous oak and the first occurrences of evergreen oak are observed. The development of larch occurs at 1800 13P, together with walnut, chestnut, cereals and vine. (C) 2003 Acaddmie des sciences. Publie par Editions scientifiques et medicales Elsevier SAS. Tons droits reserves.

Keywords: History, Man, Pollen, Pollen Analysis, Postglacial, Reconstruction, Southeast France, Vegetation, Wood

Ogasawara, O., Kawamoto, S. and Okubo, K. (2003), Zipf’s law and human transcriptomes: An explanation with an evolutionary model. *Comptes Rendus Biologies*, **326** (10-11), 1097-1101.

Full Text: [C\Com Ren Bio326, 1097.pdf](C/Com%20Ren%20Bio326,%201097.pdf)

Abstract: Detailed analysis of human gene expression data reveals several patterns of relationship between transcript frequency and abundance rank. In muscle and liver, organs composed primarily of a homogeneous population of differentiated cells, they obey Zipf’s law. In cell lines, epithelial tissue and compiled transcriptome data, only high-rankers deviate from it. We propose an evolutionary process model during which expression level changes stochastically proportionally to its intensity, providing a novel interpretation of transcriptome data and of evolutionary constraints on gene expression. To cite this article: O. Ogasawara et al., C. R. Biologies 326 (2003).

Keywords: Abundance, Expression, Frequency, Transcriptome, Zipf’s Law Abondance, Expression, Fréquence, Loi de Zipf, Transcriptome

# Title: Comptes Rendus Chimie

Full Journal Title: Comptes Rendus Chimie

ISO Abbreviated Title:

JCR Abbreviated Title:

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Language:

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Subject Categories:

Impact Factor

? Benguella, B. and Yacouta-Nour, A. (2009), Removal of acid dyes from aqueous solutions by bentonite and kaolin. *Comptes Rendus Chimie*, **12** (6-7), 762-771.

Full Text: [2009\Com Ren Chi12, 762.pdf](2009/Com%20Ren%20Chi12,%20762.pdf)

Abstract: The adsorption of three acid dyes used in the textile industry, namely Bezanyl Yellow, Bezanyl Red and Nylomine Green onto bentonite and kaolin from aqueous solutions were studied. The kinetic equilibrium data show that bentonite fixes more Bezanyl Yellow, Bezanyl Red and Nylomine Green than kaolin. The results also showed that the kinetics of adsorption are best described by a pseudo-second-order expression. Adsorption isotherms of acid dyes onto bentonite and kaolin were determined and correlated with common isotherm equations such as the Langmuir and Freundlich models. The Langmuir model agrees very well with experimental data. The thermodynamic parameters obtained indicate that the adsorption of acid dyes onto bentonite and kaolin was a spontaneous and an exothermic process. To cite this article: B. Benguella, A. Yacouta-Nour, C R. Chimie 12 (2009). (C) 2008 Academie des sciences. Published by Elsevier Masson SAS. All rights reserved.

Keywords: Acid Dyes, Adsorbents, Adsorption, Adsorption, Adsorption Isotherms, Aqueous Solutions, Bentonite, Coal, Data, Dyes, Equilibrium, Equilibrium, Exothermic, Experimental, Expression, Freundlich, Ions, Isotherm, Isotherm Equations, Isotherms, Kaolin, Kinetic, Kinetics, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Model, Model, Models, Pseudo Second Order, Pseudo-Second-Order, Removal, Rights, Sciences, Solutions, Sorption, Thermodynamic, Thermodynamic Parameters

? Bouhdadi, R., El Moussaouiti, M., George, B., Molina, S. and Merlin, A. (2011), Cellulose acylation by 3-pyridinoyl chloride hydrochloride: Application to lead Pb2+ adsorption. *Comptes Rendus Chimie*, **14** (6), 539-547.

Full Text: [2011\Com Ren Chi14, 539.pdf](2011/Com%20Ren%20Chi14,%20539.pdf)

Abstract: 3-pyridinoyl chloride hydrochloride (or nicotinoyl chloride hydrochloride) which possesses a pyridine ring able to adsorb cationic pollutants, was grafted on "Kraft cellulose" under mild conditions. The grafting efficiency was checked by FTIR, TGA, SEM and elemental analysis. Afterwards, adsorption capacity of unmodified and grafted cellulose was compared by using aqueous solutions of lead nitrate. It appeared that retention properties of modified cellulose are largely enhanced (adsorbed amount: 14.50 mg/g versus 3.26 mg/g, equilibrium time: 60 min versus 150 min) and a pseudo second order model can be applied to describe the adsorption kinetics for the metallic cation. Besides, a Langmuir-type isotherm gives a good representation of the adsorption phenomenon. Moreover, we have observed that the reaction is spontaneous and exothermic which could be interesting from a recycling point of view since the cation could be desorbed at elevated temperatures. (C) 2011 Academie des sciences. Published by Elsevier Masson SAS. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Aqueous-Solutions, Beads, Biosorption, Cellulose, Chloride, Chromium(VI), Depollution, Dyes, Equilibrium, FTIR, Heavy-Metal Ions, Isotherm, Isotherms, Kinetics, Lead, Lead Adsorption, Lithium Chloride, N,N-Dimethylacetamide, Modeling, Removal, SEM, Sugarcane Bagasse, Waste Treatment, Water

# Title: Comptes Rendus Hebdomadaires des Seances de l Academie des Sciences

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Impact Factor

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Full Text: [-1959\Com Ren Heb Sea Aca Sci130, 159.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci130,%20159.pdf)

Keywords: Surfaces

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Full Text: [-1959\Com Ren Heb Sea Aca Sci130, 477.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci130,%20477.pdf)

Keywords: Surfaces

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Full Text: [-1959\Com Ren Heb Sea Aca Sci130, 1752.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci130,%201752.pdf)

Keywords: Glass, Hydrogen, Permeability

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Keywords: Surfaces

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Keywords: Isotherms

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Keywords: Surfaces

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Full Text: [-1959\Com Ren Heb Sea Aca Sci140, 1672.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci140,%201672.pdf)

Keywords: Research, Surfaces

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Keywords: Surfaces

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Keywords: Surfaces

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Keywords: Surfaces

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Full Text: [-1959\Com Ren Heb Sea Aca Sci143, 578.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci143,%20578.pdf)

Keywords: Surfaces

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Full Text: [-1959\Com Ren Heb Sea Aca Sci143, 874.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci143,%20874.pdf)

Keywords: Research, Surfaces

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Full Text: [-1959\Com Ren Heb Sea Aca Sci147, 62.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci147,%2062.pdf)

Abstract: Rubber emulsions showing Brownian motions are coagulated into a network by acids, and agglutinated into droplets by alkalies. The author took micro-kinematograms of emulsions to which small quantities of hydrochloric or acetic acid, soda, urea, or alcohol had been added. He found that the addition of a coagulating substance retards the motions before coagulation sets in. Acids may be made to reduce the range of motion ninefold as compared with distilled water. The ions H and OH are not the determining agents, since alcohol also retards before coagulation. The real cause of retardation is an adsorption of alkali or acid by the granules, especially the latter.

Keywords: Adsorption, Coagulation, Network, Water

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Full Text: [-1959\Com Ren Heb Sea Aca Sci149, 250.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci149,%20250.pdf)

Abstract: Attention is directed to the fact that although the law of fixed vapour-pressure for liquids has been verified accurately by experiment, the corresponding law of fixed dissociation pressures of solids such as chalk is practically unsupported by experiment, the values obtained by various observers being very far from constant, /b e.g./, there is an uncertainty of 100 degrees as to the temperature at which the dissociation-pressure of chalk is equal to 1 atmo. These irregularities are attributed to the porosity of the dissociating solid, which may, like charcoal, condense large volumes of gas by “adsorption” in the pores. This difficulty may be got over by working in presence of a solvent. Thus in the case of chalk, it is suggested that the porosity might be removed by working in presence of a mixture of carbonates melting at about 600 degrees; this would be saturated with lime and with chalk, and the pressure of carbonic anhydride in equilibrium with the melt would be identical with the normal dissociation pressure of chalk. For the dissociation of slaked lime a mixture of sodium and potassium hydroxides might be used, and for the dissociation of hydrated salts a solution of some deliquescent salt or acid. Under these conditions, it is suggested, the law of fixed dissociation-pressures might hold good rigidly.

Keywords: Equilibrium, Lime, Solution, Temperature

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Full Text: [-1959\Com Ren Heb Sea Aca Sci158, 791.pdf](-1959/Com%20Ren%20Heb%20Sea%20Aca%20Sci158,%20791.pdf)

Abstract: Measurements were made of the adsorption of substances on glass surfaces of known area. The quantities of a colouring-matter adsorbed were 2 \* 10/sup -8/ and 14 \* 10/sup -8/ grains per sq. cm. when the concentrations were 10/sup -6/ and 10/sup -5/ gm. per c.cm. respectively. In the case of common salt, the adsorption was 14 \* 10/sup -8/ gm. per sq. cm. at a concentration of N/10,000. Other salts gave analogous results.

Keywords: Adsorption, Measurement

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# Title: Comptes Rendus Hebdomadaires des Seances de l Academie des Sciences Serie C

Full Journal Title: Comptes Rendus Hebdomadaires des Seances de l Academie des Sciences Serie C

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JCR Abbreviated Title: C R Acad Sci Ser C

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Publisher:

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Subject Categories:

Impact Factor

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# Title: Comptes Rendus des Seances de la Societe de Biologie et de Ses Filiales

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Subject Categories:

Impact Factor

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# Title: Computational Geosciences

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Publisher Address: Po Box 221, 1400 Ae Bussum, Netherlands

Subject Categories:

Computer Science, Interdisciplinary Applications: Impact Factor 0.344, / (2000)

Geosciences, Interdisciplinary: Impact Factor 0.344, / (2000)

? Keijzer, H., van der Zee, S.E.A.T.M. and Leijnse, A. (1998), Characteristic regimes for in-situ bioremediation of aquifers by injecting water containing an electron acceptor. *Computational Geosciences*, **2** (1), 1-22.

Abstract: A one-dimensional model is developed for simulating in-situ bioremediation. The modeled processes are advective and dispersive transport, biotransformation and microbial growth. The biodegradation of the contaminant is limited by the supply of electron acceptor or microbial mass. We distinguish three regimes of oxygen consumption, a low oxygen consumption regime, an intermediate regime and a fast oxygen consumption regime. Parameter variation reveals the influence of the dimensionless numbers on the duration of the three regimes.

Keywords: Binary Ion-Exchange, Traveling Waves, Porous-Media, Contaminant Transport, Reactive Solutes, Biodegradation, Groundwater, Simulation, Adsorption, Model, Bioremediation, Monod Kinetics, Porous Medium, Traveling Wave

# Title: Computational and Mathematical Organization Theory

Full Journal Title: Computational and Mathematical Organization Theory

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Meyer, M., Zaggl, M.A. and Carley, K.M. (2011), Measuring CMOT’s intellectual structure and its development. *Computational and Mathematical Organization Theory*, **17** (1), 1-34.

Full Text: [2011\Com Mat Org The17, 1.pdf](2011/Com%20Mat%20Org%20The17,%201.pdf)

Abstract: Computational Organization Theory is often described as a multidisciplinary and fast-moving field which can make it difficult to keep track of it. The recent inclusion of Computational and Mathematical Organization Theory (CMOT) into the Social Science Citation Index offers a good reason to take stock of what has happened since the foundation of the journal and to analyze its intellectual structure and development from 1995 to 2008. We identify the most influential publications by means of citation analysis and show that a core of codified knowledge has developed over time. Additionally, we provide empirical support for the characteristics generally ascribed to the journal such as multidisciplinarity. Finally, we depict the main research foci in CMOT’s intellectual structure employing a co-citation analysis of publications and investigate their development over time. Overall, our quantitative review shows CMOT to be thematically focused on organizations, groups and networks while being remarkably diverse in terms of theoretical approaches and methods used.

Keywords: Bibliometrics, Citation, Citation Analysis, Citation Analysis, Co-Citation Analysis, Cocitation Analysis, Computational Organization Theory, Development, Journal, Limitations, Management, Multidisciplinarity, Publications, Research, Research Foci, Review, Science Citation Index, Science Policy, Sociology of Science

# Title: Computer Journal

Full Journal Title: Computer Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Churchho, R.F. (1968), Note on 25 most cited papers in some leading journals. *Computer Journal*, **11** (1), 116-??.

Full Text: 1960-80\Com J11, 116.pdf

Keywords: Journals

# Title: Computer Methods and Programs in Biomedicine

Full Journal Title: [Computer Methods and Programs in Biomedicine](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5004&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=a3c57d835f1f584c6bef751313d561da)

ISO Abbreviated Title: Comput. Meth. Programs Biomed.

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ISSN: 0169-2607

Issues/Year: 9

Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Ireland Ltd

Publisher Address: Elsevier House, Brookvale Plaza, East Park Shannon, Co, Clare 00000, Ireland

Subject Categories:

Computer Science, Interdisciplinary Applications: Impact Factor 0.788, 42/83 (2005)

Computer Science, Theory & Methods: Impact Factor 0.788, 39/71 (2005)

Engineering, Biomedical: Impact Factor 0.788, 34/41 (2005)

Medical Informatics: Impact Factor 0.788, 15/18 (2005)

Bourne, D.W.A. (1989), BOOMER, a simulation and modeling program for pharmacokinetic and pharmacodynamic data analysis. *Computer Methods and Programs in Biomedicine*, **29** (3), 191-195.

Full Text: [C\Com Met Pro Bio29, 191.pdf](C/Com%20Met%20Pro%20Bio29,%20191.pdf)

Abstract: BOOMER is an improved version of an earlier non-linear regression program, MULTI-FORTE. Rather than the user writing a FORTRAN subroutine, models are defined by means of the parameters which make up the model. Models based on differential equations are specified by means of zero-order, first-order, or Michaelis-Menten-type rate constants. Doses (in units of mass) are translated into the usually observed concentration units by a reciprocal volume parameter. Integrated equation models are specified in terms of baseline terms, exponential terms, or the emax functions with slope term as described by the Hill equation. Time points can be specified as parameters to specify dose times, infusion start/stop times, or lag times. With careful selection of parameters quite complex models can be specified. The user has a choice of differential equation solvers and fitting algorithms.

Keywords: IBM PC, Fortran, Non-Linear Estimation, Simulation

Gangemi, P.F., Messori, A., Baldini, S., Parigi, A., Massi, S. and Zaccara, G. (1991), Comparison of two nonlinear models for fitting saccadic eye movement data. *Computer Methods and Programs in Biomedicine*, **34** (4), 291-297.

Full Text: [C\Com Met Pro Bio34, 291.pdf](C/Com%20Met%20Pro%20Bio34,%20291.pdf)

Abstract: Saccadic eye movement are rapid shifts in the direction of gaze which are being studied increasingly for clinical and pharmacological purposes. The evaluation of the relationship between amplitude and peak velocity of these ocular movements (the so-called ‘main sequence’ plot) is particularly useful for characterising the saccade pattern in movements patients. This relationship is nonlinear and the peak velocity tend to achieve an asymptote for high values of amplitude. Since a standard parametrisation of the main sequence based on specific mathematical models has not yet been achieved, in the present dtudy two simple models based on the Michaelis-Menten equation and on an exponential equation are proposed together with their implementation on a micromputer. Two microcomputer programs are described which estimate the model parameters from the experimental data of the patients using a weighted nonlinear least-squares fit. The two procedures have been tested and compared in a series of 23 healthy volunteers. The following results (mean ± S.D.) were obtained: Michaelis-Menten model *K*m(degrees) = 31.2 ±7.7., *V*max(degrees/s) = 841.0 ± 165.5, root-mean-squared error (%) = 6.0 ± 1.6, exponential model, *K* (degrees) = 23.4 ± 4.6, *V*max(degrees/s) = 578.0 ± 97.4, root-mean-squared error (%) = 5.4 ± 1.6. The two techniques of parametrisation provided similar indices of intra-individual variability in 4 healthy volunteers. In conclusion, our methods for saccade parametrisation can be regarded as simple but efficient tools for facilitating research on these ocular movements.

Keywords: Ocular movement, Saccade, Michaelis-Menten

? Wen, H.C., Ho, Y.S., Jian, W.S., Li, H.C. and Hsu, Y.H.E. (2007), Scientific production of electronic health record research, 1991–2005. *Computer Methods and Programs in Biomedicine*, **86** (2), 191-196.

Full Text: [2007\Com Met Pro Bio86, 191.pdf](2007/Com%20Met%20Pro%20Bio86,%20191.pdf)

Abstract: Purpose: The increasing numbers of publications on electronic health record (EHR) indicate its increasing importance in the world. This study attempted to quantify the scientific production of EHR research articles, and how they have changed over time, in an effort to investigate changes in the trends cited in these critical evaluations. Method: The articles were based on the science citation index (SCI) from 1991 to 2005. A descriptive study was performed using the 1803 documents published in the SCI from 39 countries in America, Europe, Africa, Asia, and Oceania. The evaluationwas based on parameters including document type, language, first author’s country of origin, number of citations and citations per publication. Results: Of all publications, 1455 (80.7%) were articles, followed by meeting abstracts which represented about one-tenth of all types of EHR publications. Numbers of published articles have significantly increased when compared by each 5-year period. Most articles were published in English (98%) and were from the region of America (57%). The top 10 of the 374 journals accounted for 41% of the number of published articles. The US dominates publication production (57%) with a cumulative impact factor (IF) of 2227 and followed by the UK (8.5%, with a cumulative IF of 257.0) and the Netherlands (7.8%, with a cumulative IF of 211.1). An analysis of the number of articles related to population revealed a high publication output for relative small countries like Switzerland, the Netherlands, and Norway. Conclusions: Research production in EHR showed a considerable increase during 1991–2005. The production was dominated by articles, those from the US, and those published in English. The production came from many countries, denoting the devotion to this field in different areas around the world.

Keywords: Africa, Analysis, Asia, Bibliometrics, Care, Citation, Citations, Cumulative Impact, Electronic Health Records (EHRS), English, Europe, Evaluation, Health, Impact, Impact Factor, Importance, Index, Journals, Language, Medical-Records, Norway, Output, Parameters, Population, Production, Publication, Publications, Research, Research Articles, SCI, Science, Science Citation Index, Science Citation Index (SCI), Scientific Production, Switzerland, Trends, UK, US

# Title: Computer Physics Communications

Full Journal Title: [Computer Physics Communications](http://www.sciencedirect.com/science/journal/00104655)

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Fuchs, M. and Scheffler, M. (1999), Ab initio pseudopotentials for electronic structure calculations of poly-atomic systems using density-functional theory. *Computer Physics Communications*, **119** (1), 67-98.

Full Text: [1999\Com Phy Com119, 67.pdf](1999/Com%20Phy%20Com119,%2067.pdf)

Abstract: The package fhi98PP allows one to generate norm-conserving pseudopotentials adapted to density-functional theory total-energy calculations for a multitude of elements throughout the periodic table, including first-row and transition metal elements. The package also facilitates a first assessment of the pseudopotentials’ transferability, either in semilocal or fully separable form, by means of simple tests carried out for the free atom. Various parameterizations of the local-density approximation and the generalized gradient approximation for exchange and correlation are implemented. (C) 1999 Elsevier Science B.V.

Keywords: Pseudopotential, Total Energy, Electronic Structure, Density Functional, Local Density, Generalized Gradient, Generalized Gradient Approximation, Norm-Conserving Pseudopotentials, Exchange-Correlation, Molecular-Dynamics, Self-Diffusion, Ultrasoft Pseudopotentials, Energy Calculations, Surfaces, Adsorption, Formalism

? Hsu, J.W. and Huang, D.W. (2011), Dynamics of citation distribution. *Computer Physics Communications*, **182** (1), 185-187.

Full Text: [2011\Com Phy Com182, 185.pdf](2011/Com%20Phy%20Com182,%20185.pdf)

Abstract: We study the citation dynamics of scientific publications over the years We propose a simple cellular automaton model featuring a combination of two distinct mechanisms i e the random assignment and the preferential attachment to investigate the dynamics of journal citation Different from most previous studies focusing on highly cited papers we analyze the time evolution of the entire citation distribution Empirical data can be well reproduced by numerical simulations Within the linear regime of the Cited Half-Life a steady accumulation of citations can be expected Moreover within this linear regime the ratio between the above two mechanisms is a constant Besides the average citation represented by the Impact Factor such a constant ratio can also be a characteristic of the journal (C) 2010 Elsevier B V All rights reserved.

Keywords: Bibliometrics, Citation, Citation Analysis, Citations, Data, Dynamics, Evolution, Highly-Cited, Impact Factor, Impact-Factor, Journal, Mechanisms, Model, Networks, Publications, Scientific Papers, Scientific Publications, Statistics, Stochastic Processes

# Title: Computer Programs in Biomedicine

Full Journal Title: Computer Programs in Biomedicine

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Bianchi, R., Hanozet, G.M. and Simonetta, M.P. (1983), MIR: A versatile program for the statistical analysis of enzyme kinetic data. *Computer Programs in Biomedicine*, **16** (3), 189-194.

Full Text: [C\Com Pro Bio16, 189.pdf](C/Com%20Pro%20Bio16,%20189.pdf)

Abstract: We have developed a package program for the estimation of Michaelis-Menten parameters for enzymes that conform to different kinetic mechanisms. Data from different experimental schemes can be fitted with appropriate weighting factors to any of 6 mathematical models, corresponding to 5 kinetic mechanisms: ordered bi-bi, Theorell-Chance, rapid equilibrium random bi-bi, rapid equilibrium ordered bi-bi and ping pong bi-bi. The program also performs a significance test to discriminate between different candidate models. To illlustrate the performance of the program, real data from kinetic experiments with glucose 6-phosphate from *Leuconostoc mesenteroides* have been fitted to different mathematical models, and the results are discussed. The program can be easily implemented for the fitting of kinetic data to any other model.

Keywords: Computer program, Enzyme parameters, Kinetic mechanism

# Title: Computers & Education

Full Journal Title: [Computers & Education](http://www.sciencedirect.com/science/journal/03601315)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Shih, M.L., Feng, J. and Tsai, C.C. (2008), Research and trends in the field of e-learning from 2001 to 2005: A content analysis of cognitive studies in selected journals. *Computers & Education*, **51** (2), 955-967.

Full Text: [2008\Com Edu51, 955.pdf](2008/Com%20Edu51,%20955.pdf)

Abstract: This paper provided a content analysis of studies in the field of cognition in e-learning that were published in five Social Sciences Citation Index (SSCI) journals (i.e. Computers and Education, British Journal of Educational Technology, Innovations in Education and Teaching International, Educational Technology Research & Development, and Journal of Computer Assisted Learning) from 2001 to 2005. Among the 1027 articles published in these journals from 2001 to 2005, 444 articles were identified as being related to the topic of cognition in e-learning. These articles were cross analyzed by published years, journal, research topic, and citation count. Furthermore, 16 highly-cited articles across different topics were chosen for further analysis according to their research settings, participants, research design types, and research methods. It was found from the analysis of the 444 articles that “Instructional Approaches,” “Learning Environment,” and “Metacognition” were the three most popular research topics, but the analysis of the citation counts suggested that the studies related to “Instructional Approaches,” “Information Processing” and “Motivation” might have a greater impact on subsequent research. Although the use of questionnaires might still be the main method of gathering research data in e-learning cognitive studies, a clear trend was observed that more and more studies were utilizing learners’ log files or online messages as data sources for analysis. The results of the analysis provided insights for educators and researchers into research trends and patterns of cognition in e-learning. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Analysis, Citation, Citation Counts, Cognition, Content Analysis, Data, Design, Field, Impact, Journal, Journals, Methods, Questionnaires, Research, Research Design, Rights, Sources, SSCI, Trend, Trends

? Heller, S., Tsai, C.C. and Underwood, J. (2010), *Computers & Education*: Looking back and looking forward. *Computers & Education*, **54** (2), 1-2.

Full Text: [2010\Com Edu54, 1.pdf](2010/Com%20Edu54,%201.pdf)

? Gutiérrez, E., Trenas, M.A., Ramos, J., Corbera, F. and Romero, S. (2010), A new *Moodle* module supporting automatic verification of VHDL-based assignments. *Computers & Education*, **54** (2), 562-577.

Full Text: [2010\Com Edu54, 562.pdf](2010/Com%20Edu54,%20562.pdf)

Abstract: This work describes a new Moodle module developed to give support to the practical content of a basic computer organization course. This module goes beyond the mere hosting of resources and assignments. it makes use of an automatic checking and verification engine that works on the VHDL designs submitted by the students. The module automatically keeps up to date information about their state, and significantly reduces the overload that a continuous assessment demands to the teacher. Additionally, this new module is oriented to promote a collaborative teamwork allowing to define student teams in a more operative way than built-in Moodle groups. The module has been designed according to the Moodle philosophy and its application can be extended to other similar subjects. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Applications in Subject Areas, Architecture, Assessment, Automatic Assessment, Courses, Design, Distance Education and Telelearning, Engineering-Education, Hardware, Learning Management Systems, Learning-Process, Organization, Plagiarism, Simulations, Students

? Martin, S., Diaz, G., Sancristobal, E., Gil, R., Castro, M. and Peire, J. (2011), New technology trends in education: Seven years of forecasts and convergence. *Computers & Education*, **57** (3), 1893-1906.

Full Text: [2011\Com Edu57, 1893.pdf](2011/Com%20Edu57,%201893.pdf)

Abstract: Each year since 2004, a new Horizon Report has been released. Each edition attempts to forecast the most promising technologies likely to impact on education along three horizons: the short term (the year of the report), the mid-term (the next 2 years) and the long term (the next 4 years). This paper analyzes the evolution of technology trends from 2004 to 2014 that correspond to the long-term predictions of the most recent Horizon Report. The study analyzes through bibliometric analysis which technologies were successful and became a regular part of education systems, which ones failed to have the predicted impact and why, and the shape of technology flows in recent years. The study also shows how the evolution and maturity of some technologies allowed the revival of expectations for others. The analysis here, which focuses on educational applications, offers guidelines that may be helpful to those seeking to invest in new research areas. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Analysis, Augmented Reality, Bibliometric, Bibliometric Analysis, Bibliometrics, Design, Education, Evolution, Forecasts, Game, Guidelines, Immersive Environments, Impact, Learning Objects, Mobile and Ubiquitous Devices, Patent Analysis, Research, Semantic Web, Social Web, System, Teach, Technology Trends, Trends

? Denoyelles, A. and Seo, K.K.J. (2012), Inspiring equal contribution and opportunity in a 3d multi-user virtual environment: Bringing together men garners and women non-gamers in Second Life®. *Computers & Education*, **58** (1), 21-29.

Full Text: [2012\Com Edu58, 21.pdf](2012/Com%20Edu58,%2021.pdf)

Abstract: A 3D multi-user virtual environment holds promise to support and enhance student online learning communities due to its ability to promote global synchronous interaction and collaboration, rich multisensory experience and expression, and elaborate design capabilities. Second Life (R), a multi-user virtual environment intended for adult users 18 and older, is the most cited in educational literature, so it is important to explore how college-aged students are using it to form online learning communities. Previous research suggests that there is unbalanced participation between traditional college-aged men and women with regards to 3D multi-user video games, which closely resemble Second Life (R). In this research study, we investigated in what manner women and men college students projected their virtual identities and engaged in interaction in Second Life (R), and how this influenced their learning of course content. Analysis of multiple data sources revealed that conceptions of identity, beliefs of the nature of the virtual world, and technical skill were primary factors which affected group cohesion and learning within the community. Results from this study can provide insight into the class activities that can support all learners in accessing and contributing to the multi-user virtual environment learning community. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Activities, Adult, Capabilities, Collaboration, College Students, Computer-Mediated Communication, Contribution, Design, Environment, Games, Identity, Insight, Interactive Learning Environments, Learning, Literature, Men, Motivations, Multi-User Virtual Environments, Online Learning, Participation, Primary, Research, Students, Traditional, Virtual Reality, Women

# Title: Computers & Geosciences

Full Journal Title: Computers & Geosciences

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Language:

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Subject Categories:

: Impact Factor

? Huber, R. and Klump, J. (2009), Charting taxonomic knowledge through ontologies and ranking algorithms. *Computers & Geosciences*, **35** (4), 862-868.

Full Text: [2009\Com Geo35, 862.pdf](2009/Com%20Geo35,%20862.pdf)

Abstract: Since the inception of geology as a modern science, paleontologists have described a large number of fossil species. This makes fossilized organisms an important tool in the study of stratigraphy and past environments. Since taxonomic classifications of organisms, and thereby their names, change frequently, the correct application of this tool requires taxonomic expertise in finding correct synonyms for a given species name. Much of this taxonomic information has already been published in journals and books where it is compiled in carefully prepared synonymy lists. Because this information is scattered throughout the paleontological literature, it is difficult to find and sometimes not accessible. Also, taxonomic information in the literature is often difficult to interpret for non-taxonomists looking for taxonomic synonymies as part of their research. The highly formalized structure makes Open Nomenclature synonymy lists ideally suited for computer aided identification of taxonomic synonyms. Because a synonymy list is a list of citations related to a taxon name, its bibliographic nature allows the application of bibliometric techniques to calculate the impact of synonymies and taxonomic concepts. TaxonRank is a ranking algorithm based on bibliometric analysis and Internet page ranking algorithms. TaxonRank uses published synonymy list data stored in TaxonConcept, a taxonomic information system. The basic ranking algorithm has been modified to include a measure of confidence on species identification based on the Open Nomenclature notation used in synonymy list, as well as other synonymy specific criteria. The results of our experiments show that the output of the proposed ranking algorithm gives a good estimate of the impact a published taxonomic concept has on the taxonomic opinions in the geological community. Also, our results show that treating taxonomic synonymies as part of on an ontology is a way to record and manage taxonomic knowledge, and thus contribute to the preservation our scientific heritage. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Algorithm, Algorithms, Analysis, Application, Bibliometric, Bibliometric Analysis, Bibliometric Techniques, Change, Citations, Community, Computer, Confidence, Criteria, Data, Experiments, Expertise, Geology, Identification, Impact, Information, Internet, Journals, Knowledge, Knowledge Management, Literature, Measure, Modified, Ontology, Opinions, Paleontology, Preservation, Ranking, Record, Research, Rights, Science, Si, Species, Structure, Taxonomy, Techniques, Tool, Visualization

# Title: Computers in Biology and Medicine

Full Journal Title: [Computers in Biology and Medicine](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5007&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=e86c32f4c9a385cc21ec1ab31aa61190)

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JCR Abbreviated Title:

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Language:

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Publisher Address:

Subject Categories:

: Impact Factor

Vaughin, W.K., Neal, R.A. and Anderson, A.J. (1967), Computer estimation of the parameters of the sigmoidal kinetic model. *Computers in Biology and Medicine*, **6** (1), 1-7.

Full Text: [C\Com Bio Med6, 1.pdf](C/Com%20Bio%20Med6,%201.pdf)

Abstract: A computer program is described which fits the non-linear sigmoidal model used in enzyme kinetics. The procedure used is a modification of the Gauss-Newton method for fitting non-linear regression functions. A technique for estimation of variances and covariances of the estimators is given and examples from enzyme kinetics experiments are used to compare the sigmoidal and hyperbolic models.

Keywords: Sigmoidal, Kinetic, Least-Squares, Estimation, Maximum-Likelihood, Michaelis-Menten

Estreicher, J., Revillard, C. and Scherrer, J.R. (1979), Compartmental analysis—II: ACT, a program for compartmental models of the generalized Michaelis-Menten type. *Computers in Biology and Medicine*, **9** (1), 67-80.

Full Text: [C\Com Bio Med6, 67.pdf](C/Com%20Bio%20Med6,%2067.pdf)

Abstract: An adequate approach of biological systems requires most of the time the use of non-linear models. A general theoretical model for compartmental analysis, essentially based on the Michaelis-Menten laws, is presented here, as well as the algorithmical developments solving the classical problems of simulation and of fitting, and the problems of predetermination and of latency time. Besides the theoretical aspect, a new FORTRAN program, ACT, allowing to handle all the mentioned problems, is made available.

Keywords: Active, Control, Predetermination, Latency Time

Atkins, G.L. (1982), Fitting biological equations to data using non-parametric methods. *Computers in Biology and Medicine*, **12** (3), 201-215.

Full Text: [C\Com Bio Med12, 201.pdf](C/Com%20Bio%20Med12,%20201.pdf)

Abstract: Simulated experimental data were generated for these equations: a straight line, the integrated Michaelis-Menten equation, plus a linear term, the Hill equation, a two-exponential function and a double Michaelis-Menten equation. The equations were fitted to the data using (i) least-squares and (II) non-parametric methods. The precision and accuracy of the parameter estimates obtained by each method were compared and the methods assessed. For several of the equations, non-parametric methods provided robust techniques for parameter estimation. For the remainder, the results were poor. The reasons for this are discussed.

Keywords: Curve-Fitting, Data Error, Least-Squares, Non-Parametric, Parameter Estimation, Regression, Robust

Greco, W.R., Priore, R.L., Sharma, M. and Korytnyk, W. (1982), ROSFIT: An enzyme kinetics nonlinear regression curve fitting package for a microcomputer. *Computers in Biology and Medicine*, **15** (1), 39-45.

Full Text: [C\Com Bio Med12, 39.pdf](C/Com%20Bio%20Med12,%2039.pdf)

Abstract: A nonlinear regression curve fitting package has been specifically developed for enzyme kinetic analyses for use on the Hewlett-Packard HP-85 microcomputer. Data are entered in a conversational manner. Data can be changed, deleted or added, and data sets can be stored and retrieved from a magnetic tape cassette. Data can be fit to any of nine models: the Michaelis-Menten equation, substrate inhibition, random bi bi, ordered bi bi, ping pong bi bi, competitive inhibition, classical noncompetitive inhibition, modern noncompetitive inhibition, or uncompetitive inhibition. The printout for each model consists of several goodness-of-fit statistics, the parameter estimates with 95% confidence intervals, the variance-covariance, and correlation matrices, a residual analysis, and graphs. For example, for competitive inhibition the graphs provided are v vs [S], v vs [I], 1/*v* vs 1/[*S*], and 1/*v* vs [I] with up to four concentrations of the second compound plotted on each graph. The nonlinear regression algorithm in the package is that of Marquardt. The values determined by ROSFIT are essentially the same as those found using the BMDPAR, BMDP3R, and NONLIN programs on a Univac 90/60 mainframe computer. A typical run for competitive inhibition with 46 data points took a total time of about 18.5 min, not including dat entry time, 14 min for the graph generation, 2 min for the three required iterations, and 2.5 min for miscellaneous operations.

? Oestreicher, E.G. and Pinto, G.F. (1983), Pocket computer-program for fitting the Michaelis-Menten equation. *Computers in Biology and Medicine*, **13** (4), 309-315.

Full Text: Com Bio Med6, 309

# Title: Computers and Biomedical Research

Full Journal Title: [Computers and Biomedical Research](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6751&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=71e72b6da2a98b77f543b613c89f92ee)

ISO Abbreviated Title:

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Journal Country/Territory:

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Subject Categories:

: Impact Factor

Greco, W.R., Priore, R.L., Sharma, M. and Korytnyk, W. (1982), Rosfit - an enzyme-kinetics non-linear regression curve fitting package for a microcomputer. *Computers and Biomedical Research*, **15** (1), 39-45.

Full Text: [C\Com Bio Res26, 39.pdf](C/Com%20Bio%20Res26,%2039.pdf)

Abstract: A nonlinear regression curve fitting package has been specifically developed for enzyme kinetic analyses for use on the Hewlett-Packard HP-85 microcomputer. Data are entered in a conversational manner. Data can be changed, deleted or added, and data sets can be stored and retrieved from a magnetic tape cassette. Data can be fit to any of nine models: the Michaelis-Menten equation, substrate inhibition, random bi bi, ordered bi bi, ping pong bi bi, competitive inhibition, classical noncompetitive inhibition, modern noncompetitive inhibition, or uncompetitive inhibition. The printout for each model consists of several goodness-of-fit statistics, the parameter estimates with 95% confidence intervals, the variance-covariance, and correlation matrices, a residual analysis, and graphs. For example, for competitive inhibition the graphs provided are v vs [S], v vs [I], 1/*v* vs 1/[*S*], and 1/*v* vs [I] with up to four concentrations of the second compound plotted on each graph. The nonlinear regression algorithm in the package is that of Marquardt. The values determined by ROSFIT are essentially the same as those found using the BMDPAR, BMDP3R, and NONLIN programs on a Univac 90/60 mainframe computer. A typical run for competitive inhibition with 46 data points took a total time of about 18.5 min, not including dat entry time, 14 min for the graph generation, 2 min for the three required iterations, and 2.5 min for miscellaneous operations.

Pao, M.L. (1993), Perusing the Literature via Citation Links. *Computers and Biomedical Research*, **26** (2), 143-156.

Full Text: [C\Com Bio Res26, 143.pdf](C/Com%20Bio%20Res26,%20143.pdf)

Abstract: While MEDLINE searching is recognized as the single most effective means to identify relevant items to solve clinical and research problems, the clinician should also consider the complementary strategy to search for relevant items citing a known key paper. This study reports on the usefulness of citation searching based on the analysis of 89 searches. For each topic, the citations linked to an average of 24% additional relevant materials. At least one relevant item was added to 85% of the searches. The additional effort of scanning another printout is minimal since citation searching for 42% of the searches produced less than 7 additional items, half of which were judged to he useful. Duplicate retrievals were mostly of definite relevance. This alternate strategy appeared to be effective in interdisciplinary topics. Furthermore, the online version of the citation index is known for short turnaround time in processing, a feature important for many rapidly developing specialties.

# Title: Computers & Chemical Engineering

Full Journal Title: [Computers & Chemical Engineering](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5235&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=93a5ecc5d3aebf0fbae75eee462bafb7)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Kaczmarski, K., Mazzotti, M., Storti, G. and Morbidelli, M. (1997), Modeling fixed-bed adsorption columns through orthogonal collocations on moving finite elements. *Computers & Chemical Engineering*, **21** (6), 641-660.

Full Text: [C\Com Che Eng21, 641.pdf](C/Com%20Che%20Eng21,%20641.pdf)

Abstract: An orthogonal collocation method based on moving finite elements has been developed for simulating fixed-bed adsorbers. The movement of the grid is calculated explicity before starting the integration of the discretized equations, using the results of the Equilibrium Theory for wave transitions and the shock layer theory for shock transitions. The performance of the developed moving grid technique has been extensively compared with that of the corresponding techniques based on a fixed discretization grid. Substantial improvements both in computational time as well as in accuracy of the obtained solutions have been found in all cases.

Keywords**:** Adsorption, Finite Element Method, Integration, Computational Methods, Mathematical Models, Fixed Bed Adsorption Columns, Orthogonal Collocation Method, Equilibrium Theory, Shock Layer Theory, Moving Grid Technique

# Title: Computers & Chemistry

Full Journal Title: Computers & Chemistry

ISO Abbreviated Title: Comput. Chem.

JCR Abbreviated Title: Comput Chem

ISSN: 0097-8485

Issues/Year: 5

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:

Chemistry, Multidisciplinary: Impact Factor 0.926, / (2000)

Computer Science, Interdisciplinary: Impact Factor 0.926, / (2000)

Applications: Impact Factor 0.926, / (2000)

? Aranovich, G.L. and Donohue, M.D. (1998), A simple numerical algorithm for solution of non-linear equations with multiple roots. *Computers & Chemistry*, **22** (5), 429-432.

Abstract: A new algorithm is proposed to calculate the behavior of non-linear equations with multiple solutions. Use of this algorithm is demonstrated by calculation of compositions in an adsorbed layer for a vapor that exhibits two-dimensional condensation.

# Title: Computers & Industrial Engineering

Full Journal Title: Computers & Industrial Engineering

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Kadidal, M. and Bidanda, B. (1993), A castability expert system. *Computers & Industrial Engineering*, **25** (1-4), 99-102.

Full Text: [C\Com Ind Eng25, 99.pdf](C/Com%20Ind%20Eng25,%2099.pdf)

Abstract: The castability analysis of a part, its cost estimation and preparation of competitive quotations typically requires years of experience, is time consuming and is dependent on the expert personnel available. Considerable amount of personnel time is also involved in preparing these quotations. An expert system is ideally suited for this application as it can automate the castability analysis and the quotation preparation process. This will not only substantially improve productivity and consistency, but also the accuracy of the process. This paper describes the development and implementation of an expert system for a typical medium sized company, which receives approximately thousand requests for quotations every year. A Castability Expert System apart from reducing time and increasing accuracy, will enable people with little experience to analyze the part, estimate cost and prepare quotations without the assistance of an expert, whose time can be better utilized in other areas.

? Morris, S., De Yong, C., Wu, Z., Salman, S. and Yemenu, D. (2002), DIVA: A visualization system for exploring document databases for technology forecasting. *Computers & Industrial Engineering*, **43** (4), 841-862.

Full Text: [2002\Com Ind Eng43, 841.pdf](2002/Com%20Ind%20Eng43,%20841.pdf)

Abstract: Database Information Visualization and Analysis system (DIVA) is a computer program that helps perform bibliometric analysis of collections of scientific literature and patents for technology forecasting. Documents, drawn from the technological field of interest, are visualized as clusters on a two dimensional map, permitting exploration of the relationships among the documents and document clusters and also permitting derivation of summary data about each document cluster. Such information, when provided to subject matter experts performing a technology forecast, can yield insight into trends in the technological field of interest. This paper discusses the document visualization and analysis process: acquisition of documents, mapping documents, clustering, exploration of relationships, and generation of summary and trend information. Detailed discussion of DIVA exploration functions is presented and followed by an example of visualization and analysis of a set of documents about chemical sensors. (C) 2002 Published by Elsevier Science Ltd.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Chemical, Cluster, Clustering, Data, Databases, Experts, Field, Forecast, Forecasting, Functions, Generation, Information, Literature, Mapping, Patents, Scientific Literature, Technology, Trend, Trends, Visualization

# Title: Computer Networks

Full Journal Title: Computer Networks

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Levene, M., Fenner, T., Loizou, G. and Wheeldon, R. (2002), A stochastic model for the evolution of the Web. *Computer Networks*, **39** (3), 277-287.

Full Text: [C\Com Net39, 277.pdf](C/Com%20Net39,%20277.pdf)

Abstract: Recently several authors have proposed stochastic models of the growth of the Web graph that give rise to power-law distributions. These models are based on the notion of preferential attachment leading to the “rich get richer” phenomenon. However, these models fail to explain several distributions arising from empirical results, due to the fact that the predicted exponent is not consistent with the data. To address this problem, we extend the evolutionary model of the Web graph by including a non-preferential component, and we view the stochastic process in terms of an urn transfer model. By making this extension, we can now explain a wider variety of empirically discovered power-law distributions provided the exponent is greater than two. These include: the distribution of incoming links, the distribution of outgoing links, the distribution of pages in a Web site and the distribution of visitors to a Web site. A by-product of our results is a formal proof of the convergence of the standard stochastic model (first proposed by Simon).

Keywords: Lotka’s Law, Scale-Free Distribution

# Title: Computers & Structures

Full Journal Title: [Computers & Structures](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5696&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=7ff4173b3ec83ab6085485fac7889881)

ISO Abbreviated Title: Comput. Struct.

JCR Abbreviated Title: Comput Struct

ISSN: 0045-7949

Issues/Year: 32

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:

Computer Science, Interdisciplinary Applications: Impact Factor 0.418, / (2002)

Engineering, Civil: Impact Factor 0.418, / (2002)

Mackerle, J. (1997), Some remarks on progress with finite elements. *Computers & Structures*, **55** (6), 1101-1106.

Full Text: [1997\Com Str55, 1101.pdf](1997/Com%20Str55,%201101.pdf)

Abstract: Information is the most valuable but least valued tool that professionals have. The amount of data in science and technology grows so rapidly that broad-coverage compilations cannot be maintained but concentrate on the coverage of specialized topics. The volume of finite element literature in the form of books, conference proceedings and journal papers, as well as a number of developed finite element codes, has been growing at a prodigious rate. It is almost impossible to be up to date with all the relevant information. A bibliometric study is presented; the author takes the number of published papers on finite elements as a measure of the research activity in the field of finite element techniques and investigates some engineering fields/topics where these techniques have been/are used.

# Title: Comunicación y Sociedad

Full Journal Title: Comunicacion y Sociedad

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0214-0039

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Castillo, A. and Carreton, M.C. (2010), Research in communication. Bibliometric study in journals of communication in Spain. *Comunicación y Sociedad*, **23** (2), 289-327.

Full Text: [2010\Com Soc23, 289.pdf](2010/Com%20Soc23,%20289.pdf)

Abstract: Research into communication has already produced a considerable number of articles and texts which have examined the historical development and main doctrinal approaches, according to the different authors. However, bibliometric studies on research in scientific journals remain scarce. This article comprises an analysis of Spanish communication journals with the best impact factor ranking according to the impact factor quantification system established by INRECS (impact factor of Spanish Social Sciences journals). Ten journals with the highest impact factor in 2008 were analyzed with the aim of investigating the state of current research in Spain. Results indicate gender balance, an average of two researchers per article and a prevalence of quantitative studies.

Keywords: Analysis, Authors, Bibliometric, Bibliometric Studies, Communication, Consequences, Development, Gender, Impact, Impact Factor, Journals, Prevalence, Quantification, Ranking, Research, Science, Scientific Journals, Spain, State

# Title: Comunicar

Full Journal Title: Comunicar

ISO Abbreviated Title: Comunicar

JCR Abbreviated Title: Comunicar

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Repiso, R., Torres, D. and Delgado, E. (2011), Bibliometric and social network analysis applied to television dissertations presented in Spain (1976/2007). *Comunicar*, **19** (37), 151-159.

Full Text: [2011\Comunicar19, 151.pdf](2011/Comunicar19,%20151.pdf)

Abstract: This paper analyses the productive structure in Spanish television research. Data from theses about Spanish television which had been defended in this country over the period 1976/2007 was extracted. Two methodologies are used within this analysis: a bibliometric analysis and Social Network Analysis (SNA). Results show the production of theses by time period, university, these advisors and examination board members. The use of social networks leads us in the identification of notable academic groups operating in the present period as well as tendencies in the composition of the board in terms of university of origin and thesis advisor. There are 404 theses on television written in this period. The results indicate a general and constant increase in the number of theses, especially noticeable over the last 15 years. Regarding scientific production, the Complutense University of Madrid stands out as the most productive. The structural analysis shows that only the Complutense University of Madrid, the Autonomous University of Barcelona, University of Navarre and the University of La Laguna generate their own research groups. Professors shaping the Spanish research system for television are found through the analysis of social networks. Leading positions within the network structure are held by professors of communication from the Complutense University of Madrid and the Autonomous University of Barcelona.

Keywords: Analysis, Audiovisual Communication, Bibliometric, Bibliometric Analysis, Communication, Dissertations, Interdisciplinarity, Network, Professors, Research, Scientific Production, Social, Social Network, Social Networks, Spain, Television, Thesis, University

# Title: Conduction of Heat in Solids

The Clarendon Press, Oxford

? Carslaw, H.S. and Jaeger, J.C. (1959), *Conduction of Heat in Solids*. The Clarendon Press, Oxford.

# Title: Conference on Environmental Pollution and Public Health

Full Journal Title: Conference on Environmental Pollution and Public Health

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yang, H.F., Dang, C.G. and Xiao, J.J. (2010), Steel slag as neutralization-adsorption material for treatment of acidic Cd2+-containing wastewater. *Conference on Environmental Pollution and Public Health*, **1-2**, 1203-1207.

Full Text: 2010\Con Env Pol Pub Hea1-2, 1203.pdf

Abstract: Treatment effect of acidic Cd(2+)-containing wastewater was investigated using steel slag as a water treatment material, and then mechanism of removal Cd(2+) was discussed. The results showed the treatment effect of steel slag on acidic wastewater with different Cd(2+) content was different, and the steel slag was a more suitable material for the treatment of acidic wastewater with low Cd(2+) content. Under treatment conditions of the slag size fraction of -0.5+0mm, slag concentration of 10 g.L(-1) and stirring speed of 120rpm, Cd(2+) content in acidic wastewater was reduced after treatment of steel slag for a period. Acidic wastewater with Cd(2+) content of 10 mg/L, Cd(2+) concentration was reduced to 0.02 mg/L after 90 minutes of treatment, with Cd(2+) content of 50 mg/L, reduced to 0.025 mg/L after 120 minutes and. with Cd(2+) content of 100 mg/L, reduced to 0.07 mg/L after 150 minutes. The Cd(2+) concentration and pH of filtrate after treatment reached integrated wastewater discharge standard (GB8978-1996). Removal of Cd(2+) in wastewater included three main processes: hydration reaction of active calcium silicate in steel slag production of Cd(OH)(2) precipitation in wastewater, deposition of Cd(OH)(2) on the surface of steel slag. Steel slag was a low cost material with the function of both neutralization and adsorption indeed.

Keywords: Acidic Wastewater, Adsorption, Aqueous-Solution, Calcium, Cd(2+), Making Slag, Mechanism, Neutralization, pH, Removal, Steel Slag, Treatment, Wastewater

# Title: Conference Record of the Thirty-First IEEE Photovoltaic Specialists Conference - 2005

Full Journal Title: Conference Record of the Thirty-First IEEE Photovoltaic Specialists Conference - 2005

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fthenakis, V.M., Alsema, E.A. and de Wild-Scholten, M.J. (2005), Life cycle assessment of photovoltaics: Perceptions, needs, and challenges. *Conference Record of the Thirty-First IEEE Photovoltaic Specialists Conference - 2005*, 1655-1658.

Abstract: High impact publications recently depicted PV technologies as having higher external environmental costs than those of nuclear energy and natural-gas-fueled power plants. These assessments are based on old data and unbalanced assumptions, and they illustrate the need for LCA data describing the continuously improving photovoltaic systems and the inclusion of social benefits in this comparison.

Keywords: Assessment, Energy, Module, Publications, Time

# Title: Conservation Biology

Full Journal Title: [Conservation Biology](http://www.blackwell-synergy.com/loi/cbi)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0888-8892

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Noss, R.F. (1990), Indicators for monitoring biodiversity - A hierarchical approach. *Conservation Biology*, **4** (4), 355-364.

Full Text: [1990\Con Bio4, 355.pdf](1990/Con%20Bio4,%20355.pdf)

Abstract: Biodiversity is presently a minor consideration in environmental policy. It has been regarded as too broad and vague a concept to be applied to real-world regulatory and management problems. This problem can be corrected if biodiversity is recognized as an end in itself, and if measurable indicators can be selected to assess the status of biodiversity over time. Biodiversity, as presently understood, encompasses multiple levels of biological organization. In this paper, I expand the three primary attributes of biodiversity recognized by Jerry Franklin - composition, structure, and function - into a nested hierarchy that incorporates elements of each attribute at four levels of organization: regional landscape, community-ecosystem, population-species, and genetic. Indicators of each attribute in terrestrial ecosystems, at the four levels of organization, are identified for environmental monitoring purposes. Projects to monitor biodiversity will benefit from a direct linkage to long-term ecological research and a commitment to test hypotheses relevant to biodiversity conservation. A general guideline is to proceed from the top down, beginning with a coarse-scale inventory of landscape pattern, vegetation, habitat structure, and species distributions, then overlaying data on stress levels to identify biologically significant areas at high risk of impoverishment. Intensive research and monitoring can be directed to high-risk ecosystems and elements of biodiversity, while less intensive monitoring is directed to the total landscape (or samples thereof). In any monitoring program, particular attention should be paid to specifying the questions that monitoring is intended to answer and validating the relationships between indicators and the components of biodiversity they represent.

Keywords: Approach, Biodiversity, Biodiversity Conservation, Biological, Commitment, Composition, Conservation, Data, Ecosystems, Environmental, Environmental Monitoring, Environmental Policy, Function, General, Genetic, Guideline, Habitat, Indicators, Inventory, Landscape, Landscape Pattern, Linkage, Long Term, Long-Term, Management, Minor, Monitoring, Monitoring Program, Nested, Organization, Pattern, Policy, Primary, Regional, Research, Risk, Species, Stress, Structure, Vegetation

Notes: highly cited

? Saunders, D.A., Hobbs, R.J. and Margules, C.R. (1991), Biological consequences of ecosystem fragmentation: A review. *Conservation Biology*, **5** (1), 18-32.

Full Text: [1991\Con Bio5, 18.pdf](1991/Con%20Bio5,%2018.pdf)

Abstract: Research on fragmented ecosystems has focused mostly on the biogeographic consequences of the creation of habitat “islands” of different sizes, and has provided little of practical value to managers. However, ecosystem fragmentation causes large changes in the physical environment as well as biogeographic changes. Fragmentation generally results in a landscape that consists of remnant areas of native vegetation surrounded by a matrix of agricultural or other developed land. As a result, fluxes of radiation, momentum (i.e., wind), water, and nutrients across the landscape are altered significantly. These in turn can have important influences on the biota within remnant areas, especially at or near the edge between the remnant and the surrounding matrix. The isolation of remnant areas by clearing also has important consequences for the biota. These consequences vary with the time since isolation, distance from other remnants, and degree of connectivity with other remnants. The influences of physical and biogeographic changes are modified by the size, shape, and position in the landscape of individual remnants, with larger remnants being less adversely affected by the fragmentation process. The dynamics of remnant areas are predominantly driven by factors arising in the surrounding landscape. Management of, and research on, fragmented ecosystems should be directed at understanding and controlling these external influences as much as at the biota of the remnants themselves. There is a strong need to develop an integrated approach to landscape management that places conservation reserves in the context of the overall landscape.

Keywords: Agricultural, Approach, Biota, Changes, Connectivity, Conservation, Context, Dynamics, Ecosystem, Ecosystems, Environment, Fluxes, Fragmentation, Habitat, Landscape, Management, Mar, Matrix, Modified, Nutrients, Physical, Radiation, Research, Size, Understanding, Value, Vegetation, Water

Notes: highly cited

? Pounds, J.A. and Crump, M.L. (1994), Amphibian declines and climate disturbance - The case of the golden toad and the harlequin frog. *Conservation Biology*, **8** (1), 72-85.

Full Text: [1994\Con Bio8, 72.pdf](1994/Con%20Bio8,%2072.pdf)

Abstract: The endemic golden toad (Bufo periglenes) was abundant in Costa Rica’s Monteverde Cloud Forest Preserve in April-May 1987 but afterwards disappeared, along with local populations of the harlequin frog (Atelopus varius). We examine the possible relationship between these sudden declines and unusually warm, dry conditions in 1987 For our analyses of local weather patterns, we define a 12-month (July-June) amphibian moisture-temperature cycle consisting of four periods: (1) late wet season; (2) transition into dry season; (3) dry season; and (4) post-dry-season (early-wet-season) recovery. The 1986-1987 cycle was the only one on record (of 20 analyzed) with abnormally low rainfall in all four periods, and temperature anomalies in 1987 reached record highs. Flow in local aquifer-fed streams during the dry season and post-dry-season recovery period reached a record low. This climate disturbance, associated with the 1986-1987 El Nino/Southern Oscillation, was more severe than a similar event associated with the 1982-1983 El Nino, though this earlier oscillation was the strongest of the past century. Demographic data for one harlequin frog population, gathered during these two climatic events, support the hypothesis that in 1987, shortly before the population collapsed, the frogs underwent an unprecedented shift in distribution within the habitat in response to desiccating conditions. The juxtaposition of these rare demographic events suggests they were causally linked yet sheds little light on mechanisms underlying the sudden decline. While desiccation or direct temperature effects may have been factors leading to high adult mortality, moisture-temperature conditions may have interacted with some other, unidentified agent. We discuss two hypotheses concerning possible synergistic effects. In the climate-linked epidemic hypothesis, microparasites are the additional agent In the climate-linked contaminant pulse hypothesis, atmospheric contaminants scavenged by mist and cloud water in montane areas reach critical concentrations when conditions are abnormally warm and dry.

? Bini, L.M., Diniz, J.A.F., Carvalho, P., Pinto, M.P. and Rangel, T.F.L.V. (2005), Lomborg and the litany of biodiversity crisis: What the peer-reviewed literature says. *Conservation Biology*, **19** (4), 1301-1305.

Full Text: [2005\Con Bio19, 1301.pdf](2005/Con%20Bio19,%201301.pdf)

Abstract: Lomborg’s (2001) book has generated passionate discussion about the state of the global environment. We performed a bibliometric evaluation of the peer-reviewed primary scientific. literature to determine whether there is any consistent evidence that “things are getting better.” The global literature primarily reported negative impacts on biodiversity caused by human actions, although Europe appeared to be doing better than the rest of the world. These results cannot be explained by publication bias alone because rejection rates of papers indicating improvements in the environment would have to be unrealistically high to change our results. There were nonrandom distributions of papers showing environmental recovery in developed countries and for ecosystems not strongly subjected to conservation-development conflicts. Although the literature did not paint a picture of universal gloom, the empirical evidence clearly showed growing environmental crises.

Keywords: Biodiversity, Environmental Crisis, Impact Factors, Journals, Population-Growth, Publication, Science, Skeptical-Environmentalist

? Harrison, A.L. (2006), Who’s who in *Conservation Biology* - An authorship analysis. *Conservation Biology*, **20** (3), 652-657.

Full Text: [2006\Con Bio20, 652.pdf](2006/Con%20Bio20,%20652.pdf)

Abstract: As the flagship journal of the field, Conservation Biology represents a multidisciplinary, global constituency of conservation professionals-a constituency composed of more than 5200 authors representing 1500 organizations and 89 countries. Using bibliometric records of research published in Conservation Biology, I evaluated trends in authorship of research papers from 1987 to 2005. Authorship diversified and became increasingly collaborative over time. North Americans now compose one-half of primary authorship, down from 75% in the 1990s, and European primary authors contribute a quarter of the journal’s contributed research. Forty-five countries were represented in volume 19 of the journal. The top three most-cited authors are Australian. The percentage of single-authored papers declined from 57% in 1987 to 18% in 2005. Collectively, academic institutions contribute the most research to Conservation Biology, although a government agency, the US. Department of Agriculture Forest Service, was the single most-productive organization. The maturing of conservation biology as a discipline, the complex geographic and multidisciplinary nature of conservation questions, and the increased ease of communication in a technologically connected world contribute to the increasingly diverse and collaborative Conservation Biology authorship.

Keywords: Academic, Analysis, Authorship, Biology, Communication, Complex, Conservation, Conservation Biology, Global, Institutions, Multidisciplinary, Organizations, Research, Trends, US

? Scott, J.M., Rachlow, J.L., Lackey, R.T., Pidgorna, A.B., Aycrigg, J.L., Feldman, G.R., Svancara, L.K., Rupp, D.A., Stanish, D.I. and Steinhorst, R.K. (2007), Policy advocacy in science: Prevalence, perspectives, and implications for conservation biologists. *Conservation Biology*, **21** (1), 29-35.

Full Text: [2007\Con Bio21, 29.pdf](2007/Con%20Bio21,%2029.pdf)

Keywords: Advocacy, Conservation, Science

? Godet, L., Zelnio, K.A. and Van Dover, C.L. (2011), Scientists as stakeholders in conservation of hydrothermal vents. *Conservation Biology*, **25** (2), 214-222.

Full Text: [2011\Con Bio25, 214.pdf](2011/Con%20Bio25,%20214.pdf)

Abstract: Hydrothermal vents are deep-sea ecosystems that are almost exclusively known and explored by scientists rather than the general public. Continuing scientific discoveries arising from study of hydrothermal vents are concommitant with the increased number of scientific cruises visiting and sampling vent ecosystems. Through a bibliometric analysis, we assessed the scientific value of hydrothermal vents relative to two of the most well-studied marine ecosystems, coral reefs and seagrass beds. Scientific literature on hydrothermal vents is abundant, of high impact, international, and interdisciplinary and is comparable in these regards with literature on coral reefs and seagrass beds. Scientists may affect hydrothermal vents because their activities are intense and spatially and temporally concentrated in these small systems. The potential for undesirable effects from scientific enterprise motivated the creation of a code of conduct for environmentally and scientifically benign use of hydrothermal vents for research. We surveyed scientists worldwide engaged in deep-sea research and found that scientists were aware of the code of conduct and thought it was relevant to conservation, but they did not feel informed or confident about the respect other researchers have for the code. Although this code may serve as a reminder of scientists’ environmental responsibilities, conservation of particular vents (e.g., closures to human activity, specific human management) may effectively ensure sustainable use of vent ecosystems for all stakeholders.

Keywords: Actividades Cientificas, Analysis, Bibliometric, Bibliometric Analysis, Code of Conduct, Conservation, Coral Reefs, Deep Sea, Ecosystems, Environmental, Fuentes Hidrotermales, General, Human, Hydrothermal Vents, Impact, Interdisciplinary, International, Knowledge Value, Literature, Management, Mar Profundo, Odigo de Conducta, Potential, Public, Research, Responsibilities, Sampling, Science, Scientific Activities, Small, Stakeholders, Sustainable, Systems, Valor de Conocimiento, Value

# Title: Contact Dermatitis

Full Journal Title: [Contact Dermatitis](http://www.blackwell-synergy.com/loi/cod); [Contact Dermatitis](http://www3.interscience.wiley.com/journal/117986410/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0105-1873

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Uter, W., Geier, J., Lessmann, H. and Hausen, B.M. (2001), Contact allergy to Disperse Blue 106 and Disperse Blue 124 in German and Austrian patients, 1995 to 1999. *Contact Dermatitis*, **44** (3), 173-177.

Full Text: [2001\Con Der44, 173.pdf](2001/Con%20Der44,%20173.pdf)

Abstract: Between 1995 and 1999, 1986 patients were tested in the 31 participating centres of the Information Network of Departments of Dermatology (IVDK), all of them members of the German Contact Dermatitis Research Group, with a textile dyes series containing Disperse Blue (DB) 106 and 124, and since 1997 also with a mix of both. 86 patients (4.3%) reacted positively to DB 106 and/or DB 124; with good concordance between the 2 allergens (Cohen’s weighted kappa 0.72), and the single allergens and the mix (kappa =0.75 in both cases), which had been tested in parallel in 969 and 975 patients, respectively. In contrast, concordance between DB 106/124 and p-phenylenediamine and p-aminoazobenzene, respectively, was poor. Some 70% of positive reactions to DB 106/124 had current clinical relevance. Furthermore, a significant increase in the proportion of DB 106/124-positive patients among those tested was found from 1995 to 1999. Hence, DB 106/124 are important allergens deserving close monitoring. The use of a mix of DB 106 and DB 124 seems justified in view of the close chemical similarity of both compounds. If possible, the presence of the allergen(s) in individual textiles considered causative should be checked by thin layer or column chromatography.

Keywords: Contact Allergy, Disperse Blue 106/124, Textile Dye Dermatitis, Clinical Epidemiology, Cross Reactivity, P-Phenylenediamine, P-Aminoazobenzene, Clothing, Occupational, Shoes, Textile Dyes, Azo Dyes, Dermatitis, Sensitization, Multicenter, IVDK

? Ezughah, F.I., Murdoch, S.R. and Finch, T.M. (2001), Occupational airborne allergic contact dermatitis from medium-density fibreboard containing phenol-formaldehyde resin-2 (PFR-2). *Contact Dermatitis*, **45** (4), 242.

Full Text: Con Der45, 242

Keywords: Occupational, Allergic Contact Dermatitis, Airborne, Fibreboard, Carpentry, Phenol-Formaldehyde Resin-2, Formaldehyde, Wood Dust

? Owen, C.M. and Beck, M.H. (2001), Occupational allergic contact dermatitis from phenol-formaldehyde resins, 1995 to 1999. *Contact Dermatitis*, **45** (5), 294-295.

Full Text: [2001\Con Der45, 294.pdf](2001/Con%20Der45,%20294.pdf)

Keywords: Occupational, Allergic Contact Dermatitis, Phenol-Formaldehyde Resins, Resol, Novolak

? Smith, D.R. (2008), Impact factors and contact dermatitis. *Contact Dermatitis*, **58** (4), 191-192.

Full Text: [2008\Con Der58, 191.pdf](2008/Con%20Der58,%20191.pdf)

? Smith, D.R. (2008), Bibliometrics, dermatology and contact dermatitis. *Contact Dermatitis*, **59** (3), 133-136.

Full Text: [2008\Con Der59, 133.pdf](2008/Con%20Der59,%20133.pdf)

Abstract: Although the fields of bibliometrics and citation analysis have existed for many years, relatively few studies have specifically focused on the dermatological literature. This article reviews citation-based research in the dermatology journals, with a particular interest in manuscripts that have included Contact Dermatitis as part of their analysis. Overall, it can be seen that the rise of bibliometrics during the mid-20th century and its subsequent application to dermatology has provided an interesting insight into the progression of research within our discipline. Further investigation of citation trends and top-cited papers in skin research periodicals would certainly help complement the current body of knowledge.

Keywords: Analysis, Articles, Authors, Bibliometrics, Citation, Citation Analysis, Citation Trends, Citation-Index, Contact Dermatitis, Dermatology, History, Impact Factor, Impact Factor, Journal Impact, Of-Investigative-Dermatology, Publications, Reference Accuracy, Relevance

? Smith, D.R. (2009), The continuing rise of contact dermatitis, Part 1: The academic discipline. *Contact Dermatitis*, **61** (4), 189-193.

Full Text: [2009\Con Der61, 189.pdf](2009/Con%20Der61,%20189.pdf)

Abstract: This article describes the history and development of contact dermatitis as an academic discipline, from early observations documented in ancient Egypt and Greece, to the current medical specialization we know today. Given its essential role in clinical diagnosis, the history of patch testing is also discussed, including the pioneering work of Stadeler, von Hebra, Jadassohn, and others. The historical development of some international societies for contact dermatitis is provided, along with some discussion on bibliometric performance in this field. Overall, it can be seen that from humble beginnings, contact dermatitis is now thriving as a specialized field in clinical dermatology.

Keywords: Bibliometric, Contact Dermatitis, Dermatology, Dermatology, Diagnosis, History, History, Impact Factors, Medical, Occupational-Medicine, Origins, Patch Testing

? Thyssen, J.P., Johansen, J.D., Linneberg, A. and Menne, T. (2010), The epidemiology of hand eczema in the general population - prevalence and main findings. *Contact Dermatitis*, **62** (2), 75-87.

Full Text: [2010\Con Der62, 75.pdf](2010/Con%20Der62,%2075.pdf)

Abstract: Numerous studies have investigated the prevalence and risk factors of hand eczema in the general population. These studies are of high value as they tend to be less biased than studies using clinical populations and as they are important for healthcare decision makers when they allocate resources. This study aimed to review the epidemiology of hand eczema in the general population. Literature was examined using PUBMED-Medline, Biosis, Science Citation Index, and dermatology text books. On the basis of studies performed between 1964 and 2007, the point prevalence of hand eczema was around 4%, the 1-year prevalence nearly 10%, whereas the lifetime prevalence reached 15%. Based on seven studies, the median incidence rate of hand eczema was 5.5 cases/1000 person-years (women = 9.6 and men = 4.0). A high incidence rate was associated with female sex, contact allergy, atopic dermatitis, and wet work. Atopic dermatitis was the single most important risk factor for hand eczema. Hand eczema resulted in medical consultations in 70%, sick leave (> 7 days) in about 20%, and job change in about 10%. Mean sick time was longer among those with allergic hand eczema than those with atopic and irritant hand eczema. Moderate to severe extension of hand eczema was the strongest risk factor for persistence of hand eczema. Other risk factors included early onset of hand eczema and childhood eczema. The aetiology of hand eczema is multifactorial and includes environmental as well as genetic factors. Future studies should focus on unresolved areas of hand eczema, for example, genetic predisposition.

Keywords: 15-Year Follow-Up, Atopic-Dermatitis, Books, Citation, Dermatology, Epidemiology, Filaggrin Mutations, General Population, Hand Dermatitis, Hand Eczema, Industrial-City, Irritant Contact-Dermatitis, Literature, Medical, Nickel Allergy, Nickel Allergy, Odense Adolescence Cohort, Public Health, Regulation, Review, Risk Factors, Science, Science Citation Index, Secondary-School Pupils, Skin Exposure, Swedish Population

# Title: Contemporary Clinical Trials

Full Journal Title: [Contemporary Clinical Trials](http://www.sciencedirect.com/science/journal/15517144)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rahman, M., Saito, M. and Fukui, T. (2005), Articles with high-grade evidence: Trend in the last decade. *Contemporary Clinical Trials*, **26** (4), 510-511.

Full Text: [2005\Con Cli Tri26, 510.pdf](2005/Con%20Cli%20Tri26,%20510.pdf)

Keywords: Evidence

? Dumville, J.C., Hahn, S., Miles, J.N.V. and Torgerson, D.J. (2006), The use of unequal randomisation ratios in clinical trials: A review. *Contemporary Clinical Trials*, **27** (1), 1-12.

Full Text: [2006\Con Cli Tri27, 1.pdf](2006/Con%20Cli%20Tri27,%201.pdf)

Abstract: Objective: To examine reasons given for the use of unequal randomisation in randomised controlled trials (RCTs). Main Measures: Setting of the trial; intervention being tested; randomisation ratio; sample size calculation; reason given for randomisation. Methods: Review of trials using unequal randomisation. Databases and sources: Cochrane library, Medline, Pub Med and Science Citation Index. Results: A total of 65 trials were identified; 56 were two-armed trials and nine trials had more than two arms. Of the two-arm trials, 50 trials recruited patients in favour of the experimental group. Various reasons for the use of unequal randomisation were given. Six studies stated that they used unequal randomisation to reduce the cost of the trial, with one screening trial limited by the availability of the intervention. Other reasons for using unequal allocation were: avoiding loss of power from drop-out or crossover, ethics and the gaining of additional information on the treatment. Thirty seven trials papers (57%) did not state why they had used unequal randomisation and only 14 trials (22%) appeared to have taken the unequal randomisation into account in their sample size calculation. Conclusion: Although unequal randomisation offers a number of advantages to trials the method is rarely used and is especially under-utilised to reduce trial costs. Unequal randomisation should be considered more in trial design especially where there are large differences between treatment costs. (c) 2005 Elsevier Inc. All rights reserved.

Keywords: Abdominal Hysterectomy, Alzheimers-Disease, Children, Chronic Hepatitis-C, Citation, Clinical Trials, Colorectal-Cancer, Combination Therapy, Costs, Databases, Double-Blind, Efficacy, Elsevier, Ethics, Hypertensive Patients, Intervention, Medline, Multicenter Trial, Randomised Controlled Trials, Review, Science, Science Citation Index, Screening, State, Treatment, Unequal Randomisation

? Schellings, R., Kessels, A.G., ter Riet, G., Knottnerus, J.A. and Sturmans, F. (2006), Randomized consent designs in randomized controlled trials: Systematic literature search. *Contemporary Clinical Trials*, **27** (4), 320-332.

Full Text: [2006\Con Cli Tri27, 320.pdf](2006/Con%20Cli%20Tri27,%20320.pdf)

Abstract: Background: Three types of randomized consent designs are distinguished and ranked according to the extent to which participants are informed about treatment options: single-consent (those in the experimental group learn about their assigned treatment), incomplete-double-consent (all participants learn about their assigned treatment), and complete-double-consent (all participants team about all treatments studied). All are methodologically, ethically, and judicially controversial. Even so, their use is justified if blinding is deemed necessary, but impossible to achieve by sham procedures (placebo), and experimental treatment seems attractive to potential participants. Objective: The aim of this study is to give a comprehensive overview of the use of randomized consent designs. Data sources are MEDLINE (1/1977-2/2003), EMBASE (1/1984-2/2003), PsycINFO (1/1996-2/2003), the Cochrane Library, and the Science Citation Index database. Review methods: Eligible were studies using a randomized consent design. Cluster randomized trials were excluded. One reviewer selected and data-extracted eligible papers. A second reviewer independently data-extracted 10% of the papers. Data on country of study conduct, year of commencement, area of medicine, type of design, reason(s) for use, details on approval by a research ethics committee, the index and reference intervention, nature of endpoints, and details on collection of data were extracted. Furthermore, for each trial, the rates of non-compliance and loss to follow-up were registered by treatment arm. The three types of randomized consent designs were compared as to differences between the rates of non-compliance and loss to follow-up in the separate trial arms. Results: Randomized consent designs are seldom used (n = 50). When used, they have often been used in the wrong circumstances (misuse). In 65% of the studies the non-compliance in the index group is larger than in the reference group. Contrary toexpectation, trials using the incomplete-double design were associated with significantly higher rates of non-compliance and loss to follow-up in the reference groups than trials employing the other two versions. Conclusion: Trialists and physicians should be aware of the proper indication for the use of randomized consent designs. (c) 2005 Elsevier Inc. All rights reserved.

Keywords: Active Rheumatoid-Arthritis, Advanced Breast-Cancer, Cancer Cooperative Group, Citation, Clinical-Trials, Collection, Colorectal-Cancer, Comparing Total Mastectomy, Consent, Country, Data, Database, Design, Ethics, Ethics Committee, Experimental, Experimental Treatment, Follow-up, Index, Indication, Informed Consent, Intervention, Literature, Medicine, Medline, Methods, Options, Papers, Patient Education, Physicians, Placebo, Postoperative Adjuvant Chemotherapy, Potential, Pre-Randomization, Primary-Care, Procedures, Prostate-Cancer, Psycinfo, Randomized, Randomized Consent Design, Randomized Controlled Trials, Rates, Reference, Research, Research Ethics, Review Research Ethics, Rights, Science, Science Citation Index, Sources, Systematic Literature Search, Treatment, Trial, Zelen Design

# Title: Contemporary Economic Policy

Full Journal Title: Contemporary Economic Policy

ISO Abbreviated Title: Contemp. Econ. Policy

JCR Abbreviated Title: Contemp Econ Policy

ISSN: 1074-3529

Issues/Year: 4

Journal Country/Territory: United States

Language: English

Publisher: Western Economic Assoc Int

Publisher Address: 7400 Center Ave Suite 109, Huntington Beach, CA 92647-3039

Subject Categories:

Economics: Impact Factor 0.303, (2001)

Public Administration: Impact Factor 0.303, (2001)

Yuen, C.W. (1998), The fifth Asian dragon: Sources of growth in Guangdong, 1979-1994. *Contemporary Economic Policy*, **16** (1), 1-11.

Full Text: [C\Con Eco Pol16, 1.pdf](C/Con%20Eco%20Pol16,%201.pdf)

Abstract: This paper presents a growth accounting exercise to uncover the sources of spectacular growth in the Guangdong Province in China, the so-called “Fifth Dragon” in Asia, for the post-open-door period 1979-1994. A large fraction of Guangdong’s output growth cannot be attributed to the growth in its capital and labor inputs. of the unexplained residuals, foreign direct investment is a significant growth-spurring engine while export expansion is not. In this sense, China’s open door policy did not generate export-led growth although it did stimulate capital accumulation through the importation of foreign capital.

# Title: Contemporary Educational Psychology

Full Journal Title: Contemporary Educational Psychology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Chambliss, M., Bong, M., Greene, B., Kauffman, D., Loyens, S. and Van Meter, P. (2010), Building trust by eliminating plagiarism: White paper from the AD HOC committee on plagiarism. *Contemporary Educational Psychology*, **35** (2), 103-107.

Keywords: Plagiarism

# Title: Contemporary Sociology-A Journal of Reviews

Full Journal Title: Contemporary Sociology-A Journal of Reviews

ISO Abbreviated Title: Contemp. Sociol.-J. Rev.

JCR Abbreviated Title: Contemp Sociol

ISSN: 0094-3061

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Amer Sociological Assoc

Publisher Address: 1307 New York Ave NW #700, Washington, DC 20005-4712

Subject Categories:

Sociology: Impact Factor 0.976, / (2000)

? Bolin, R. (1994), Community reconstruction after an earthquake: Dialectical sociology in action-Rossi, I. *Contemporary Sociology-A Journal of Reviews*, **23** (4), 505-507.

# Title: Context: Nature, Impact, and Role, Proceedings Lecture Notes in Computer Science

Full Journal Title: Context: Nature, Impact, and Role, Proceedings Lecture Notes in Computer Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0302-9743

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Skovvang, M., Elbaek, M.K. and Hertzum, M. (2005), Personometrics: Mapping and visualizing communication patterns in R&D projects. *Context: Nature, Impact, and Role, Proceedings Lecture Notes in Computer Science*, **3507**, 141-154.

Abstract: People such as R&D engineers rely on communication with their colleagues to acquire information, get trusted opinion, and as impetus for creative discourse. This study investigates the prospects of using bibliometric citation techniques for mapping and visualizing data about the oral communication patterns of a group of R&D engineers. Representatives of the R&D engineers find the resulting maps - we term them personometric maps rich in information about who knows what and potentially useful as tools for finding people with specific competences. Maps of old projects are seen as particularly useful because old projects are important entry points in searches for information and the maps retain information indicative of people’s competences, information that is otherwise not readily available. Face-to-face communications and communications via phone, email, and other systems are more ephemeral than scholarly citations, and (semi -)automated means of data collection are critical to practical application of personometric analyses.

Keywords: Science, Cocitation, Documents, Knowledge, Networks, Citation

? Schneider, J.W. and Borlund, P. (2005), A bibliometric-based semi-automatic approach to identification of candidate thesaurus terms: Parsing and filtering of noun phrases from citation contexts. *Context: Nature, Impact, and Role, Proceedings Lecture Notes in Computer Science*, **3507**, 226-237.

Abstract: The present study investigates the ability of a bibliometric based semi-automatic method to select candidate thesaurus terms from citation contexts. The method consists of document co-citation analysis, citation context analysis, and noun phrase parsing. The investigation is carried out within the specialty area of periodontology. The results clearly demonstrate that the method is able to select important candidate thesaurus terms within the chosen specialty area.

Keywords: Bibliometric, Citation, Co-Citation, Cocitation, Design, Documents

# Title: Continental Shelf Research

Full Journal Title: Continental Shelf Research

ISO Abbreviated Title: Cont. Shelf Res.

JCR Abbreviated Title: Cont Shelf Res

ISSN: 0278-4343

Issues/Year: 12

Journal Country/Territory: England

Language: English

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Oceanography: Impact Factor

Okey, T.A. (1997), Sediment flushing observations, earthquake slumping, and benthic community changes in Monterey Canyon head. *Continental Shelf Research*, **17** (8), 877-897.

Full Text: [C\Con She Res17, 877.pdf](C/Con%20She%20Res17,%20877.pdf)

Abstract: A large area of axis sediment (>500 m2) may be annually removed from the head of Monterey Submarine Canyon with the first onshore storm of the fall/winter storm season. In this scenario, flushing events are followed by accumulation of sediment and organic debris-especially macro-algae-in the shallow axis. Net accumulation of this fill material increases during the calmer spring and summer until the next fall-flushing. The benthic community at a canyon axis station was characterized by highly fluctuating populations of opportunistic polychaete worm; and gammarid amphipods, primarily Capitella s, Armandia brevis, and Orchomene pacifica. The canyon axis community was very different from communities living at two other stations where sudden flushing does not occur-an adjacent sloping-wall station and a sandflat station. Sloping-wall and sandflat stations harbored more and longer-lived species, larger individuals, and a less-variable population structure during a year of sampling. The Loma Prieta earthquake in the fall of 1989 triggered small sediment slumps on the canyon walls, but it did not trigger axis-flushing. The usual seasonal flushing of the axis occurred 2 weeks after the earthquake with the arrival of the first storm. Benthic communities were reduced in abundance inside earthquake-induced slumps; however, the slumped areas were rapidly colonized by Prionospio pygmaea, a polychaete opportunist common to the sandflat. Surprisingly, the physical and biological impacts of the earthquake were much less severe than the seasonal axis-Bushing associated with storms. Observations of sediment-flushing combined with measurements of benthic community changes in Monterey Canyon head represent a step towards an ecological model of mass wasting with implications for the continental shelf and slope and possibly the deep sea.

Tang, D.L., Ni, I.H., Müller-Karger, F.E. and Liu, Z.J. (1998), Analysis of annual and spatial patterns of CZCS-derived pigment concentration on the continental shelf of China. *Continental Shelf Research*, **18** (12), 1493-1515.

Full Text: [C\Con She Res18, 1493.pdf](C/Con%20She%20Res18,%201493.pdf)

Abstract: The combination of a population of more than 1.2 billion people in China, Taiwan and Hong Kong and recent rapid industrialization has placed a very heavy burden on the region’s coastal environment. Algal blooms and red tides pose a serious threat to public health. fisheries and the aquaculture industry. Consequently, a thorough examination of the temporal variations in phytoplankton pigment concentrations in coastal water on a large scale is necessary. This study examined the annual and geographic variations of pigment concentration on the continental shelf of China from 1978 to 1986. All the available Coastal Zone Color Scanner (CZCS) images (2139 scenes) from the Nimbus satellite were screened and examined. A total of nine annual composite images were generated. Annual average pigment concentrations were then examined for three transects along the shelf Significant geographic variation of pigment concentrations was revealed. A distinctive high concentration belt of about 50 km wide exists along the coastline of China, and a large plume of high pigment concentration was observed to extend nearly 500 km to the east from the Yangtze River. This plume merged with high pigment concentration water along the coast of the yellow Sea. A basin-wide gyre rotating clockwise appeared in the center of the Yellow Sea in 1986. Pigment concentrations were high in the Yellow Sea (about 1-2 mg m-3) and decreased seawards and southeastwards with a minimum value in the Philippine Sea (about 0.2 mg m-3). Interannual variation in the study area was also revealed. Annual pigment concentration reached a peak in 1981. Generally, annual pigment concentrations were relatively higher and more variable in the inner shelf and in the northern area whereas they were lower and less variable in the outer shelf and in the southeast region. (C) 1998 Elsevier Science Ltd. All rights reserved.

# Title: Continuum Mechanics and Thermodynamics

Full Journal Title: [Continuum Mechanics and Thermodynamics](http://www.springeronline.com/sgw/cda/frontpage/0,11855,5-175-70-1015307-0,00.html)

ISO Abbreviated Title: Continuum Mech. Thermodyn.

JCR Abbreviated Title: Continuum Mech Therm

ISSN: 0935-1175

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Springer-Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Thermodynamics: Impact Factor 0.870, / (2000)

Mechanics: Impact Factor 0.870, / (2000)

McKay, G. (2000), Double-diffusive convective motions for a saturated porous layer subject to modulated surface heating. *Continuum Mechanics and Thermodynamics*, **12** (1), 69-78.

Full Text: [C\Con Mec The12, 69.pdf](C/Con%20Mec%20The12,%2069.pdf)

Abstract: We examine convective motions in a horizontal porous layer saturated with a binary mixture. The effect of variable solar radiation heating is introduced by allowing the upper surface temperature of the region to vary sinusoidally with time. By modelling flow in the porous layer via Darcy’s law and carrying out a linear stability analysis using Floquet theory, we discuss the response of the velocity, temperature and solute fields at the onset of convection. It is shown that each type of instability (synchronous, subharmonic or at a frequency unrelated to the heating frequency) can be characterized by the behaviour of the vertical components of the perturbation fields. We demonstrate this by considering the time-dependent stationary points of the vertical components over several periods of heating. Phase shifts in the Galerkin coefficients for the temperature and solutal perturbations are also compared with theoretical predictions.

Keywords: Gravity Modulation, Fluid Mixture, Couette-Flow, Onset, Instability, Stability

# Title: Contrib Microbiol Immunol

(Contrib. Microbiol. Immunol.)

? Ohtomo, Y., Toyokawa, Y., Saito, M., Yamaguchi, M., Kaneko, S. and Maruyama, T. (1995), Epidemiology of Yersinia enterocolitica serovar O: 8 infection in the Tsugaru area in Japan. *Contrib Microbiol Immunol*, **13**, 48-50.

# Title: Control Engineering

Full Journal Title: Control Engineering

ISO Abbreviated Title: Control Eng.

JCR Abbreviated Title: Control Eng

ISSN: 0010-8049

Issues/Year: 13

Journal Country/Territory: United States

Language: English

Publisher: Cahners-Denver Publishing Co

Publisher Address: 2000 Clearwater Dr, Oak Brook, IL 60523-8809

Subject Categories:

Robotics & Automatic Control Engineering, Electrical & Electronic Instruments & Instrumentation: Impact Factor

Mandel, S.B. (1996), Continuous emission monitoring systems: An overview. *Control Engineering*, **43** (6), 47-48.

? Hoske, M.T. (2004), Top articles of 2003. *Control Engineering*, **51** (2), 31

Keywords: Articles

? Hoske, M.T. (2006), Top 10 articles of ‘05. *Control Engineering*, **53** (2), 33

Keywords: Articles

# Title: Control Engineering Practice

Full Journal Title: [Control Engineering Practice](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5703&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=83e802524bbb208e0732b57d057695ad)

ISO Abbreviated Title: Control Eng. Practice

JCR Abbreviated Title: Control Eng Pract

ISSN: 0967-0661

Issues/Year: 6

Journal Country/Territory: England

Language: English

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Robotics & Automatic Control Engineering, Electrical & Electronic: Impact Factor

Miyamoto, Y., Kurosaki, Y., Fujiyama, H. and Nanbu, E. (1998), Dynamic characteristic analysis and combustion control for a fluidized bed incinerator. *Control Engineering Practice*, **6** (9), 1159-1168.

Full Text: [C\Con Eng Pra6, 1159.pdf](C/Con%20Eng%20Pra6,%201159.pdf)

Abstract: Since thermal plants are multi-input, multi-output systems, it is important to capture the characteristics of the system for precise combustion control. Furthermore, in refuse incinerator plants (RIPs), the properties of the fuel are unstable, and minimization of the exhaust emissions is required. Thus, optimization of efficiency from an overall standpoint, including consideration of sensor and control technology, is required in RIPs. In particular, in comparison with stoker incinerators, the combustion cycle in fluidized bed incinerators (FBIs) is short, and combustion processes occur in multiple layers within the incinerator. As a result, analysis of the dynamic characteristics is considered most the effective way of grasping the characteristics of FBIs.

This paper has focused on an operating FBI, where a hybrid system consisting of fuzzy systems and neural networks has been realized, which assesses the fuel-feeding state on the basis of measured values and combustion image processing, and operates with low CO/NOx concentrations by means of air-fuel ratio control. Furthermore, a proposed tuning method for the fuzzy systems simplifies the evaluation of speculative results, and the determination of control rules, by the utilization of an operation support system based on a numerical model. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Fluidized Bed Incinerators, Combustion Control, Dynamic Characteristic Analysis, Fuzzy, Neural Networks, Low-CO Low-NOX Operation

# Title: Controlled Clinical Trials

Full Journal Title: Controlled Clinical Trials

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0197-2456

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? DerSimonian, R. and Laird, N. (1986), Meta-Analysis in clinical trials. *Controlled Clinical Trials*, **7** (3), 177-188.

Full Text: [1986\Con Cli Tri7, 177.pdf](1986/Con%20Cli%20Tri7,%20177.pdf)

Abstract: This paper examines eight published reviews each reporting results from several related trials. Each review pools the results from the relevant trials in order to evaluate the efficacy of a certain treatment for a specified medical condition. These reviews lack consistent assessment of homogeneity of treatment effect before pooling. We discuss a random effects approach to combining evidence from a series of experiments comparing two treatments. This approach incorporates the heterogeneity of effects in the analysis of the overall treatment efficacy. The model can be extended to include relevant covariates which would reduce the heterogeneity and allow for more specific therapeutic recommendations. We suggest a simple noniterative procedure for characterizing the distribution of treatment effects in a series of studies.

Keywords: Random Effects Model, Heterogeneity of Treatment Effects, Distribution of Treatment Effects, Covariate Information

Notes: highly cited

? Jadad, A.R., Moore, R.A., Carroll, D., Jenkinson, C., Reynolds, D.J.M., Gavaghan, D.J. and Mcquay, H.J. (1996), Assessing the quality of reports of randomized clinical trials: Is blinding necessary? *Controlled Clinical Trials*, **17** (1), 1-12.

Full Text: [1996\Con Cli Tri17, 1.pdf](1996/Con%20Cli%20Tri17,%201.pdf)

Abstract: It has been suggested that the quality of clinical trials should be assessed by blinded raters to limit the risk of introducing bias into meta-analyses and systematic reviews, and into the peer-review process. There is very little evidence in the literature to substantiate this. This study describes the development of an instrument to assess the quality of reports of randomized clinical trials (RCTs) in pain research and its use to determine the effect of rater blinding on the assessments of quality. A multidisciplinary panel of six judges produced an initial version of the instrument. Fourteen raters from three different backgrounds assessed the quality of 36 research reports in pain research, selected from three different samples. Seven were allocated randomly to perform the assessments under blind conditions. The final version of the instrument included three items. These items were scored consistently by all the raters regardless of background and could discriminate between reports from the different samples. Blind assessments produced significantly lower and more consistent scores than open assessments. The implications of this finding for systematic reviews, meta-analytic research and the peer-review process are discussed.

Keywords: Articles, Bias, Clinical Trials, Development, Health Technology Assessment, Literature, Meta-Analysis, Metaanalysis, Pain, Peer Review, Peer-Review, Quality, Randomized Clinical Trials, Randomized Controlled Trials, Research, Risk, Systematic, Systematic Reviews

? Anderson, G., Cummings, S., Freedman, L.S., Furberg, C., Henderson, M., Johnson, S.R., Kuller, L., Manson, J., Oberman, A., Prentice, R.L. and Rossouw, J.E. (1998), Design of the women’s health initiative clinical trial and observational study. *Controlled Clinical Trials*, **19** (1), 61-109.

Abstract: The Women’s Health Initiative (WHI) is a large and complex clinical investigation of strategies for the prevention and control of Some of the most common causes of morbidity and mortality among postmenopausal women, including cancer, cardiovascular disease, and osteoporotic fractures. The WHI was initiated in 1992, with a planned completion date of 2007. Postmenopausal women ranging in age from 50 to 79 are enrolled at one of 40 WHI clinical centers nationwide into either a clinical trial (CT) that will include about 64, 500 women or an observational study (OS) that will include about 100,000 women. The CT is designed to allow randomized controlled evaluation of three distinct interventions: a low-fat eating pattern, hypothesized to prevent breast cancer and colorectal cancer and, secondarily, coronary heart disease; hormone replacement therapy, hypothesized to reduce the risk of coronary heart disease and other cardiovascular diseases and, secondarily, to reduce the risk of hip and other fractures, with increased breast cancer risk as a possible adverse outcome; and calcium and vitamin D supplementation, hypothesized to prevent hip fractures and, secondarily, other fractures and colorectal cancer.

Overall benefit-versus-risk assessment is a central focus in each of the three CT components. Women are screened for participation in one or both of the components-dietary modification (DM) or hormone replacement therapy (HRT)-of the CT, which will randomize 48,000 and 27, 500 women, respectively. Women who prove to be ineligible for, or who are unwilling to enroll in, these CT components are invited to enroll in the OS. At their 1-year anniversary of randomization, CT women are invited to be further randomized into the calcium and vitamin D (CaD) trial component, which is projected to include 45,000 women. The average follow-up for women in either CT or OS is approximately 9 years. Concerted efforts are made to enroll women of racial and ethnic minority groups, with a target of 20% of overall enrollment in both the CT and OS.

This article gives a brief description of the rationale for the interventions being studied in each of the CT components and for the inclusion of the OS component. Some detail is provided on specific study design choices, including eligibility criteria, recruitment strategy, and sample size, with attention to the partial factorial design of the CT. Some aspects of the CT monitoring approach are also outlined. The scientific and logistic complexity of the WHI implies particular leadership and management challenges. The WHI organization and committee structure employed to respond to these challenges is also briefly described. (C) Elsevier Science Inc. 1998.

Keywords: Calcium and Vitamin D Supplementation, Clinical Trial Monitoring, Cohort Study, Dietary Modification, Disease Prevention, Hormone Replacement Therapy, Partial Factorial Design, Post-Menopausal Women, Randomized Clinical Trial, Study Organization and Management, Trial Monitoring, Women’s Health, Estrogen Replacement Therapy, Coronary Heart-Disease, Low-Fat Diet, Breast-Cancer Mortality, Middle-Aged Women, Postmenopausal Women, Colon-Cancer, Vitamin-D, Elderly Women, Calcium Intake

# Title: Coordination Chemistry Reviews

Full Journal Title: [Coordination Chemistry Reviews](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5237&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=8133029f230a1cfa8477348caff05515)

ISO Abbreviated Title: Coord. Chem. Rev.

JCR Abbreviated Title: Coordin Chem Rev

ISSN: 0010-8545

Issues/Year: 10

Journal Country/Territory: Netherlands

Language: Multi-Language

Publisher: Elsevier Science SA

Publisher Address: Po Box 564, 1001 Lausanne, Switzerland

Subject Categories:

Chemistry, Inorganic & Nuclear: Impact Factor 3.763, / (2000)

Fanning, J.C. (2000), The chemical reduction of nitrate in aqueous solution. *Coordination Chemistry Reviews*, **199** (1), 159-179.

Full Text: [C\Coo Che Rev199, 159.pdf](C/Coo%20Che%20Rev199,%20159.pdf)

Abstract: The nitrate ion has high chemical stability, especially at low concentrations. Standard reduction potentials indicate that it should serve as an excellent oxidizing agent, but in order to react with suitable reducing agents to form elemental nitrogen or ammonia, special conditions, such as catalysts and high temperature and pressure, are required. A review of the literature on the chemical reduction of nitrate in aqueous systems has found about a hundred articles dealing with nitrate removal from such systems, with the majority having been published over the last decade. The reducing agents which have been examined to the greatest extent for acidic solution are formic acid, iron metal, methanol and the ammonium ion; while for basic solution aluminum, zinc and iron metals, iron(II), ammonia, hydrazine, glucose and hydrogen have been studied. (C) 2000 Elsevier Science S.A. All rights reserved.

Keywords: Nitrate, Nitrite, Ammonia, Chemical Reduction, Nitrogen, Aqueous Solution, Drinking-Water, Electrochemical Reduction, Hydrothermal Reactions, Ferrous Iron, Nitrite, Ammonia, Ions, Hydrogenation, Cadmium, Removal

? Nurchi, V.M. and Villaescusa, I. (2008), Agricultural biomasses as sorbents of some trace metals. *Coordination Chemistry Reviews*, **252** (10-11), 1178-1188.

Full Text: [2008\Coo Che Rev252, 1178.pdf](2008/Coo%20Che%20Rev252,%201178.pdf)

Abstract: The studies of sorption of six metal ions (Cd2+, Cu2+, Pb2+, Zn2+, Ni2+, Cr3+ and Cr(VI)) from by-products of agriculture are taken into account. The Langmuir q(max) values obtained with the use of different biomasses are evaluated and, in order to acquire comparable results, the necessity of using molar concentrations is stressed. The main effects of pH on sorption are estimated by considering both the behaviour of metal ions (hydrolysis and hydroxide precipitation) and the effect of pH on coordination, using a simulated example. Some considerations are made on the information that can be obtained using the most common isotherms and on the need to use chemical dimensions rather than weight in order to make comparison among various metal ions (since atomic weight differences deeply alter the significance of parameters in non-chemical units) and to predict the effects of competition between two (or more) of these for the same sorbent sites on the biomass surface. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Agricultural Biomasses, Metal Ions, Sorption, Isotherms, pH Effects, Occidentalis Hook-F, Black Gram Husk, Aqueous-Solutions, Heavy-Metals, Thermodynamic Parameters, Stability-Constants, Cassava Waste, Removal, Ions, Adsorption

# Title: Coporate Environmental Strategy

Cherry, J. and Weiler, E.D. (??), Using critical success factors in a responsible care management systems verification process. *Coporate Environmental Strategy*, **??**, 20-25.

# Title: Corporate Governance-An International Review

Full Journal Title: [Corporate Governance-An International Review](http://www3.interscience.wiley.com/journal/117967216/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Durisin, B. and Puzone, F. (2009), Maturation of Corporate Governance Research, 1993-2007: An assessment. *Corporate Governance-An International Review*, **17** (3), 266-291.

Full Text: [2009\Cor Gov- Int Rev17, 266.pdf](2009/Cor%20Gov-%20Int%20Rev17,%20266.pdf)

Abstract: Review This study seeks to investigate whether governance research in fact is a discipline or whether it is rather the subject of multi-disciplinary research. We map the intellectual structure of corporate governance research and its evolution from 1993-2007. Based on the analysis of more than 1,000 publications and 48,000 citations in Corporate Goverance: An International Review (CGIR) and other academic journals, our study identifies the most influential works, the dominant subfields, and their evolution. Our study assesses the maturation of corporate governance research as a discipline; it finds increasing sophistication, depth and rigor, and consistency in its intellectual structure. There is a large body of accumulated corporate governance research in the US, yet there is an empirical gap on cross-national studies in the literature. Furthermore, hardly any of the top cited works undertake their study in a cross-national setting. Thus, corporate governance research and CGIR in its quest to contribute to a global theory of corporate governance might benefit if articles have a cross-national methodological approach and empirical grounding in their research design and if articles explicitly aim at stating the theoretical underpinnings they draw on. Globalists find in CGIR an outlet addressing economics and finance (e.g., whether and how compensation or dismissal of CEOs is related to board characteristics), management (e.g., whether and how best practice codes adoption is related to board characteristics and performance), and accounting (e.g., whether and how earnings manipulations is related to board characteristics) issues globally.

Keywords: Analysis, Asian Financial Crisis, Bibliometrics, Board Composition, Citations, Co-Citation Analysis, Cocitation Analysis, Consumer Research, Corporate Governance, Earnings Management, Executive-Compensation, Firm Performance, Intellectual Structure, Journal Influence, Ownership Structure, Strategic-Management, US

# Title: Correspondance Mathématique et Physique

Full Journal Title: Correspondance Mathématique et Physique

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: MModel, LLogistic

? Verhulst, P.F. (1838), Notice sur la loi que la population suit dans son accroissement. *Correspondance Mathématique et Physique*, **10**, 113-121.

Full Text: [-1959\Cor Mat Phy10, 113.pdf](-1959/Cor%20Mat%20Phy10,%20113.pdf)

# Title: Corrosion

Full Journal Title: [Corrosion](http://proquest.umi.com/pqdweb?TS=0&JSEnabled=1&RQT=317&SK=2&ScQ=000026508&TS=1040455274)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bastidas, J.M., Pinilla, P., Polo, J.L. and Cano, E. (2002), Adsorption of benzotriazole on copper electrode surfaces in citric acid media. *Corrosion*, **58** (11), 922-931.

Abstract: The corrosion inhibition of copper in 0.001 M to 1.0 M citric acid (C6H8O7) solution by benzotriazole (BTA, C6H5N3) has. been investigated using gravimetric measurements. BTA was tested in concentrations from 1×106 M to 1×10-1 M at temperatures of 298, 308, 318, and 328 K. The inhibitor mechanism is discussed in terms of applicability of Langmuir, Frumkin, Hill-de Boer, Parsons, Damaskin-Parsons, Kastening-Holleck, Flory-Huggins, Dhar-Flory-Huggins, and Bockris-Swinkels isotherms. The best fit was obtained using the Frumkin isotherm model. A structural parameter, the projected molecular area of BTA, was calculated to elucidate inhibitor orientation in the adsorption process.

Keywords: Adsorption Isotherm, Benzotriazole, Citric Acid, Copper, Projected Molecular Area, Mild-Steel, Hydrochloric-Acid, Corrosion-Inhibitors, 2-Amino-5-Mercapto-1, 3, 4-Thiadiazole

# Title: Corrosion Prevention & Control

Full Journal Title: Corrosion Prevention & Control

ISO Abbreviated Title: Corrosion Prev. Control

JCR Abbreviated Title: Corros Prevent Control

ISSN: 0010-9371

Issues/Year: 6

Journal Country/Territory: England

Language: English

Publisher: Scientific Surveys Ltd

Publisher Address: Po Box 21, Beaconsfield, Bucks, England HP9 1NS

Subject Categories:

Metallurgy & Metallurgical Engineering: Impact Factor 0.125, / (2001)

? Badawy, W.A., Al-Kharafi, F.M. and Al-Hassan, E.Y. (1998), Inhibition of cadmium corrosion in acidic solutions using different alcohols. *Corrosion Prevention & Control*, **45** (5), 145-155.

Abstract: THE RATE of corrosion of cadmium in acidic solutions is relatively high. The inhibition of. the corrosion process taking place at the electrode/electrolyte interface was investigated. Different alcohols were used as corrosion inhibitors. The corrosion parameters in the alcohol-free free and alcohol-containing solutions were calculated from polarization and impedance measurements. The corrosion rate and corrosion resistance were found to depend on the chain: length of the alcohol molecule. The corrosion-inhibition efficiency increased as the length of the alkyl chain increased. The mechanism of the corrosion-inhibition process based on the adsorption of the alcohol molecules through their functional (OH) groups on the metal surface. The hydrophobic alkyl tails retard the direct attack of the corrosive medium on the metal. The alcohol molecules were physically adsorbed, and the adsorption process was found to obey the Freundlich isotherm, theta = KCn. The free energy of adsorption, Delta G(ads), depends on the alcohol used and-amounts to approx.7.86 kJmol-1 for n-propanol. X-ray photoelectron spectroscopy (XPS)and scanning-electron microscopy (SEM) were used to investigate the electrode surface before and after immersion in the different solutions. The results of surface analysis: are consistent with, the suggested corrosion-inhibition mechanism.

Keywords: Chloride Solution, Mechanism

# Title: Corrosion Reviews

Full Journal Title: [Corrosion Reviews](http://www.freundpublishing.com/Corrosion_Reviews/CorrPrev.htm)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0334-6005

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fang, D.J., Mao, X.H., Zhang, Y.M., Zhang, S.Y., Qiao, Y.J. and Gan, F.X. (2009), A bibliometric analysis of the global literature in the corrosion field from 1992 to 2007. *Corrosion Reviews*, **27** (6), 381-397.

Full Text: [2009\Cor Rev27, 381.pdf](2009/Cor%20Rev27,%20381.pdf)

Abstract: The corrosion field experienced a rapid growth in knowledge and innovations in the last decade. In this paper, a bibliometric analysis was applied to evaluate the global scientific production of corrosion papers (46,384 pieces) front 1992 to 2007 in all journals of all the subject categories of the Science Citation Index Expanded (SCIE) compiled by the Institute for Scientific Information (ISI), Philadelphia, USA. The analysis of the published Outputs showed that research on corrosion increased steadily over the past 16 years and the researchers from the EU, the USA and China contributed greatly to the rise in publications. Synthetically analyzing the information including international cooperation, subject category, distribution Of journals, document type, document language and author keywords, the development of corrosion research over the past 16 years has been visualized and several key findings were provided. This bibliometric method can help relevant researchers realize the panorama of global corrosion research, and establish the further research direction.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometrics, China, Citation, Corrosion, EU, Field, Global, Institute for Scientific Information, International Cooperation, ISI, Journals, Literature, Publications, Research, Research Trends, Researchers, Science, Science Citation Index, Scientific Production, USA

# Title: Corrosion Science

Full Journal Title: [Corrosion Science](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=0010938x)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Moretti, G. and Guidi, F. (2002), Tryptophan as copper corrosion inhibitor in 0.5 M aerated sulfuric acid. *Corrosion Science*, **44** (9), 1995-2011.

Full Text: [C\Cor Sci44, 1995.pdf](C/Cor%20Sci44,%201995.pdf)

Abstract: The use of Tryptophan (Trp) as a copper corrosion inhibitor was tested in 0.5 M aerated sulfuric acid (H2SO4) in the 20-50 degreesC temperature range. Its effectiveness was assessed through potentiodynamic (at 1 h, 72 h, 6 months), spectrophotometric (72 11 tests) and gravimetric (72 h tests) tests. At 20-50 degreesC (1 h tests) the Trp adsorption followed Bockris-Swinkels’ isotherm (x = 2). The Trp even underwent over time (six month) a photodegradation, but surprisingly enough this did not affect the inhibition percentage (IP) which was 80% for the solutions kept in the dark as well as those kept in light. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Tryptophan, Corrosion Inhibitors At Low Environmental Impact, Copper, Aerated Sulfuric Acid, Long-Time Tests, Stability Tests, Mild-Steel Corrosion, Chloride Solutions, Electrochemical-Behavior, Amino-Acids, H2SO4, Electrode, Indole, AHT

# Title: Cortex

Full Journal Title: Cortex

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0010-9452

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Masson Divisione Periodici, Milan

Publisher Address:

Subject Categories:

: Impact Factor 0.276, / (2000)

? Garfield, E. (2001), Interview with Eugene Garfield, Chairman Emeritus of the Institute for Scientific Information (ISI). *Cortex*, **37** (4), 575-577.

? Kostoff, R.N., Buchtel, H.A., Andrews, J. and Pfeil, K.M. (2005), The hidden structure of neuropsychology: Text mining of the journal Cortex: 1991-2001. *Cortex*, **41** (2), 103-115.

Full Text: [2005\Cortex41, 103.pdf](2005/Cortex41,%20103.pdf)

Abstract: Background: The stated mission of Cortex is “the study of the inter-relations of the nervous system and behavior, particularly as these are reflected in the effects of brain lesions on cognitive functions.” The purpose of this paper is to explore the relationship between the stated mission and the executed mission as reflected by the characteristics of papers published in Cortex. In addition, we examine whether the results and conclusions of an analysis of this kind are affected by the level of description of the published papers. Objectives: A) Identify characteristics of contributors to Cortex; B) Identify characteristics of those who cite Cortex; C) Identify recurring themes; D) Identify the relationships among the recurring themes; E) Compare recurring themes and determine their relationships to the mission of Cortex; F) Identify the sensitivity of these results to the level of description of the Cortex papers used as the source database. G) Compare Cortex characteristics with those of Neuropsychologia, another Europe-based international neuropsychology journal. Methods: Text mining (extraction of useful information from text) was used to generate the characteristics of the journal Cortex. Bibliometrics provided the Cortex contributor infrastructure (author, organization, country, citation distributions), and computational linguistics identified the recurring technical themes and their inter-relationships. Citation mining (the integration of citation bibliometrics and text mining) was used to profile the research user community. Four levels of published article description were compared for the analysis: Full Text, Abstract, Title, Keywords. Results and Conclusions: Highly cited documents were compared among Cortex, Neuropsychologia, and Brain, and a number of interesting parametric trends were observed. The characteristics of the papers that cite Cortex papers were examined, and some interesting insights were generated. Finally, the document clustering taxonomy showed that papers in y Cortex can be reasonably divided into four categories (papers in each category in parenthesis): Semantic Memory (151); Handedness (145): Amnesia (119); and Neglect (66). It is concluded that Cortex needs to take steps to attract a more diverse group of contributors outside its continental Western European base if it wishes to capture a greater share of seminal neuropsychology papers. Further investigation of the critical citation differences reported in the paper is recommended.

Keywords: Bibliometrics, Bibliometrics, Citation, Citation Mining, Computational Linguistics, Database Tomography, Document Clustering, Information, Information Technology, Journal, Neuropsychology, Research, Roadmaps, Set, Technical Intelligence, Text Mining

? Della Sala, S. and Crawford, J.R. (2007), A double dissociation between impact factor and cited half life. *Cortex*, **43** (2), 174-175.

Full Text: [2007\Cortex43, 174.pdf](2007/Cortex43,%20174.pdf)

Keywords: Half-Life, Impact, Impact Factor, Life

? Sala, S.D. and Brooks, J. (2008), Multi-authors’ self-citation: A further impact factor bias? *Cortex*, **44** (9), 1139-1145

Full Text: [2008\Cortex44, 1139.pdf](2008/Cortex44,%201139.pdf)

Keywords: Alzheimers Type Dementia, Brocas Area, Event-Related Potentials, Frontal-Lobe Lesions, Grapheme-Color Synaesthesia, Language Impairment, Posterior Parietal Cortex, Synesthetic Colors, Ventral Premotor Cortex, Williams-Syndrome

? Foley, J.A. and la Sala, S. (2010), The impact of self-citation. *Cortex*, **46** (6), 802-810.

Full Text: [2010\Cortex46, 802.pdf](2010/Cortex46,%20802.pdf)

Keywords: Alzheimers-Disease, Cerebral-Blood-Flow, Frontotemporal Degeneration, Left Intraparietal Sulcus, Mild Cognitive Impairment, of-Body Experiences, Parkinsons-Disease Patients, Semantic Dementia, Spatial Representations, Transcranial Magnetic Stimulation

? Brooks, J. and la Sala, S. (2010), Are special issue papers more cited? *Cortex*, **46** (8), 1060-1064

Full Text: [2010\Cortex46, 1060.pdf](2010/Cortex46,%201060.pdf)

Keywords: Alzheimers-Disease, Brain, Disconnection Syndromes, Frontotemporal Degeneration, Left Intraparietal Sulcus, Memory, Neglect, Papers, Spatial Representations, Transcranial Magnetic Stimulation, Unusual Experiences

# Title: Counseling Psychology

Full Journal Title: Counseling Psychology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Howard, G.S. and Curtin, T.D. (1993), Individual productivity and impact in *Counseling Psychology*. *Counseling Psychologist*, **21** (2), 288-302.

Abstract: Individual eminence in counseling psychology was examined through a textbook citation analysis conducted on four current textbooks and the three most recent Annual Review of Psychology chapters on counseling psychology. For the 223 leading authors in this textbook citation study, data on individual research productivity in psychology (from 1980 to 1990), and on a subset of eight journals of special importance for counseling psychology (also from 1980-1990) was obtained from the PsycLIT data base. An estimate of the scholarly impact of these authors was obtained from citation counts from the 1987 through 1990 volumes of the Social Sciences Citation Index.

Keywords: Analysis, Citation, Citation Analysis, Citation Counts, Data, Data Base, Impact, Journals, Productivity, Psychology, Research, Research Productivity, Scholarly Impact, Textbooks

# Title: Creativity Research Journal

Full Journal Title: Creativity Research Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Nemeth, C.J. and Goncalo, J.A. (2005), Creative collaborations from afar: The benefits of independent authors. *Creativity Research Journal*, **17** (1), 1-8.

Full Text: [2005\Cre Res J17, 1.pdf](2005/Cre%20Res%20J17,%201.pdf)

Abstract: The number of times that an article is cited has served as an indicator of both its creativity and impact. In this study, we investigated the relationship between citations and 2 very simple variables-the number of authors and the number of separate locations. Previous research, on balance, would support the notion that an increased number of collaborators would increase the quality of the product, at least to some asymptote. Research on the effect of separate locations is more sparse. Most work favors collaborations at the same locale, given a sharing of perspective and benefits in terms of coordination and motivation. However research from the minority influence literature documents the stimulating effects of independent and differing views, leading to the conclusion that independent locations would be an asset. Results from an analysis of 6 journals and 5,113 articles over a 10-year period show the benefit of both the number of authors and the number of independent locations. Journals also differed in their citation average, Psychological Review being cited significantly more often than any of the other 5 journals.

Keywords: Group-Size, Virtual Organization, Social Dilemmas, Communication, Decision, Personality, Perception, Psychology, Efficacy, Behavior

# Title: Crime and Justice: A Review of Research

Full Journal Title: Crime and Justice: A Review of Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cohn, E.G. and Farrington, D.P. (1996), Crime and justice and the criminal justice and criminology literature. *Crime and Justice: A Review of Research*, **20**, 265-300.

Abstract: The most-cited scholars in state-of-the-art literature reviews in general volumes of Crime and Justice: A Review of Research between 1986 and 1993 were significantly correlated with the most-cited scholars in three major American criminology journals, three major American criminal justice journals, and three international criminology journals between 1986 and 1990. There was also substantial overlap between the most-cited works in Crime and Justice and the most-cited crime and justice works in the Social Sciences Citation Index between 1979 and 1993. Concepts developed in criminal career research can be used to enrich citation analysis. The prevalence of citations (the number of different articles in which an author was cited) can be distinguished from the individual citation frequency (the average number of an author’s works cited whenever that author was cited). Mathematical models of citation careers can be developed.

Keywords: Analysis, Careers, Citation, Citation Analysis, Citation Frequency, Citations, Crime, General, International, Journals, Justice, Literature, Models, Prevalence, Research, Reviews

# Title: CRC Critical Reviews in Solid State and Materials Sciences

Full Journal Title: CRC [Critical Reviews in Solid State and Materials Sciences](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7022&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=ead901215f81eda3e48a1bcaaf99d407)

ISO Abbreviated Title:

JCR Abbreviated Title: Crc Crit Rev Sol St Mat Sci

ISSN: 0010-9452

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Masson Divisione Periodici, Milan

Publisher Address:

Subject Categories:

: Impact Factor 0.276, / (2000)

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# Title: Critical Care

Full Journal Title: Critical Care

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Brusselaers, N., Monstrey, S., Vogelaers, D., Hoste, E. and Blot, S. (2010), Severe burn injury in Europe: A systematic review of the incidence, etiology, morbidity, and mortality. *Critical Care*, **14** (5), Article Number: R188.

Full Text: [2010\Cri Car14, R188.pdf](2010/Cri%20Car14,%20R188.pdf)

Abstract: Introduction: Burn injury is a serious pathology, potentially leading to severe morbidity and significant mortality, but it also has a considerable health-economic impact. The aim of this study was to describe the European hospitalized population with severe burn injury, including the incidence, etiology, risk factors, mortality, and causes of death. Methods: The systematic literature search (1985 to 2009) involved PUBMED, the Web of Science, and the search engine Google. The reference lists and the Science Citation Index were used for hand searching (snowballing). Only studies dealing with epidemiologic issues (for example, incidence and outcome) as their major topic, on hospitalized populations with severe burn injury (in secondary and tertiary care) in Europe were included. Language restrictions were set on English, French, and Dutch. Results: The search led to 76 eligible studies, including more than 186,500 patients in total. The annual incidence of severe burns was 0.2 to 2.9/10,000 inhabitants with a decreasing trend in time. Almost 50% of patients were younger than 16 years, and similar to 60% were male patients. Flames, scalds, and contact burns were the most prevalent causes in the total population, but in children, scalds clearly dominated. Mortality was usually between 1.4% and 18% and is decreasing in time. Major risk factors for death were older age and a higher total percentage of burned surface area, as well as chronic diseases. (Multi) organ failure and sepsis were the most frequently reported causes of death. The main causes of early death (<48 hours) were burn shock and inhalation injury. Conclusions: Despite the lack of a large-scale European registration of burn injury, more epidemiologic information is available about the hospitalized population with severe burn injury than is generally presumed. National and international registration systems nevertheless remain necessary to allow better targeting of prevention campaigns and further improvement of cost-effectiveness in total burn care.

Keywords: 1083 Turkish Patients, Admissions, Childhood Burns, Children, Citation, Death, English, Epidemiologic Data, Europe, French, Language, Literature, Mortality, Pediatric Burns, Population, Prognostic Indexes, PUBMED, Retrospective Analysis, Risk-Factors, Science, Science Citation Index, Serious Burns, Surface Area, Systematic Review, Trend, Web of Science

# Title: Critical Care Medicine

Full Journal Title: [Critical Care Medicine](http://www.ccmjournal.com/pt/re/ccm/issuelist.htm;jsessionid=Lz2GK7xk7pbLD2qgYMK4x2TVJTnhnn111r2KSJjPJXvFFvdx1KQT!-966548442!181195628!8091!-1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0090-3493

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor 0.276, / (2000)

? Cronin, L., Cook, D.J., Carlet, J., Heyland, D.K., King, D., Lansang, M.A.D. and Fisher, C.J. (1995), Corticosteroid treatment for sepsis: A critical-appraisal and metaanalysis of the literature. *Critical Care Medicine*, **23** (8), 1430-1439.

Full Text: [1995\Cri Car Med23, 1430.pdf](1995/Cri%20Car%20Med23,%201430.pdf)

Abstract: Objective: To determine the effect of corticosteroid therapy on morbidity and mortality in patients with sepsis.

Data Sources: We searched for published and unpublished research using MEDLINE, EMBASE, and the Science Citation Index, manual searching of Index Medicus, citation review of relevant primary and review articles, personal files, and contact with primary investigators.

Study Selection: From a pool of 124 potentially relevant articles, duplicate independent review identified nine relevant, randomized, controlled trials of corticosteroid therapy in sepsis and septic shock among critically ill adults.

Data Extraction: In duplicate, independently, we abstracted key data on population, intervention, outcome, and methodologic quality of the randomized controlled trials.

Data Synthesis: Corticosteroids appear to increase mortality in patients with overwhelming infection (relative risk 1.13, 95% confidence interval 0.99 to 1.29), and have no beneficial effect in the subgroup of patients with septic shock (relative risk 1.07, 95% confidence interval 0.91 to 1.26). Studies with the highest methodologic quality scores also suggest a trend toward increased mortality overall (relative risk 1.10, 95% confidence interval 0.94 to 1.29). A similar trend was observed for patients with septic shock (relative risk 1.12, 95% confidence interval 0.95 to 1.32). No difference in secondary infection rates was demonstrated in corticosteroid-treated patients with sepsis or septic shock. However, there was a trend toward increased mortality from secondary infections in patients receiving corticosteroids (relative risk 1.70, 95% confidence interval 0.70 to 4.12). The occurrence rate of gastrointestinal bleeding was increased slightly in the treatment group (relative risk 1.17, 95% confidence interval 0.79 to 1.73).

Conclusions: Current evidence provides no support for the use of corticosteroids in patients with sepsis or septic shock, and suggests that their use may be harmful. These trials underscore the need for future methodologically rigorous trials evaluating new immune-modulating therapies in well-defined critically ill patients with overwhelming infection.

Keywords: Corticosteroids, Steroids, Sepsis, Septic Shock, Bacterial Infection, Critical Illness, Antiinflammatory Agents, Respiratory-Distress Syndrome, High-Dose Methylprednisolone, Controlled Clinical-Trial, Gram-Negative Sepsis, Septic Shock, Double-Blind, Monoclonal-Antibody, Bacterial-Infections, Endotoxin, Steroids

? Parrillo, J.E. (2005), Our Journal, *Critical Care Medicine*, in 2005: High impact factor, rapid manuscript review, growing submissions, and widespread distribution. *Critical Care Medicine*, **33** (5), 923-924.

Full Text: [2005\Cri Car Med33, 923.pdf](2005/Cri%20Car%20Med33,%20923.pdf)

Keywords: Distribution, Impact, Impact Factor, Review

? De-Souza, D.A. and Greene, L.J. (2005), Intestinal permeability and systemic infections in critically ill patients: Effect of glutamine. *Critical Care Medicine*, **33** (5), 1125-1135.

Full Text: [2005\Cri Car Med33, 1125.pdf](2005/Cri%20Car%20Med33,%201125.pdf)

Abstract: Objective: This article provides a critical review of the evidence indicating that an increase in intestinal permeability is associated with the installation of bacteremia, sepsis, and the multiple organ failure syndrome and that glutamine in pharmacologic doses reduces the acute increase of intestinal permeability and the infection frequency in critically ill patients. Data Source. All studies published until December 2004 about intestinal permeability, bacterial translocation, and glutamine were located by search of PUBMED and Web of Science. The reference lists of review articles and primary publications were also examined to identify references not detected in the computer search. Study Selection. Clinical and experimental studies investigating the correlation between intestinal permeability, bacterial translocation, and frequency of infections, associated or not with the effect of glutamine administration. Data Extraction: Information regarding patient population, experimental design, glutamine doses and routes of administration, nutritional therapy prescribed, methods used to assess intestinal permeability, metabolic variables, and the frequency of infections were obtained from the primary literature. Data Synthesis. Intestinal permeability is increased in critically ill patients. The results have not always been consistent, but the studies whose results support the association between intestinal permeability and systemic infections have had better design and more appropriate controls. The administration of glutamine by the intravenous or oral route and at the doses recommended before or immediately after surgery, burns, or the administration of parenteral nutrition has a protective effect that prevents or reduces the intensity of the increase in intestinal permeability. Glutamine reduces the frequency of systemic infections and may also reduce the translocation of intestinal bacteria and toxins, but this has not been demonstrated. Conclusions. Glutamine administration improves the prognosis of critically ill patients presumably by maintaining the physiologic intestinal barrier and by reducing the frequency of infections.

Keywords: Bacteria, Bacterial Translocation, Bacterial Translocation, Clostridium-Difficile Toxins, Critically Ill Patients, Extraction, Frequency, Gastric Intramucosal Ph, Glutamine, Gut Barrier Function, Increased Inos Activity, Infection, Intensive-Care Unit, Intestinal Permeability, Literature, Multiple Organ Failure Syndrome, Multiple-Organ Failure, Nutrition, Parenteral Nutrition, Permeability, Primary, Prognosis, Publications, Pubmed, Randomized Controlled-Trials, Review, Science, Supplemented Parenteral-Nutrition, Surgery, Systemic Infections, Therapy, Tight Junction Dysfunction, Web of Science

? Caples, S.M. and Gay, P.C. (2005), Noninvasive positive pressure ventilation in the intensive care unit: A concise review. *Critical Care Medicine*, **33** (11), 2651-2658.

Full Text: [2005\Cri Car Med33, 2651.pdf](2005/Cri%20Car%20Med33,%202651.pdf)

Abstract: Objective: To critically assess available high-level clinical studies regarding use of noninvasive positive pressure ventilation in varied intensive care unit settings. Data Source: Search of pertinent articles within Ovid MEDLINE from 1975 to 2005, CINAHL from 1982 to 2005, EMBASE from 1988 to 2005, and Web of Science from 1993 to 2005. Study Selection: Randomized, controlled clinical trials and cohort studies and observational studies the authors consider important or novel. Data Extraction/Synthesis: Performed equally by both authors with the use of an Excel data spreadsheet. Conclusion: There is abundant level I evidence supporting the use of noninvasive positive pressure ventilation in such critical care settings as acute hypercapnic respiratory failure, particularly related to chronic obstructive pulmonary disease, and acute cardiogenic pulmonary edema. We also report on other clinical scenarios in which the data may be somewhat less compelling, but evidence favors a noninvasive positive pressure ventilation trial. Some well designed studies suggest that noninvasive positive pressure ventilation is not an appropriate intervention for patients who have failed endotracheal extubation.

Keywords: Acute Exacerbations, Acute Respiratory Failure, Acute Respiratory-Failure, Airway Pressure, Authors, Cardiogenic Pulmonary-Edema, Chronic Obstructive Pulmonary Disease, Clinical Trials, Clinical-Trial, Cohort Studies, Controlled Clinical Trials, Conventional Mechanical Ventilation, Critical Care, Disease, Embase, Face Mask, Hypercapnic Respiratory Failure, Intensive Care, Intensive Care Unit, Intervention, Mechanical Ventilation, Medline, Nasal Ventilation, Noninvasive Positive Pressure Ventilation, Observational Studies, Positive Airway Pressure, Pressure, Randomized Controlled-Trial, Review, Science, Support Ventilation, Web of Science

? Hockenhull, J.C., Dwan, K.M., Smith, G.W., Gamble, C.L., Boland, A., Walley, T.J. and Dickson, R.C. (2009), The clinical effectiveness of central venous catheters treated with anti-infective agents in preventing catheter-related bloodstream infections: A systematic review. *Critical Care Medicine*, **37** (2), 702-712.

Full Text: [2009\Cri Car Med37, 702.pdf](2009/Cri%20Car%20Med37,%20702.pdf)

Abstract: Objectives. To assess the clinical effectiveness of central venous catheters (CVCs) treated with anti-infective agents (AI-CVCs) in preventing catheter-related bloodstream infections (CRBSI). Data Sources. MEDLINE (OVID), EMBASE, SCI//Web of Science, SCI/ISI Proceedings, and the Cochrane Library. Study Selection: A systematic review of the literature was conducted using internationally recognized methodology. All included articles were reports of randomized controlled trials comparing the clinical effectiveness of CVCs treated with AI-CVCs with either standard CVCs or another anti-infective treated catheter. Articles requiring in-house preparation of catheters or that only reported interim data were excluded. Data Extraction, Data extraction was carried out independently and crosschecked by two reviewers using a pretested data extraction form. Data Synthesis: Meta-analyses were conducted to assess the effectiveness of AI-CVCs in preventing CRBSI, compared with standard CVCs. Results are presented in forest plots with 95% confidence intervals. Results: Thirty-eight randomized controlled trials met the inclusion criteria. Methodologic quality was generally poor. Metaanalyses of data from 27 trials assessing CRBSI showed a strong treatment effect in favor of AI-CVCs (odds ratio 0.49 (95% confidence interval 0.37-0.64) fixed effects, test for heterogeneity, chi-square = 28.78, df = 26, p = 0.321, I(2) = 9.7). Results subgrouped by the different types of anti-infective treatments generally demonstrated treatment effects favoring the treated catheters. Sensitivity analyses investigating the effects of methodologic differences showed no differences to the overall conclusions of the primary analysis. Conclusion: Al-CVCs appear to be effective in reducing CRBSI compared with standard CVCs. However, it is important to establish whether this effect remains in settings where infectionprevention bundles of care are established as routine practice. This review does not address this question and further research is required. (Crit Care Med 2009; 37:702-712).

Keywords: Analysis, Anti-Infective Agents, Antiseptic-Impregnated Catheters, Articles, Bacterial-Colonization, Benzalkonium Chloride, Cancer-Patients, Care, Catheterization, Central Venous, Clinical Effectiveness, Coated Catheter, Cochrane, Confidence Intervals, Critically-Ill Patients, Double-Blind, Effectiveness, Embase, Extraction, Infection, Infection Control, Intensive-Care-Unit, Literature, Medline, Methodology, Practice, Preparation, Primary, Randomized Controlled Trials, Randomized Controlled-Trial, Ratio, Research, Review, Review [Publication Type], Science, Silver-Sulfadiazine, Sources, Systematic, Systematic Review, Treatment, Treatment Outcome

? Melsen, W.G., Rovers, M.M. and Bonten, M.J.M. (2009), Ventilator-associated pneumonia and mortality: A systematic review of observational studies. *Critical Care Medicine*, **37** (10), 2709-2718.

Full Text: [2009\Cri Car Med37, 2709.pdf](2009/Cri%20Car%20Med37,%202709.pdf)

Abstract: Objective., To determine the attributable mortality of ventilator-associated pneumonia in a systematic review and meta-analysis of observational studies. Ventilator-associated pneumonia is generally believed to increase the mortality of patients. This notion is predominantly based on the results of observational studies. Data Source. We performed a systematic search strategy using PUBMED, Web of Science, and EMBASE from their inception through February 2007. In addition, a reference and related article search was performed. Study Selection. Studies were included if they reported mortality rates of patients with and without ventilator-associated pneumonia. Data Extraction and Synthesis. Fifty-two studies with a total of 17,347 patients met the inclusion criteria. Pooling of all studies resulted in relative risk of 1.27 (95% Confidence Interval = 1.15-1.39), but heterogeneity was considerable (12 statistic = 69%). The origin of heterogeneity could not be explained by differences in study design, study quality, and diagnostic approach. However, heterogeneity was limited for studies investigating only trauma patients (I(2) = 1.3%) or patients with acute respiratory distress syndrome (I(2) = 0%), with estimated relative risk of 1.09 (95% Confidence Interval = 0.87-1.37) among trauma patients and 0.86 (95% Confidence Interval = 0.72-1.04) among patients with acute respiratory distress syndrome. Conclusions: There is no evidence of attributable mortality due to ventilator-associated pneumonia in patients with trauma or acute respiratory distress syndrome. However, in other nonspecified patient groups, there is evidence for attributable mortality due to ventilator-associated pneumonia, but this could not be quantified due to heterogeneity in study results. More detailed studies, allowing subgroup analyses, are needed to determine the attributable mortality of ventilator-associated pneumonia in these patient populations. (Crit Care Med 2009; 37:2709-2718).

Keywords: Adult Patients, Care, Developing-Country, Distress, Double-Blind, Extraction, Intensive Care, Intensive-Care-Unit, Mechanical Ventilation, Mechanical Ventilation, Meta-Analysis, Mortality, Multiple Trauma Patients, Nosocomial Pneumonia, Nosocomial Pneumonia, Observational Studies, Outcome, Pubmed, Relative Risk, Respiratory-Distress-Syndrome, Review, Risk, Risk-Factors, Science, Selective Decontamination, Strategy, Systematic, Systematic Review, Trauma, Web of Science

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Full Text: [2010\Cri Car Med38, 2386.pdf](2010/Cri%20Car%20Med38,%202386.pdf)

Abstract: Objectives: To evaluate quality of life at least 12 months after discharge from the intensive care unit of adult critically ill patients, to evaluate the methodology used to assess long-term quality of life, and to give an overview of factors influencing quality of life. Data Sources: EMBASE-PUBMED, MEDLINE (OVID), SCI/Web of Science, the Cochrane Library, Google Scholar, and personal files. Data Extraction: Data extraction was performed independently and cross-checked by two reviewers using a predefined data extraction form. Eligible studies were published between 1999 and 2009 and assessed quality of life >= 12 months after intensive care unit discharge by means of the Medical Outcomes Study 36-Item Short Form Health Survey, the RAND 36-Item Health Survey, EuroQol-5D, and/or the Nottingham Health Profile in adult intensive care unit patients. Data Synthesis: Fifty-three articles (10 multicenters) were included, with the majority of studies performed in Europe (68%). The Medical Outcomes Study 36-Item Short Form Health Survey was used in 55%, and the EuroQol-5D, the Nottingham Health Profile, the RAND 36-Item Health Survey, or a combination was used in 21%, 9%, 8%, or 8%, respectively. A response rate of >= 80% was attained in 26 studies (49%). Critically ill patients had a lower quality of life than an age-and gender-matched population, but quality of life tended to improve over years. The worst reductions in quality of life were seen in cases of severe acute respiratory distress syndrome, prolonged mechanical ventilation, severe trauma, and severe sepsis. Study quality criteria, defined as a baseline quality of life assessment, the absence of major exclusion criteria, a description of nonresponders, and a comparison with a reference population were met in only four studies (8%). Results concerning the influence of severity of illness, comorbidity, preadmission quality of life, age, gender, or acquired complications were conflicting. Conclusions: Quality of life differed on diagnostic category but, overall, critically ill patients had a lower quality of life than an age-and gender-matched population. A minority of studies met the predefined methodologic quality criteria. Results concerning the influence of the patients’ characteristics and illnesses on long-term quality of life were conflicting. (Crit Care Med 2010; 38:2386-2400).

Keywords: Acute-Pancreatitis, Adult, Assessment, Care, Cochrane, Comorbidity, Critically Ill Patients, Critically-Ill Patients, Distress, Elderly-Patients, Europe, Extraction, Gender, Google Scholar, Health, Hospital Cardiac-Arrest, Intensive Care, Intensive Care Unit, Literature, Long-Term Outcome, Long-Term Survivors, Major Trauma, Mechanical Ventilation, Medline, Methodology, Nottingham Health Profile, Outcomes, Overview, Profile, Prolonged Mechanical Ventilation, Pulmonary-Function, Quality, Quality of Life, Respiratory-Distress-Syndrome, Review, Science, Sources, Systematic, Systematic Review, Trauma

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Full Text: [2011\Cri Car Med39, 1507.pdf](2011/Cri%20Car%20Med39,%201507.pdf)

Abstract: Objective: Early and aggressive treatment of trauma-associated coagulopathy through transfusion of high plasma to packed red blood cell ratios is gaining favor. Whether this strategy is associated with improved survival is unclear. We performed a systematic review to determine whether higher plasma to packed red blood cell ratios compared with lower plasma to packed red blood cell ratios were associated with a survival advantage. Data Sources: We searched electronic databases MEDLINE, EMBASE, and Web of Science from 1950 to February 2010 for studies comparing mortality in massively transfused trauma cohorts receiving different plasma to packed red blood cell ratios. Study Selection: Two reviewers independently performed study selection. Discrepancies in study selection were resolved by discussion and consensus. Data Extraction: Two reviewers independently extracted data from each study using a standardized form. Two authors independently assessed study quality using the Newcastle-Ottawa Scale. Data Synthesis: Eleven observational studies and no randomized controlled trials were identified. Three studies found a survival benefit with a 1: 1 plasma to packed red blood cell transfusion ratio compared with either higher or lower ratios. Six studies did not examine a 1: 1 ratio but concluded that higher plasma to packed red blood cell ratios improved survival. Secondary outcomes, including multiorgan system failure, packed red blood cell transfusion, respiratory outcomes, and coagulation variables, did not uniformly favor 1: 1 or higher plasma to packed red blood cell ratios. Conclusions: Methodological flaws, including survival bias, and heterogeneity between studies preclude statistical comparisons concerning the effects of a 1: 1 plasma to packed red blood cell transfusion ratio. There is insufficient evidence to support a survival advantage with a 1: 1 plasma to packed red blood cell transfusion strategy. Randomized controlled trials evaluating safety and efficacy are warranted before a high plasma to packed red blood cell transfusion ratio can be recommended. (Crit Care Med 2011; 39: 1507-1513).

Keywords: Activated Factor-VII, Authors, Bias, Blood, Care, Databases, Efficacy, Extraction, Fresh-Frozen Plasma, Hypothermia, Impact, Life-Threatening Coagulopathy, Management, Massive Transfusion, Medline, Mortality, Observational Studies, Outcomes, Packed Red Blood Cells, Plasma, Products, Randomized Controlled Trials, Ratio, Resuscitation, Review, Safety, Scale, Science, Sources, Statistical, Strategy, Survival, Systematic, Systematic Review, Trauma, Treatment, Web of Science

? Melsen, W.G., Rovers, M.M., Koeman, M. and Bonten, M.J.M. (2011), Estimating the attributable mortality of ventilator-associated pneumonia from randomized prevention studies. *Critical Care Medicine*, **39** (12), 2736-2742.

Full Text: [2011\Cri Car Med39, 2736.pdf](2011/Cri%20Car%20Med39,%202736.pdf)

Abstract: Objective: To assess the attributable mortality of ventilator-associated pneumonia using results from randomized controlled trials on ventilator-associated pneumonia prevention. Data Sources: A systematic search was performed in PubMed, Embase, Web of Science, and Cochrane Library from their inception until July 2010. In addition, a reference and related article search was performed. Study Selection: Randomized ventilator-associated pneumonia prevention studies in which all patients were mechanically ventilated and from which ventilator-associated pneumonia and mortality rates of intervention and control group could be extracted were included. Data Extraction/Synthesis: Fifty-three papers were identified describing 58 comparisons. Statistical significant reductions in ventilator-associated pneumonia incidences were reported in 20 of the 58 comparisons, whereas none of these trials reported a significant reduction of mortality. Pooled estimates of the relative risk reductions of both ventilator-associated pneumonia and mortality were calculated and the attributable mortality was estimated as the ratio between the relative risk reductions of mortality and ventilator-associated pneumonia. Effects of study quality, diagnostic methods used, and effectiveness of preventing ventilator-associated pneumonia on the mortality rate of ventilator-associated pneumonia were assessed in subgroup analyses. The overall attributable mortality of ventilator-associated pneumonia was estimated as 9%. In subgroup analyses, the attributable mortality varied between 3% and 17%. Conclusion: Based on the results of 58 randomized studies on ventilator-associated pneumonia prevention, the attributable mortality rate of ventilator-associated pneumonia was estimated to be 9% and ranged between 3% and 17% in subgroup analyses. Together with the results of other recent studies, there is cumulative evidence that the attributable mortality resulting from ventilator-associated pneumonia is approximately 10%. (Crit Care Med 2011; 39:2736-2742).

Keywords: Care, Cochrane, Control, Critically-Ill Patients, Double-Blind, Effectiveness, Intensive Care, Intensive-Care-Unit, Intervention, Intubated Patients, Mechanical Ventilation, Meta-Analysis, Mortality, Nosocomial Pneumonia, Nosocomial Pneumonia, Outcome, Papers, Patients, Placebo-Controlled Trial, Pneumonia, Prevention, Pubmed, Quality, Randomized Controlled Trials, Ratio, Reduction, Relative Risk, Risk, Science, Selection, Selective Digestive Decontamination, Sources, Stress-Ulcer Prophylaxis, Subglottic Secretion Drainage, Systematic, Trauma Patients, Web of Science

# Title: [Critical Perspectives on International Business](http://www.scopus.com/scopus/source/sourceInfo.url?sourceId=f9c3c4f13dd46a544f45494fbd3b7fbb)

Full Journal Title: [Critical Perspectives on International Business](http://www.scopus.com/scopus/source/sourceInfo.url?sourceId=f9c3c4f13dd46a544f45494fbd3b7fbb)

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: Purpose - The purpose of this paper is to explore the production of management knowledge in Argentina. Design/methodology/approach - Based on a qualitative research strategy that draws on one of the authors’ participant observation in the field of Argentine management education, selected data from Argentine universities, and a bibliometric study of local and foreign management journals. Findings - Suggests that local academics are mainly engaged in the production of practitioner-oriented management knowledge that is highly influenced by US popular market managerialism. Analyses the causes of the low level of production of indigenous academic knowledge, concluding that it can be explained by three related factors: the lack of financial resources to pursue independent scholarly research; the academic elite’s lack of independence relative to the consulting elite; and the resulting patterns of cultural and social capital of Argentine management scholars. Concludes that that this situation might not be unique to Argentina, and that the hegemonic position of popular management discourse in developing countries is useful for those interest groups who benefit from managerialism. Originality/value - Contributes to the largely neglected study of the processes of creation diffusion and consumption of management knowledge in developing countries. © Emerald Group Publishing Limited.

Keywords: Academic Staff, Argentina, Consultants, Developing Countries, Knowledge Management

# Title: Critical Reviews in Analytical Chemistry

Full Journal Title: [Critical Reviews in Analytical Chemistry](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7013&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=d054456a0c1061f36054a6d5dc6bdf15)

ISO Abbreviated Title: Crit. Rev. Anal. Chem.

JCR Abbreviated Title: Crit Rev Anal Chem

ISSN: 1040-8347

Issues/Year: 4

Journal Country/Territory: United States

Language: English

Publisher: Crc Press Llc

Publisher Address: 2000 Corporate Blvd Nw, Journals Customer Service, Boca Raton, Fl 33431

Subject Categories:

Chemistry, Analytical: Impact Factor 0.276, / (2000)

? Braun, T. and Bujdoso, E. (1982), The growth of modern analytical-chemistry as reflected in the statistical evaluation of its subject literature. *CRC Critical Reviews in Analytical Chemistry*, **13** (3), 223-312.

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Abstract: Thin-layer chromatography (TLC) or chromatography on planar beds finds many applications in the synthesis and determination of organic molecules. This review is devoted to an area of application at least as important but perhaps not as widely known - analysis of inorganic and radioactive substances. Information about the historical development, recent advances in both methodological and instrumental aspects and a scientometric analysis of the use of TLC for inorganic determinations in various fields is provided. Considerable space is devoted to description of the instrumental methods known to be successful in the determination of and quantitative estimation of inorganic TLC zones directly on the plate (densitometry, fluorimetry, radiometry, planimetry, visual methods, etc.) and after elution of the material from the developed zones. Methods applicable to most of the elements of the Periodic Table are summarized as are those for various natural and industrial samples including minerals, ores, rocks, waters, metals, salts, biological samples, botanical materials, foodstuffs, drugs and cosmetics.

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Full Text: Cri Rev Ana Che31, 175

Abstract: Living organisms, naturally occurring in human environment, gained in the last decade, increasing interest in analytical chemistry. This review presents the application of bacteria, yeast, algae, and fungi for the preconcentration of heavy metals from environmental samples. The specific bonding sites on cell walls are responsible for the selective binding of different species of studied metals that permit the use of them as sorbents for speciation analysis purposes.

Keywords: Biosorbents, Living Organisms, Immobilization of Living Organisms, Preconcentration, Speciation, Atomic-Absorption Spectrometry, *Saccharomyces-Cerevisiae*, Bacterial-Cells, Bakers-Yeast, *Pseudomonas-Putida*, Silica-Gel, Environmental-Samples, Biological Organisms, Inorganic Mercury, *Escherichia*-Coli

# Title: Critical Reviews in Biotechnology

Full Journal Title: [Critical Reviews in Biotechnology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7015&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=3bfefcfe6e148a99bc8a81c4f2c599a8)

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JCR Abbreviated Title:

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Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Mehta, S.K. and Gaur, J.P. (2005), Use of algae for removing heavy metal ions from wastewater: Progress and prospects. *Critical Reviews in Biotechnology*, **25** (3), 113-152.

Full Text: [2005\Cri Rev Bio25, 113.pdf](2005/Cri%20Rev%20Bio25,%20113.pdf)

Abstract: Many algae have immense capability to sorb metals, and there is considerable potential for using them to treat wastewaters. Metal sorption involves binding on the cell surface and to intracellular ligands. The adsorbed metal is several times greater than intracellular metal. Carboxyl group is most important for metal binding. Concentration of metal and biomass in solution, pH, temperature, cations, anions and metabolic stage of the organism affect metal sorption. Algae can effectively remove metals from multi-metal solutions. Dead cells sorb more metal than live cells. Various pretreatments enhance metal sorption capacity of algae. CaCl2 pretreatment is the most suitable and economic method for activation of algal biomass. Algal periphyton has great potential for removing metals from wastewaters. An immobilized or granulated biomass-filled column can be used for several sorption/desorption cycles with unaltered or slightly decreased metal removal. Langmuir and Freundlich models, commonly used for fitting sorption data, cannot precisely describe metal sorption since they ignore the effect of pH, biomass concentration, etc. For commercial application of algal technology for metal removal from wastewaters, emphasis should be given to: (i) selection of strains with high metal sorption capacity, (II) adequate understanding of sorption mechanisms, (iii) development of low-cost methods for cell immobilization, (iv) development of better models for predicting metal sorption, (v) genetic manipulation of algae for increased number of surface groups or over expression of metal binding proteins, and (vi) economic feasibility.

Keywords: Algae, Biosorption, Heavy Metal, Immobilization, Isotherm, Ion Exchange, Seaweed, Periphyton, Laboratory-Grown Microcystis, Granular Activated Carbon, Dilute Aqueous-Solutions, *Sargassum* sp Biomass, Sphagnum Moss Peat, Blue-Green-Algae, Chlorella-Vulgaris, Marine-Algae, Saccharomyces-Cerevisiae, Cadmium Removal

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Full Text: [2006\Cri Rev Bio26, 223.pdf](2006/Cri%20Rev%20Bio26,%20223.pdf)

Abstract: The state of the art in the field of biosorption using algae as biomass is reviewed. The available data of maximum sorption uptake (qmax) and biomass-metal affinity (b) for Cd2+, Cu2+, Ni2+, Pb2+ and Zn2+ were statistically analyzed using 37 different algae (20 brown algae, 9 red algae and 8 green algae). Metal biosorption research with algae has used mainly brown algae in pursuit of treatments, which improve its sorption uptake. The information available in connection with multimetallic systems is very poor. Values of qmax were close to 1 mmol/g for copper and lead and smaller for the other metals. Metal recovery performance was worse for nickel and zinc, but the number of samples for zinc was very small. All the metals except lead present a similar affinity for brown algae. The difference in the behavior of lead may be due to a different uptake mechanism. Brown algae stand out as very good biosorbents of heavy metals. The best performer for metal biosorption is lead.

Keywords: Biosorption, Algae, Statistical Review, Heavy Metals, Multicomponent Adsorption-Isotherms, Heavy-Metal Biosorption, Marine-Algae, Pretreated Biomass, Aqueous-Solutions, Durvillaea-Potatorum, Chlorella-Vulgaris, Nonliving Biomass, Mucor-Rouxii, Waste-Water

# Title: Critical Reviews in Microbiology

Full Journal Title: Critical Reviews in Microbiology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kostoff, R.N. (2010), The highly cited SARS research literature. *Critical Reviews in Microbiology*, **36** (4), 299-317.

Full Text: [2010\Cri Rev Mic36, 299.pdf](2010/Cri%20Rev%20Mic36,%20299.pdf)

Abstract: A chronically weak area in research papers, reports, and reviews is the complete identification of important background reference documents that formed the building blocks for the research. A method for systematically determining these important references is presented. Citation-Assisted Background (CAB) is based on the assumption that important documents tend to be highly cited. Application of CAB to the field of Severe Acute Respiratory Syndrome (SARS) research is presented. While CAB is a highly systematic approach for identifying highly cited references, it is not a substitute for the judgment of the researchers, and serves as a supplement.

Keywords: Acute Respiratory Syndrome, Angiotensin-Converting Enzyme-2, Coronavirus Spike Protein, Feline Infectious Peritonitis, Genome Sequence, Hong-Kong, Host Gene-Expression, Literature, Mouse Hepatitis-Virus, Murine Coronavirus, Papers, Recombinant Vaccinia Virus, Research

# Title: CRC Critical Reviews in Environmental Control

Full Journal Title: [CRC Critical Reviews in Environmental Control](http://www.informaworld.com/smpp/title~content=t713606375~db=all)

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: [1986\CRC Cri Rev Env Con16, 327.pdf](1986/CRC%20Cri%20Rev%20Env%20Con16,%20327.pdf)

Keywords: Activated Carbon, Adsorption, Carbon, Models

# Title: Critical Reviews in Environmental Science and Technology

Full Journal Title: [Critical Reviews in Environmental Science and Technology](http://journalsonline.tandf.co.uk/(vgcmyq45zkcnnmqefqidfke5)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:106794,1;&absoluteposition=2#A2)

ISO Abbreviated Title: Crit. Rev. Environ. Sci. Technol.

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Subject Categories:

Environmental Sciences: Impact Factor 0.651, 73/126 (1999); Impact Factor 1.421, 28/127 (2000)

Notes: highly cited

? Brown, M.A. and Devito, S.C. (1993), Predicting azo-dye toxicity. *Critical Reviews in Environmental Science and Technology*, **23** (3), 249-324.

Full Text: [1993\Cri Rev Env Sci Tec23, 249.pdf](1993/Cri%20Rev%20Env%20Sci%20Tec23,%20249.pdf)

Abstract: Literature regrading azo dye carcinogenicity was examined to establish, if possible, guidelines to predict the human health risks of new azo dyes. Three different mechanisms for azo dye carcinogenicity were identified, all involving metabolic activation to reactive electrophilic intermediates that covalently bind DNA. In the order of decreasing number of published references, these mechanisms are

1. Azo dyes that are toxic only after reduction and cleavage of the azo linkage to give aromatic amines, mostly via intestinal anaerobic bacteria. The aromatic amines are metabolically oxidized to reactive electrophilic species that covalently bind DNA.

2. Azo dyes with structures containing free aromatic amine groups that can be metabolically oxidized without azo reduction.

3. Azo dyes that may be activated via direct oxidation of the azo linkage to highly reactive electrophilic diazonium salts.

Each mechanism may be compound specific, thus azo toxicity is probably caused by more than one mechanism. Although it is not possible to predict azo dye carcinogenicity with absolute certainty, it is possible to establish certain guidelines. Because some species of intestinal anaerobic bacteria (and in some cases, hepatic azo reductases) may reduce any azo compound to aromatic amines, those containing aromatic amine subgroups known to be carcinogenic, such as benzidines, must be suspect. Information about human carcinogenicity of other specific aromatic amines is scant, and various short-term mutagenicity tests may provide some guidance. Other in vitro tests can directly assay new azo dyes. Although it is unlikely that azo dyes can be developed that can be guaranteed not to generate constituent aromatic amines, it may be possible to select aromatic amines that are not toxic.

Keywords: Azo, Dye, Toxicity, Azo Reduction, Carcinogenicity, Metabolism, Microsomal Azoreductase Activity, Carcinogenic Aromatic-Amines, Non-Aminoazo Dye, Rat-Liver DNA, Intestinal Bacteria, Pseudomonas-Cepacia, Reductase-Activity, N-Acetylbenzidine, Covalent Binding, Trypan Blue

Notes: highly cited

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Full Text: [1999\Cri Rev Env Sci Tec29, 83.pdf](1999/Cri%20Rev%20Env%20Sci%20Tec29,%2083.pdf)

Abstract: Wetlands and streams buffer the interactions among uplands and adjacent aquatic systems. Phosphorus (P) is often the key nutrient found to be limiting in both estuarine and freshwater ecosystems. As such, the ability of wetlands and streams to retain P is key to determining downstream water quality. This article reviews the processes and factors regulating P retention in streams and wetlands and evaluates selected methodologies used to estimate P retention in these systems. Phosphorus retention mechanisms reviewed include uptake and release by vegetation, periphyton and microorganisms; sorption and exchange reactions with soils and sediments; chemical precipitation in the water column; and sedimentation and entrainment. These mechanisms exemplify the combined biological, physical, and chemical nature of P retention in wetlands and streams. Methodologies used to estimate P retention include empirical input-output analysis and mass balances, and process kinetics applied at various scales, including micro- and mesocosms to full-scale systems. Although complex numerical models are available to estimate P retention and transport, a simple understanding of P retention at the process level is important, but the overall picture provided by mass balance and kinetic evaluations are often more useful in estimating long-term P retention.

Keywords: Anaerobic Conditions, Fresh-Water Wetlands, Inorganic Phosphorus, Kinetics, Lake-Sediments, Lowland River System, Nutrient Retention, Primary Productivity, Soil Organic Phosphorus, Sorption, Treated Waste-Water, Water, Woodland Stream

? Schijven, J.F. and Hassanizadeh, S.M. (2000), Removal of viruses by soil passage: Overview of modeling, processes, and parameters. *Critical Reviews in Environmental Science and Technology*, **30** (1), 49-127.

Full Text: [2000\Cri Rev Env Sci Tec30, 49.pdf](2000/Cri%20Rev%20Env%20Sci%20Tec30,%2049.pdf)

Abstract: In this article, the modeling of subsurface virus transport under saturated conditions and the factors that affect adsorption and inactivation are evaluated. Both equilibrium and kinetic adsorption are considered. Equilibrium adsorption is found to be of little significance. Adsorption appears to be mainly kinetically limited. At pH 7 and higher, conditions are generally unfavorable for attachment, but viruses may preferentially attach to a minor surface fraction of soil grains that is positively charged. The relation of pH with surface charge and their effects on sticking efficiencies are evaluated. Dissolved organic matter decreases virus attachment by competition for the same binding sites and thus reduces attachment. Bonded organic matter may provide hydrophobic binding sites for viruses and thus enhance attachment. Dissolved organic matter may disrupt hydrophobic bonds. The enhancing and attenuating effects of organic matter are very difficult to quantify and may be responsible for considerable uncertainty when predicting virus removal. Values of inactivation rate coefficients for attached viruses were calculated using data from some batch studies. Enhanced or reduced inactivation is found to be virus-specific and almost independent of adsorption. Temperature is the most important factor that influences virus inactivation. Probably the inactivation rate coefficients of free and attached viruses change similarly with temperature. Some frequently used bacteriophages are evaluated as model viruses. MS2 and PRD1 meet the requirements for worst-case model viruses, at water temperatures less than about 10°C, at pH 6 to 8, and if the soil does not contain too many hydrophobic sites and not too much multivalent cations. Bacteriophage phi X174 may be a relatively conservative model virus, because of its low hydrophobicity and stability. Together in a cocktail, these three viruses span a range of properties, like size, surface charge, and hydrophobicity. F-specific RNA bacteriophages (FRNAPHs) may be very useful naturally occurring worst-case viruses. FRNAPHs that are present in surface water or treated wastewater that is used for recharging groundwater, consist of stable and poorly adsorbing viruses. An inventory of parameter values from field studies is made. Attachment appears to be the major process that determines virus removal. Still, only very few data are available on attachment and detachment of viruses under field conditions. Removal of viruses by soil passage, log (C/C0), appears to decline nonlinearly with distance due to heterogeneities within the soil as well as within the population of transported virus particles. Predictions of virus removal at larger distances are severely overestimated if they are based on removal data from column experiments or from short-distance field studies.

Keywords: Saturated Porous-Media, Waste-Water, Enteric Viruses, Chaotropic Agents, Membrane Filters, Unsaturated Flow, Ground-Water, Electrostatic Interactions, Bacteriophage Transport, Chemical Perturbations, Virus Adsorption, Virus Inactivation, Virus Transport Models, Virus Removal, Model Viruses, MS2, PRD1, PHI X174, F-Specific RNA Bacteriophages

? Scherer, M.M., Richter, S., Valentine, R.L. and Alvarez, P.J.J. (2000), Chemistry and microbiology of permeable reactive barriers for in situ groundwater clean up. *Critical Reviews in Environmental Science and Technology*, **30** (3), 363-411.

Full Text: [2000\Cri Rev Env Sci Tec30, 363.pdf](2000/Cri%20Rev%20Env%20Sci%20Tec30,%20363.pdf)

Abstract: Permeable reactive barriers (PRBs) are receiving a great deal of attention as an innovative, cost-effective technology for in situ clean up of groundwater contamination. A wide variety of materials are being proposed for use in PRBs, including zero-valent metals (e.g., iron metal), humic materials, oxides, surfactant-modified zeolites (SMZs), and oxygen- and nitrate-releasing compounds. PRE materials remove dissolved groundwater contaminants by immobilization within the barrier or transformation to less harmful products. The primary removal processes include: (1) sorption and precipitation, (2) chemical reaction, and (3) biologically mediated reactions. This article presents an overview of the mechanisms and factors controlling these individual processes and discusses the implications for the feasibility and long-term effectiveness of PRE technologies.

Keywords: Zero-Valent Iron, Nonionic Organic Contaminants, Surfactant-Modified Zeolite, Acid-Mine Drainage, Sphagnum Moss Peat, Carbon-Tetrachloride, In-Situ, Sand Columns, Rapid Dechlorination, Metallic Iron

? Hao, O.J., Kim, H. and Chiang, P.C. (2000), Decolorization of wastewater. *Critical Reviews in Environmental Science and Technology*, **30** (4), 449-505.

Full Text: [2000\Cri Rev Env Sci Tec30, 449.pdf](2000/Cri%20Rev%20Env%20Sci%20Tec30,%20449.pdf)

Abstract: The public demand for color-free waste discharge to receiving waters and tougher color standards have made decolorization of a variety of industrial wastes a top priority. Unfortunately, with the complicated color-causing compounds, the decolorization of these wastes is a difficult and challenging task. This article first describes the background information of dye molecules and dye waste characteristics. The methods for color measurements and standards are then discussed. Different techniques including almost all the known physical, chemical and biological techniques are described for decolorization. Each process alone may not be able to meet the requirements. A combination of these processes, for example, chemical-biological, biological-chemical, chemical-physical, chemical-chemical, etc. is often used. The formation of intermediates during the decolorization process is emphasized. These byproducts may be more toxic than the parent compounds. Thus, the extent of the mineralization in waste decolorization should be evaluated.

Keywords: Dye, Decolorization, Color Standards, Color Measurements, Intermediates, Activated-Sludge Process, Fruit Bunch Particles, Reactive Azo-Dye, Remazol-Black-B, *Phanerochaete-Chrysosporium*, Color Removal, Aqueous-Solutions, Bagasse Pith, Electrochemical Treatment, Textile Effluents

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Full Text: [2002\Cri Rev Env Sci Tec32, 337.pdf](2002/Cri%20Rev%20Env%20Sci%20Tec32,%20337.pdf)

Abstract: We examine similarities in constraints to mass transfer of hydrophobic organic compounds (HOCs) between the aqueous and various organic phases in porous media at the grain scale. Published research and data are reviewed regarding equilibrium coefficients and first-order rate constants for mass transfer of HOCs between water and natural organic matter present in various geosorbents (e.g., soils, sediments, and aquifer solids), and several oils (petroleum products, decane, and coal tar). We propose how these equilibrium and mass-transfer coefficients can be estimated by methods common to all organic phases. Equilibrium coefficients can be reliably estimated using Raoult’s law. First-order rate constants obtained from extensive literature data appear to be dependent on aqueous-phase diffusion and duration of exposure (or contact). The aqueous diffusion domain may be either an interfacial film (for low viscosity oil ganglia) or a retarded immobile water zone (for geosorbents).

Keywords: Compounds, Dense Chlorinated Solvents, Diffusion, Distributed Reactivity Model, Duration, Equilibrium, Hydrophobic, Hydrophobic Organic Compounds, Hydrophobic Pollutants, Literature, Long-Term Sorption, Mass Transfer, Mass-Transfer Rates, Natural Sediments, Nonequilibrium Sorption, Organic Compounds, Organic Matter, Polycyclic Aromatic-Hydrocarbons, Research, Saturated Subsurface Systems, Soil, Soil Equilibrium Partitioning, Soils, Solute Transport, Sorption, Sorption Dissolution, System, Water

? Gerente, C., Lee, V.K.C., Le Cloirec, P. and McKay, G. (2007), Application of chitosan for the removal of metals from wastewaters by adsorption: Mechanisms and models review. *Critical Reviews in Environmental Science and Technology*, **37** (1), 41-127.

Full Text: [2007\Cri Rev Env Sci Tec37, 41.pdf](2007/Cri%20Rev%20Env%20Sci%20Tec37,%2041.pdf)

Abstract: Chitin is the world’s second most abundant naturally occurring polysaccharide. Much of this is disposed of as waste from seafood crustacean, mainly in shrimps, prawns, crabs, and lobsters, where it occurs as a significant component in the shells/exoskeletons of crustacea. Due to its widespread abundance, its chemical and physical versatility, and the problems of its disposal as a waste material, a wide range of value-added applications of chitin and chitosan is being initiated, investigated, and developed. The widely ranging value-added applications of chitin and chitosan are presented in this review. Chitin and its derivative, chitosan, both highly stable and difficult to degrade materials, can be obtained as 10-20% w/w from the waste seafood shells by suitable chemical processing. One of the significant developments in the new range of applications is the study of the ability of chitosan, as a potentially major environmental treatment material, to remove metal ions from wastewaters. Chitosan is the deacetylated form of chitin, and this process produces a chain of amino groups along the chitosan structure. Many researchers are now looking at the ability of this amino group to adsorb metal ions from industrial wastewaters and leachates. This review presents the developments in this area and identifies the defficiences in existing chitosan research by reviewing the equilibrium studies carried out to determine the capacity of chitosan for various metal ions. Then the kinetic studies are reviewed, as well as the solution methodologies adopted by various researchers to explain and model the rate of adsorption of the metal ions from solution. Both equilibrium knowledge and kinetic knowledge are required in order to design commercial treatment systems.

Keywords: Chitosan, Equilibrium, Kinetics, Mechanisms, Metal Ions, Modeling, Cross-Linked Chitosan, Liquid-Phase Adsorption, Waste Fe(III)/Cr(III) Hydroxide, Partially Deacetylated Chitins, Chemically-Modified Chitosan, Activated Carbon Adsorption, Rhizopus-Arrhizus Biomass, Dilute Aqueous-Solutions, Surface-Diffusion-Model, Mass-Transfer Processes

? Babatunde, A.O. and Zhao, Y.Q. (2007), Constructive approaches toward water treatment works sludge management: An international review of beneficial reuses. *Critical Reviews in Environmental Science and Technology*, **37** (2), 129-164.

Full Text: [2007\Cri Rev Env Sci Tec37, 129.pdf](2007/Cri%20Rev%20Env%20Sci%20Tec37,%20129.pdf)

Abstract: Virtually all known drinking water processing systems generate an enormous amount of residual sludge, and what to do with this rapidly increasing “waste” stream in an economic and environmentally sustainable manner remains a significant environmental issue. Perhaps the realization of this fact has led to a series of concerted efforts aimed at beneficial reuses in an effort to close the loop between efficient water treatment and sustainable sludge management. This article therefore presents a comprehensive review of available literature on attempts at beneficial reuses of water treatment plant sludge, in an effort to provide a compendium of recent and past developments, and to update our current state of knowledge. Four broad categories of uses, which included more than 11 possible ways in which waterworks sludges can be reused, are identified and examined. Obvious advantages of such reuse options are highlighted and knowledge gaps are identified. Future issues that will assist in the development of sustainable waterworks sludge management options with a multiprong approach are discussed.

Keywords: Disposal, Reuse, Wastewater Treatment, Waterworks Sludge, Treatment Plant Sludge, Alum Sludge, Waste-Water, Treatment Residuals, Phosphorus Removal, Land Application, Poultry Litter, Surface Runoff, Recovery, Soil

? Rai, P.K. (2009), Heavy metal phytoremediation from aquatic ecosystems with special reference to macrophytes. *Critical Reviews in Environmental Science and Technology*, **39** (9), 697-753.

Full Text: [2009\Cri Rev Env Sci Tec39, 697.pdf](2009/Cri%20Rev%20Env%20Sci%20Tec39,%20697.pdf)

Abstract: The rapid pace of industrialization and urbanization has given birth to heavy metal pollution. Heavy metals are one of the most hazardous contaminants that may be present in the aquatic environment. It derives its origin from both natural and anthropogenic sources. Heavy metal pollution in aquatic ecosystem poses a serious threat to aquatic biodiversity, and drinking contaminated water poses severe health hazards in humans. The economic aspects and side effects of conventional treatment technologies in aquatic ecosystems paved the way to phytoremediation technology. In phytoremediation, plants are used to ameliorate the environment from various hazardous pollutants. It is cost-effective and eco-friendly technology for environmental cleanup. The characteristics, general mechanism, and ecology of metal hyper-accumulation have been discussed previously. The present review examines the role of aquatic macrophytes in phytoremediation studies. Macrophytes are potent tools in the abatement of heavy metal pollution in aquatic ecosystems receiving industrial effluents and municipal wastewater. They are preferred over other bio-agents due to low cost, frequent abundance in aquatic ecosystems, and easy handling. Aquatic macrophytes usually follow the mechanism of rhizo-filtration for metal removal. The efficiency and selection of potent aquatic plants is done through microcosm investigation, and an overview of significant works is given here. Aquatic macrophytes in natural and constructed wetlands proved to be a potent tool for the treatment of heavy metals from industrial effluents. Physico-chemical factors like temperature, pH, light, salinity, and presence of other heavy metal may affect the metal uptake. Both live and dead biomass of macrophytes may be used in phytoremediation, though dead biomass is generally preferred in the treatment of industrial effluents due to reduced cost, easy disposal, and lack of active biochemical machinery leading to metal toxicity and death of plants. Biomass disposal problem and seasonal growth of aquatic macrophytes are some of the limitations in the transfer of phytoremediation technology from the lab to the field. However, an eco-sustainable model has been developed through our various works that may curb some of the limitations. Disposed biomass of macrophytes may be used for many fruitful applications. Genetic engineering, biodiversity prospecting, and X-ray diffraction spectroscopy are promising future prospects regarding the use of macrophytes in phytoremediation studies. A multidisciplinary and integrated approach may enable this embryonic technology to become the new frontier in environmental science and technology.

Keywords: Anthropogenic, Approach, Aquatic Ecosystem, Aquatic Ecosystems, Aquatic Environment, Aquatic Macrophytes, Aquatic Plants, Aqueous-Solution, Biodiversity, Biodiversity Prospecting, Biomass, Birth, Characteristics, Constructed, Constructed Wetlands, Contaminants, Conventional, Cost, Cost-Effective, Death, Disposal, Ecology, Economic, Ecosystem, Ecosystems, Efficiency, Effluents, Embryonic, Engineering, Environment, Environmental, Environmental Science, Fern Azolla-Filiculoides, Field, General, Genetic Engineering, Growth, Health, Heavy Metal, Heavy Metal Pollution, Heavy Metals, Humans, Hyacinth Eichhornia-Crassipes, Investigation, Ion-Exchange-Resins, Lemna-Minor, Low Cost, Macrophytes, Mechanism, Metal, Metal Toxicity, Metal Uptake, Metals, Microcosm, Model, Multidisciplinary, Municipal Wastewater, Natural, Origin, pH, Phytochelatin Synthase Genes, Phytoremediation, Plant Myriophyllum-Spicatum, Plants, Pollutants, Pollution, Removal, Review, Rhizofiltration, Role, Salinity, Science, Science And Technology, Seasonal, Side Effects, Sources, Spectroscopy, Technologies, Technology, Temperature, Toxicity, Treatment, Typha-Latifolia, Uptake, Urbanization, Waste-Water Treatment, Wastewater, Water, Wetlands, X-Ray, X-Ray Diffraction

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Full Text: [2009\Cri Rev Env Sci Tec39, 783.pdf](2009/Cri%20Rev%20Env%20Sci%20Tec39,%20783.pdf)

Abstract: Industrial, agricultural, and domestic activities of humans have affected the environmental system, resulting in drastic problems such as global warming and the generation of wastewater containing high levels of pollutants. As water of good quality is a precious commodity and available in limited amounts, it has become highly imperative to treat wastewater for removal of pollutants. In addition, the rapid modernization of society has also led to the generation of huge amount of materials of little value that have no fruitful use. Such materials are generally considered as waste, and their disposal is a problem. Also, there are some materials that are available in nature that have little or no use. The utilization of all such materials as low-cost adsorbents for the treatment of wastewater may make them of some value. An effort has been made to give a brief idea of an approach to wastewater treatment, particularly discussing and highlighting in brief the low-cost alternative adsorbents with a view to utilizing these waste/low-cost materials.

Keywords: Activated Carbon, Adsorbents, Adsorption, Agricultural, Alternative, Approach, Aqueous-Solution, Bagasse Fly-Ash, Blast-Furnace Waste, Disposal, Environmental, Fixed-Bed Systems, Generation, Global Warming, Granular Activated Carbon, Heavy-Metal Removal, Humans, Low Cost, Low Cost Adsorbents, Low-Cost Adsorbents, Methylene-Blue, Neutralized Red Mud, Peanut Hull Carbon, Pollutants, Quality, Removal, Society, Sugar-Industry Waste, Treatment, Utilization, Value, Waste, Wastewater, Wastewater Treatment, Water

# Title: Critical Reviews in Microbiology

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Subject Categories:

Microbiology: Impact Factor

? Duncan, H.E. and Edberg, S.C. (1995), Host-microbe interaction in the gastrointestinal-tract. *Critical Reviews in Microbiology*, **21** (2), 85-100.

Abstract: In order for an infection to occur, the target organ must come in contact with sufficient microbes, the microbe must possess specific virulence factors, these virulence factors must be expressed, and the defenses of the organ system must be overcome. This dynamic process, which is ongoing in all living entities, can be described by the following relationship:

Infection proportional to [Number of Microbes]x[Virulence Characteristics]/Immune Status of the Host

The establishment of infection first occurs in a particular organ. This phenomenon is known as tissue trophism and the association of microbes with organ systems governs the practice of clinical microbiology and infectious disease. With some microbes (e.g., *Giardia*, *Cryptosporidium*) the interaction with the particular organ is so specific that infections are almost always confined to one site, with others (e.g., Salmonella, enterovirus) the microbe has the potential to become systemic. When attempting to establish health risk assessment from microbes by contact with food and drinking water, one must therefore consider that the gastrointestinal tract is a complex organ system with a variety of specific host defense mechanisms. It is only when the microbe has particular virulence factors for sites in gastrointestinal tract, and the specific host defense mechanisms in the gastrointestinal tract are breached, that infection of this organ system occurs. Therefore, the general terms “immunosuppression” or “immunocompromise” are meaningless unless the specific immune defect is known. A description of the microbial virulence factors active against the gastrointestinal tract and the defense mechanisms of this organ system are reviewed to provide a biological basis health risk assessment and future food and drinking water regulations.

Keywords: Gastrointestinal Tract, Virulence, *Pseudomonas-Aeruginosa*, M-Cells, Cystic-Fibrosis, Virulence Determinants, Entamoeba-Histolytica, Coordinate Regulation, Bacterial Virulence, Medical Progress, Diarrhea, Mechanisms

? Hardalo, C. and Edberg, S.C. (1997), *Pseudomonas aeruginosa*: Assessment of risk from drinking water. *Critical Reviews in Microbiology*, **23** (1), 47-75.

Abstract: *Pseudomonas aeruginosa* is an ubiquitous environmental bacterium. It can be recovered, often in high numbers, in common food, especially vegetables. Moreover, it can be recovered in low numbers in drinking water. A small percentage of clones of P. aeruginosa possesses the required number of virulence factors to cause infection. However, P. aeruginosa will not proliferate on normal tissue but requires previously organs. Further narrowing the risk to human health is that only certain specific hosts are at risk, including patients with profound neutropenia, cystic fibrosis, severe burns, and those subject to foreign device installation. Other than these very well-defined groups, the general population is refractory to infection with P. aeruginosa. Because of its ubiquitous nature, it is not only not practical to eliminate P. aeruginosa from our food and drinking water, but attempts to do so would produce disinfection byproducts more hazardous than the species itself. Moreover, because there is no readily available sensitive and specific means to detect and identify P. aeruginosa available in the field, any potential regulation governing its control would not have a defined laboratory test measure of outcome. Accordingly, attempts to regulate P. aeruginosa in drinking water would not yield public health protection benefits and could, in fact, be counterproductive in this regard.

? Edberg, S.C., Le Clerc, H., Robertson, J. (1997), Natural protection of spring and well drinking water against surface microbial contamination. II. Indicators and monitoring parameters for parasites. *Critical Reviews in Microbiology*, **23** (2), 179-206.

Abstract: Recent outbreaks of cryptosporidiosis and reports of other newly described para-sitic diseases associated with drinking water transmission prompted a reevaluation of source water monitoring criteria for public health protection. The field of microbial indicators was reviewed and each candidate sentinel evaluated in terms of its sensitivity, specificity, and technical feasibility. In addition, a clear distinction was made between source water monitoring and monitoring in the distribution system. of all potential candidate microbial sentinels, *Escherichia coli* is deemed the most efficacious for public health protection. Based on a conservative estimate of its half-life in groundwater for 8 d, it is recommended that at least two samples be obtained during this half-life. In addition to E. coli, two water quality indicator sentinels, which are not necessarily direct public health threats, should also be monitored at the same frequency. These are the total coliform group and the enterococci. If E. coli is present in any source water sample, the borehole and any directly connected borehole should be embargoed. If either total coliforms or enterococci are detected, only that individual borehole should be taken off line and not used until the situation is remediated and the cause of the fecal contamination eliminated. Clostridium perfringens spores serve as a useful long-lived indicator. However, their perseverance in a sample should not be considered a direct public health threat because spores may far outlive pathogens. As a parasite indicator, C. perfringens should have the same importance as a positive coliform or *Enterococcus* analysis. Coliphages do not yet fulfill enough of the criteria to be routinely employed. Biological monitoring should be coupled with physicochemical monitoring to establish a long-term history of the source. Because all natural waters vary in the amounts of heterotrophic plate count bacteria, test methods should be employed that are refractory to them. A combination of rigorous source protection plus extraordinary source monitoring serve as sufficient multiple barriers for parasite protection.

? Scherer, M.M., Richter, S., Valentine, R.L. and Alvarez, P.J.J. (2000), Chemistry and microbiology of permeable reactive barriers for in situ groundwater clean up. *Critical Reviews in Microbiology*, **26** (4), 221-264.

Abstract: Permeable reactive barriers (PRBs) are receiving a great deal of attention as an innovative, cost-effective technology for in situ clean up of groundwater contamination. A wide variety of materials are being proposed for use in PRBs, including zero-valent metals (e.g., iron metal), humic materials, oxides, surfactant-modified zeolites (SMZs), and oxygen-and nitrate-releasing compounds. PRB materials remove dissolved groundwater contaminants by immobilization within the barrier or transformation to less harmful products. The primary removal processes include: (1) sorption and precipitation, (2) chemical reaction, and (3) biologically mediated reactions. This article presents an overview of the mechanisms and factors controlling these individual processes and discusses the implications for the feasibility and long-term effectiveness of PRB technologies.

Keywords: Zero-Valent Iron, Nonionic Organic Contaminants, Surfactant-Modified Zeolite, Acid-Mine Drainage, Sphagnum Moss Peat, Carbon-Tetrachloride, In-Situ, Sand Columns, Rapid Dechlorination, Metallic Iron

# Title: Critical Reviews in Oncology Hematology

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: Impact Factor

Denkhaus, E. and Salnikow, K. (2002), Nickel essentiality, toxicity, and carcinogenicity. *Critical Reviews in Oncology Hematology*, **42** (1), 35-56.

Full Text: [C\Cri Rev On Hem42, 35.pdf](C/Cri%20Rev%20On%20Hem42,%2035.pdf)

Abstract: The increasing utilization of heavy metals in modern industries leads to an increase in the environmental burden. Nickel represents a good example of a metal whose use is widening in modern technologies. As the result of accelerated consumption of nickel-containing products nickel compounds are released to the environment at all stages of production and utilization. Their accumulation in the environment may represent a serious hazard to human health. Among the known health related effects of nickel are skin allergies, lung fibrosis, variable degrees of kidney and cardiovascular system poisoning and stimulation of neoplastic transformation. The mechanism of the latter effect is not known and is the subject of detailed investigation. This review provides an analysis of the current state in the field. (C) 2002 Elsevier Science Ireland Ltd. All rights reserved.

Keywords: Nickel Toxicity, Nickel Carcinogenicity, Nickel Essentiality, Inducible Factor 1-Alpha, Hamster-Embryo Cells, Invitro Morphological Transformation, Endothelial Growth-Factor, Kidney Epithelial-Cells, Xenopus-Laevis Oocytes, DAN Gene-Product, Strain-A Mice, Mammalian-Cells, Trace-Elements

# Title: Critical Reviews in Toxicology

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Subject Categories:

Toxicology: Impact Factor

? Anderson, R.L., Bishop, W.E. and Campbell, R.L. (1985), A review of the environmental and mammalian toxicology of nitrilotriacetic acid. *Critical Reviews in Toxicology*, **15** (1), 1-102.

Abstract: This article provides a review of available information on the chemistry, environmental toxicology, and mammalian toxicology of nitrilotriacetic acid (NTA). The ability of NTA to chelate metal ions such as Mg2+ and Ca2+ into water soluble complexes makes NTA useful as an additive to boiler water, as a builder in laundry detergents, and as a stabilizer in textile, paper, and pulp processing. Environmental fate studies show NTA biodegrades in wastewater treatment plants, in natural waters, and in soils under a wide variety of conditions. Studies on the environmental effects of NTA indicate that no adverse effects occur in treatment plants or receiving waters at anticipated levels. Monitoring programs have established that only low steady-state concentrations of NTA occur in natural waters as a result of NTA usage. In mammalian systems, NTA is not metabolized and is excreted rapidly by filtration in the kidney. No reproductive, teratogenic, or adverse bone effects have been observed at highly exaggerated doses. In numerous genotoxicity assay systems, both in vivo and in vitro, NTA is nongenotoxic. Chronic oral exposure of rodents to high doses of NTA is associated with tumorigenicity in, and restricted to, the urinary tract. The urinary tract tumors are the consequence of chronic toxicity that is caused by changes in Zn and Ca distributions between the urinary tract tissues and urine at high doses of NTA. Thresholds for the effects of NTA on Zn and Ca distributions are 105 to 106 greater than the possible maximum human exposure resulting from the low levels of NTA that are known to occur in the environment.

? McConnell, E.E. and Swenberg, J.A. (1994), Review of styrene and styrene oxide long-term animal studies. *Critical Reviews in Toxicology*, **24**, S49-S55.

Abstract: Eleven long-term toxicity studies were reviewed on styrene and five on styrene oxide in an effort to evaluate the potential carcinogenic activity of these chemicals in animals. The styrene studies included inhalation exposure (rats, mice, guinea pigs, and rabbits), intragastric gavage (rats and mice), drinking water (rats), and intraperitoneal injection (rats), while styrene oxide exposure was via intragastric gavage (rats and mice) or skin painting (mice). Each study was reviewed and evaluated for details and adequacy of design, adequacy of reported data, and interpretation. The results of this review are 1. There was no convincing evidence of carcinogenic activity of styrene in animals, although many of the studies were considered inadequate. 2. Styrene oxide was carcinogenic to the forestomach of both sexes of rats and mice after gavage exposure and was associated with an increase in liver neoplasms in male mice in one study. No carcinogenic activity was observed in mice after dermal exposure (skin paint). 3. None of the studies of styrene or styrene oxide reported here are well suited for extrapolating potential carcinogenic activity of either compound to humans because all have deficiencies in design, conduct, interpretation, or utilized a less than ideal route of exposure. A chronic state-of-the-art inhalation study is needed to evaluate this aspect of hazard assessment.

? Käfferlein, H.U., Göen, T. and Angerer, J. (1998), Musk xylene: Analysis, occurrence, kinetics, and toxicology. *Critical Reviews in Toxicology*, **28** (5), 431-476.

Abstract: 1,3-Dimethyl-2,4,6-trinitro-5-tert.-butylbenzene (musk xylene, MX), a synthetic musk, is often used in fragrances and soaps to substitute the natural musk. MX belongs to the common group of nitromusk compounds. The main environmental intake of MX occurs after sewage introduction. The consumption of fish and drinking water as well as the use of body care and perfumed household products could lead to an ingestion of this substance in humans. Although the acute oral and dermal toxicity of MX is low, some hint for the carcinogenic potential of MX was found in one animal experiment. These findings and the high potential of MX as environmental contaminant, it is stable against biological and chemical degradation and it is highly lipophil, raised considerable attention in the field of environmental medicine. Biological monitoring and the toxicology of MX, which previously has been described to occur in human milk, human fat tissue, as well as human blood samples, are of central interest. The aim of this article is to summarize the data on the analysis, occurrence, kinetics, and toxicology of MX. As there is a lack of knowledge on human toxicity and human carcinogenicity of MX, a final evaluation of the toxicological data with regard to public health is still impossible. Nevertheless, in view of the published data about MX, there is no evidence for any substantial human risk at the moment.

Vos, J.G., Dybing, E., Greim, H.A., Ladefoged, O., Lambré, C., Tarazona, J.V., Brandt, I. and Vethaak, A.D. (2000), Health effects of endocrine-disrupting chemicals on wildlife, with special reference to the European situation. *Critical Reviews in Toxicology*, **30** (1), 71-133.

Full Text: [C\Cri Rev Tox30, 71.pdf](C/Cri%20Rev%20Tox30,%2071.pdf)

Abstract: Many wildlife species may be exposed to biologically active concentrations of endocrine-disrupting chemicals. There is strong evidence obtained from laboratory studies showing the potential of several environmental chemicals to cause endocrine disruption at environmentally realistic exposure levels. In wildlife populations, associations have been reported between reproductive and developmental effects and endocrine-disrupting chemicals. In the aquatic environment, effects have been observed in mammals, birds, reptiles, fish, and mollusks from Europe, North America, and other areas. The observed abnormalities vary from subtle changes to permanent alterations, including disturbed sex differentiation with feminized or masculinized sex organs, changed sexual behavior, and altered immune function. For most reported effects in wildlife, however, the evidence for a causal link with endocrine disruption is weak or nonexisting. Crucial in establishing causal evidence for chemical-induced wildlife effects appeared semifield or laboratory studies using the wildlife species of concern. Impaired reproduction and development causally linked to endocrine-disrupting chemicals are well documented in a number of species and have resulted in local or regional population changes. These include: Masculinization (imposex) in female marine snails by tributyltin, a biocide used in antifouling paints, is probably the clearest case of endocrine disruption caused by an environmental chemical. The dogwhelk is particularly sensitive, and imposex has resulted in decline or extinction of local populations worldwide, including coastal areas all over Europe and the open North Sea. DDE-induced egg-shell thinning in birds has caused severe population declines in a number of raptor species in Europe and North America. Endocrine-disrupting chemicals have adversely affected a variety of fish species. In the vicinity of certain sources (e.g., effluents of water treatment plants) and in the most contaminated areas is this exposure causally linked with the effects on reproductive organs that could have implications for fish populations. However, there is also a more widespread occurrence of endocrine disruption in fish in the U.K., where estrogenic effects have been demonstrated in freshwater systems, in estuaries, and in coastal areas. In mammals, the best evidence comes from the-field studies on Baltic gray and ringed seals, and from the Dutch semifield studies on harbor seals, where both reproduction and immune functions have been impaired by PCBs in the food chain. Reproduction effects resulted in population declines, whereas impaired immune function has likely contributed to the mass mortalities due to morbillivirus infections. Distorted sex organ development and function in alligators has been related to a major pesticide spill into a lake in Florida, U.S.A. The observed estrogenic/antiandrogenic effects in this reptile have been causally linked in experimental studies with alligator eggs to the DDT complex. Although most observed effects currently reported concern heavily polluted areas, endocrine disruption is a potential global problem. This is exemplified by the widespread occurrence of imposex in marine snails and the recent findings of high levels of persistent potential endocrine-disrupting chemicals in several marine mammalian species inhabiting oceanic waters.

Keywords: Kraft Pulp-Mill, Bivalve Scrobicularia-Plana, Mink Mustela-Vison, Asterias-Rubens L, Polyhalogenated Aromatic-Hydrocarbons, Beta-Hexachlorocyclohexane Exposure, Whales Delphinapterus-Leucas, Eagles Haliaeetus-Albicilla, Methyl Sulfone Metabolites, Tributyltin TBT Pollution, Endocrine Modulator, Estrogenic Effects, Reproduction Effects, Immunotoxic Effects, Marine Mammals, Reptiles, Fish, Birds, Invertebrates, Chlorinated Compounds, PCBs, PCDFs, PCDDs, DDT, TBT

# Title: Critical Stability Constants

Plenum Press, New York and London

Smith, R.M. and Martell, A.E. (1976), *Critical Stability Constants*, Plenum Press New York and London.

# Title: Croatian Medical Journal

Full Journal Title: [Croatian Medical Journal](http://www.cmj.hr/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0353-9504

Issues/Year:

Journal

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Garfield, E. (2000), Use of Journal Citation Reports and Journal Performance Indicators in measuring short and long term journal impact. *Croatian Medical Journal*, **41** (4), 368-374.

Full Text: [2000\Cro Med J41, 368.pdf](2000/Cro%20Med%20J41,%20368.pdf)

Abstract: The impact factor has become the subject of widespread controversy. It has gradually developed to mean both journal and author impact. The emphasis on impact factors obscures the main purpose of bibliographic databases created at the Institute for Scientific Information. I will here show how two of these databases, Journal Citation Reports and the Journal Performance Indicators, can be used to study scientific journals and the articles they publish, as well as the evolution of scientific fields.

Keywords: Bibliometrics, Citation Analysis, Impact Factor, journal Article, Library Science, Medical Informatics, Medical Literature Analysis and Retrieval System

? Huth, E.J. (2001), Authors, editors, policy makers, and the impact factor. *Croatian Medical Journal*, **42** (1), 14-17.

Full Text: [2001\Cro Med J42, 14.pdf](2001/Cro%20Med%20J42,%2014.pdf)

Abstract: Some aspects of the “impact factor”, a quantitative measure of journals’ influence on journals in scientific fields, was discussed in the preceding issue of the Croatian Medical Journal by Dr Eugene Garfield, one of its devisers. This factor can be of interest to authors, journal editors, and policy makers, but they should keep in mind the complexity of the determinants of impact factors while using them in coming to their particular kinds of decisions. A clearer picture of the influence a journal may have in its own scientific field rather than among all scientific journals could come from a variant of the impact factor, “the scope-adjusted impact factor”. The calculation of this variant impact factor is described. A table presents some sample data from this calculation and shows how the relative positions of some major journals shift when they are ranked by this factor rather than the unadjusted impact factor. The possible value of this variant factor may merit further testing.

Keywords: Bibliometrics, Citation Analysis, Impact Factor, Journal Article, Library Science, Medical Informatics, Periodicals, Publishing

? Marušić, M. and Marušić, A. (2001), Good editorial practice: Editors as educators. *Croatian Medical Journal*, **42** (2), 113-120.

Full Text: [2001\Cro Med J42, 113.pdf](2001/Cro%20Med%20J42,%20113.pdf)

Abstract: There may be valuable research going on in the developing and financially less-privileged countries, but it usually does not reach international visibility, in spite of a large number of scientific journals in these countries. Such journals are not only invisible but, by perpetuating a vicious circle of inadequacy, may be directly damaging to the local science and research culture. We call for an international action to help journal editors in less privileged countries. International associations of editors may be leaders of these activities by defining, promoting, and perhaps controlling good editorial practice, as a main criterion for international recognition of a journal. However, the editors of small journals have the power and moral obligation to become a stronghold of quality and advancement in their scientific community. Their educational “tools” are editorial integrity and author-friendly policy. Editors can teach the authors study design statistical analysis, precision, punctuality, research integrity, style and format of writing, and other aspects of scientific communication. The editors of “big”, mainstream scientific journals can act as global educators, teaching and providing guidance to editors of small journals. The editors from developed countries as leaders, and editors from less advantageous environments as teachers are the key figures in shaping research communication in less privileged scientific communities.

Keywords: Bibliometrics, Cross-Cultural Comparison, Education, Professional, Retraining, Indexing, Journals, Periodicals, Practice Guidelines, Practice Patterns, Professional, Publishing, Training Support, Journals, Publication, Countries

? Bashchinskiy, S., Callaham, M., Chalmers, I., El-Badawi, M., Fletcher, R.H., Fletcher, S.W., Godlee, F., Marusic, A., Ncayiyana, D., Nylenna, M., Overbeke, J., Pini, P., Pitkin, R., Qian, S.C., Rennie, D., Reyes, H., Sahni, P., Squire, B., Utiger, T. and Winker, M. (2001), Report of the World Association of Medical Editors: Agenda for the future. *Croatian Medical Journal*, **42** (2), 121-126.

Full Text: [2001\Cro Med J42, 121.pdf](2001/Cro%20Med%20J42,%20121.pdf)

Abstract: During a 3-day meeting at Bellagio in January 2001, a group of 20 editors from 12 countries in 5 continents met to map out a strategy for the World Association of Medical Editors (WAME)’s continued development in the service of medical editors over the next several years. The group: 1) Developed a statement of principles on the standards of professionalism and responsibilities of editors (this statement will be posted on the Web site after electronic consultation with and comment by WAME editors), 2) Agreed to assess the extent to which these principles are reflected in practice and to explore barriers to their adoption, using data from a survey and focus groups, 3) Developed and outlined an on-line program for distance learning, targeted at new editors, 4) Planned for formal evaluation of the educational outreach program, and 5) Agreed to support regional initiatives to strengthen local editorial capacity. Underpinning all past and proposed future activities is the WAME Web site. The ambitious plans outlined above will require extensive development of the site, plans for which were made at the Bellagio meeting.

Keywords: Bibliometrics, Education, Professional, Refraining, Journalism, Medical, Manuscripts, Medical, Periodicals, Practice Guidelines, Practice Patterns, Professional, Publishing, Training Support

? Sharp, D. (2002), Kipling’s guide to writing a scientific paper. *Croatian Medical Journal*, **43** (3), 262-267.

Full Text: [2002\Cro Med J43, 262.pdf](2002/Cro%20Med%20J43,%20262.pdf)

Abstract: The generally accepted structure of a scientific paper is four sections, an introduction, a methods section, the results, and a discussion. This so-called IMRaD format is, with a few small variations, found in most research articles in biomedical journals. However, as a guide for someone writing up research data for the first time, it is far from complete for example, there is no T for title or even S for summary. Nor does IMRaD explain what belongs in which section and how much should be included in or excluded from any section. As a supplement to, but nota replacement for, IMRaD research-workers could bear in mind the “six honest serving-men” of the poet Rudyard Kipling. These writer’s servants are called What, Why, When, How, Where, and Who, and they can be applied to all parts of the paper from its title down to the tables.

Keywords: Authorship, Journal Article, Journalism, Medical, Periodicals, Science, Writing

? Petrak, J. and Božikov, J. (2003), Journal publications from Zagreb University Medical School in 1995-1999. *Croatian Medical Journal*, **44** (6), 681-689.

Full Text: [2003\Cro Med J44, 681.pdf](2003/Cro%20Med%20J44,%20681.pdf)

Abstract: Aim. To analyze a five-year publication output of the Zagreb University Medical School in scientific journals, especially in the journals covered by the Current Contents (CC), bibliographic database of the Institute for Scientific Information. Methods. Medical School of the Zagreb University is organized in 10 preclinical, 6 public health, and 17 clinical departments, with 359 faculty members. Research activity is important for the academic promotion, with the number of publications (especially in journals covered by CC) and their impact as a key element. Bibliographic data on the published papers by the authors affiliated to the Zagreb University Medical School in the 1995-1999 period were searched in the CC and Biomedicina Croatica databases, according to the official faculty name list. The collected data were classified into three groups according to the source journals: papers published in international journals covered by the CC, Croatian journals covered by the CC, and Croatian journals not covered by the CC. The publication production was measured on individual and departmental levels by using two counting schemes: a) full publication to each author/department; and b) an equal fraction of a publication (1/n) to each author/department. Results. In the 1995-1999 period, the faculty published 578 papers in the journals covered by the CC, 22.6% of them in the subset of Croatian journals. The differences among departments were considerable, with publishing activity per faculty member varying from 0.25 to 6.23 papers in CC journals and from 0.0 to 15.8 in Croatian non-CC journals. Preclinical departments published significantly less in the Croatian journals indexed in the CC then public health and clinical departments. There was a high variance in the number of publications on the individual level, with I he 15.4% of the faculty in the professor rank and 45% in the assistant rank who did not publish a single paper in journals covered by the CC in the analyzed period. On the contrary, 10.1% of professors and 6.0% of assistants published more than 10 and more than 4 CC-indexed papers, respectively. A number of authors who have been very productive in international journals indexed in the CC (11 or more papers) did not publish in Croatian journals indexed in the same database, and vice versa. Conclusion. Publication output of the Zagreb University Medical School shows imbalances characteristic of a small scientific community: productivity with extreme values, relatively unsatisfactory number of papers published in the international journals covered by the CC database as compared to their importance in the process of the academic promotion, and disproportional role of certain domestic journals covered by the CC.

Keywords: Authors, Bibliographic, Bibliometrics, Croatia, Databases, Faculty, Journals, Medical, Papers, Periodicals, Public Health, Publication, Publications, Publishing, Research, Research Performance, Schools, University

? Kovačić, N. (2004), Structure of the 2003 impact factor for *Croatian Medical Journal*. *Croatian Medical Journal*, **45** (6), 671-673.

Full Text: [2004\Cro Med J45, 671.pdf](2004/Cro%20Med%20J45,%20671.pdf)

Abstract: According to the Journal Citation Report from the Institute for Scientific Information (ISI), the last year’s (2003) impact factor (IF) of the Croatian Medical Journal (CMJ) was 0.943. To determine the factors that contributed to this significant increase in the IF, we analyzed the structure of citations to CMJ in the ISI’s publications, Science Citation Index (SCI), and Social Science Citation Index (SSCI). Thematic issues generally acquired more citations than regular issues. Furthermore, citation number varied for different article types. The citations to the original scientific articles corresponded to the average number of citations for the current IF value, whereas reviews and especially case reports were cited less frequently, and negatively contributed to the IF of the journal. Only half of all articles published in two previous years were cited in 2003. The majority of these articles were cited once or twice, whereas only 4 5 articles received more than three citations. journal self-citations are still an important contributor to the CMJ’s IF (39.6%). Their proportion may decrease in time, by further improving the visibility of the journal, and thus acquiring greater number of independent citations. In future, we can expect year-to-year variations in the journals IF. This trend may be positive on a long-term basis, but expectation of a value significantly higher than 1 is unrealistic. CMJ is small general medical journal whose quality-oriented editorial policy may in the long-term result in the increase in the IF.

Keywords: Case Reports, Citation, Citations, General, Impact, Impact Factor, Institute For Scientific Information, ISI, Journal, Journals, Long Term, Long-Term, Medical, Policy, Publications, Reviews, SCI, Science Citation Index, Self-Citations, Small, Social Science Citation Index, SSCI, Structure, Trend, Value, Visibility

? Lukenda, J., Kolarić, B., Kolčić, I., Pažur, V. and Biloglav, Z. (2005), Cardiovascular diseases in Croatia and other transitional countries: Comparative study of publications, clinical interventions, and burden of disease. *Croatian Medical Journal*, **46** (6), 865-874.

Full Text: [2005\Cro Med J46, 865.pdf](2005/Cro%20Med%20J46,%20865.pdf)

Abstract: Aim To determine the number of publications on cardiovascular diseases in the MEDLINE database, the rate of medical doctors and clinical interventions in cardiology, and health and socioeconomic indicators for Croatia, and to compare them with those for Slovenia, Hungary, the Czech Republic, and Austria. Methods PUBMED was used in search for publications on cardiovascular diseases published in 1991-2004. Rates per million population and proportions of publications on cardiovascular diseases in the MEDLINE database were calculated. Gross domestic product (GDP) per capita was used as a socioeconomic indicator, whereas human resources in medicine were presented as the rate of medical doctors per million population. Standardized death rates from cardiovascular diseases and ischemic heart disease were used as indicators of cardiovascular health. Clinical interventions in cardiology, such as coronary angiograms, percutaneous transluminal coronary angioplasties (PTCA), and coronary bypass surgeries (CABG) were expressed per million population per year. Results Croatia had the lowest GDP per capita among the analyzed countries. The standardized death rate from cardiovascular diseases in Croatia was 91.7 per 100,000 population aged 0-64 in 2001, which was higher than that in Slovenia and Austria (P < 0.001), similar to that in the Czech Republic, and lower than that in Hungary (P < 0.001). Cardiovascular scientific output in Croatia was the lowest among investigated countries, ie, 1.1 per million population in 2003 (P < 0.001). Despite a significantly lower number of medical doctors in comparison with Hungary and the Czech Republic (P < 0.001), Croatia experienced a similar increment in the amount of clinical interventions in cardiology. Conclusion In contrast to high cardiovascular mortality rates, cardiovascular scientific production in Croatia was significantly lower than in other investigated Countries. A positive trend in cardiovascular medicine was recorded in clinical practice, but has yet to be followed by scientific production.

Keywords: Aged, Austria, Burden, Cardiovascular, Clinical, Clinical Practice, Comparison, Croatia, Czech Republic, Database, Death, Diseases, Doctors, GDP per Capita, Health, Heart, Human, Hungary, Indicator, Indicators, Interventions, Ischemic Heart Disease, Medical, Medicine, MEDLINE, Mortality, P, Population, Practice, Publications, PUBMED, Rates, Scientific Output, Scientific Production, Slovenia, Trend

? Marcovitch, H., Barbour, V., Borrell, C., Bosch, F., Fernandez, E., Macdonald, H., Marusic, A. and Nylenna, M. (2010), Conflict of interest in science communication: more than a financial issue report from Esteve Foundation Discussion Group, April 2009. *Croatian Medical Journal*, **51** (1), 7-15.

Full Text: 2010\Cro Med J51, 7.pdf

Abstract: A systematic review and meta-analysis suggests that around 2% of scientists admit to have falsified research at least once (1). Up to 33% admit other questionable practices such as plagiarism, duplicate publication, undisclosed changes in pre-research protocols or dubious ethical behavior (1). There can be no doubt that discovered cases of research and publication misconduct represent a tip of an iceberg and many cases go unreported (2). Experienced biomedical journal editors are aware of a “rogues’ gallery” of major fraudsters, such as Schoen, Hwang, Sudbo, Poehlman, Singh, and Chandra (3-8). Much more common are the less dramatic, because more subtle but probably more dangerous, examples; these are more dangerous because they remain undiscovered so may feed into meta-analyses and guidelines. A seminar organized by the Esteve Foundation, held in Sitges in April 2009, concentrated on conflicts of interest (COI, sometimes also referred to as Competing Interests, CI), which underlie so much research and publication misconduct. All attendants of the meeting agreed that there were many sources of COI in the general process of scientific communication (Figure 1). The meeting was mainly focused on non-financial COI. Three introductory presentations highlighted some of the topics related to COI in the contemporary scientific publishing enterprise.

Keywords: Biomedical, Could Disclosure, Duplicate Publication, Epidemiology, Industry, Journal, Journal Editors, Medicine, Meta-Analysis, Metaanalysis, Plagiarism, Public-Health, Publication, Publishing, Research, Review, Systematic Review, Work

? Sember, M., Utrobicic, A. and Petrak, J. (2010), *Croatian Medical Journal* citation score in Web of Science, Scopus, and Google Scholar. *Croatian Medical Journal*, **51** (2), 99-103.

Full Text: [2010\Cro Med J51, 99.pdf](2010/Cro%20Med%20J51,%2099.pdf)

Abstract: Aim To analyze the 2007 citation count of articles published by the Croatian Medical Journal in 2005-2006 based on data from the Web of Science, Scopus, and Google Scholar. Methods Web of Science and Scopus were searched for the articles published in 2005-2006. As all articles returned by Scopus were included in Web of Science, the latter list was the sample for further analysis. Total citation counts for each article on the list were retrieved from Web of Science, Scopus, and Google Scholar. The overlap and unique citations were compared and analyzed. Proportions were compared using chi(2)-test. Results Google Scholar returned the greatest proportion of articles with citations (45%), followed by Scopus (42%), and Web of Science (38%). Almost a half (49%) of articles had no citations and 11% had an equal number of identical citations in all 3 databases. The greatest overlap was found between Web of Science and Scopus (54%), followed by Scopus and Google Scholar (51%), and Web of Science and Google Scholar (44%). The greatest number of unique citations was found by Google Scholar (n = 86). The majority of these citations (64%) came from journals, followed by books and PhD theses. Approximately 55% of all citing documents were full-text resources in open access. The language of citing documents was mostly English, but as many as 25 citing documents (29%) were in Chinese. Conclusion Google Scholar shares a total of 42% citations returned by two others, more influential, bibliographic resources. The list of unique citations in Google Scholar is predominantly journal based, but these journals are mainly of local character. Citations received by internationally recognized medical journals are crucial for increasing the visibility of small medical journals but Google Scholar may serve as an alternative bibliometric tool for an orientational citation insight.

Keywords: Articles, Bibliometric, Books, Citation, Citation Count, Citation Counts, Citations, Databases, English, Google Scholar, Journal, Journals, Language, Local, Medical, Science, Scopus, Visibility, Web of Science

? Mavrinac, M., Brumini, G., Bilic-Zulle, L. and Petrovecki, M. (2010), Construction and validation of attitudes toward plagiarism questionnaire. *Croatian Medical Journal*, **51** (3), 195-201.

Full Text: 2010\Cro Med J51, 195.pdf

Abstract: Aim To develop and test the psychometric characteristics of a questionnaire measuring attitudes toward plagiarism. Methods Participants were 227 undergraduates and graduate students (128 women and 99 men) from three Croatian universities, with a median age of 21 years (range 18 to 48). Research was conducted from March to June 2009. For the purpose of construction of the first version of the questionnaire, 67 statements (items) were developed. The statements were based on the relevant literature and were developed following rules and recommendations for questionnaire writing, and 36 items were chosen for final validation. Factor analysis was used to find out the factor structure of the questionnaire and to measure construct validity. Results The final version of the questionnaire consisted of 29 items divided into a three-factor structure: factor I -positive attitude toward plagiarism (12 items); factor II - negative attitude toward plagiarism (7 items); and factor III -subjective norms toward plagiarism (10 items). Cronbach a was calculated to confirm the reliability of the scale: factor I a = 0.83; factor II a = 0.79; and factor III a = 0.85. Correlations between factors were: -0.37 between I and II, -0.41 between I and III, and +0.31 between II and III. Conclusion Attitudes Toward Plagiarism questionnaire was developed, with good psychometric characteristics. It will be used in future research as a standardized tool for measuring attitudes toward plagiarism.

Keywords: Ethics, Literature, Medical-Students, Plagiarism, Planned Behavior, Publication, Questionnaire, Research, Research Integrity, Students, Writing

# Title: Croatica Chemica Acta

Full Journal Title: [Croatica Chemica Acta](http://public.carnet.hr/ccacaa/)

ISO Abbreviated Title: Croat. Chem. Acta.

JCR Abbreviated Title: Croat Chem Acta

ISSN: 0011-1643

Issues/Year: 4

Journal Country/Territory: Croatia

Language: Multi-Language

Publisher: Croatian Chemical Soc

Publisher Address: Marulicev Trg 19/II, 41001 Zagreb, Croatia

Subject Categories:

Chemistry, Multidisciplinary: Impact Factor 0.831, 77/125 (2008)

? Cerjan-Stefanović, Š., Ćurković, L. and Filipan, T. (1996), Metal ion exchange by natural zeolites. *Croatica Chemica Acta*, **69** (1), 281-290.

Full Text: 1996\Cro Che Act69, 281.pdf

Abstract: The influence of pretreatment on the capacity and selectivity of natural zeolite for Zn2+ and Mn2+ ions has been studied. Natural tuff (sample 1), consisting mainly of zeolite clinoptilolite, was converted into the Na+ form by conditioning with 2 M NaCl at 22°C (sample 2) and 70°C (sample 3), respectively. Simultaneously, 0.26, 0.31, 0.38 mmol Zn2+ and 0.20, 0.23, 0.30 mmol Mn2+ were taken up by 1.00 g of zeolite samples 1, 2 and 3, respectively The results show that zeolites converted to the Na+ form at 70°C possess the highest capacity for metal ions. For all the zeolite samples tested, zinc was more selectively removed than manganese. The amount and composition of exchangeable cations as well as their impact on ion-exchange performances of zeolite in the process of Zn2+ and Mn2+ removal were determined.

Keywords: Heavy-Metals

? Sondi, I. and Pravdić, V. (1998), The colloid and surface chemistry of clays in natural waters. *Croatica Chemica Acta*, **71** (4), 1061-1074.

Full Text: [1998\Cro Che Act71, 1061.pdf](1998/Cro%20Che%20Act71,%201061.pdf)

Abstract: The colloid and surface chemistry of clays is discussed based on recent work of the authors. The aim is to test the predictability of the role and fate of suspended matter in natural waters, transforming a reductionistic approach into a holistic picture. Most of the information is based on model substances and model clay minerals, for which electrokinetic properties, ion exchange capacities, and enthalpies of wetting were measured. It has been shown that mimicking the disintegration of particles, accomplished by milling, new positively charged surfaces can be created. Beidellite, a model smectite mineral, is the prevailing type of clay minerals by its large specific surface area, large ammonia saturation indexes, and high specific enthalpies of wetting, however with little contribution to new amphoteric surfaces as a result of milling. In ripidolite, a chlorite, all these values are much lower, however the creation of amphoteric surfaces through milling is strongly expressed. Indeed, ripidolite is a unique example of clays that can exhibit positively charged surfaces. Adsorption of fulvic acid, a widespread detrital organic, obscures the differences by producing commonly observed negatively charged surfaces of natural suspended matter and sediments.

Keywords: Adriatic Sea, Beidellite Clays, Adige River, Minerals, Matter, Electrokinetics, Sedimentation, Coagulation, Ripidolite, Kaolinite

? Kaštelan-Macan, M. and Klaić, B. (2000), Analytical chemistry in Croatia. *Croatica Chemica Acta*, **73** (1), 1-21.

Full Text: [2000\Cro Che Act73, 1.pdf](2000/Cro%20Che%20Act73,%201.pdf)

Abstract: Analytical chemistry started to develop in Croatia as an independent scientific discipline at the Royal Agricultural and Forestry College in Krizevci (1860). Lectures in analytical chemistry began at the University of Zagreb in the school year 1875/76 within the University Institute of Chemistry. Today, analytical chemistry is taught as an independent course at eleven university faculties, in Zagreb, Split, Osijek and Rijeka. This paper presents a comparison of the compulsory contents of basic curricula in analytical chemistry in Croatia with the WPAC Eurocurriculum. Scientometric analysis of the Croatian scientific output covered by the Analytical Abstracts shows that during the 1980-1996 period Croatian analytical chemistry scientists published 442 papers, 89.6% of which were also indexed in SCI. Croatian analytical chemists most frequently deal with spectroscopic, chromatographic and electroanalytical methods. Distribution of the scientific analytical publications with respect to the number of authors, analytical method used and the number of total and independent citations is graphically presented.

? Li, J.F., Zhang, Y.H., Wang, X.S. and Ho, Y.S. (2009), Bibliometric analysis of atmospheric simulation trends in meteorology and atmospheric science journals. *Croatica Chemica Acta*, **82** (3), 695-705.

Full Text: [2009\Cro Che Act82, 695A.pdf](2009/Cro%20Che%20Act82,%20695A.pdf); [2009\Cro Che Act82, 695.pdf](2009/Cro%20Che%20Act82,%20695.pdf)

Abstract: This study was designed to evaluate the global scientific output of simulation research in “meteorology and atmospheric sciences” for the past 16 years and to assess the characteristics of the atmospheric simulation research patterns, tendencies and methods in the papers, from leading countries and institutes. Data were based on the online version of Science Citation Index, Web of Science from 1992 to 2007. Articles referring to atmospheric simulation were assessed by exponential regression fitting the trend of publication outputs with r2 = 0.9996, distribution of source countries, source institutes, source titles, author keywords, and keywords plus, and the four most cited articles in these years. By synthetic analysis of the three kinds of keywords, it was concluded that atmospheric simulation research related to “ozone”, “climate”, “circulation”, “transport”, “parameterization” and “assimilation” will be foci of atmospheric simulation research in the 21st century.

Keywords: Acid Deposition, Aerosol, Air-Quality, Articles, Atmospheric Simulation, Author Keywords, Bibliometric, Bibliometric Analysis, Characteristics, Chemical-Characterization, Citation, Climate-Change, Distribution, Exponential Model, Forecast Model, Global, Journals, Largest US Cities, Methods, Modeling System, Pollution, Publication, Regression, Research, Research Trend, SCI, Science, Science Citation Index, Scientific Output, Scientometrics, Simulation, Trend, Trends, United-States, Web of Science

# Title: Crop Science

Full Journal Title: Crop Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

IDS Number:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Volenec, J.J., Nelson, C.J. and Sleper, D.A. (1984), Influence of temperature on leaf dark respiration of diverse tall fescue genotypes. *Crop Science*, **24** (5), 907-912.

Full Text: [1984\Cro Sci24, 907.pdf](1984/Cro%20Sci24,%20907.pdf)

# Title: Crustacean Issues, History of Carcinology

Full Journal Title: Crustacean Issues, History of Carcinology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0168-6356

IDS Number:

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Inst Sci Inform Inc, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Rice, A. (1993), Two centuries of larval crab papers: A preliminary analysis. *Crustacean Issues, History of Carcinology*, 285-292.

# Title: Cryo-Letters

Full Journal Title: Cryo-Letters

ISO Abbreviated Title: Cryo-Lett.

JCR Abbreviated Title: Cryo-Lett

ISSN: 0143-2044

Issues/Year: 6

Journal Country/Territory: England

Language: Multi-Language

Publisher: Cryo Letters

Publisher Address: C/O Royal Veterinary College, Royal College St, London NW1 0TU, England

Subject Categories:

Biology, Miscellaneous: Impact Factor 1.053, / (2000)

Physiology: Impact Factor 1.053, / (2000)

? Rogge, G.D., Viana, A.M. and Randi, A.M. (2000), Cryopreservation of spores of Dicksonia sellowiana: An endangered tree fern indigenous to South and Central America. *Cryo-Letters*, **21** (4), 223-230.

Abstract: Spores of Dicksonia sellowiana (Presl.) Hook., an endangered tree fern, were stored in liquid nitrogen. Surface sterilized spores were placed in 1 ml sterile polypropylene cryotubes and were plunged into liquid nitrogen cryo-cans for 15 minutes, 15 days, 1 month and 3 months. In all, of the treatments the percentage of germination was higher than the control (fresh spores). Germination in Dyer and MS media supplement with 10-7, M and 5×10-7, M BA was also promoted as comparing to control. There was no difference between the germination of spores thawed rapidly in a water bath at 45°C during 5 minutes or slowly at room temperature. Cryopreservation seems to promote germination of some dormant spores of D. sellowiana. The pre-treatment in cryoprotective solution of dimethyl sulphoxide 15%(v/v) in 1M(v/v) glycerol inhibited the germination of cryopreserved spores.

Keywords: Dicksonia Sellowiana, Spore, Medium Term Cryogenic Storage, Germination, Gametophyte Development, Germination, Cultivars

# Title: Crystengcomm

Full Journal Title: Crystengcomm

ISO Abbreviated Title: Crystengcomm

JCR Abbreviated Title: Crystengcomm

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhang, K.L., Chang, Y., Hou, C.T., Diao, G.W., Wu, R.T. and Ng, S.W. (2010), Effect of *N*-donor auxiliary ligands on the engineering of crystalline architectures of a series of lead(II) complexes with 5-amino-2,4,6-triiodoisophthalic acid. *Crystengcomm*, **12** (4), 1194-1204.

Full Text: [2010\Crystengcomm12, 1194.pdf](2010/Crystengcomm12,%201194.pdf)

Abstract: The aqueous medium reactions of lead(II) nitrate with H(2)ATIBDC as a main ligand and bipy or biim as an auxiliary ligand lead to the two fascinating coordination polymers: [Pb(ATIBDC)(bipy)(H2O)]center dot 3H(2)O (1) and [Pb(ATIBDC)(biim)]center dot H2O (2) [bipy 2,2’-bipyridine, biim 2,2’-biimidazole, and H(2)ATIBDC 5-amino-2,4,6-triiodoisophthalic acid]. The interesting chiral three-dimensional (3D) network [Pb(ATIBDC)] (3) is obtained in the absence of any auxiliary ligands. Complex 1 is a one-dimensional (1D) helical chain, which further arrays into a 3D supramolecular metal-organic framework (MOF) with a 1D channel through the hydrogen-bonding and strong offset pi center dot center dot center dot pi stacking interactions. Furthermore, a 1D hydrogen-bonded helical water chain was found in 1. Interestingly, complex 1 exhibits reversible adsorption/desorption to water molecules. Framework 1 falls within the category of “recoverable collapsing” and “guest-induced re-formation” frameworks. Complex 2 features a fascinating 3D MOF. It displays a novel four-connected 4(6)6(8)-SOD (sodalite) zeotype network structure with 1D nanotubular channels. Complex 3 crystallizes in the chiral space group P3(1) and possesses a 3D honeycomb-like structure built up from a 1D Pb(II)-carboxylate-bridged helical chain with a 3(1) helix and ATIBDC(2-) ligand. The coordination modes of the ATIBDC(2-) ligand and crystalline architectures of the complexes are greatly dependent on the auxiliary ligands. The thermal stability and solid state fluorescent properties have been studied. Adsorption/desorption properties reveal that 2 may be used as an adsorbent material for some guest molecules. The study broadens the still very limited use of H(2)ATIBDC as a spacer and lead(II) ion for crystal engineering of MOFs with channels and cavities. These compounds represent the first examples of lead(II) complexes with H(2)ATIBDC.

Keywords: 3D, Adsorbent, Adsorption, Desorption, Aqueous Medium, Chemistry, Coordination, Coordination Polymers, Design, Engineering, First, Framework, Hydrogen Bonding, Hydrogen-Bonds, Large Pores, Lead, Lead(II), Ligand, Ligands, Lone-Pair, Metal-Organic Framework, MOFS, Network, Nitrate, Polymers, Reticular Synthesis, Sodalite-Type, Sorption Properties, Stability, State, Structure, Thermal Stability, Three-Dimensional, Water

# Title: Cuadernos de Economia y Direccion de la Empresa

Full Journal Title: Cuadernos de Economia y Direccion de la Empresa

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Velasco, C.A.B., Parra, V.F.G. and Garcia, C.Q. (2011), The evolution of Family Firm literature as a research discipline. *Cuadernos de Economia y Direccion de la Empresa*, **14** (2), 78-90.

Full Text: 2011\Cua Eco Dir Emp14, 78.pdf

Abstract: This paper describes the evolution of the family firm research over the 1961-2008 time period. We have compiled a database of the 684 articles focused on the field published in journals included in the Social Science Citation Index. Bibliometric methods and techniques are used to describe the evolution of publication activity, the most active institutions, the methodologies applied, and the main subjects researched. Based on these analyses, potential avenues for future research are proposed to advance in the consolidation of the field as a scientific discipline. (C) 2009 ACEDE. Published by Elsevier Espana, S.L. All rights reserved.

Keywords: Activity Indicators, Agency, Bibliometric, Bibliometric Methods, Bibliometrics, Business, Citation, Co-Words, Dynamic Capabilities, Family Firm, Governance, Journals, Literature, Methodology, Ownership, Performance, Perspective, Publication, Research, Resource-Based View, Science, Science Citation Index, Strategic Management, Succession

# Title: Cultura y Educacion

Full Journal Title: Cultura y Educacion

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Dorta-González, P. and Dorta-González, M.I. (2011), Empirical application of a bibliometric indicator based on the h-index. *Cultura y Educacion*, **23** (2), 297-313.

Full Text: [2011\Cul Edu23, 297.pdf](2011/Cul%20Edu23,%20297.pdf)

Abstract: The h-index is one of the bibliometric indicators used to estimate the success of a researcher. This indicator combines production and impact, and eliminates biases caused by the tails of the citations distribution. However, this indicator has limitations in discriminating between researchers with different publication habits, penalising in h-index based evaluations those who follow a more selective publication strategy and publish a relatively low number of documents that are frequently cited. This paper presents an empirical application of environment indicators, an addition to the h-index that considers the intermediate zone of the citations distribution.

Keywords: Bibliometric, Bibliometric Indicators, Citation Analysis, Citations, Education, Environment, h Index, h-Index, Publication, Research, Research Evaluation, Scientific-Research, Spain

# Title: Cultural Diversity & Ethnic Minority Psychology

Full Journal Title: Cultural Diversity & Ethnic Minority Psychology

ISO Abbreviated Title:

JCR Abbreviated Title: Cultur Divers Ethnic Minor Psychol

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hall, G.C. and Maramba, G.G. (2001), In search of cultural diversity: Recent literature in cross-cultural and ethnic minority psychology. *Cultural Diversity & Ethnic Minority Psychology*, **7** (1), 12-26.

Abstract: The purpose of this study was to identify where the most work on cross-cultural and ethnic minority psychology is being published and who the most productive authors are. The journals that published the most articles on cross-cultural and ethnic minority issues from 1993 to 1999 and the most prolific authors on these issues were identified by PsycINFO. Cross-cultural research is cross-national, whereas ethnic minority research involves groups of color within the United States. The citation impact of these journals and authors was determined from the 1997 Social Sciences Citation Index. The results suggest that there is very limited overlap between the literatures in cross-cultural and ethnic minority psychology. Most of the research in these areas is published in specialty journals, and there is a paucity of this research in prestigious journals. Perceived or actual barriers to publication in prestigious journals may cause some to seek specialty journals as outlets for research on cultural diversity. The top scholars in cross-cultural psychology are primarily men of European ancestry, whereas most of the top scholars in ethnic minority psychology are ethnic minority men and women. Strategies to increase the prominence of cultural diversity in the psychology literature include combining cross-cultural and ethnic minority psychology, increasing the number of editorial board members of prestigious journals having expertise in cultural diversity, and increasing the quality of specialty journals. Psychology will remain ill-equipped to face the challenges of the new millennium without increased attention to cultural diversity.

Keywords: Barriers, Citation, Cultural, Diversity, Ethnic Minority, Impact, Journals, Literature, Men, Psychology, PsycINFO, Publication, Purpose, Quality, Quality of, Research, Specialty, United States, Women, Work

# Title: Culture and Organization

Full Journal Title: Culture and Organization

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Basboll, T. (2010), Softly constrained imagination: Plagiarism and misprision in the theory of organizational sensemaking. *Culture and Organization*, **16** (2), 163-178.

Abstract: While Karl Weick’s writings have been very influential in contemporary work on organizations, his scholarship is rarely subjected to critical scrutiny. Indeed, despite its open ‘breaching’ of the conventions of much academic writing, Weick’s work has been widely celebrated as ‘first-rate scholarship.’ As it turns out, however, his ‘softly constrained’ textual practices are rendered doubtful by both misreading and plagiarism, which makes his work resemble ‘poetry’ in a much stronger sense than perhaps originally intended. This paper draws inspiration from literary theory to analyze three cases of questionable scholarship in Weick’s 1995 book Sensemaking in organizations, framing them in the context of standard formulations of the methodology of sensemaking drawn from the literature. It concludes that we need to rethink our tolerance of the sensemaking style and reaffirm a commitment to more traditional academic constraints.

Keywords: Anecdote of the Map, Battered Child Syndrome, Disaster, Interpretation, Literature, Methodology, Plagiarism, Poetry, Sensemaking, Style As Theory, Weick, Karl, Writing

# Title: Current Biology

Full Journal Title: Current Biology

ISO Abbreviated Title: Curr. Biol.

JCR Abbreviated Title: Curr Biol

ISSN: 0960-9822

Issues/Year: 24

Journal Country/Territory: United States

Language: English

Publisher: Cell Press

Publisher Address: 1100 Massachusettes Ave, Cambridge, MA 02138

Subject Categories:

Biochemistry & Molecular Biology: Impact Factor 7.460, / (2001)

Biology: Impact Factor 7.460, / (2001)

Dixon, B. (2003), Editors sound the SARS alarm bells. *Current Biology*, **13** (9), R339-R340.

Full Text: [C\Cur Bio13, R339.pdf](C/Cur%20Bio13,%20R339.pdf)

Abstract: Mediawatch: Lethal virus outbreaks may help sell newspapers but Bernard Dixon finds that the early response from journalists to the severe acute respiratory syndrome (SARS) has been more informed than in many previous scares with diseases resulting from other dangerous viruses.

# Title: Current Comments

Full Journal Title: Current Comments

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Garfield, E. (1990), The most cited physical sciences publications in the 1945-1954 Science Citation Index. 1. 52 Citation classics in physics and chemistry. *Current Comments*, **20**, 3-??.

Keywords: Chemistry, Citation, Science Citation Index

? Garfield, E. (1990), The Russian are coming. 2. The top 50 Soviet papers most cited in the 1973-1988 Science Citation Index and a look at 1988 research fronts. *Current Comments*, **25**, 3-??.

Keywords: Jun, Russian, Science Citation Index, Soviet

? Garfield, E. (1990), The most-cited papers of all time, SCI 1945-1988. 2. the 2nd 100 citation-classics. *Current Comments*, **26**, 3-??.

Keywords: Time

# Title: Current Contents

Full Journal Title: Current Contents

ISO Abbreviated Title: Curr. Contents

JCR Abbreviated Title: Curr Contents

ISSN:

IDS Number: R8189

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Inst Sci Inform Inc, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Garfield, E. (1972), Introducing Schroeder, M - ISIs Treasurer. *Current Contents*, **15** (51), 5-??.

? Garfield, E. (1973), Core research library for developing graduate schools - 100 books most-cited by researchers. *Current Contents*, **1**, 5-9.

Keywords: Books, Research, Researchers

? Garfield, E. (1973), Which journals attract most frequently cited articles - Heres a list of top 15. *Current Contents*, **39**, 5-6.

? Garfield, E. (1973), More on forecasting Nobel-Prizes and most cited scientists of 1972. *Current Contents*, **40**, 5-7.

Keywords: Scientists

? Garfield, E. (1973), Were 1972 papers most cited in 1972 most significant. *Current Contents*, **42**, 5-7.

Keywords: Significant

? Garfield, E. (1973), 25 most cited 1971 papers reveal a great deal about research in 1971. *Current Contents*, **44**, 5-8.

Keywords: Research

? Garfield, E. (1974), Selecting all-time citation classics - Here are 50 most cited papers for 1961-1972. *Current Contents*, **2**, 5-8.

Keywords: Citation

? Garfield, E. (1974), Second 50 papers most cited from 1961-1972. *Current Contents*, **6**, 5-9.

? Garfield, E. (1974), List of 100 most cited chemical articles. *Current Contents*, **10**, 5-12.

Keywords: Articles

Notes: highly cited

? Garfield, E. (1974), Was Science Citation Index concept inevitable. *Current Contents*, **50**, 5-6.

Full Text: Cur Con50, 5.pdf

Keywords: Citation, Science Citation Index

? Garfield, E. (1975), Journal Citation Studies. 18. Highly cited botany journals. *Current Contents*, **2**, 5-9.

Notes: highly cited

? Garfield, E. (1975), Come blow your horn: Why were proud of Social Sciences Citation Index. *Current Contents*, **12**, 5-9.

Full Text: Cur Con12, 5.pdf

? Garfield, E. (1976), 1973 papers most cited in 1973. *Current Contents*, **7**, 5-8.

? Garfield, E. (1976), 1974 articles most cited in 1974. *Current Contents*, **8**, 5-8.

Keywords: Articles

? Garfield, E. (1976), More on Jazz Transcriptions. *Current Contents*, **17**, 5-10.

Notes: highly cited

? Garfield, E. (1976), Social Sciences Citation Index clusters. *Current Contents*, **27**, 5-11.

Notes: highly cited

? Garfield, E. (1976), Literature of social sciences and usage and effectiveness of Social Sciences Citation Index. *Current Contents*, **34**, 5-10.

? Garfield, E. (1977), ISI adds non-journal material to 1977 Science Citation Index. *Current Contents*, **9**, 5-6.

Keywords: Science Citation Index

? Garfield, E. (1977), 250 most cited primary authors, 1961-1975. 1. How names were selected. *Current Contents*, **49**, 5-15.

Keywords: Authors, Primary

? Garfield, E. (1977), 250 most-cited primary authors, 1961-1975. 2. Correlation between citedness, Nobel-Prizes, and academy memberships. *Current Contents*, **50**, 5-15.

Keywords: Authors, Correlation, Primary

? Garfield, E. (1977), 250 most-cited primary authors, 1961-1975. 3. Each authors most-cited publication. *Current Contents*, **51**, 5-20.

Keywords: Authors, Primary, Publication

Notes: highly cited

? Garfield, E. (1978), So Whos perfect - Corrections and additions to 250 most-cited authors list. *Current Contents*, **21**, 5-10.

Keywords: Authors

? Garfield, E. (1978), 300 most-cited authors, 1961-1976, including co-authors at last. 1. How names were selected. *Current Contents*, **28**, 5-17.

Keywords: Authors

? Garfield, E. (1978), Endless quest for timeliness - 4th Quarterly-Science Citation Index. *Current Contents*, **31**, 5-8.

? Garfield, E. (1978), 100 articles most cited by social-scientists, 1969-1977. *Current Contents*, **32**, 5-14.

Keywords: Articles

? Garfield, E. (1978), 300 most-cited authors, 1961-1976, including co-authors. 2. Relationship between citedness, awards, and academy memberships. *Current Contents*, **35**, 5-30.

Keywords: Authors

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Keywords: Books

? Garfield, E. (1978), 100 most-cited SSCI authors, 1969-1977. 1. How names were selected. *Current Contents*, **38**, 5-11.

Keywords: Authors

? Garfield, E. (1978), 100 most-cited SSCI authors. 2. Catalog of their awards and academy memberships. *Current Contents*, **45**, 5-15.

Keywords: Authors

? Garfield, E. (1978), 300 most-cited authors, 1961-1976, including co-authors. 3A. Their most-cited papers - introduction and journal analysis. *Current Contents*, **47**, 5-16.

Keywords: Authors, Journal, Journal Analysis

? Garfield, E. (1978), 300 most-cited authors, 1961-1976, including co-authors. 3B. Their most-cited papers and a correction note. *Current Contents*, **48**, 5-12.

? Garfield, E. (1978), 300 most-cited authors, 1961-1976, including co-authors. 3C. Their most-cited papers and affiliation data. *Current Contents*, **49**, 5-16.

Keywords: Authors

? Garfield, E. (1979), 1976 articles most cited in 1976 and 1977. 1. Life sciences. *Current Contents*, **13**, 5-23.

Keywords: Articles, Sciences

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Keywords: Articles, Sciences

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Keywords: Articles, Sciences

? Garfield, E. (1979), Most-cited authors in the Arts and Humanities, 1977-1978. *Current Contents*, **32**, 5-10.

Keywords: Arts, Authors, Humanities

? Garfield, E. (1979), Most-cited articles of the 1960s. 2. Biochemistry and molecular-biology. *Current Contents*, **35**, 5-14.

Keywords: Articles

Notes: highly cited

? Garfield, E. (1979), Scientometrics comes of age. *Current Contents*, **46**, 5-10

Notes: highly cited

? Garfield, E. (1979), Psychedelic art of the huichol Indians. *Current Contents*, **52**, 5-7.

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Keywords: Authors, Citation, Literature, Nobel Prize

? Garfield, E. (1980), Most-cited articles of the 1960S. 3. Pre-clinical basic research. *Current Contents*, **5**, 5-13.

Keywords: Articles, Research

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Keywords: Articles, Research

? Garfield, E. (1980), From citation amnesia to bibliographic plagiarism. *Current Contents*, **23**, 5-9.

? Garfield, E. (1980), The 1977 articles most cited from 1977 to 1979. 1. Life SCIENCES. *Current Contents*, **29**, 5-18.

Keywords: Articles, Sciences

? Garfield, E. (1980), The 1977 articles most cited from 1977 to 1979. 2. Physical sciences. *Current Contents*, **30**, 5-17.

Keywords: Articles, Sciences

? Garfield, E. (1980), 1978 Articles most cited in 1978 and 1979. 1. Physical sciences. *Current Contents*, **46**, 5-16.

Keywords: Articles, Sciences

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Keywords: Articles, Sciences

? Garfield, E. (1981), The 1,000 contemporary scientists most-cited 1965-1978. 1. The basic list and introduction. *Current Contents*, **41**, 5-14.

Keywords: Scientists

Notes: highly cited

? Garfield, E. (1982), In tribute to Nalimov, V.V. - Renaissance scholar and scientometrician par excellence. *Current Contents*, **8**, 5-15.

? Garfield, E. (1982), The 1,000 most-cited contemporary authors. 2A. Details on authors in the physical and chemical sciences and some comments about Nobels and academy memberships. *Current Contents*, **9**, 5-13.

Keywords: Authors, Sciences

? Garfield, E. (1982), The 1,000 most-cited contemporary authors. 2B. Details on authors in biochemistry, biophysics, cell biology, enzymology, genetics, molecular-biology, and plant sciences. *Current Contents*, **21**, 5-13.

Keywords: Authors, Genetics, Sciences

? Garfield, E. (1982), The 1,000 most-cited contemporary authors. 2C. Details on authors in hematology, histology, immunology, microbiology, physiology, and virology. *Current Contents*, **22**, 5-13.

Keywords: Authors

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Keywords: Authors, Cardiology, Neurobiology, Oncology, Pharmacology, Psychiatry, Surgery

? Garfield, E. (1982), The 1979 articles most cited from 1979 to 1981. 1. Life sciences. *Current Contents*, **26**, 5-20.

Keywords: Articles, Sciences

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Keywords: Scientists

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Keywords: Articles, Sciences

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Keywords: Publications

? Garfield, E. (1982), Data from Arts-and-Humanities-Citation-Index reveal the interrelationships of science and humanities. *Current Contents*, **46**, 5-7.

Notes: highly cited

? Garfield, E. (1982), Journal citation studies. 38. Earth sciences journals - What they cite and what cites them. *Current Contents*, **52**, 5-14.

Notes: highly cited

? Garfield, E. (1983), The 1955-1964 Science Citation Index Cumulation - A major new bibliographic tool for historians of science and all others who need precise information-retrieval for the age of space and molecular biology. *Current Contents*, **5**, 5-8.

Keywords: Citation, Science Citation Index

Notes: highly cited

? Garfield, E. (1983), How to use Science Citation Index (SCI). *Current Contents*, **9**, 5-14,

Keywords: Citation, Science Citation Index

? Garfield, E. (1983), The 1980 articles most cited in 1980 and 1981. 1. Life sciences. *Current Contents*, **10**, 5-15.

Keywords: Articles, Sciences

? Garfield, E. (1983), The 1980 articles most cited in 1980 and 1981. 2. Physical sciences. *Current Contents*, **20**, 5-16.

Keywords: Articles, Sciences

? Price, D.J.D. (1983), This week’s citation classic. *Current Contents*, **29**, 18.

Full Text: [1983\Cur Con29, 18.pdf](1983/Cur%20Con29,%2018.pdf)

? Garfield, E. (1983), Third-world research. 2. High-impact journals, most-cited articles, and most active areas of research. *Current Contents*, **34**, 5-16.

Keywords: Articles, Journals, Research

? Garfield, E. (1983), The 1980 chemistry articles most cited in 1980-1982. *Current Contents*, **35**, 5-15.

Keywords: Articles, Chemistry

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Keywords: Articles, Sciences

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Keywords: Articles, Sciences

Notes: highly cited

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Keywords: Citation, Science Citation Index

? Garfield, E. (1984), Latin-american research. 2. Most-cited articles, discipline orientation, and research front concentration. *Current Contents*, **20**, 3-10.

Keywords: Articles, Latin American, Research

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Notes: highly cited

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Keywords: Articles, Citation, Science, Technology

? Garfield, E. (1984), The multidisciplinary impact of math and computer-science is reflected in the 100 most-cited articles in compumath citation index, 1976-1980. *Current Contents*, **31**, 3-10.

Keywords: Articles, Citation, Impact, Multidisciplinary

? Garfield, E. (1984), The 1981 geosciences articles most cited from 1981 through 1983. *Current Contents*, **33**, 3-15.

Keywords: Articles

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Keywords: Books, Citation

? Garfield, E. (1984), The articles most cited in 1961-1982. 3. Another 100 all-time citation-classics. *Current Contents*, **35**, 3-9.

Keywords: Articles

? Garfield, E. (1984), The articles most cited in 1961-1982. 4. 100 additional citation classics. *Current Contents*, **40**, 3-9.

Keywords: Articles, Citation

? Garfield, E. (1984), The articles most cited in 1961-1982. 5. Another 100 citation-classics and a summary of the 500 papers identified to date. *Current Contents*, **42**, 3-12.

Keywords: Articles

? Garfield, E. (1984), Journal citation studies. 44. Citation patterns in nursing journals, and their most-cited articles. *Current Contents*, **43**, 3-12.

Keywords: Articles, Citation, Journal, Journals, Nursing

? Garfield, E. (1984), The 1982 articles most cited in 1982 and 1983. 1. Life sciences. *Current Contents*, **45**, 3-15.

Keywords: Articles, Sciences

? Garfield, E. (1984), The 1982 articles most cited in 1982 and 1983. 2. Physical sciences. *Current Contents*, **48**, 3-14.

Keywords: Articles, Sciences

? Garfield, E. (1984), The awards of science - Beyond the Nobel-Prize. 2. The winners and their most-cited papers. *Current Contents*, **50**, 3-17.

Keywords: Nobel Prize, Science

? Garfield, E. (1984), Science books for children. *Current Contents*, **52**, 3-11.

? Garfield, E. (1985), The 250 most-cited citation-classics from the essential decade 1955-1964. *Current Contents*, **5**, 3-15.

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Keywords: Chemistry

? Garfield, E. (1985), The articles most cited in the SCI from 1961 to 1982. 6. More citation-classics to think about. *Current Contents*, **14**, 3-10.

Keywords: Articles

? Garfield, E. (1985), The articles most cited in the SCI from 1961 to 1982. 7. Another 100 citation-classics - the Watson-crick double helix has its turn. *Current Contents*, **20**, 3-12.

Keywords: Articles

? Garfield, E. (1985), The articles most cited in the SCI from 1961 to 1982. 8. Ninety-eight more classic papers from unimolecular reaction velocities to natural opiates - the changing frontiers of science. *Current Contents*, **33**, 3-11.

Keywords: Articles, Science

? Garfield, E. (1985), The 1981 most-cited chemistry papers. 2. Highlighting the arbitrary boundaries between chemistry and physics. *Current Contents*, **35**, 3-14.

Keywords: Chemistry, Physics

? Garfield, E. (1985), The 1983 articles most cited in 1983 and 1984. 1. Life sciences. *Current Contents*, **47**, 3-18.

Keywords: Articles, Sciences

? Garfield, E. (1985), The 1983 articles most cited in 1983 and 1984. 2. Physical sciences. *Current Contents*, **50**, 3-19.

Keywords: Articles, Sciences

? Garfield, E. (1985), The 1982 chemistry articles most cited, 1982-1984. *Current Contents*, **51-5**, 3-17.

Keywords: Articles, Chemistry

? Garfield, E. (1986), Journal citation studies. 46. Physical-chemistry and chemical physics journals. 2. Core journals and most-cited papers. *Current Contents*, **2**, 3-10.

Keywords: Citation, Journal, Journals, Physics

? Garfield, E. (1986), The articles most cited in the SCI, 1961-1982. 9. More contemporary classics of science. *Current Contents*, **8**, 3-12.

Keywords: Articles, Science

? Garfield, E. (1986), The 1,000 articles most cited in 1961-1982. 10. Another 100 citation-classics cap the millenary. *Current Contents*, **16**, 3-14.

Keywords: Articles

? Garfield, E. (1986), The 250 most-cited primary authors in the 1984 SCI. 1. Names, ranks, and citation numbers. *Current Contents*, **45**, 3-11.

Keywords: Authors, Citation, Primary

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Keywords: Authors, Primary

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Keywords: Articles, Chemistry, Superconductivity

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Keywords: Articles, Research

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Keywords: Science Citation Index

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Keywords: Science Citation Index, Separation

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Keywords: Time

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Keywords: Articles, Superconductivity

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Full Text: 1990\Cur Con41, 5.pdf

Keywords: Citation, Control, Editors, Impact, Journal

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Keywords: Science Citation Index

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Keywords: Science Citation Index

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Keywords: Articles, Cancer

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Keywords: Cancer

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Abstract: The purpose of this paper was to determine if quantitative rankings of highly cited research authors confirm Nobel prize awards. Six studies covering different time periods and author sample sizes were reviewed. The number of Nobel laureates at the time each study was published was tabulated, as was the number of high impact authors who later became laureates. The Nobelists and laureates-to-be were also compared with non-Nobelists to see if they differed in terms of impact and productivity. The results indicate that high rankings by citation frequency identify researchers of Nobel class-that is, a small set of authors that includes a high proportion of actual Nobelists and laureates-to-be. Also, the average impact (citations per author) of Nobelists and laureates-to-be is sufficiently high to distinguish them from non-Nobelists in these rankings. In conclusion, a simple, quantitative, and objective algorithm based on citation data can effectively corroborate-and even forecast-a complex, qualitative, and subjective selection process based on human judgement.

Keywords: Authors, Citation, Citation Analysis, Citation Frequency, Citation Impact, Citations, Complex, Impact, Nobel Prize, Productivity, Quantitative, Rankings, Research, Researchers, Science-Citation-Index, Scientometrics, Selection

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Abstract: This study examined trends in the number of papers published annually in various languages in 78 microbiology journals indexed in the Science Citation Index(R) (SCI(R)), 1981-1991. Trends in the average number of citations per paper (impact) for each language were also tracked. In addition, interlingual citation patterns were examined. The results showed that English is the lingua franca of microbiology research, accounting for 90-95 percent of all SCI-indexed papers in this time period. Also, the impact of English-language papers was greater than that of other languages by factors ranging from 2.4 to 14.4. Lastly, the majority of citations to papers published in English, German, French, or Italian were from English-language papers. The exception was papers in Russian-more than 90 percent of citations they received were from Russian-language papers.

Keywords: Citation, Citation Patterns, Citations, Impact, Journals, Languages, Microbiology, Papers, Research, Trends

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Abstract: A citation analysis of the xenobiotics literature published and cited from 1981 through 1992 is presented. It is based on 45 ISI(R) indexed journals, representing 123,063 research papers, reviews. and technical notes that received 986,375 citations. The papers, institutions, and authors with the highest current impact on xenobiotics research are identified.

Keywords: Analysis, Authors, Citation, Citation Analysis, Citations, Journals, Research

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Keywords: CD

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Abstract: A citation analysis of current scientific research in Taiwan is presented, based on papers published and cited from 1981 through 1992. The data are drawn from 20,986 papers with at least one author based in Taiwan indexed in the Science Citation Index(R) (SCI(R)). The papers, institutions, and authors with the highest citation frequency and impact are identified.

Keywords: Analysis, Author, Authors, Citation, Citation Analysis, Frequency, Impact, Institutions, Papers, Research, Science, Scientific Research, Taiwan

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Keywords: Aggregation, Changes, Clustering, Multidimensional, Multidimensional Scaling, Nested, Permanent, Scaling, Science, Scientometrics, Structure

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Keywords: Impact, Institutions, Research

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Keywords: Impact, Institutions, Research

# Title: Current Contents/Agriculture Biology & Environmental Sciences

Full Journal Title: Current Contents/Agriculture Biology & Environmental Sciences

ISO Abbreviated Title: Curr.

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ISSN: 0090-0508

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Inst Sci Inform Inc, Philadelphia

Publisher Address:

Subject Categories:

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# Title: Current Contents/Life Sciences

Full Journal Title: Current Contents/Life Sciences

ISO Abbreviated Title:

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ISSN:

Issues/Year:

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Language:

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Subject Categories:

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Keywords: Citation, Science Citation Index

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Keywords: Citation, Science Citation Index

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Keywords: Citation, Science Citation Index

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Keywords: Citations/Science Citation Index

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Keywords: Science Citation Index

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Keywords: Citation, Science Citation Index

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Keywords: Citation, Science Citation Index

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Full Text: [1960-80\Cur Con Lif Sci14, 5.pdf](1960-80/Cur%20Con%20Lif%20Sci14,%205.pdf)

Keywords: Science Citation Index

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Full Text: 1960-80\Cur Con Lif Sci15, 3.pdf

Keywords: Journal, Journals

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Full Text: [1960-80\Cur Con Lif Sci15, 5.pdf](1960-80/Cur%20Con%20Lif%20Sci15,%205.pdf)

Keywords: Science Citation Index

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Full Text: [1960-80\Cur Con Lif Sci15, 6.pdf](1960-80/Cur%20Con%20Lif%20Sci15,%206.pdf)

# Title: Current Drug Metabolism

Full Journal Title: [Current Drug Metabolism](http://www.ingentaconnect.com/content/ben/cdm;jsessionid=2tubs4207hosj.victoria)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

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Full Text: 2010\Cur Dru Met11, 162.pdf

Abstract: This study traces the evolution of the scientific literature on cytochrome P450 (P450) published during the last 30+ years (1977-2008). Using the Web of Science (R), P450 articles from the Science Citation Index Expanded (TM) published from 1977 to 2008 were retrieved and analyzed. The number of P450 papers has increased from 342 articles in 1977-1978 to 2,357 in 2007-2008, and the number of contributing countries has grown from 23 countries for 1977-1978 to 76 for 2007-2008. While the USA and Japan were the most productive countries, along with several industrialized countries (e. g. UK, Germany and Canada), two Asian countries have recently joined the group of leading countries (in 2007-2008 China ranked 4(th) and South Korea, 7(th)). During 1977-2008, the number of journals publishing papers in P450 research increased more than seven-fold (7.7): 94 journals in 1977-1978 and 724 in 2007-2008; however, citation by readers (as measured by the journal impact factor) of the top-ten leading journals increased only slightly from 3.25 for 1977-1978 to 3.81 for 2007-2008. While Biochemistry & Molecular Biology and Pharmacology and Pharmacy are the two main targeted subject areas for P450 research during the period considered, there has been a gradual shift from the biophysical and biochemical fields of interest to aspects of genomics and clinical approaches. The rapid evolution of P450 research in the last 30+ years was accompanied by important changes in the landscape of the contributing countries, in the subject domains, and consequently in the scientific journals targeted by researchers.

Keywords: Articles, Basic Research, Bibliometric Analysis, Bibliometrics, Canada, China, Chinese Populations, Citation, Country Analysis, Cytochrome P450, Evolution, Germany, History, Impact, Impact Factor, Interethnic Differences, Journal, Journal Analysis, Journal Impact, Journal Impact Factor, Journals, Korea, Landscape, Literature, Liver-Microsomes, Monoxide-Binding Pigment, P450, Pharmacokinetics, Publication Trends, Publishing, Research, Researchers, Science, Science Citation Index, Scientific Journals, Scientific Literature, UK, USA, Web of Science

# Title: Current Genetics

Full Journal Title: [Current Genetics](http://portalt.wok.mimas.ac.uk/portal.cgi?DestApp=WOS&Func=Frame)

ISO Abbreviated Title:

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ISSN: 0172-8083

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Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Roncero, C. (2002), The genetic complexity of chitin synthesis in fungi. *Current Genetics*, **41** (6), 367-378.

Full Text: [C\Cur Gen41, 367.pdf](C/Cur%20Gen41,%20367.pdf)

Abstract: Chitin synthesis is a process maintained across the fungal kingdom that, thanks to the power of genetic manipulation of yeast cells, is now beginning to be understood. Chitin synthesis is based on the regulation of distinct chitin synthase isoenzymes whose number ranges from one in Schizosaccharomyces pombe to seven in some filamentous fungi, such as Aspergillus fumigatus. This high diversity makes it difficult to find a unique model of regulation. However, the results available suggest common themes in regulation. The arrival of the genomic era, together with the development of fungal genetic technology should allow experimental approaches to this process.

Keywords: Cell Wall, Chitin, Fungi, Chitin Synthases, CHS Genes, Wangiella Exophiala Dermatitidis, Polarized Growth Sites, Cell-Wall Biogenesis, Saccharomyces-Cerevisiae, Candida-Albicans, Aspergillus-Nidulans, Synthase Genes, Neurospora-Crassa, Ustilago-Maydis, Hyphal Growth

# Title: Current Medical Research and Opinion

Full Journal Title: [Current Medical Research and Opinion](http://www.ingentaconnect.com/content/apl/cmro)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

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? Yu, A.P., Cabanilla, L.A., Wu, E.Q., Mulani, P.M. and Chao, J.D. (2008), The costs of Crohn’s disease in the United States and other Western countries: A systematic review. *Current Medical Research and Opinion*, **24** (2), 319-328.

Full Text: 2008\Cur Med Res Opi24, 319.pdf

Abstract: Objective: To conduct a critical and systematic literature review of the costs of Crohn’s disease (CD) in Western industrialized countries. Research design and methods: Studies published in English that described the cost of CD in Western industrialized countries were identified using three major databases (MEDLINE, EMBASE, and ISI Web of Science). Studies were reviewed and rated based on their relevance to cost of illness and the reliability of the estimates. All costs were adjusted for inflation to 2006 values. Results: Estimated direct medical costs were $18 022-18 932 per patient with CD per year in the United States, and (sic)2898-6960 in other Western countries. Hospitalizations accounted for 53-66% of direct medical costs, with an average cost-per-hospitalization of $37459 in the United States. Estimated indirect costs accounted for 28% of the total cost in the United States and 64-69% in Europe. Costs differed greatly by disease severity. Costs of patients with severe disease were 3- to 9-fold higher than patients in remission. Direct medical costs in the United States for patients in the top 25% of total costs averaged $60 582 per year; costs of patients in the top 2% averaged more than $300000 per year. Combining prevalence rates, the total economic burden of CD was $10.9-15.5 billion in the United States and (sic)2.1-16.7 billion in Europe. Limitations: This review is limited by the research quality and variations of the individual studies reviewed, and only includes English articles. Conclusions: This updated literature synthesis demonstrated the substantial total cost burden of CD, of which hospitalizations accounted for more than half of direct medical costs.

Keywords: Burden, Care, Cd, Cohort, Cost Of Illness, Costs, Crohn’S Disease, Databases, Direct Medical Costs, Disease, Economic Burden, Embase, Epidemiology, Europe, Follow-Up, Hospitalization, Hospitalizations, Illness, Inflammatory-Bowel-Disease, ISI, Literature, Literature Review, Medical, Natural-History, Population, Prevalence, Reliability, Remission, Research, Review, Science, Systematic, Systematic Literature Review, Systematic Review, Ulcerative-Colitis, Web of Science

? Korpela, K.M. (2010), How long does it take for the scientific literature to purge itself of fraudulent material? the Breuning case revisited. *Current Medical Research and Opinion*, **26** (4), 843-847.

Full Text: 2010\Cur Med Res Opi26, 843.pdf

Abstract: It has been proposed that the scientific literature purges itself of articles known to be fraudulent. To test this, an investigation was carried out of post-retraction citations over a 19-year period in the Breuning case. On 10 March 2008 a cited reference search was conducted (all languages, all document types) using the name ‘Breuning SE\*’. The time limit was 1989-2007 with an option to exclude self-citations. The search included the ISI Web of Science Database including the Science Citation Index Expanded, the Social Sciences Citations Index and the Arts & Humanities Citation Index. To ascertain the citation context, citations of Breuning were classified by two raters as affirmative, negative or neutral. For the period 1989-2000 both negative and affirmative citations were found. For the period 2001-2006 only affirmative citations (even to retracted articles) were found, some in journals with higher impact factors than those citing the case as fraudulent. In spite of the small number of citations of Breuning’s articles, it is alarming that the affirmative citing of fraudulent research has not completely ceased but continues 24 years post-retraction (retracted 1982, cited 2006). While the limitations of a single case study are conceded, the results challenge the belief of scientific literature purging itself of fraudulent material. Retraction databases and widespread availability of computer software to check lists of references free of charge in any database or the internet are called for. Moreover, if a paper is never formally retracted, software for searching author names in the internet for fully investigated and proven scientific misconduct might be developed. The ethical guidelines on duplicate publication for purposes of disseminating the information as widely as possible should be reviewed.

Keywords: Articles, Citation, Citations, Computer, Database, Databases, Editors, Impact, Impact Factors, ISI, ISI Web, ISI Web of Science, Journals, Literature, Misconduct, Post-Retraction Citations, Psychiatry, Publication, Publication Ethics, Publishing Ethics, Purge, Reasons, Research, Retraction, Science, Science Citation Index, Scientific Literature, Scientific Misconduct, Self-Citations, Software, Web of Science

? Deshpande, A., Pasupuleti, V., Pant, C., Hall, G. and Jain, A. (2010), Potential value of repeat stool testing for Clostridium difficile stool toxin using enzyme immunoassay? *Current Medical Research and Opinion*, **26** (11), 2635-2641.

Full Text: 2010\Cur Med Res Opi26, 2635.pdf

Abstract: Objective: The aim of this brief review is to summarize the literature as it relates to the potential value of repeat stool testing for Clostridium difficile (C. difficile) toxin using an enzyme immunoassay (EIA) for toxin A&B and also propose a potential newer algorithm for diagnosing C. difficile. Research design and methods: Two investigators conducted independent literature searches using PUBMED, Web of Science, and Scopus until May 1st, 2010. All databases were searched using the terms Clostridium difficile, CDAD, antibiotic associated diarrhea, C. difficile in combination with enzyme immunoassay, enzyme linked immunosorbent assay, Clostridium difficile toxin A, Clostridium difficile toxin B, Clostridium difficile toxin and repeat stool testing. Articles which discussed EIA in C. difficile infection (CDI) patients were reviewed and relevant cross references also read and evaluated for inclusion. Selection bias could be a possible limitation of the approach used in selecting or finding articles for this article. Findings: The evidence for repeat stool testing for C. difficile toxin detection using toxin EIA is becoming weaker. Most recent published practice guidelines recommend a two- or three-step testing algorithm for the detection of C. difficile. Conclusions: EIA for C. difficile stool toxin has a limited sensitivity, but, it does not warrant repeat stool testing. The data for this are suggestive but not conclusive. More studies and better tests are needed to have clear guidelines which can specify the number of tests needed in a diagnostic workup of suspected C. difficile infection. A two-step or three-step method in the diagnosis of C. difficile-associated diarrhea offered a marked increase in sensitivity compared to that of toxin A&B EIA alone.

Keywords: Algorithm, Antibiotic, Articles, Assay, Bias, Colitis, Culture, Cytotoxin, Databases, Diagnosis, Diarrhea, Disease, Guidelines, Infection, Laboratory Detection, Literature, Practice, Practice Guidelines, Pubmed, Research, Review, Science, Scopus, Web of Science

? Stretton, S., Bramich, N.J., Monk, J.A., Keys, J.R., Haley, C., Cameron, R., Ely, J.A., Woolley, M.J. and Woolley, K.L. (2011), Evidence-based guidance for publication professionals on publication misconduct and plagiarism. *Current Medical Research and Opinion*, **27**, S9.

Full Text: 2011\Cur Med Res Opi27, S9.pdf

Keywords: Plagiarism, Publication

? Woolley, K.L., Lew, R.A., Stretton, S., Ely, J.A., Bramich, N.J., Keys, J.R., Monk, J.A. and Woolley, M.J. (2011), Lack of involvement of medical writers and the pharmaceutical industry in publications retracted for misconduct: A systematic, controlled, retrospective study. *Current Medical Research and Opinion*, **27** (6), 1175-1182.

Full Text: 2011\Cur Med Res Opi27, 1175.pdf

Abstract: Objectives: The primary objective of this study was to quantify how many publications retracted because of misconduct involved declared medical writers (i.e., not ghostwriters) or declared pharmaceutical industry support. The secondary objective was to investigate factors associated with misconduct retractions. Design: A systematic, controlled, retrospective, bibliometric study. Data source: Retracted publications dataset in the MEDLINE database. Data selection: PUBMED was searched (Limits: English, human, January 1966 - February 2008) to identify publications retracted because of misconduct. Publications retracted because of mistake served as the control group. Standardized definitions and data collection tools were used, and data were analyzed by an independent academic statistician. Results: Of the 463 retracted publications retrieved, 213 (46%) were retracted because of misconduct. Publications retracted because of misconduct rarely involved declared medical writers (3/213; 1.4%) or declared pharmaceutical industry support (8/213; 3.8%); no misconduct retractions involved both declared medical writers and the industry. Retraction because of misconduct, rather than mistake, was significantly associated with: absence of declared medical writers (odds ratio: 0.16; 95% confidence interval: 0.05-0.57); absence of declared industry involvement (0.25; 0.11-0.58); single authorship (2.04; 1.01-4.12); first author having at least one other retraction (2.05; 1.35-3.11); and first author affiliated with a low/middle income country (2.34; 1.18-4.63). The main limitations of this study were restricting the search to English-language and human research articles. Conclusions: Publications retracted because of misconduct rarely involved declared medical writers or declared pharmaceutical industry support. Increased attention should focus on factors that are associated with misconduct retractions.

Keywords: Authorship, Bibliometric, Conflicts-of-Interest, Definitions, Drug Industry, Guidelines, Impact, Medical Writer, Medical Writing, Medline, Misconduct, Peer-Reviewed Publications, Plagiarism, Primary, Publications, PUBMED, Research, Retraction, Retraction of Publication as Topic Scientific Misconduct

? Mosges, R., Nematian-Samani, M., Hellmich, M. and Shah-Hosseini, K. (2011), A meta-analysis of the efficacy of quinolone containing otics in comparison to antibiotic-steroid combination drugs in the local treatment of otitis externa. *Current Medical Research and Opinion*, **27** (10), 2053-2060.

Full Text: 2011\Cur Med Res Opi27, 2053.pdf

Abstract: Background: The term otitis externa denotes the inflammation of the external auditory canal and can be treated locally in the form of monotherapy or a combination drug. Objective: The aim of the present meta-analysis was to compare the efficacy of an antibiotic-steroid combination drug with that of monotherapy. According to current data, a comparable investigation based on network analysis does not exist. Methods: After systematically searching the PubMed, Medline, Medpilot, Web of Science and Embase electronic databases, 12 relevant randomized, controlled, clinical studies were identified involving 2682 evaluable patients with regard to the cure rate and seven publications with 1251 microbiologically assessable patients. The collected data were compared directly and indirectly by means of network analysis. Results: The direct comparison showed a trend towards the superiority of the monotherapy containing quinolone. The network analysis verified this tendency and demonstrated that pure quinolone drugs can achieve a significantly higher cure rate (OR: 1.29; 95% CI: 1.06-1.57; p=0.01) and a significantly superior eradication rate (OR: 1.44; 95% CI: 1.03-2.02; p=0.03) compared to combination drugs not containing quinolone. We found substantial heterogeneity (with I(2) up to 88.7%) between studies, presumably due to treatments applied in varying frequency, thus bearing on compliance and outcome. Conclusion: With a level Ia evidence, this investigation validates the clinical benefit of quinolones as compared to classic combination drugs in the local treatment of acute otitis externa.

Keywords: Acetate, Acute, Agent, Analysis, Antibiotics, Auditory, B-Neomycin-Hydrocortisone, Ciprofloxacin, Compliance, Databases, Drug, Drugs, Efficacy, Eradication Rate, Frequency, Glucosteroids, Inflammation, Local Treatment, Medline, Meta Analysis, Meta-Analysis, Methods, Monotherapy, Network, Network Analysis, Otitis, Otitis Externa, Outcome, Oxytetracycline Hydrocortisone, Patients, Polymyxin-B, Publications, Pubmed, Quinolones, Safety, Science, Suspension, Therapy, Treatment, Trend, Trial, Web of Science

? Ligthelm, R.J. (2011), Insulin analogues: How observational studies provide key insights into management of patients with type 2 diabetes mellitus. *Current Medical Research and Opinion*, **27** (12), 2343-2355.

Full Text: 2011\Cur Med Res Opi27, 2343.pdf

Abstract: Objective: The aim of this commentary was to evaluate the current evidence regarding the use of synthetic insulin analogues in the ‘real-world’ clinic setting for the treatment of type 2 diabetes mellitus (T2DM). Methods: Relevant publications were searched on PubMed MEDLINE, EMBASE, Cochrane Register of Controlled Trials Google Scholar, NLM Gateway, Science Direct, Web of Science and OVID for the period of January 2007 to June 2010. Articles were included if they (a) provided specific study results on the use of insulin analogues in T2DM and (b) gave sufficiently clear methodology details to establish treatment strategies, diagnosis and diagnostic criteria using an observational study (OS) design. Results: Twenty one articles specifically addressing both type 2 diabetes management and the use of synthetic insulin analogues were identified. Results from recently published OS in patients with T2DM have shown, in the patient populations tested, the effective initiation, optimization and switch to use of insulin analogues in routine clinical settings (day-to-day common practice), with a good safety profile. Conclusions: OS can provide clinicians with additional insights into the management of T2DM patients in their practices. However, the selection and initiation of insulin analogue regimens should be tailored to the individual patient and be one that the physician is comfortable using.

Keywords: 30, 70 Novomix((R)) 30, Articles, Basal-Bolus Regimen, Cochrane, Commentary, Design, Diabetes, Diabetes Mellitus, Diabetes Treatment, Diagnosis, Embase, Epidemiology Strobe Statement, Follow-Up Data, Glycaemic Control, Google Scholar, Improves Glycemic Control, Insulin, Insulin Analogue, Insulin Analogues, Intensive Glucose Control, Long-Term Efficacy, Management, Medline, Methodology, Methods, Nonrandomized, Observational, Observational Studies, Observational Study, Oral Antidiabetic Agents, Patients, Practice, Profile, Prospective, Publications, Pubmed, Randomized Controlled-Trials, Routine, Safety, Science, To-Target Trial, Treatment, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Web of Science

# Title: Current Microbiology

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Language: English

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Microbiology: Impact Factor

Ahuja, P., Gupta, R. and Saxena, R.K. (1997), Oscillatoria anguistissima: A promising Cu2+ biosorbent. *Current Microbiology*, **35** (3), 151-154.

Full Text: [C\Cur Mic35, 151.pdf](C/Cur%20Mic35,%20151.pdf)

Abstract: Oscillatoria anguistissima rapidly adsorbs Cu2+ from aqueous solution, The adsorption of Cu2+ followed Freundlich Isotherm, and the amount of Cu2+ removed from solution increased with increasing Cu2+ concentration. The adsorption is pH dependent, and maximum Cu2+ removal occurs at pH 5. of the various pretreatments, HCl treatment of the biomass increased the capacity for Cu2+ removal. Presence of Mg2+ and Ca2+ resulted in decline in the Cu2+ adsorption capacity of Oscillatoria cells, This species could also effectively remove Cu2+ from mine water containing 68.4 µg/ml of Cu2+ at pH 3.45.

Keywords: Heavy-Metal Ions, *Pseudomonas-Aeruginosa*, Marine-Algae, Biosorption, Accumulation, Biomass, Cells, Adsorption, Recovery, Uranium

Ahuja, P., Gupta, R. and Saxena, R.K. (1999), Sorption and desorption of cobalt by *Oscillatoria anguistissima*. *Current Microbiology*, **39** (1), 49-52.

Full Text: [C\Cur Mic39, 49.pdf](C/Cur%20Mic39,%2049.pdf)

Abstract: *Oscillatoria anguistissima* rapidly adsorbs appreciable amounts of cobalt from the aqueous solutions within 15 min of initial contact with the metal solution. *O. anguistissima* showed a high sequestration of cobalt at low equilibrium concentrations, and it followed the Freundlich model of adsorption. The adsorption is a strongly pH-dependent and temperature-independent phenomenon. The presence of Mg2+ and Ca2+ (100-200 ppm) resulted in decline in Co2+ adsorption capacity of *Oscillatoria* biomass. Sulphate and nitrate (0.75-10 mM) drastically reduced the extent of Co2+ biosorption. The biosorption of cobalt is an ion-exchange process as the Co2+ binding was accompanied by release of a large amounts of Mg2+ ions. Na2CO3 (1.0 mM) resulted in about 76% desorption of Co2+ from the loaded biomass.

Hamdy, A.A. (2000), Biosorption of heavy metals by marine algae. *Current Microbiology*, **41** (4), 232-238.

Full Text: [C\Cur Mic41, 232.pdf](C/Cur%20Mic41,%20232.pdf)

Abstract: The ability of four different algae (three brown and one red) that have not been previously studied to adsorb Cr3+, Co2+, Ni2+, Cu2+, and Cd2+ ions was investigated. The metal uptake was dependent on the type of biosorbent, with different accumulation affinities towards the tested elements. The HCl-treated biomass decreased the metal biosorptive capacity particularly in the case of Cr3 adsorption with *Laurencia obtusa*. The extent of uptake of the different metals with the tested algae was assessed under different conditions such as pH, time of algal residence in solution with the metal, and concentration of algal biomass. The rate of uptake of the different metals was very fast in the first 2 h, thereafter the increase in metal uptake was insignificant. The amount of the metal uptake (5-15 mg range) increased steeply by increasing the weight of the biomass. An exception was *L. obtusa*, where a parallel increase of the uptake of different metals was observed on increasing the algal mass from 5 to 50 mg.

Hamdy, A.A. (2000), Removal of Pb2+ by biomass of marine algae. *Current Microbiology*, **41** (4), 239-245.

Full Text: [C\Cur Mic41, 239.pdf](C/Cur%20Mic41,%20239.pdf)

Abstract: New biosorbent material derived from ubiquitous marine algae has been examined in packed-bed flow for Pb2+ removal through sorption columns. Mixed biomass of marine algae has been used, consisting of representative species of the following algae: *Ulva lactuca* (green algae), *Jania rubens* (red algae), and *Sargassum asperifolium* (brown algae). A mixture of these three species showed a promising removal capacity for Pb2+ from aqueous solution. Lead uptake up to 281.8 mg/g dry algal mixture was observed. Equilibrium was achieved after 120 min. No significant effect of changing the flow rate on the removal capacity was noticed. It was found that Langmuir model expresses the system at pH 4. Mineral acids exhibited good elution properties (a mean of 93%) for recovery of sorbed biomass ions as compared with the tested alkalies (about 60%).

Incharoensakdi, A. and Kitjaharn, P. (2002), Zinc biosorption from aqueous solution by a halotolerant cyanobacterium *Aphanothece halophytica*. *Current Microbiology*, **45** (4), 261-264.

Full Text: [C\Cur Mic45, 261.pdf](C/Cur%20Mic45,%20261.pdf)

Abstract: We have investigated the characteristics of zinc biosorption by *Aphanothece halophytica*. Zinc could be rapidly taken up from aqueous solution by the cells with an equilibrium being reached within 15 min of incubation with 100 mg L-1 ZnCl2. The adsorbed zinc was desorbed by treatment with 10 mM EDTA. The presence of glucose, carbonyl cyanide *m*-chlorophenylhydrazone (CCCP), and N, N’-dicyclohexylcarbodiimide (DCCD) did not affect the uptake of zinc. The specific uptake of zinc increased at low cell concentration and decreased when cell concentration exceeded 0.2 g L-1. The binding of zinc followed Langmuir isotherm kinetics with a maximum zinc binding capacity of 133 mg g-1 and an apparent zinc binding constant of 28 mg L-1. The presence of an equimolar concentration of Mn2+, Mg2+, Co2+, K+, or Na+ had no effect on zinc biosorption, whereas Ca2+, Hg2+, and Pb2+ showed an inhibitory effect. The biosorption of zinc was low at a pH range from 4 to 6, but increased progressively at pH 6.5 and 7.

? Sivasamy, A. and Sundarabal, N. (2011), Biosorption of an azo dye by *Aspergillus niger* and *Trichoderma* sp. fungal biomasses. *Current Microbiology*, **62** (2), 351-357.

Full Text: [2011\Cur Mic62, 351.pdf](2011/Cur%20Mic62,%20351.pdf)

Abstract: Biosorption is an eco-friendly and cost-effective method for treating the dye house effluents. *Aspergillus niger* and Trichoderma sp. were cultivated in bulk and biomasses used as biosorbents for the biosorption of an azo dye Orange G. Batch biosorption studies were performed for the removal of Orange G from aqueous solutions by varying the parameters like initial aqueous phase pH, biomass dosage, and initial dye concentration. It was found that the maximum biosorption was occurred at pH 2. Experimental data were analyzed by model equations such as Langmuir and Freundlich isotherms, and it was found that both the isotherm models best fitted the adsorption data. The monolayer saturation capacity was 0.48 mg/g for *Aspergillus niger* and 0.45 mg/g for Trichoderma sp. biomasses. The biosorption kinetic data were tested with pseudo first-order and pseudo second-order rate equations, and it was found that the pseudo second-order model fitted the data well for both the biomasses. The rate constant for the pseudo second-order model was found to be 10-0.8 (g/mg min-1) for *Aspergillus niger* and 8-0.4 (g/mg min-1) for Trichoderma sp. by varying the initial dye concentrations from 5 to 25 mg/l. It was found that the biomass obtained from *Aspergillus niger* was a better biosorbent for the biosorption of Orange G dye when compared to Trichoderma sp.

Keywords: Adsorption, Aqueous Phase, Aqueous Solutions, Ash, *Aspergillus niger*, Azo Dye, Biomass, Biosorbent, Biosorbents, Biosorption, Biosorption Kinetic, Capacity, Concentration, Cost-Effective, Data, Dye, Effluents, Equilibrium, First Order, Freundlich, Green, Isotherm, Isotherms, Kinetic, Langmuir, Langmuir and Freundlich Isotherms, Model, Models, Monolayer, pH, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constant, Removal, Saturation, Second Order, Second-Order, Second-Order Model, Solutions, Waste, Water

# Title: Current Nanoscience

Full Journal Title: [Current Nanoscience](http://www.ingentaconnect.com/content/ben/cnano;jsessionid=1tkux2jks72h7.victoria)

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Subject Categories:

: Impact Factor

? Kostoff, R.N., Koytcheff, R.G. and Lau, C.G.Y. (2007), Structure of the nanoscience and nanotechnology instrumentation literature. *Current Nanoscience*, **3** (2), 135-154.

Full Text: [2007\Cur Nan3, 135.pdf](2007/Cur%20Nan3,%20135.pdf)

Abstract: The instrumentation literature associated with nanoscience and nanotechnology research was examined. About 65000 nanotechnology records for 2005 were retrieved from the Science Citation Index/ Social Science Citation Index (SCI/SSCI) [1], and similar to 27000 of those were identified as instrumentation-related. All the diverse instruments were identified, and the relationships among the instruments, and among the instruments and the quantities they measure, were obtained. Metrics associated with research literatures for specific instruments/instrument groups were generated.

Keywords: Afm, Bibliometrics, Database Tomography, Discovery, Groups, Information Technology, Instrumentation, Nanoscience, Nanotechnology, Research, Science Citation Index, Science-and-Technology, SEM, Social Science Citation Index, STM, TEM, Text Mining, XRD

? Sarijo, S.H., bin Hussein, M.Z., Yahaya, A.H., Zainal, Z. and Yarmo, M.A. (2010), Synthesis of Phenoxyherbicides-Intercalated Layered Double Hydroxide Nanohybrids and Their Controlled Release Property. *Current Nanoscience*, **6** (2), 199-205.

Full Text: [2010\Cur Nan6, 199.pdf](2010/Cur%20Nan6,%20199.pdf)

Abstract: Synthesis of new generation of agrochemicals of phenoxyherbicides-type, namely 2-chloro-(2CPA) and 2,4,5trichlorophenoxy acetates (TCPA) were accomplished by hybridization of the phenoxyherbicides into zinc-aluminium-layered double hydroxide interlamellae for the formation of new nanohybrids of 2CPA and TCPA, labeled as N2CPA and NTCPA, respectively. Basal spacing expansion from 8.9 angstrom in the layered double hydroxide (LDH) to 18.5 and 26.2 angstrom in the resulting N2CPA and NTCPA nanohybrid, respectively, together with FTIR, CHNS and TGA/DTG data support that the phenoxyherbicides were successfully intercalated into the layered double hydroxide inorganic interlayers. The release of the phenoxyherbicides from their nanohybrids at various pHs can be expressed by parabolic diffusion at the beginning of the process, but the release data for the whole process followed the pseudo-second order equation. The release process was found to be pH-dependent, in the order of pH 12 > 3 > 6.25. In addition, the release time for TCPA is longer than 2CPA, suggesting a stronger interaction of TCPA than 2CPA with the layered double hydroxide inorganic interlayer. This study indicates the potential application of zinc-aluminium-layered double hydroxide as the matrix of the controlled release formulation of agrochemicals such as 2-chlorophenoxyacetic acid and 2,4,5-trichlorophenoxyacetic acid.

Keywords: 2,4,5-Trichlorophenoxy Acetate, 2,4-Dichlorophenoxyacetic Acid, 2-Chlorophenoxy Acetate, Agrochemicals, Application, Controlled Release, Controlled-Release, Data, Diffusion, Double Hydroxide, Exchange, Formulation, FTIR, Generation, Hybridization, Hydrotalcite, Interaction, Layered Double Hydroxide, LDH, Matrix, Organic-Inorganic Nanohybrids, pH, pH-Dependent, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Release, Support, Synthesis, Systems, Time

# Title: Current Neuropharmacology

Full Journal Title: Current Neuropharmacology

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? Fornaro, M., Prestia, D., Colicchio, S. and Perugi, G. (2010), A systematic, updated review on the antidepressant agomelatine focusing on its melatonergic modulation. *Current Neuropharmacology*, **8** (3), 287-304.

Full Text: [2010\Cur Neu8, 287.pdf](2010/Cur%20Neu8,%20287.pdf)

Abstract: Objective: To present an updated, comprehensive review on clinical and pre-clinical studies on agomelatine. Method: A MEDLINE, Psycinfo and Web of Science search (1966-May 2009) was performed using the following keywords: agomelatine, melatonin, S20098, efficacy, safety, adverse effect, pharmacokinetic, pharmacodynamic, major depressive disorder, bipolar disorder, Seasonal Affective Disorder (SAD), Alzheimer, ADHD, Generalized Anxiety Disorder (GAD), Panic Disorder (PD), Obsessive-Compulsive Disorder (OCD), anxiety disorders and mood disorder. Study collection and data extraction: All articles in English identified by the data sources were evaluated. Randomized, controlled clinical trials involving humans were prioritized in the review. The physiological bases of melatonergic transmission were also examined to deepen the clinical comprehension of agomelatine’ melatonergic modulation. Data synthesis: Agomelatine, a melatonergic analogue drug acting as MT(1)/MT(2) agonist and 5-HT(2C) antagonist, has been reported to be an effective antidepressant therapy. Conclusions: Although a bias in properly assessing the “sleep core” of depression may still exist with current screening instruments, therefore making difficult to compare agomelatine’ efficacy to other antidepressant ones, comparative studies showed agomelatine to be an intriguing option for depression and, potentially, for other therapeutic targets as well.

Keywords: Agomelatine, Alzheimer, Anxiety, Bias, Bipolar Disorder, Circadian-Rhythms, Clinical Trials, Cognition, Controlled Clinical Trials, Depression, Discontinuation Symptoms, Disorder, Double-Blind, Drug, Efficacy, Generalized Anxiety Disorder, Humans, Major Depressive Disorder, Medline, Melatonin, Mild Stress Model, Mood, OCD, Placebo-Controlled-Trial, Review, Sad, Safety, Science, Screening, Seasonal Affective-Disorder, Serotonin-Reuptake Inhibitors, Systematic, Therapy, Web of Science, Weekly Symptomatic Status

? Boskovic, M., Vovk, T., Plesnicar, B.K. and Grabnar, I. (2011), Oxidative stress in schizophrenia. *Current Neuropharmacology*, **9** (2), 301-312.

Full Text: 2011\Cur Neu9, 301.pdf

Abstract: Increasing evidence indicates that oxidative damage exists in schizophrenia. Available literature about possible mechanisms of oxidative stress induction was reviewed. Furthermore, possibilities of measuring biomarkers of schizophrenia outside the central nervous system compartment, their specificity for different types of schizophrenia and potential therapeutic strategies to prevent oxidative injuries in schizophrenia were discussed. Data were extracted from published literature found in Medline, Embase, Biosis, Cochrane and Web of Science, together with hand search of references. Search terms were: schizophrenia, oxidative stress, antipsychotics, antioxidants and fatty acids. Finding a sensitive, specific and non invasive biomarker of schizophrenia, which could be measured in peripheral tissue, still stays an important task. Antioxidant enzymes, markers of lipid peroxidation, oxidatively modified proteins and DNA are most commonly used. As it considers the supplemental therapy, according to our meta-analysis vitamin E could potentially improve tardive dyskinesia, while for the effect of therapy with polyunsaturated fatty acids there is no clear evidence. Oxidative stress is a part of the pathology in schizophrenia and appears as a promising field to develop new therapeutic strategies. There is a need for well designed, placebo controlled trials with supplementation therapy in schizophrenia.

Keywords: Antioxidant Enzyme Levels, Antioxidants, Antipsychotics, Biochemical Markers, Biomarkers, Cochrane, DNA, Double-Blind, Essential Fatty-Acids, Ethyl-Eicosapentaenoic Acid, Fatty Acids, Hand, Lipid, Literature, Mechanisms, Medline, Meta Analysis, Meta-Analysis, Modified, N-Acetyl-Cysteine, Nitric-Oxide, Oxidative Stress, Pathology, Placebo-Controlled Trial, Polyunsaturated Fatty Acids, Schizophrenia, Science, Specificity, Stress, Superoxide-Dismutase, Tardive Dyskinesia, Tardive-Dyskinesia, Therapy, Vitamin E, Vitamin-E Treatment, Web of Science

# Title: Current Opinion in Anesthesiology

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: Impact Factor

? Miller, D.R. (2011), Publication fraud: Implications to the individual and to the specialty. *Current Opinion in Anesthesiology*, **24** (2), 154-159.

Abstract: Purpose of review To provide a brief review and update on the subject of scientific misconduct relevant to the specialty of anesthesia. The overall goal is to raise awareness amongst readers of the scientific literature that although publication fraud is relatively infrequent, the reasons for fraud are complex and the consequences to the individual and for the specialty are substantial. Recent findings Scientific misconduct and publication fraud can easily go undetected. However, plagiarism is being detected with increasing frequency as a result of newer detection software. There are recent examples of scientific misconduct involving extensive data fabrication in the anesthesiology literature that have far-reaching, and as-yet-to-be determined implications for the scientific record. The reasons for publication fraud and methods to detect scientific misconduct are reviewed. The implications for related studies in the field, systematic reviews and practice guidelines are considered. Summary When suspected, alleged misconduct must be thoroughly investigated. When proven, scientific misconduct must be addressed by the relevant institutions and the scientific record must be corrected. Many stakeholders are involved in this complex and most unfortunate process.

Keywords: Blocks, Data Fabrication, Literature, Misconduct, Plagiarism, Publication, Publication: Publication Ethics, Retraction, Review, Scientific Misconduct, Systematic Reviews

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Horwitz, E.M. (2003), Stem cell plasticity: A new image of the bone marrow stem cell. *Current Opinion in Pediatrics*, **15** (1), 32-37.

Abstract: The central tenet of stem cell biology is that Within tissues there reside stem cells with the capacity for both self-renewal and terminal differentiation to the multiple lineages of that tissue. Over the last few years, numerous studies have challenged this paradigm by showing that tissue stem cells can differentiate to unexpected cell lineages, suggesting an enormous plasticity of differentiation. The hematopoietic stem cell, which resides within bone marrow and gives rise to all blood cells, has been the focal point of these efforts. However, recent studies have disputed the notion of hematopoietic stem cell plasticity. In truth, stem cell plasticity, strictly defined, has yet to be rigorously proven. Both animal models to carefully address outstanding issues and pilot clinical trials to explore the therapeutic potential will be key elements to advance science for the benefit of patients. Curr Opin Pediatr 2003, 15, 32-37 (C) 2003 Lippincott Williams Wilkins, Inc.

Keywords: In-Vivo, Osteogenesis Imperfecta, Progenitor Cells, Muscle, Transplantation, Brain, Regeneration, Expression, Myocardium, Children

# Title: Current Opinion in Rheumatology

Full Journal Title: Current Opinion in Rheumatology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

(2000), Bibliography current world literature. *Current Opinion in Rheumatology*, **12** (2), B25.

Full Text: [C\Cur Opi Rhe12, B25.pdf](C/Cur%20Opi%20Rhe12,%20B25.pdf)

# Title: Current Pharmaceutical Analysis

Full Journal Title: Current Pharmaceutical Analysis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hur, D., DiFrancesco, R., Hochreiter, J., Ma, Q., Slish, J., Maponga, C.C. and Morse, G.D. (2007), Review of HIV-1 protease inhibitor assay methods. *Current Pharmaceutical Analysis*, **3** (3), 180-185.

Abstract: In support of individualizing antiretroviral treatment by combining therapeutic drug monitoring (TDM) and HIV resistance tests, numerous assays have been reported in the literature in an attempt to optimize treatment outcomes. These assays vary with regard to analysis method of separation and detection such as using high performance liquid chromatography (HPLC) coupled to mass tandem spectrometry (HPLC/MS or HPLC/MSMS) or ultraviolet spectrometry (HPLC/UV). To prepare plasma samples prior to analysis, clinical samples are subject to chemical procedures including solid phase extraction (SPE), liquid-liquid extraction (LLE), and protein precipitation (PP). Information searches were performed using database searching tools such as PUBMED, MEDLINE, Web of Science, and EMBASE using the key words protease inhibitors, HIV, assay, quantification, determination, therapeutic drug monitoring and pharmacokinetics. Publications were reviewed and the data categorized by the specific protease inhibitor, the limit of quantification (LOQ), the type of assay, chromatographic conditions, sample preparation, and total assay run time. The analytical methods summarized in the review reflect the timeframe since the PI were introduced, their eventual combination with ritonavir, transitioning toward once or twice daily dosing and more recently their use in simplified regimes for chronic dosing. As antiretrovirals are introduced into developing countries additional considerations related to drug quality and potency may require that laboratories adapt these assays in support of clinical pharmacology research and patient monitoring.

Keywords: Active Metabolite M8, Analysis, Antiretroviral, Antiretroviral Drugs, Blood Mononuclear-Cells, Developing Countries, Drug, Embase, Hiv, Human Plasma, Infected Patients, Literature, Medline, Monitoring, Outcomes, Performance Liquid-Chromatography, Plasma, Preparation, Publications, Pubmed, Quantitative-Determination, Research, Resistance, Reverse-Transcriptase Inhibitors, Review, Science, Solid-Phase Extraction, Tandem Mass-Spectrometry, Treatment, Web of Science

# Title: Current Pharmaceutical Analysis

Full Journal Title: Current Pharmaceutical Analysis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hasani-Ranjbar, S., Nayebi, N., Moradi, L., Mehri, A., Larijani, B. and Abdollahi, M. (2010), The efficacy and safety of herbal medicines used in the treatment of hyperlipidemia: A systematic review. *Current Pharmaceutical Design*, **16** (26), 2935-2947.

Abstract: Objective: This review focuses on the efficacy and safety of effective herbal medicines in the management of hyperlipidemia in human. Methods: PUBMED, Scopus, Google Scholar, Web of Science, and IranMedex databases were searched up to 11(th) May 2010. The search terms were “hyperlipidemia” and (“herbal medicine” or “medicine traditional”, “extract plant”) without narrowing or limiting search elements. All of the human studies on the effects of herbs with the key outcome of change in lipid profiles were included. Results: Fifty three relevant clinical trials were reviewed for efficacy of plants. This study showed significant decrease in total cholesterol and LDL cholesterol after treatment with Daming capsule (DMC), chunghyul-dan, Glycyrrhiza glabra, garlic powder (Allicor), black tea, green tea, soy drink enriched with plant sterols, licorice, Satureja khuzestanica, Monascus purpureus Went rice, Fenugreek, Commiphora mukul (guggul), Achillea wilhelmsii C. Koch, Ningzhi capsule (NZC), cherry, compositie salviae dropping pill (CSDP), shanzha xiaozhi capsule, Ba-wei-wan (hachimijiogan), rhubarb stalk, Silybum marianum, Rheum Ribes and Jingmingdan granule (primrose oil). Conflicting data exist for red yeast rice, garlic and guggul. No significant adverse effect or mortality were observed except in studies with DMC, guggul, and Terminalia belerica, Terminalia chebula, Emblica officinalis, ginger, and garlic powder (Allium sativum). Conclusion: Amongst reviewed studies, 22 natural products were found effective in the treatment of hyperlipidemia that deserve further works to isolate and characterization of their constituents to reach novel therapeutic and more effective agents.

Keywords: Clinical Trials, Colesevelam Hydrochloride, Coronary-Heart-Disease, Databases, Density-Lipoprotein-Cholesterol, Efficacy, Extract Plant, Garlic-Powder Tablets, Google Scholar, Herbal Medicine, Human, Hyperlipidemia, Ldl, Lipid, Management, Medicine Traditional, Methods, Mortality, Outcome, Oxidative Stress, Placebo-Controlled-Trial, Plant, Plants, Plasma-Lipid Levels, Primary Hypercholesterolemia, Pubmed, Randomized Controlled-Trial, Red-Yeast-Rice, Review, Safety, Science, Scopus, Systematic, Systematic Review, Total Cholesterol, Treatment, Web of Science

? Nikfar, S., Mirfazaelian, H. and Abdollahi, M. (2010), Efficacy and tolerability of immunoregulators and antibiotics in fistulizing crohn’s disease: A systematic review and meta-analysis of placebo-controlled trials. *Current Pharmaceutical Design*, **16** (33), 3684-3698.

Abstract: Objective: This meta-analysis of randomized controlled trials was conducted to evaluate the efficacy and tolerability of two drug groups (immunoregulators and antibiotics) in the treatment of fistula in Crohn’s disease (CD). Methods: PUBMED, EMBASE, Scopus, Google Scholar, and Web of Science were searched for clinical trial studies investigated the effects of immunoregulators and antibiotics in the treatment of fistulizing CD. Clinical response and adverse effects were the key outcomes of interest. Data were searched from the time period of 1966 through June 2010. Result: Eleven randomized placebo-controlled clinical trials that met our criteria (nine in different immunoregulators and two in antibiotics) were included in the analysis. Pooling of data showed that immunoregulators and antibiotics are significantly effective for at least a 50% reduction from baseline in the number of open actively draining fistulas with relative risk (RR) of 2.57 (95% CI of 1.55-4.25, P= 0.0003) in four trials and 2.05 (95% CI of 1.03-4.08, P= 0.0414) in two trials respectively. The summary of RR for complete closure of fistulas in nine trials was 2.65 with a 95% CI of 1.66-4.22 and a significant RR (P < 0.0001). In regard to the tolerability, both immunoregulators and antibiotics showed insignificant adverse effects in comparison to placebo with an RR of 1.11 (95% CI of 0.96-1.27, P= 0.1513) and 0.6 (95% CI of 0.36-1, P= 0.0515), respectively and discontinuation because of these adverse effects in drug-treated groups was the same as placebo. Data about severe adverse effects were only available for immunoregulators that showed a significantly higher incidence when compared to placebo (RR= 2.24 with a 95% CI of 1.05-4.79; significant at P= 0.0374). Conclusion: This meta-analysis demonstrates the efficacy of immunoregulators and antibiotics in fistulizing CD. Regarding the safety, mild to moderate adverse effects were the same in both antibiotic and immunoregulators groups in comparison to the placebo but incidence of severe adverse effects in immunoregulator groups was higher than that of antibiotics.

Keywords: Adverse Effects, Anal Fistulas, Analysis, Antibiotic, Antibiotics, Azathioprine, Cd, Ciprofloxacin, Clinical Trial, Clinical Trials, Complications, Crohn’s Disease, Disease, Double-Blind, Drug, Efficacy, Fistula, Google Scholar, Immunoregulators, Inflammatory Bowel Disease, Inflammatory-Bowel-Disease, Infliximab, Interest, Meta Analysis, Meta-Analysis, Methods, Outcomes, Perianal Fistulas, Predictors, PUBMED, Randomized Controlled Trials, Relative Risk, Review, Risk, Safety, Science, Scopus, Systematic, Systematic Review, Tacrolimus, Treatment, Web of Science

# Title: Current Science

Full Journal Title: [Current Science](http://www.ias.ac.in/currsci/)

ISO Abbreviated Title: Curr. Sci.

JCR Abbreviated Title: Curr Sci India

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Journal Country/Territory: India

Language: English

Publisher: Current Science Assn

Publisher Address: CV Raman Avenue, PO Box 8005, Bangalore 560 080, India

Subject Categories:

Multidisciplinary Sciences: Impact Factor 0.533, 20/48 (2002), Impact Factor 0.694, 17/46 (2003); Impact Factor 0.782, 22/48 (2009)

Subraman, K. and Rao, M.R.A. (1969), Kinetics of adsorption of carbon monoxide and hydrogen mixtures on iron Fischer-Tropsch catalysis at different temperatures. *Current Science*, **38** (22), 539-541.

Full Text: Cur Sci38, 539.pdf

Visnanat, R.P., Viswanat, B., Srinivas, V. and Sastri, M.V.C. (1970), A new approach to Elovich equation. *Current Science*, **39** (18), 407-408.

Full Text: [1960-80\Cur Sci39, 407.pdf](1960-80/Cur%20Sci39,%20407.pdf)

Varadarajan, T.K. and Viswanathan, B. (1979), Surface heterogeneity and Elovich equation. *Current Science*, **48** (1), 17-19.

Full Text: [1960-80\Cur Sci48, 17.pdf](1960-80/Cur%20Sci48,%2017.pdf)

Kuriachan, P.I. (1981), Chromosome-number of the tree fern: Cyathea-gigantea. *Current Science*, **50** (13), 597-598.

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Mehrotra, R. and Lancaster, F.W. (1984), Where Indian scientists publish? *Current Science*, **53** (13), 684-688.

Full Text: [1984\Cur Sci53, 684.pdf](1984/Cur%20Sci53,%20684.pdf)

West, W.D. (1985), Current Science - 50 years ago - Some recent advances in Indian geology (Reprinted from Curr Sci, Vol 3, Pg 412, 1935). *Current Science*, **54** (6), 275-276.

Full Text: [1985\Cur Sci54, 275.pdf](1985/Cur%20Sci54,%20275.pdf)

Keywords: SCI

(1985), Current Science 50 years ago – Agricultural Research in India (Reprinted in Curr Sci, Vol 4, Pg 212, 1935). *Current Science*, **54** (19), 991-993.

Full Text: [1985\Cur Sci54, 991.pdf](1985/Cur%20Sci54,%20991.pdf)

Keywords: SCI

(1985), Current Science - 50 years ago - (Reprinted From, Curr Sci, Vol 4, Pg 293, 1935) Over-population in India. *Current Science*, **54** (21), 1107-1108.

Full Text: [1985\Cur Sci54, 1107.pdf](1985/Cur%20Sci54,%201107.pdf)

Keywords: SCI

? (1986), Current Science - 50 years ago - Neglected Human-Genetics (Reprinted from Current Sci, Vol 4, March 1936, Pg 637). *Current Science*, **55** (5), 239-240.

Full Text: Cur Sci55, 239

Keywords: SCI

(1987), Current Science - 50 years ago - Need for a soil survey of India (Reprinted from Current Sci J, Vol 5, Pg 563, 1937). *Current Science*, **56** (7), 302-303.

Full Text: [1987\Cur Sci56, 302.pdf](1987/Cur%20Sci56,%20302.pdf)

Keywords: SCI

Subrahmanyan, V. (1987), Current Science - 50 years ago - Some aspects of the chemistry of swamp soil (Reprinted from Current Sci, Vol 5, P 656, 1937). *Current Science*, **56** (11), 527-529.

Full Text: [1987\Cur Sci56, 527.pdf](1987/Cur%20Sci56,%20527.pdf)

Keywords: SCI

(1988), Current Science - 50 years ago - the Calder Plan (Reprinted from Curr Sci, Vol 7, P 41, 1938). *Current Science*, **57** (15), 835-836.

Full Text: [1988\Cur Sci57, 835.pdf](1988/Cur%20Sci57,%20835.pdf)

Keywords: SCI

Gale, A.J.V. and Brimble, L.J.F. (1989), Current Science - 50 years ago - Gregory, Richard - (Reprinted from Current Sci, Vol 8, Pg 249, 1939). *Current Science*, **58** (11), 619-620.

Full Text: [1989\Cur Sci58, 619.pdf](1989/Cur%20Sci58,%20619.pdf)

Keywords: SCI

Narayanan, K.R., Ajmalkhan, S. and Pechimuthu, S. (1990), Cadmium-induced cancer in the gills of the crab scylla-serrata (Forskal). *Current Science*, **59** (24), 1334-1336.

Full Text: [1990\Cur Sci59, 1334.pdf](1990/Cur%20Sci59,%201334.pdf)

? Muraleedharan, T.R., Iyengar, L. and Venkobachar, C. (1991), Biosorption: An attractive alternative for metal removal and recovery. *Current Science*, **61** (6), 379-385.

Full Text: [1991\Cur Sci61, 379.pdf](1991/Cur%20Sci61,%20379.pdf)

Abstract: The most recent development in environmental biotechnology is the use of microbe-based sorbents for removal and recovery of strategic and precious heavy metals from industrial wastewaters. We review metal-microbe interactions, utilization of biosorbents for heavy-metal-pollution control and the mechanisms of biosorption that can help in selecting the appropriate reactor configuration for field application of this process. Studies show that this process can replace the conventional processes of heavy-metal-pollution control.

Keywords: Bacterial Extracellular Polymers, Activated-Sludge, Biological-Systems, Chlorella-Regularis, Uranium, Accumulation, Elements, Efficiency, Mechanism, Binding

Chattopadhyay, G., Das, N.C., Sengupta, D.K. and Bandyopadhyay, M. (1991), A study on palamau vermiculite with special reference to its metal-adsorption properties. *Current Science*, **61** (7), 475-477.

Full Text: [1991\Cur Sci61, 475.pdf](1991/Cur%20Sci61,%20475.pdf)

Abstract: Vermiculite-hydrobiotite is a hydrated magnesium aluminium iron sheet silicate of variable chemical composition. X-ray diffraction study of samples of mineral deposit shows that the material consists of unaltered biotite, hydrobiotite and vermiculite. We also present chemical composition determined by microprobe analysis. Vermiculite also has useful metal-adsorption properties and can be used as a low-cost adsorbent. Zinc removal by vermiculite is pH-dependent and is higher in alkaline medium. Vermiculite may also be useful as an adsorbent for removal of other metal pollutants.

Sahni, B. (1991), On a paleozoic tree-fern, Grammatopteris Baldaufi (beck) Hirmer, a link between the Zygopterideae and Osmundaceae. *Current Science*, **61** (9-10), 609-626.

Full Text: [1991\Cur Sci61, 609.pdf](1991/Cur%20Sci61,%20609.pdf)

Mehra, P.N. (1991), Anatomy and ecology of the tree fern Hemitelia-brunoniana (wall) Clarke, with remarks on the phylogeny of Cyatheaceae. *Current Science*, **61** (9-10), 659-663.

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Arunachalam, S., Singh, U.N. and Sinha, R. (1993), The sleeping dragon wakes up: A scientometric analysis of the growth of science and the usage of journals in China. *Current Science*, **65** (11), 809-822.

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Keywords: Citation Patterns, Countries, Publication

Ranganathan, S. (1994), Quasicrystals: Indian research accomplishments and imperatives. *Current Science*, **67** (11), 884-886.

Full Text: [1994\Cur Sci67, 884.pdf](1994/Cur%20Sci67,%20884.pdf)

Abstract: Within two months of the first report on quasicrystals in PRL in November 1984, Indian research which had a ‘premature discovery’ in 1978 in this area got under way, In the past nine years these efforts have led to original discoveries relating to new types of quasicrystalline phases as well as extensive investigations involving tiling theory, hyperspace, positron annihilation and electrical properties, These researches have been multi-institutional and multi-disciplinary. Enlightened and generous funding was extended by DST from 1986 by recognizing it as a thrust area in basic research via SERC and US-India Funds. International recognition, subjective though it is, in the form of citation of Indian papers, invited lectures and reviews, books as well as the membership of International Advisory Committee has followed and is among the highest in the fields of condensed matter science covered at the Bangalore meeting, Future directions pertaining to the exploration of mechanical and electronic properties as well as structures beyond the quasicrystalline order will be pointed out.

Keywords: Alloys, Crystallography, Electron-Microscopy, Fe, Icosahedral Symmetry, Order, Phase, Quasi-Crystals, System

Szavá Kováts, E. (1997), Non-indexed citedness. *Current Science*, **72** (10), 705-707.

Full Text: [1997\Cur Sci72, 705.pdf](1997/Cur%20Sci72,%20705.pdf)

Abstract: Two recent fact-finding investigations demonstrate that eponymal and indirect-collective citedness are very frequent and long-standing phenomena in the journal literature of physics, and present not indexed by Citation Indexes. In consequence of non-indexed literature citedness, the Indexes are not suitable for the measurement of real literature citedness. The meaning and value of quantified citation data of the Citation Indexes must be reduced, especially in the cases of the (mis)use of the dta for the purpose of evaluating scientists as scientists.

Keywords: Citation Analysis

Garfield, E. (1997), A statistically valid definition of bias is needed to determine whether the Science Citation Index(R) discriminates against third world journals. *Current Science*, **73** (8), 639-641.

Full Text: [1997\Cur Sci73, 639.pdf](1997/Cur%20Sci73,%20639.pdf)

Arunachalam, S., Srinivasan, R. and Raman, V. (1998), Science in India - A profile based on India’s publications as covered by Science Citation Index 1989-1992. *Current Science*, **74** (5), 433-441.

Full Text: [1998\Cur Sci74, 433.pdf](1998/Cur%20Sci74,%20433.pdf)

Keywords: Output, Scientific Journals

Rai, L.C., Singh, S. and Pradhan, S. (1998), Biotechnological potential of naturally occurring and laboratory-grown Microcystis in biosorption of Ni2+ and Cd2+. *Current Science*, **74** (5), 461-464.

Full Text: [1998\Cur Sci74, 461.pdf](1998/Cur%20Sci74,%20461.pdf)

Abstract: In this article we provide information on the biosorption of Cd2+ and Ni2+ by capsulated nuisance cyanobacterium Microcystis both from field and laboratory, Compared to laboratory, the naturally occurring cells show higher efficiency both for Ni2+ (14%) and Cd2+ (9%) biosorption, Freundlich and Langmuir constants revealed that Microcystis is not only an excellent biosorbent for metal removal but it has greater affinity for Cd2+ than Ni2+. Freundlich isotherm was found to explain the biosorption mechanism more explicitly than Langmuir isotherm, both for single metal and for the bimetallic combination, Freundlich mathematical model further revealed that the biosorption would follow different courses at low and high concentrations. The failure of Freundlich and suitability of BET isotherms at high metal concentration demonstrated a multilayer binding of metals by Microcystis.

Keywords: Lead(II) Ions, Polysaccharide, Cyanophyta, Algae

Balaram, P. (1998), Citation counting and impact factors. *Current Science*, **75** (3), 175.

Full Text: [1998\Cur Sci75, 175.pdf](1998/Cur%20Sci75,%20175.pdf)

Rai, L.C., Singh, S. and Pradhan, S. (1998), Biotechnological potential of naturally occurring and laboratory-grown Microcystis in biosorption of Ni2+ and Cd2+ (vol 74, pg 461, 1998). *Current Science*, **75** (8), 861.

Full Text: [C\Cur Sci75, 861.pdf](C/Cur%20Sci75,%20861.pdf)

Keywords: Citation Patterns, Medical-Research, Publication

Jain, N.C. (1999), Indian journals and SCI. *Current Science*, **76** (8), 1061-1062.

Full Text: [C\Cur Sci76, 1061.pdf](C/Cur%20Sci76,%201061.pdf)

Keywords: SCI

Arunachalam, S. (1999), Mapping life sciences research in India: A profile based on BIOSIS 1992-1994. *Current Science*, **76** (9), 1191-1203.

Full Text: [C\Cur Sci76, 1191.pdf](C/Cur%20Sci76,%201191.pdf)

? Susheela, A.K. (1999), Fluorosis management programme in India. *Current Science*, **77** (10), 1250-1256.

Full Text: [1999\Cur Sci77, 1250.pdf](1999/Cur%20Sci77,%201250.pdf)

Abstract: India is among the 23 nations around the globe, where health problems occur due to the consumption of fluoride contaminated water. An estimated 62 million people in India in 17 out of the 32 states are affected with dental, skeletal and/or non-skeletal fluorosis. The extent of fluoride contamination of water varies from 1.0 to 48.0 mg/l. An innovative approach developed for fluorosis mitigation is reported. Networking between Public Health Engineering and Health Sector personnel. well-defined objectives for provision of safe/defluoridated water; improvement in the health status of the community through nutritional intervention are the highlights of the programme. Modules for use in out-patient departments for early and correct diagnosis of fluorosis have been developed The need for teaching about fluorosis in medical colleges is emphasized. Early detection of the disease is the crux of the problem. In the Fluorosis Management Programme, the major thrust is on (i) awareness generation, iii) opting technology for fluoride removal/strategy for providing safe water on a sustainable basis, and (iii) emphasis on importance of consuming calcium, vitamin C, E and antioxidant-rich diet for minimizing the adverse effects of fluoride.

Keywords: Fluoride Ingestion, Skeletal Fluorosis, Manifestations

Gupta, R., Ahuj, P., Khan, S., Saxena, R.K. and Mohapatra, H. (2000), Microbial biosorbents: Meeting challenges of heavy metal pollution in aqueous solutions. *Current Science*, **78** (8), 967-973.

Full Text: [C\Cur Sci78, 967.pdf](C/Cur%20Sci78,%20967.pdf)

Abstract: Heavy metal pollution in the aquatic system has become a serious threat today. The chemical processes that exist are not economical for treating a large volume of water bodies of dilute metal concentration. In this endeavour, microbial biomass has emerged as an option for developing economic and ecofriendly wastewater treatment processes. Nonliving and dead microbial biomass may passively sequester metal(s) by the process of biosorption from dilute solutions. This biosorption technology has advantages of low operating cost, is effective in dilute solutions and generates minimum effluent. Here the dead microbial biomass functions as an ion exchanger by virtue of various reactive groups available on the cell surface such as carboxyl, amine, imidazole, phosphate, sulfhydryl, sulfate and hydroxyl. The process can be made economical by procuring natural bulk biomass or spent biomass from various fermentation industries. The performance of a biosorbent can further be improved by various physical and chemical treatments. The pretreatments modify the cell surface either by removing or masking the groups or exposing more metal binding sites. Immobilized biomass of these microbes offers the continuous sorption–desorption system in a fixed bed reactor. Various commercial microbial biosorbents available are AlgaSorb, AMT-Bioclaim and Bio-fix. The economics of these sorbents merit their commercialization, over chemical ion exchangers.

Virk, H.S. (2000), A bibliometric analysis of scientific research in India. *Current Science*, **78** (11), 1280-1281.

Full Text: [2000\Cur Sci78, 1280.pdf](2000/Cur%20Sci78,%201280.pdf)

Keywords: Science-Citation-Index

Vinkler, P. (2000), Evaluation of the publication activity of research teams by means of scientometric indicators. *Current Science*, **79** (5), 602-612.

Full Text: [2000\Cur Sci79, 602.pdf](2000/Cur%20Sci79,%20602.pdf)

Abstract: In the Chemical Research Center of the Hungarian Academy of Sciences, special scientometric indicators have been used for evaluating publication activity of research teams for about 30 years. Modified Garfield impact factors for journals as well as relative citedness of papers are applied as indicators because of differences among subfields in scientometric features of the publications assessed. Our experience has shown that the evaluation of real scientometric systems needs compromises among the parties interested and between the practical applicability and the theoretical requirements of scientometrics.

Keywords: Basic Research, Evaluation, Impact, Impact Factors, Indicators, Journals, Performance, Publication, Publications, Research, Scientometric Indicators, Scientometrics

Jayashree, B. and Arunachalam, S. (2000), Mapping fish research in India. *Current Science*, **79** (5), 613-620.

Full Text: [C\Cur Sci79, 613.pdf](C/Cur%20Sci79,%20613.pdf)

Abstract: Fish and aquaculture research in India has been mapped using data from six databases, About 460 papers, roughly 5.5% of the world output, come from India every year, of which 82% are journal articles. Close to 70% of journal articles have appeared in 113 Indian journals. Less than a third of the journal articles are published in journals indexed in SCI, About 61% of publications are contributed by government laboratories and over 25% by academic institutions. Government laboratories publish most of their work in low impact and low visibility journals and academic institutions in journals of medium impact. However, even those papers appearing in better- rated journals are not cited well. Kochi, Chennai, Mumbai and Mangalore are the cities and Tamil Nadu and Kerala are the states contributing large number of papers.

Keywords: Citation Patterns, Fisheries, Publication, Science

Arunachalam, S. and Jinandra, D.M. (2000), Mapping international collaboration in science in Asia through coauthorship analysis. *Current Science*, **79** (5), 621-628.

Full Text: [C\Cur Sci79, 621.pdf](C/Cur%20Sci79,%20621.pdf)

Abstract: Using data from SCI 1998, we have analysed international collaboration in science in 11 Asian countries. Papers resulting from collaboration among these countries and with G7, European Union, OECD and selected Latin American and African countries were classified under subject categories to characterize each country’s total and collaborated scientific literature output. Japan (16.4% of internationally collaborated papers), India (17.6%) and Taiwan (16.3%) recorded an internationalization index less than 30 whereas China (28.5%), South Korea (24.6%) and Hong Kong (36.2%) recorded an internationalization index greater than 40. India, China and South Korea have collaborated more in physics, whereas the other eight countries have collaborated more in life sciences. In almost all fields and for virtually all Asian countries, USA is the most preferred collaborating partner. All G7 countries collaborate more with China, which is emerging as a leader in regional collaboration, than with India.

Basa, D.K. (2000), Publication lists, citation counts and the impact factor. *Current Science*, **79** (8), 1042-1043.

Full Text: [C\Cur Sci79, 1042.pdf](C/Cur%20Sci79,%201042.pdf)

Garfield, E. (2002), Research impact vs economic impact. *Current Science*, **81** (1), 9.

Full Text: [C\Cur Sci81, 9.pdf](C/Cur%20Sci81,%209.pdf)

? Arunachalam, S. and Gunasekaran, S. (2002), Tuberculosis research in India and China: From bibliometrics to research policy. *Current Science*, **82** (8), 933-947.

Full Text: [2002\Cur Sci82, 933.pdf](2002/Cur%20Sci82,%20933.pdf)

Abstract: India and China lead the world in the incidence of tuberculosis (TB), accounting for 23% and 17% respectively, of the global burden of the disease and hold the 15th and the 18th positions in terms of incidence per 100,000 population. But India accounts for only about 5-6% of the world’s research output in this area and China a paltry 1% as seen from papers indexed in three international databases, viz. PUBMED, Science Citation Index and Biochemistry and Biophysics Citation Index over the ten-year period 1990-1999. Thus there is a tremendous mismatch between the share of the burden of the disease and share of research efforts. Is such mismatch acceptable? It raises the question ‘should resource-poor countries invest in research or should they depend on research performed elsewhere and invest their meagre resources predominantly in health-care measures?’ We argue that both India and China should invest much more in research than they do. We have also mapped TB research in the two countries and identified institutions and cities active in research, journals used to publish the findings, use of high impact journals, impact of their research as seen from citations received and extent of international collaboration. Although China performs much less research than India and its work is quoted much less often, it seems to have done far better than India in health-care delivery in TB. Perhaps the Chinese are better able to translate know-how into do-how than the Indians.

Khan, M.L., Upadhyaya, K., Singha, L.B. and Devi, A. (2002), A plea for conservation of threatened tree fern (*Cyathea gigantea*). *Current Science*, **82** (4), 375-376.

Full Text: [C\Cur Sci82, 375.pdf](C/Cur%20Sci82,%20375.pdf)

Balasubrahmanyam, S.N. (2002), Science is alive and kicking, but has not sci-fi fantasy done better? *Current Science*, **82** (6), 611-612.

Full Text: [C\Cur Sci82, 611.pdf](C/Cur%20Sci82,%20611.pdf)

Keywords: SCI

Arunachalam, S. and Gunasekaran, S. (2002), Tuberculosis research in India and China: From bibliometrics to research policy. *Current Science*, **82** (8), 933-947.

Full Text: [C\Cur Sci82, 933.pdf](C/Cur%20Sci82,%20933.pdf)

Abstract: India and China lead the world in the incidence of tuberculosis (TB), accounting for 23% and 17% respectively, of the global burden of the disease and hold the 15th and the 18th positions in terms of incidence per 100,000 population. But India accounts for only about 5–6% of the world’s research output in this area and China a paltry 1% as seen from papers indexed in three international databases, viz. PUBMED, Science Citation Index and Biochemistry and Biophysics Citation Index over the ten-year period 1990–1999. Thus there is a tremendous mismatch between the share of the burden of the disease and share of research efforts. Is such mismatch acceptable? It raises the question ‘should resource-poor countries invest in research or should they depend on research performed elsewhere and invest their meagre resources predominantly in health-care measures?’ We argue that both India and China should invest much more in research than they do. We have also mapped TB research in the two countries and identified institutions and cities active in research, journals used to publish the findings, use of high impact journals, impact of  
their research as seen from citations received and extent of international collaboration. Although China performs much less research than India and its work is quoted much less often, it seems to have done far better than India in health-care delivery in TB. Perhaps the Chinese are better able to translate know-how into do-how than the Indians.

Arunachalan, S. and Gunasekaran, S. (2002), Diabetes research in India and China today: From literature- based mapping to health-care policy. *Current Science*, **82** (9), 1086-1097.

Full Text: [2002\Cur Sci82, 1086.pdf](2002/Cur%20Sci82,%201086.pdf)

Abstract: We have mapped and evaluated diabetes research in India and China, based oil papers published during 1990-1999 and indexed in PUBMED, Science Citation Index (SCI) and biochemistry and Biophysics Citation Index (BBCI) and citations to each one of these papers lip to 2000. We have identified institutions carrying out diabetes research, journals used to publish the results, subfields in which the two countries have published often, and the impact of the work as seen from actual citations to the papers. We have also assessed the extent of international collaboration in diabetes research in these two countries, based on papers indexed in SCI and BBCI. There is an enormous mismatch between the disease burden and the share of research performed in both countries. Although together these two countries account for 26% of the prevalence of diabetes, they contribute less than 2% of the world’s research. We argue that both India and China need to (i) strengthen their research capabilities in this area, (II) increase investment in health- care research considerably, (iii) facilitate substantive international collaboration in research, and (iv) support cross-disciplinary research between basic life sciences researchers and medical researchers. As data such as those presented here should form the basis of health policy, India and China should encourage evaluation of research.

Keywords: Disease, Global Burden, Information

Arunachalam, S. (2002), Is science in India on the decline? *Current Science*, **83** (2), 107-108.

Full Text: [2002\Cur Sci83, 107.pdf](2002/Cur%20Sci83,%20107.pdf)

Gupta, B.M., Munshi, U.M. and Mishra, P.K. (2002), S&T collaboration of India with other South Asian countries. *Current Science*, **83** (10), 1201-12098.

Full Text: [2002\Cur Sci83, 1201.pdf](2002/Cur%20Sci83,%201201.pdf)

Abstract: Science and technology (S&T) is being practised today in a collaborative manner with participation of scientists from different disciplines, institutions and countries. To combat the problems of pollution, environment, energy, biodiversity, health and nutrition, many countries in the world, particularly the developing countries, need cooperation and support from other developed countries. Thus, collaboration in S&T is fast emerging as the keyword in the scientific world. India had recognized the importance of international scientific collaboration quite early and considers it an important instrument for the development of S&T in India. As a result, India has signed a number of collaboration agreements on S&T with many countries, including South Asian countries. In this article, a study on the outputs of S&T collaborations is presented through the analysis of co-authored research papers published during the period 1992-99 in the journals covered by the Science Citation Index. The study analyses these collaborations front various angles, viz. nature, S&T areas, institutions involved and their impact on individual fields. It has been observed that Of the four South Asian countries - Bangladesh, Pakistan, Sri Lanka and Nepal - India had stronger collaborative linkages with Bangladesh, covering the major broad areas in S&T, and the co-authored papers resulting out of these collaborations had high values of impact factor. Collaboration with other South Asian countries had been quite narrow and restricted to few subject areas. Need for further cooperation is highlighted in newly emerging areas of ST.

Prathap, G. (2003), Cost of research index: What is an SCI paper worth? *Current Science*, **84** (3), 258.

Full Text: [2003\Cur Sci84, 258.pdf](2003/Cur%20Sci84,%20258.pdf)

Keywords: SCI, Science

Huang, N.Y. and Wu, Y.S. (2003), A comparative study of scientific and technical output indicators of Mainland China and Taiwan region. *Current Science*, **84** (5), 634-639.

Full Text: [2003\Cur Sci84, 634.pdf](2003/Cur%20Sci84,%20634.pdf)

Abstract: The article compares Mainland. China and Taiwan region in terms of two kinds of output indicators, namely scientific output indicators represented by the quantity and the citation of SCI papers, and technical output indicator represented by the number of patents granted by USPTO. Both indicators examined are those of the last decade of the 20th century. The article also examines the growth rate of these indicators. Mainland China and Taiwan region showed different trends-in terms of S&T output: the scientific output and technical output of Mainland China grew unevenly, while those of Taiwan region climbed evenly and more quickly. The possible factors causing these differences between Mainland China and Taiwan region, especially those related to S&T policies and their implementation, are discussed.

Keywords: SCI

Jain, N.C. (2003), Measuring and assessing science beyond SCI. *Current Science*, **84** (7), 863.

Full Text: [2003\Cur Sci84, 863.pdf](2003/Cur%20Sci84,%20863.pdf)

Keywords: SCI

Garfield, E. (2003), Measuring and assessing science beyond SCI. *Current Science*, **85** (4), 425.

Full Text: [2003\Cur Sci85, 425.pdf](2003/Cur%20Sci85,%20425.pdf)

Keywords: SCI

Prathap, G. (2003), A soft mathematical model for brain drain. *Current Science*, **85** (5), 593-596.

Full Text: [2003\Cur Sci85, 593.pdf](2003/Cur%20Sci85,%20593.pdf)

Abstract: It is a widely held belief, even among senior people in the government, that India is a country with vast human resources and that even if about 10% goes abroad after higher qualifications, it would not make a dent in the country’s total productive potential. Implied in this argument is the assumption that if 10% of the human resources goes abroad, it would take away only 10% of the intellectual energy in the population. Is there any scientific basis for this? If a scientific, or a mathematical model were to be sought for this, how should this be done? In this article, based on some well-known power-law models used in complex systems like ecology, economics, scientometrics and seismology, one can argue through a soft mathematical model that a small per cent of the cream at the top can take away a disproportionately large amount of intellectual resources.

Arunachalam, S. (2003), Use of SCI-based publication counts. *Current Science*, **85** (10), 1391-1392.

Full Text: [2003\Cur Sci85, 1391.pdf](2003/Cur%20Sci85,%201391.pdf)

Keywords: SCI, Science

Roy, R. (2004), International citation analysis of materials research institutions. *Current Science*, **86** (1), 9-10.

Full Text: [2004\Cur Sci86, 9.pdf](2004/Cur%20Sci86,%209.pdf)

Balaram, P. (2004), Science, scientists and scientometrics. *Current Science*, **86** (5), 623-624.

Full Text: [2004\Cur Sci86, 623.pdf](2004/Cur%20Sci86,%20623.pdf)

Dastidar, P.G. (2004), Science Citation Index, co-citation and the scientists. *Current Science*, **86** (5), 626.

Full Text: [2004\Cur Sci86, 626.pdf](2004/Cur%20Sci86,%20626.pdf)

Keywords: Citation, Co-Citation, Cocitation, MAR, Science Citation Index

Satyanarayana, K. and Jain, N.C. (2004), Web of Science: Measuring and assessing science beyond SCI. *Current Science*, **86** (5), 627-629.

Full Text: [2004\Cur Sci86, 627.pdf](2004/Cur%20Sci86,%20627.pdf)

Keywords: SCI

Garfield, E. (2004), Web of Science: Measuring and assessing science beyond SCI - Response. *Current Science*, **86** (5), 629.

Full Text: [2004\Cur Sci86, 629.pdf](2004/Cur%20Sci86,%20629.pdf)

Keywords: SCI

Arunachalam, S. (2004), Science in India - Reply. *Current Science*, **86** (9), 1197-1198.

Full Text: [2004\Cur Sci86, 1197.pdf](2004/Cur%20Sci86,%201197.pdf)

Keywords: SCI

Prathap, G. (2004), Cost of research index: What is an SCI paper worth? *Current Science*, **86** (11), 1469.

Full Text: [2004\Cur Sci86, 1469.pdf](2004/Cur%20Sci86,%201469.pdf)

Bhatt, D.K. (2004), Reply to the comments by: Mathur (Curr Sci, 2004, 86, 761-762). *Current Science*, **86** (11), 1470.

Full Text: [2004\Cur Sci86, 1470.pdf](2004/Cur%20Sci86,%201470.pdf)

Bhole, B.D., Ganguly, B., Madhuram, A., Deshpande, D. and Joshi, J. (2004), Biosorption of methyl violet, basic fuchsin and their mixture using dead fungal biomass. *Current Science*, **86** (12), 1641-1645.

Full Text: [C\Cur Sci86, 1641.pdf](C/Cur%20Sci86,%201641.pdf)

Abstract: The effect of different parameters on sorption of methyl violet, basic fuchsin and their mixture in an aqueous solution was studied. Dead biomass of *Aspergillus niger* was observed to be an efficient biosorbent. Maximum sorption was seen within 10 min. The sorption was independent of dye concentration and pH. The interaction of pH, dye concentration and biosorbent concentration showed variable results. The desorption profile showed that 0.1 M HCl was a better eluant than 50% ethanol.

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Full Text: [2004\Cur Sci87, 1180.pdf](2004/Cur%20Sci87,%201180.pdf)

Keywords: Atomic-Absorption Spectrometry, Trace-Metal Preconcentration, Silica-Gel, *Saccharomyces-Cerevisiae*, Biosorption, Biomass, Hg(II), Ions

? Prathap, G. (2005), Who’s afraid of research assessment? *Current Science*, **88** (1), 14-17.

Full Text: [2005\Cur Sci88, 14.pdf](2005/Cur%20Sci88,%2014.pdf)

Abstract: Although the field of scientometrics now offers well-tested procedures for some measure of quantitative assessment of research performance, these are largely left unused in our country when we attempt exercises to assess the performance of individuals or institutions. This is baffling in a country that is so comfortable with its obsession with cricket and cricket statistics. The present analysis is based on data from the SCOPUS database, and this approach has the potential to offer interesting sociological insights into the scientific productivity of individuals, research institutes and research agencies.

Keywords: Research, Research Performance, Scientometrics

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Full Text: [2005\Cur Sci88, 331.pdf](2005/Cur%20Sci88,%20331.pdf)

Keywords: Citation, SCI, Science Citation Index, Scope

? Kumaran, K. (2005), Status of Current Science in dissemination of knowledge. *Current Science*, **88** (5), 677.

Full Text: [2005\Cur Sci88, 677.pdf](2005/Cur%20Sci88,%20677.pdf)

? Prathap, G. (2005), Assessment of academic aeronautical research in India. *Current Science*, **88** (12), 1880-1882.

Full Text: [2005\Cur Sci88, 1880.pdf](2005/Cur%20Sci88,%201880.pdf)

Abstract: Academic research in the aeronautical sector is confined to a narrow base. Scientometric data allow a quantitative assessment of this to be made. The current status of aeronautical research shows that many departments of aerospace engineering are working in a fragmented manner and that for the aeronautical research base to contribute significantly to the strategic development sector, it must be consolidated and increased in strength.

Keywords: Development, Research

? Leydesdorff, L. (2005), Evaluation of research and evolution of science indicators. *Current Science*, **89** (9), 1510-1517.

Full Text: [2005\Cur Sci89, 1510.pdf](2005/Cur%20Sci89,%201510.pdf)

Keywords: Assessments, British Science, Collaboration, Decline, Evaluation, Innovation, Patterns, Performance, Policy Decision, Research, Research Evolution, Science Indicators, Scientometrics, Systems

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Full Text: [2005\Cur Sci89, 1518.pdf](2005/Cur%20Sci89,%201518.pdf)

Keywords: Academic-Institutions, Author Cocitation, Bibliometrics, Citation, Co-Authorship Networks, Collaboration, Complex Networks, Hyperlink Networks, Impact-Factors, Knowledge, Linking, Scholarly Communication, Science, Web Site Interlinking

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Full Text: [2005\Cur Sci89, 1531.pdf](2005/Cur%20Sci89,%201531.pdf)

Keywords: Citation, Citation Indexing, Emergence, NOV, Science Citation Index, Web of Science

? Braun, T. and Dióspatonyi, I. (2005), Counting the gatekeepers of international science journals a worthwhile science indicator. *Current Science*, **89** (9), 1548-1551.

Full Text: [2005\Cur Sci89, 1548.pdf](2005/Cur%20Sci89,%201548.pdf)

Keywords: Chemistry, Citation Impact, Fields, Gatekeepers, Life Sciences, Mathematics, National Performances, Publication Output, Science Indicators, Science Journals, Scientific Wealth, Scientometric Weight, World Science

? Dastidar, P.G. and Persson, O. (2005), Mapping the global structure of Antarctic research vis-a-vis Antarctic Treaty System. *Current Science*, **89** (9), 1552-1554.

Full Text: [2005\Cur Sci89, 1552.pdf](2005/Cur%20Sci89,%201552.pdf)

Keywords: Antarctic Research, Antarctic Treaty System, Global Structure, Research, Scientometrics

? Moed, H.F. (2005), Citation analysis of scientific journals and journal impact measures. *Current Science*, **89** (12), 1990-1996.

Full Text: [2005\Cur Sci89, 1990.pdf](2005/Cur%20Sci89,%201990.pdf)

Abstract: Eugene Garfield’s creative work on journal impact measures served more than one function. These measures were originally designed and applied to monitor the journal coverage of the Science Citation Index (SCI). They constituted a tool to identify on a permanent basis, the most important journals in the scientific communication system, and to highlight candidates to be included or dropped in view of the need to establish a cost-effective Citation Index.

Keywords: Analysis, Citation, Citation Analysis, Communication, Cost-Effective, Coverage, Eugene Garfield, Function, Impact, Impact Factor, Journal, Journal Impact, Journals, Permanent, SCI, Science, Science Citation Index, Scientific Communication, Scientific Journals, Tool, Work

? Koley, S. and Sen, B.K. (2006), A quantitative analysis of book reviews published in Current Science: 2002-2005. *Current Science*, **91** (12), 1616-1620.

Full Text: [2006\Cur Sci91, 1616.pdf](2006/Cur%20Sci91,%201616.pdf)

Abstract: This article presents results of the analysis of 325 book reviews published in Current Science during 2002 to 2005. The analysis shows that around 60% books were original works produced by single, double or multiple authors. The rest were collected works including two journals, corporate works, and a translation. The documents reviewed comprised mostly monographs (90%) followed by annual reviews and others. The largest number of documents reviewed belong to pure sciences (73%), followed by applied sciences (24%), and others (3%). Of the documents reviewed, 52.62% were published abroad and the rest 47.38% in India, Books containing 151 to 350 pages accounted for about 53% of the books. It is noticed that the number of books reviewed per year in Current Science varies from 60 to more than 100. Of the books reviewed, 71 were published from Delhi, 2 7 from Hyderabad, 24 each from New Jersey and Basel, 21 from New York, and the rest from other places. Publishers responsible for bringing out 321 books (publishers not mentioned in four cases) total 124. Birkhauser Verlag and Princeton University accounted for 26 books each, University Press (India) Ltd 24, Annual Review Inc. 18, MIT Press 13, Springer Verlag 12 books, and others less than 10 books. Prices were not mentioned in about 33% book reviews, possibly because the books did not provide the information. About 47% books were above the price range of Rs 1000. The minimum price of a book was found to be Rs 35 and maximum Rs 14,850. A large number of scientists shouldered the responsibility of reviewing books, foremost amongst them being C. P. Rajendran, M. S. Swaminathan, T. J. Pandian, S. Arunachalam and K. R. Rao.

Keywords: Analysis, Bibliometric Study, Book Reviews, Current Science, DEC, India, Information, Journals, New York, P, Quantitative Analysis, Range, Responsibility, Reviews, Sciences, Translation, York

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Full Text: [2007\Cur Sci92, 709.pdf](2007/Cur%20Sci92,%20709.pdf)

Keywords: Citation, Data, India, MAR, Science Citation Index

? Kostoff, R.N., Koytcheff, R.G. and Lau, C.G.Y. (2007), Global nanotechnology research literature overview. *Current Science*, **92** (11), 1492-1498.

Full Text: [2007\Cur Sci92, 1492.pdf](2007/Cur%20Sci92,%201492.pdf)

Abstract: Text mining was used to extract technical intelligence from the open source global nanotechnology and nanoscience research literature (SCI/SSCI databases). The following were identified: (i) the nanotechnology/nanoscience research literature infrastructure (prolific authors, key journals/ institutions/countries, most cited authors/joumals/documents); (II) the technical structure (pervasive technical thrusts and their inter-relationships); (iii) nanotechnology instruments and their relationships; (iv) potential nanotechnology applications; (v) potential health impacts and applications, and (vi) seminal nanotechnology literature. The results are summarized in this article.

Keywords: Bibliometrics, Document Clustering, Infrastructure, Mining, Nanoparticle, Nanoscience, Nanotechnology, Nanotube, Text Mining

? Abramo, G. and D’Angelo, C.A. (2007), Measuring science: Irresistible temptations, easy shortcuts and dangerous consequences. *Current Science*, **93** (6), 762-766.

Full Text: [2007\Cur Sci96, 762.pdf](2007/Cur%20Sci96,%20762.pdf)

Abstract: In benchmarking international research, although publication and citation analyses should not be used to compare different disciplines, scientometrists frequently fail to resist the temptation to present rankings based on total publications and citations. Such measures are affected by significant distortions, due to the uneven fertility across scientific disciplines and the dishomogeneity of scientific specialization among nations and universities. In this note, we provide an indication of the extent of the distortions when comparative bibliometric analyses fail to recognize the range of levels of scientific fertility, not only within a given major disciplinary area, but also within different scientific disciplines encompassed by the same area.

Keywords: Nations, Publications, Science, Universities

? Kostoff, R.N., Eriggs, M.E., Rushenberg, R.L., Eowles, C.A., Bhattacharya, S., Johnson, D., Icenhour, A.S., Nikodym, K., Barth, R.B., Dodbele, S. and Pecht, M. (2007), Assessment of science and technology literature of China and India as reflected in the SCI/SSCI. *Current Science*, **93** (8), 1088-1092.

Full Text: [2007\Cur Sci93, 1088.pdf](2007/Cur%20Sci93,%201088.pdf)

Keywords: Bibliometrics, India, Research and Technology Assessment, Science, Science and Technology, Text Mining

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Full Text: [2008\Cur Sci94, 1265.pdf](2008/Cur%20Sci94,%201265.pdf)

Abstract: The objective of this work was to analyse the scientometric parameters for chemical engineering publications. We have compared the number of journal publications and citations by various countries and institutions. The publication record in terms of quantitative aspects of the number of publications from China has increased exponentially over the last decade and has overtaken USA. However, the citation analysis indicates that there is ample scope for improvement. Thus, USA continues to maintain its leadership position with regard to impact in the field. Analysis of the output of selected Indian universities/organizations against that of the top universities in the world, indicated that the records of top institutions from India are not comparable to the best universities in USA, but are comparable to the best in Asia and are significantly better than the best universities in China.

Keywords: Chemical Engineering, Citations, Publications, Scientometric Analysis

? Arunachalam, S. and Viswanathan, B. (2008), A historiographic analysis of fuel-cell research in Asia - China racing ahead. *Current Science*, **95** (1), 36-49.

Full Text: [2008\Cur Sci95, 36.pdf](2008/Cur%20Sci95,%2036.pdf)

Abstract: Fuel-cell research in China, India, Japan, Singapore, South Korea and Taiwan, over the years 1983-2007 is analysed and compared with that in USA for number of papers, document type, journals used and international collaboration. For India and China we have also identified the key researchers and institutions. Using HistCite, the visualization technique developed by Garfield and colleagues, we have constructed the historiographs for India and China based on both local citation scores (LCS) and global citation scores, and identified key papers. We find that the knowledge flow among different Asian countries is rather limited and that China has something to offer to India. The thrust in China is in developing noble metal nanoparticle catalysts supported on carbon nanotubes and the thrust in India is in the area of direct methanol fuel cells. In India, A. K. Shukla is the single most significant contributor to fuel cell research. He is the author of 14 of the 50 nodes in the India LCS historiograph.

Keywords: Fuel-Cell Research, Historiographic Analysis, Local and Global Citation Scores

? Balaram, P. (2008), Scientometrics: A dismal science. *Current Science*, **95** (4), 431-432.

Keywords: Science, Scientometrics

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Full Text: [2008\Cur Sci95, 1383.pdf](2008/Cur%20Sci95,%201383.pdf)

Keywords: Indian, Nov, Science, Science and Technology, Scientometric, Technology

? Gowrishankar, J. and Divakar, P. (2008), Scientometrics and modified h-indices. *Current Science*, **95** (12), 1656.

Full Text: [2008\Cur Sci95, 1656.pdf](2008/Cur%20Sci95,%201656.pdf)

Keywords: Modified, Scientometrics

? Ganguli, R. (2008), A scientometric analysis of recent aerospace research. *Current Science*, **95** (12), 1670-1672.

Full Text: [2008\Cur Sci95, 1679.pdf](2008/Cur%20Sci95,%201679.pdf)

Keywords: Analysis, Research, Scientometric, Scientometric Analysis

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Full Text: [2010\Cur Sci98, 9.pdf](2010/Cur%20Sci98,%209.pdf)

Keywords: Authorship

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Full Text: [2010\Cur Sci98, 993.pdf](2010/Cur%20Sci98,%20993.pdf)

Keywords: India, Leadership, Science, Scientometrics

? Prathap, G. (2010), National academy contributions to national science: A iCE map representation. *Current Science*, **98** (8), 995-996.

Full Text: [2010\Cur Sci98, 995.pdf](2010/Cur%20Sci98,%20995.pdf)

Keywords: Science

? Raghuraman, K.P., Chander, R. and Madras, G. (2010), Scientometric analysis of some disciplines: Comparison of Indian institutions with other international institutions. *Current Science*, **99** (5), 577-587.

Full Text: [2010\Cur Sci99, 577.pdf](2010/Cur%20Sci99,%20577.pdf)

Abstract: We have carried out a three-part study comparing the research performance of Indian institutions with that of other international institutions. In the first part, the publication profiles of various Indian institutions were examined and ranked based on the h-index and p-index. We found that the institutions of national importance contributed the highest in terms of publications and citations per institution. In the second part of the study, we looked at the publication profiles of various Indian institutions in the high-impact journals and compared these profiles against that of the top Asian and US universities. We found that the number of papers in these journals from India was miniscule compared to the US universities. Recognizing that the publication profiles of various institutions depend on the field/departments, we studied the publication profiles of many science and engineering departments at the Indian Institute of Science (IISc), Bangalore, the Indian Institutes of Technology, as well as top Indian universities. Because the number of faculty in each department varies widely, we have computed the publications and citations per faculty per year for each department. We have also compared this with other departments in various Asian and US universities. We found that the top Indian institution based on various parameters in various disciplines was IISc, but overall even the top Indian institutions do not compare favourably with the top US or Asian universities.

Keywords: Indian and International Institutions, Publications, Research Performance, Scientometric Analysis

? Madhan, M., Chandrasekar, G. and Arunachalam, S. (2010), Highly cited papers from India and China. *Current Science*, 99 (6), 738-749.

Full Text: [2010\Cur Sci99, 738.pdf](2010/Cur%20Sci99,%20738.pdf)

Keywords: China, Citations, Highly Cited Papers, Impact Factor, Papers, Research Papers, Science, Science and Technology, System

? Prathap, G. (2010), Scientometric comparison of Indian institutions with other international institutions: A *iCX* map representation. *Current Science*, **99** (9), 1161-1162

Full Text: [2010\Cur Sci99, 1161.pdf](2010/Cur%20Sci99,%201161.pdf)

Keywords: Comparison

? Prathap, G. (2010), Top 20 national rankings in molecular biology and genetics: A scientometric analysis using the *iCX* map representation. *Current Science*, **99** (12), 1639-1640

Full Text: [2010\Cur Sci99, 1639.pdf](2010/Cur%20Sci99,%201639.pdf)

Keywords: Analysis, Biology, Biology and Genetics, Genetics, Molecular Biology, Rankings, Representation, Scientometric

? Arunan, E. (2011), Indian science: Catch up with India, then worry about China. *Current Science*, **100** (1), 21.

Full Text: [2011\Cur Sci100, 21.pdf](2011/Cur%20Sci100,%2021.pdf)

Keywords: China, India, Science, Scientometrics

? Sinha, B. (2011), Trends in global solar photovoltaic research: Silicon versus non-silicon materials. *Current Science*, **100** (5), 654-660.

Full Text: [2011\Cur Sci100, 654.pdf](2011/Cur%20Sci100,%20654.pdf)

Abstract: This article reports a comparative analysis of the thrust in solar photovoltaic (PV) research during 1981-1988 and 2001-2008. Global solar PV literature in the latter period recorded a 4.5-fold increase over those in 1981-1988. The USA leads all the countries in terms of absolute number of publications as is the case in other areas of basic sciences. But its relative activity in solar PV research in terms of transformative activity index (TAI) values has decreased from 1.8 in 1981-1988 to 0.9 in 2001-2008. The performance of National Renewable Energy Laboratory of USA, the top institute is similar to its national trend, i.e. increase in absolute number and decrease in TAI. Presence of 3 German institutes in the top 10 institutes is an indication of Germany’s emphasis as well as the leadership in global solar PV research. The share of silicon-based papers as percentage of total solar PV publication has decreased from around 36% in 1981-1988 to 34% in 2001-2008. The share of non-silicon-based publication has increased from 9% in 1981-1988 to 17% in 2001-2008. Within silicon, the emphasis is still on crystalline silicon while among non-silicon materials, the growth of dye-sensitized solar cells output is outstanding. The developments especially in the areas of non-silicon solar PV cells, thus, raise hopes of the possibility of developing cost-effective and more efficient solar cells.

Keywords: Amorphous Silicon, Analysis, Bibliometrics, Cadmium Telluride, Cells, Cost-Effective, Crystalline Silicon, Developing, Dye-Sensitized Solar Cells, Emerging Technologies, Future, Gallium Arsenide, Growth, Impact, Index, Indication, Leadership, Literature, Mar, Papers, Performance, Photovoltaic, Publication, Publication Output, Publications, Research, Science, Sciences, Silicon, Solar Cells, Trend, USA

? Madhan, M. and Arunachalam, S. (2011), Use made of open access journals by Indian researchers to publish their findings. *Current Science*, **100** (9), 1297-1306.

Full Text: [2011\Cur Sci100, 1297.pdf](2011/Cur%20Sci100,%201297.pdf)

Abstract: Most of the papers published in the more than 360 Indian open access journals are by Indian researchers. But how many papers do they publish in high impact international open access journals? We have looked at India’s contribution to all seven Public Library of Science (PLoS) journals, 10 BioMed Central (BMC) journals and Acta Crystallographica Section E: Structure Reports. Indian crystallographers have published more than 2,000 structure reports in Acta Crystallographica, second only to China in number of papers, but have a much better citations per paper average than USA, Britain, Germany and France, China and South Korea. India’s contribution to BMC and PLoS journals, on the other hand, is modest at best. We suggest that the better option for India is institutional self-archiving.

Keywords: China, Citations, Impact Factor, Journals, Open Access, Papers, Science Citation Index, Web of Science

# Title: Current Surgery

Full Journal Title: Current Surgery

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Schein, M., Paladugu, R., Sutija, V.G. and Wise, L. (2000), What American surgeons read: A survey of a thousand Fellows of the American College of Surgeons. *Current Surgery*, **57** (3), 252-258.

Full Text: [C\Cur Sur57, 252.pdf](C/Cur%20Sur57,%20252.pdf)

Abstract: Purpose: The modern American surgeon is immersed in an ever-deepening sea of printed and electronic information. Although publishers know how many books and journals they sell, and journals can quote their calculated impact factor, no information exists whatsoever about what surgeons read. Which surgical journals are “popular,” and how does it compare with their impact factor (IF)? Our objective was to assess the sources of information and reading habits of American surgeons and to compare the “popularity” of journals with their IFs.

Methods: A questionnaire was mailed to 1000 American surgeons, randomly selected from a list provided by the American College of Surgeons.

Results: A total of 418 surgeons responded, and 371 responses could be analyzed (37%). The leading sources of medical information were medical literature (93%), professional meetings (88%), and CME courses (69%). The average time per surgeon/month dedicated to medical literature was 14 hours (range, 1 to 120). Peer-reviewed journals were read by 95%, textbooks by 68%, and update series by 60% of the respondents. The three most popular surgical journals were *Annals of Surgery* (IF, 5.40), selected by 60%, *Journal of the American College of Surgery* (IF, 1.87), selected by 48%, and *Archives of Surgery* (IF, 2.53), selected by 36%. The most popular subspecialty journals were *Cancer* (IF, 3.66), selected by 31%, *Critical Care Medicine* (IF, 3.74), selected by 17%, and *Gastroenterology* (IF, 10.33), selected by 12%. The *New England Journal of Medicine* (IF, 28.66), selected by 67%, and the *Journal of the American Medical Association* (IF, 9.55), selected by 66%, were the most popular general medical journals, followed by *Mayo Clinic Proceedings* (IF, 1.98), selected by 16%. Among the “leaders” on the IF list for international, British medical and surgical journals were *Lancet* (IF, 11.79), selected by 5%, and *British JournaL of Surgery* (IF, 2.38), selected by 0.5% of the respondents.

Conclusions: Those American surgeons responding consider published literature as their chief source of information, especially peer-reviewed journals. Overall, they ignore non–United States publications and select the journals they read without considering its IF.

Keywords: CME, Surgical Education, Surgical Literature, Impact Factor, Surgical Journals

# Title: Current Therapeutic Research-Clinical and Experimental

Full Journal Title: [Current Therapeutic Research-Clinical and Experimental](http://www.sciencedirect.com/science/journal/0011393X)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0011-393X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Windsor, D.A. (1975), Levodopa - Bibliometric differences before and after NDA approval. *Current Therapeutic Research-Clinical and Experimental*, **18** (3), 521-524.

? Zhong, Y.Q., Fu, J.J., Liu, X.M., Diao, X., Mao, B., Fan, T., Yang, H.M., Liu, G.J. and Zhang, W.B. (2010), The reporting quality, scientific rigor, and ethics of randomized placebo-controlled trials of traditional Chinese medicine compound formulations and the differences between Chinese and non-Chinese trials. *Current Therapeutic Research-Clinical and Experimental*, **71** (1), 30-49.

Full Text: [2010\Cur The Res-Clin Exp71, 30.pdf](2010/Cur%20The%20Res-Clin%20Exp71,%2030.pdf)

Abstract: BACKGROUND: An increasing number of randomized placebo-con trolled trials involving traditional Chinese medicine (TCM) compound formulations have been implemented worldwide. OBJECTIVE: The aim of this study was to assess the reporting quality, scientific rigor, and ethics of randomized placebo-controlled trials of TCM compound formulations and compare these differences between Chinese and non-Chinese trials. METHODS: English-language databases included the following: PUBMED, OVID, EMBASE, and Science Citation Index Expanded. Chinese-language databases included the following: Chinese Biomedical Literature Database, Wanfang Database, Chinese Scientific and Technological Periodical Database, and the China National Knowledge Infrastructure. All were searched from respective inception to March 2009 to identify randomized placebo-controlled trials involving TCM compound prescriptions. Two reviewers independently assessed the retrieved trials via a modified Consolidated Standard of Reporting Trials (CONSORT) checklist and some evaluation indices that embodied the TCM characteristics or the scientific rigor and ethics of placebo-controlled trials. Trial publishing time was divided into 3 intervals: phase I (<= 1999); phase 2 (2000-2004); and phase 3 (2005-2009). The number and percentage of trials reporting each item and the corresponding differences between Chinese (mainland China, Hong Kong, and Taiwan) and non-Chinese (eg, Japan, United States, Australia, Korea, and United Kingdom) trials were calculated. Moreover, the influence of trial publishing time on the reporting of CONSORT items and the differences in the number of items reported for each time interval between Chinese and non-Chinese trials were assessed. RESULTS: A total of 324 trials from China and 51 trials from other countries were included. A mean of 39.7% of the CONSORT items across all Chinese trials and 50.2% of the items across all non-Chinese trials were reported. The number of the reported CONSORT items all increased over time in both groups and the gap between Chinese articles and non-Chinese articles gradually decreased. Additionally, of the 324 Chinese articles, 137 (42.28%) reported TCM syndrome type, 113 (34.88%) reported the diagnostic criteria of diseases for TCM, and 69 (21-30%) reported efficacy evaluation indices of TCM. Of the non-Chinese articles, 3 (5.88%) reported TCM syndrome type and 1 (1.96%) reported the diagnostic criteria of diseases and evaluation indices of efficacy for TCM. It was found that 45.37% and 6.17% of Chinese articles reported the standard intervention for the diseases being treated and the emergency plan, respectively, compared with 23.53% and 9.80% for the non-Chinese articles; 33.02% and 10.49% of Chinese articles reported informed consent and ethics committee approval, respectively, compared with 92.16% and 82.35% for the non-Chinese articles. With regard to placebo ethics, 38.89% of the Chinese trials and 23.53% of the non-Chinese trials found it would not be ethically acceptable to use placebo alone in the control group. CONCLUSIONS: The data indicate that the reporting quality of the included trials on TCM compounds has improved over time, but still remains poor regardless of Chinese or non-Chinese trials. Across all trials, particularly Chinese trials, the reporting of the CONSORT items was inadequate (39.7%). The difference in the mean number of the reported CONSORT items between Chinese trials and non-Chinese trials narrowed from phase 1 (10.0 vs 13.8) to phase 3 (14.4 vs 17.4). Moreover, a large number of trials, especially non-Chinese trials (94.1%), were lacking syndrome differentiation of TCM. More importantly, in many placebo-controlled trials, especially Chinese trials, the use of placebo was not justified and was ethically contradictory. (Curr Ther Res Clin Exp. 2010;71:30-49) (C) 2010 Excerpta Medica Inc.

Keywords: Articles, Australia, Blind, Characteristics, China, Citation, Consort Statement, Consort Statement, Database, Databases, Elaboration, Ethics, Evaluation, Explanation, Groups, Health Research Today, Herbal Medicine, Hong Kong, Korea, Literature, Medicine, Placebo, Premenstrual-Syndrome, Publishing, Randomized Controlled Trial, Recommendations, Reporting Quality, Science, Science Citation Index, Scientific Rigor, Traditional Chinese Medicine Compound Formulation, United Kingdom, United States

? Li, W.X., Gou, J.F., Tian, J.H., Yan, X.A. and Yang, L. (2010), Glucagon-like peptide-1 receptor agonists versus insulin glargine for type 2 diabetes mellitus: A systematic review and meta-analysis of randomized controlled trials. *Current Therapeutic Research-Clinical and Experimental*, **71** (4), 211-238.

Full Text: 2010\Cur The Res-Clin Exp71, 211.pdf

Abstract: BACKGROUND: Glucagon-like peptide-1 (GLP-1) receptor agonists are a new class of hypoglycemic drugs, including exenatide, liraglutide, albiglutide, lixisenatide, and taspoglutide. Insulin glargine is a standard agent used to supplement basal insulin in type 2 diabetes mellitus (T2DM). OBJECTIVE: The aim of this study was to review the efficacy and safety profiles of GLP-1 receptor agonists versus insulin glargine in type 2 diabetic patients who have not achieved treatment goals with oral hypoglycemic agents. METHODS: The Cochrane Library, MEDLINE, EMBASE, Science Citation Index Expanded, and the database of ongoing trials were searched from inception through April 2010. Additional data were sought from relevant Web sites, the American Diabetes Association, reference lists of included trials and related (systematic) reviews, and industry. Randomized controlled trials (RCTs) were selected if they were months in duration, compared GLP-1 receptor agonists with insulin glargine in patients with T2DM, and included >= 1 of the following outcomes: mortality, complications of T2DM, glycemic control, weight, lipids, blood pressure, adverse effects, and health-related quality of life. Quasirandomized controlled trials were excluded. The quality of the eligible studies was assessed on the basis of the following aspects: randomization procedure, allocation concealment, blinding, incomplete outcome data (intent-to-treat [ITT] analysis), selective outcome reporting, and publication bias. RESULTS: A total of 410 citations were retrieved; 5 multicenter RCTs that met the inclusion criteria were identified. They were all open-label designs with an insulin glargine arm, predefined outcomes reported, and ITT analysis. One trial had an unclear randomization procedure and allocation concealment. Publication bias was not able to be determined. No data were found with regard to mortality or diabetes-associated complications, and few data were found on quality of life. The results of the meta-analysis suggest that insulin glargine was significantly better in reducing the fasting blood glucose (mean difference [MD] [95% CI], 1.31 [1.04 to 1.58]; P < 0.001), but exhibits greater incidence of nocturnal hypoglycemia (risk ratio [RR] [95% CI], 0.40 [0.23 to 0.71]; P = 0.002) and influenza (RR [95% CI], 0.56 [0.32 to 0.98]; P = 0.04). GLP-1 receptor agonists are more conducive to reducing weight (MD [95% CI], -3.96 [-5.14 to 2.77]; P < 0.001), postprandial blood glucose (after breakfast, P < 0.001; after dinner, P < 0.001), and LDL-C (MD [95% CI], -0.18 [-0.28 to -0.08]; P < 0.001), but have significantly more gastrointestinal adverse effects (eg, nausea/vomiting, P < 0.001). There were no significant differences between GLP-1 receptor agonists and insulin glargine in reducing glycosylated hemoglobin (HbA(1c)) levels (MD [95% CI], -0.03 [-0.13 to 0.08]) and the overall incidence of hypoglycemia (RR [95% CI], 0.69 [0.42 to 1.14]). CONCLUSIONS: Compared with insulin glargine, GLP-1 receptor agonists did not have a significant difference in regard to reducing HbA(1c) levels and they were significantly associated with decreased weight but increased gastrointestinal adverse events. It remains unclear whether GLP-1 receptor agonists influence mortality or diabetes-associated complications in patients with T2DM. More trials with longer follow-up are needed to determine the exact long-term efficacy and safety profiles of this new class of hypoglycemic drugs. (Curr Ther Res Clin Exp. 2010;71:211-238) (C) 2010 Excerpta Medica Inc.

Keywords: Antidiabetic Agents, Beta-Cell Function, Citation, Citations, Complications, Cost-Effectiveness, Diabetes Mellitus, Exenatide, GLP-1, Glucagon-Like Peptide-1, Glycemic Control, Insulin Detemir, Insulin Glargine, Meta-Analysis, Metformin, Publication, Quality of Life, Science Citation Index, Science Citation Index Expanded, Sulfonylurea, Tolerability, Treatment, Type 2 Diabetes, Weight

# Title: Current Topics in Biochemical Research

Full Journal Title: Current Topics in Biochemical Research

ISO Abbreviated Title: Curr. Top. Biochem. Res.

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

# Title: Current Topics in Medicinal Chemistry

Full Journal Title: Current Topics in Medicinal Chemistry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Drlica, K. and Malik, M. (2003), Fluoroquinolones: Action and resistance. *Current Topics in Medicinal Chemistry*, **3** (3), 249-282.

Full Text: [2003\Cur Top Med Che3, 249.pdf](2003/Cur%20Top%20Med%20Che3,%20249.pdf)

Abstract: Fluoroquinolones trap gyrase and topoisomerase IV on DNA as ternary complexes that block the movement of replication forks and transcription complexes. 71, Studies with resistant mutants indicate that during complex formation quinolones bind to a surface alpha-helix of the GyrA and ParC proteins. Lethal action is a distinct event that is proposed to arise from release of DNA breaks from the ternary complexes. Many bacterial pathogens are exhibiting resistance due to alterations in drug permeability, drug efflux, gyrase- protecting proteins, and target topoisomerases. When selection of resistant mutants is described in terms of fluoroquinolone concentration, a threshold (mutant prevention concentration, MPC) can be defined for restricting the development of resistance. MPC varies among fluoroquinolones and pathogens, when combined with pharmacokinetics, MPC can be used to identify compounds least likely to enrich mutant subpopulations. Use of suboptimal doses and compounds erodes the efficacy of the class as a whole because resistance to one quinolone reduces susceptibility to others and, or increases the frequency at which resistance develops. When using fluoroquinolones in combination therapy, the development of resistance may be minimized by optimizing regimens for pharmacokinetic overlap

Keywords: Antimicrobial Surveillance Program, Coli Dna Gyrase, Community-Acquired Pneumonia, Complete Genome Sequence, Fluoroquinolones, Gatifloxacin, Gyrase, Hiv-Related Tuberculosis, Level Ciprofloxacin Resistance, Levofloxacin, Mosaic Elements Bimes, Moxifloxacin, Mutant Prevention Concentration, Mutant Prevention Concentration, Neisseria-Gonorrhoeae Strains, Resistance, Topoisomerase IV, Topoisomerase-I Mutants

# Title: Cutaneous and Ocular Toxicology

Journal of Toxicology. Cutaneous and Ocular Toxicology 1982-2004

Full Journal Title: [Cutaneous and Ocular Toxicology](http://informahealthcare.com/loi/cot)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0731-3829

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Golda, N., Koo, J. and Maibach, H.I. (2005), Effects and uses of occlusion on human skin: An overview. *Cutaneous and Ocular Toxicology*, **24** (2), 91-104.

Full Text: [2005\Cut Ocu Tox24, 91.pdf](2005/Cut%20Ocu%20Tox24,%2091.pdf)

Abstract: The objective of this study is to review and synthesize the literature with reference to the effects of occlusive material applied to normal and diseased human skin. Data Sources: A key word and title search of all years available on the MEDLINE, PUBMED, and Science Citation Index databases, 1966 through 2004, was executed with search terms including occlusion, occlusive, and skin. Conclusions: Occlusive dressings provide effective therapeutic intervention either as an adjunct to topical medications or as a monotherapy for skin diseases such as psoriasis and verruca vulgaris and possibly other dermatologic diseases involving disruption of the stratum corneum permeability barrier or abnormal epidermal differentiation, its greatest uses thus far is in treatment of psoriasis and dermatitis. The mechanism(s) of action remain incompletely explored, and their therapeutic potential is incompletely developed.

Keywords: Occlusion, Occlusive, Skin, Safety, Therapy, Steroid, Sodium Lauryl Sulfate, Epidermal Water-Loss, Barrier Function, Carbon-Dioxide, Percutaneous-Absorption, Triamcinolone Acetonide, Permeability Barrier, Prolonged Occlusion, Psoriasis-Vulgaris, Exposure

? Hostynek, J.J. and Maibach, H.I. (2010), Fentanyl transdermal patches: Overview of cutaneous adverse effects in humans. *Cutaneous and Ocular Toxicology*, **29** (4), 241-246.

Full Text: 2010\Cut Ocu Tox29, 241.pdf

Abstract: Using Medline, Embase, and the Science Citation Index, we summarize the cutaneous adverse effects of transdermal and parenteral fentanyl. The fentanyl transdermal therapeutic system (TTS; patch) provides continuous systemic delivery of fentanyl (N-phenyl-N-(1-(2-phenylethyl)-4-piperidinyl) propanamide), a potent opioid analgesic, for 72 hours. Clinical studies of fentanyl TTSs demonstrated varying rates of irritation at the application site, ranging from none to 42%, with a median of 25%. Most descriptions of skin reactions included erythema at the application site, indicating irritant dermatitis. Skin testing in 2 subjects receiving parenteral doses concluded that although immunoglobulin E (IgE) antibodies to fentanyl exist, few cases of immediate-type allergic reactions to fentanyl have been substantiated. Comparing the reactions to anesthetic agents during allergenic testing demonstrated positive “wheal and flare” to fentanyl in only 1 of 50 patients (2%). Pruritus has been frequently reported during administration of epidural fentanyl, but allergenicity has not been shown. The few case reports of possible anaphylactic reactions to fentanyl have not clearly demonstrated fentanyl as the causal agent. In addition, transdermal and intravenous/epidural routes of administration may not be comparable because of large differences in plasma concentrations: When these results are taken together, fentanyl (TTS) has shown limited skin intolerance.

Keywords: Cancer Pain, Citation, Epidural Fentanyl, Fatal Anaphylactic Reaction, Model, Placebo, Postoperative Analgesia, Propofol, Science Citation Index, Skin, System

# Title: Cybermetrics

International Journal of Scientometrics, Informetrics and Bibliometrics

Full Journal Title: [Cybermetrics](http://www.cindoc.csic.es/cybermetrics/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1137-5019

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Chan, L.C.Y., Jin, B., Rousseau, R., Vaughan, L. and Yu, Y. (2002-3), Newspaper coverage of SARS: A comparison among Canada, Hong Kong, Mainland China and Western Europe. *Cybermetrics*, **6-7**, 1-12.

Full Text: [C\Cybermetrics6-7, 1.pdf](C/Cybermetrics6-7,%201.pdf)

Abstract: A quantitative analysis of newspaper coverage of SARS was conducted, where the occurrence of the word SARS in newspaper articles, rather than newspaper content was examined. Data were collected from six newspapers representing Canada, mainland China, Hong Kong, and Western Europe. These data were then compared with the World Health Organization’s data on SARS cases and SARS deaths. A brief history of SARS is also provided to place the results of the study in the context of the SARS events. The analysis finds not only a similarity between the two western media examined, but also a contrast between the western media and the Chinese media in SARS coverage. The study demonstrates the usefulness of informetric methods in analyzing popular media.

Keywords: Search Engines, Web, Performance, Stability, Case Study

Ignacio de Granda-Orive, J., García-Río, F., Gutiérrez-Jiménez, T., Escobar-Sacristán, J., Riera-Palmero, J. and Callol-Sánchez, L. (2004), Evolution of bibliometric indicators and his websites evaluation approaches in relation to the foremost respiratory journal in Spanish. *Cybermetrics*, **8** (1), 1-18.

Full Text: [C\Cybermetrics8, 1.pdf](C/Cybermetrics8,%201.pdf)

Abstract: The aim of this study was to examine the evolution of bibliometric indicators from 1970 to 2000 in relation to the foremost journal on the respiratory system published in Spanish, Archivos de Bronconeumología (Arch Bronconeumol). The evolution of these indicators over this three-decade period and the origin and specialties of the authors are reported. All issues of the journal from 1970 to 2000 (inclusive) were reviewed manually. In addition, we make a websites evaluation and a search was made in Pub-Med to evaluate the dissemination of the journal and in SCISEARCH to find citations of articles published in Archivos de Bronconeumología. We conclude that there has been a notable increase in scientific output in the field of respiratory research in Spain, as indicated by the articles published in the journal Archivos de Bronconeumología. Production and consumption indicators have stabilized in this 30-year period. A maximum circulation index has been achieved and the citation rate has increased considerably in the last three decades. Archivos de Bronconeumología has a discrete estimated impact factor.

Keywords: Bibliometrics, Web-metrics, Webometrics, Respiratory System, Scientific Documentation, Statistics

# Title: CyberPsychology & Behavior

Full Journal Title: CyberPsychology & Behavior

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1094-9313

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: [2006\Cyb Beh9, 114.pdf](2006/Cyb%20Beh9,%20114.pdf)

Abstract: The application of virtual reality (VR) to rehabilitation is a young, interdisciplinary field where clinical implementation very rapidly follows scientific discovery and technological advancement. Implementation is often so rapid that demonstration of intervention efficacy by investigators, and establishment of research and development priorities by funding bodies tend to be more reactive than proactive. An examination of the dynamic unfolding of the history of our young discipline may help us recognize the facilitators of current practice and identify the barriers that limit greater progress. This paper presents a first step towards the examination of the past and future growth of VR-based rehabilitation by presenting the use of concept maps to explore the publication history of application of VR to rehabilitation.

Keywords: Co-Word Analysis, Neuropsychology, Science, Field

# Title: Czechoslovak Journal of Physics

Full Journal Title: [Czechoslovak Journal of Physics](http://www.springerlink.com/content/106035/)

ISO Abbreviated Title: Czech. J. Phys.

JCR Abbreviated Title: Czech J Phys

ISSN: 0011-4626

Issues/Year: 11

Journal Country/Territory: Czech Republic

Language: English

Publisher: Czechoslovak Jnl of Physics

Publisher Address: Fyzikalni Ustav AV Na Slovance 2, Prague 180 40, Czech Republic

Subject Categories:

Physics: Impact Factor

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Full Text: [1960-80\Cze J Phy27, 850.pdf](1960-80/Cze%20J%20Phy27,%20850.pdf)

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Full Text: [1981\Cze J Phy31, 559.pdf](1981/Cze%20J%20Phy31,%20559.pdf)

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Full Text: [1985\Cze J Phy35, 1389.pdf](1985/Cze%20J%20Phy35,%201389.pdf)

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Full Text: [1986\Cze J Phy36, 663.pdf](1986/Cze%20J%20Phy36,%20663.pdf)

Keywords: Science Citation Index

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Full Text: 1986\Cze J Phy36, 887.pdf

Keywords: Citation, Physics

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Full Text: [1986\Cze J Phy36, 1339.pdf](1986/Cze%20J%20Phy36,%201339.pdf)

Keywords: Science Citation Index

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Full Text: [1999\Cze J Phy49, 951.pdf](1999/Cze%20J%20Phy49,%20951.pdf)

Abstract: In-situ precipitation of some radwaste elements with cerium(IV)-and tin(IV) antimonates (Cs-134, Co-60, Sr-85 and Eu-152, Eu-154) together with 10-4 M of each Cs+, Co2+, Sr2+ and/or Eu3+ have been prepared and found that all the product precipitates prefer the ions of smaller ionic radii. The distribution coefficients of Cs+, Co2+, Sr2+ and Eu3+ for all products were determined and it was found that the separation factors between neighbouring pairs of metal ions are larger on tin(IV) antimonate (SnSb) than cerium(IV) antimonate (CeSb). The adsorption of Cs+, Co2+, Sr2+ on CeSb and SnSb column beds was investigated and the preliminary results given here demonstrate the promise of potential applicability of these materials in marry separations connected with nuclear fuel cycle activities.

Keywords: Antimonate

# Title: Czechoslovak Journal of Physics Section B

Full Journal Title: [Czechoslovak Journal of Physics Section B](http://www.springerlink.com/content/106035/)

ISO Abbreviated Title:

JCR Abbreviated Title: Czech J Phys Sect B

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: Cze J Phy Sec B22, 432.pdf