### REFERENCES

Adams, L.D., *Problems involving the analysis and use of fly ash in the cement industry*, Paper 9-T-80P, presented at the American Ceramic Society Pacific Coast regional meeting, 1980.

Adamson, A.W., Physical Chemistry of Surfaces, Wiley, New York, 1990.

Aggarwal, D., Goyal, M., and Bansal, R.C., Adsorption of chromium by activated carbon from aqueous solution, Carbon, 37, 1989-1997, 1999.

Ajmal, M., Khan, A.H., Ahmad, S., and Ahmad, A., Role of sawdust in the removal of copper (II) from industrial wastes, Water Research, 32, 3085-3091, 1998.

Akgerman, A., and Zardkoohi, M., Adsorption of phenolic compounds on fly ash, Journal of Chemical Engineering Data, 41, 185-187, 1996.

Aldrich, A handbook of fine chemicals and laboratory equipment, Sigma-Aldrich Corporation, 2003/2004.

Allen, T., Particle size measurement, Chapman and Hall, New York, 1974.

American Association of State Highway and Transportation Officials, *Standard specification for materials, Ground iron blast furnace slag for use in concrete and mortars*, AASHTO Designation: M302-86, 14<sup>th</sup> ed., 1986.

American Coal Ash Association (ACAA), 2000 Coal Combustion Product (CCP)

Production and Use, http://www.ACAA-USA.org/

American Concrete Institute, Ground granulated blast-furnace slag as a cementitious constituent in concrete, ACI Manual of Concrete Practice, ACI 226.1R, 1990.

Annachhatre, A.P., Win, N.N., Chadrkrachang, In: Stevens, W.J., Rao, M.S., and Chandrkrachang (Eds.), Proceedings of the Second Asia-Pacific Symposium, Asian Institute of Technology, Bangkok, Thailand, 169-173, 1996.

Annapragada, A., and Adjei, A., An analysis of the Fraunhofer diffraction method for particle size distribution analysis and its application to aerosolized sprays, International Journal of Pharmaceutics, 127, 219-227, 1996.

Apaka, R., Tutema, E., Hugula, M., and Hizala, J., Heavy metal cation retention by unconventional sorbents (red muds and fly ashes), Water Research, 32(2), 430-440, 1998.

Aptak, R., Atun, G., Guclu, K., Tutem, R., Sorptive removal of caesium-137 and strontium-90 from water by unconventional sorbents II, Journal of the Atomic Energy Association of Japan, 33, 396-402, 1996.

Arnold, E., *Phosphorous*, In: Standard Methods For The Examination of Water and Wastewater, American Public Health Association, 1985.

Babcock and Wilcox Company, Steam: its generation and use, New York, NY, 1978.

Babi, B.M., Milonji, S.K., Plovina, M.J., Upi, S., and Kaludjerovi, B.V., Adsorption of zinc, cadmium and mercury ions from aqueous solutions on activated carbon cloth, Carbon, 40, 1109-1115, 2002.

Bailey, R.P., Bennet, T., and Benjamin, M.M., Sorption onto and recovery of Cr(VI) using iron oxide-coated sand, Water Science and Technology, 26, 1239-1244, 1992.

Bark, K., Sponner, A., Kampfer, P., Grund, S., and Dott, W., Differences in polyphosphate adsorption by Acinetobacter isolates from wastewater producing phosphate: AMP phosphotransferase, Water Research, Vol. 26(10), 1379-1388, 1992.

Bauer, H.H., Christian, G.D., and O'Reilly, J.E., Eds., *Instrumental analysis*, Allyn and Bacon, Inc., Massachusetts, 1978.

Bayvel, L.P., and Jones, A.R., *Electromagnetic scattering and its applications*, Applied Science, London, 1981.

Berry, E.E., and Malhorta, V.M., Fly ash for use in concrete, Part II- A critical review of the effects of fly on the properties of concrete, CANMET Report 78-16, Ottawa, Canada Centre for Mineral and Energy Technology, 1978.

Bhattacharya, A.K., and Venkobachar, C., Removal of cadmium (III) by low cost adsorbents, Journal of Environmental Engineering, ASCE, 110(1), 110-122,1984.

Black, L.B., McQuay, M.Q., and Bonin, M.P., Laser-based techniques for particle size measurement: a review of sizing methods and their industrial applications, Progress in Energy and Combustion Science, 22, 267-306, 1996.

Bockris, J.O'M., and Khan, S.U.M., Surface Electrochemistry: A Molecular Level Approach, Plenum Press, New York, 1993.

Bogue, R.H., *The chemistry of Portland cement*, 2<sup>nd</sup> ed., Reinhold, New York, 1955.

Borhen, C.F., and Huffman, D.R., Adsorption and scattering of light by small particles, Wiley, New York, 1983.

Bouck, D.W., Nutrient removal in three-stage processing, In: Advances in water and wastewater treatment: Biological nutrient removal, Wanielista, W.W., and Eckenfelder (Eds.), Ann Arbor Science, Michigan, pg. 65, 1978.

Bragg, W.L., Proceedings of the Cambridge Philosophical Society, v. 17, 43, 1913.

Braun, R.D., Introduction to instrumental analysis, McGraw-Hill, New York, 1987.

Brina, R., and de Battisti, A., Determination of the specific surface area of solids by means of adsorption data, Journal of Chemical Education, Vol. 64(2), 175-176, 1987.

Britannica, *Eutrophication*, 15<sup>th</sup> Edition, Encyclopaedia Britannica Inc., London, 1989.

Cabrera, J.G., and Gray, M.N., Specific surface, pozzolanic activity and composition of pulverized fuel ash, Fuel, Vol. 52, 213-219, 1973.

Campbell, W.J., *X-ray spectroscopy*, In: Instrumental Analysis, Bauer, H.H., Christian, G.D., and O'Reilly, J.E., Eds., Allyn and bacon, Inc., Boston, 1978.

Chakaravarty S., Dureja, V., Bhattacharyya G., Maity, S., and Bhattacharjee, S., Removal of arsenic from groundwater using low cost ferruginous manganese ore, Water Research, 36, 625-632, 2002.

Chantawong, V., Harvey, N.W., and Bashkin, V.N., Asian Journal of Energy and the Environment, 1, 33-48, 2001.

Chern, J-M., and Chien, Y-W., Adsorption of nitrophenol onto carbon: isotherms and breakthrough curves, Water Research, Vol. 36(3), 647-655, 2002.

Curkovic, L., Stefanovic, S.C., and Filipan, T., *Metal ion exchange by natural and modified* zeolites, Water Research, 31, 1379-1382.

Dasmahapatra, G.P., Pal, T.K., Bhadra, A.K., and Bhattacharya, B., Studies on separation characteristics of hexavalent chromium from aqueous solution by fly ash, Separation Science Technology, 31(14), 2001-2009, 1996.

Diamond, S., The characterisation of fly ashes, In: Effects of fly ash incorporation in cement and concrete, Proceedings Materials Research Symposium Annual Meeting, Boston, 1981, s.12-23.

Droste, R.L., *Theory and Practice of Water and Wastewater Treatment*, John Wiley & Sons, Inc., New York, 1997.

Eckenfelder, W.W., *Principles of Water Quality Management*, CBI Publishing Company, Inc., Boston, Massachusetts, 1980.

Emery, J.J., *Pelletized lightweight slag aggregate*, Proceedings of Concrete International 1980, Concrete Society, 1980.

Erdogan, Y., and Demirbas, A., *Partly-refined chemical by-product gypsums as cement additives*, Cement and Concrete Research, 24(4), 601-604, 1994.

Freundlich, H., Colloid and Capillary Chemistry, Methuen, London, 1926.

Frumkin, A.N., Z. Phys. Chem. (Leipzig), 166, p. 466, 1925.

Garcez, I., and Tittlebaum, M.E., Investigation of leachability of sub-bituminous fly ash enhanced road base materials, In: Fly ash and coal conversion by-

products: characterization, utilization, and disposal, Materials Society Symposia Proceedings, Vol. 43, p. 237, Pennsylvannia, 1985.

Guibal, E., Saucedo, I., Jansson-Charrier, M., Delanghe, B., and Cloirec, P., Uranium and vanadium sorption by chitosan and derivatives, Water Science and Technology, 30, 183-190, 1994.

Gupta, G.S., Prasad, G, and Singh, V.N., Removal of colour from wastewater by sorption for water reuse, Journal of Environmental science and Health, A23(3), 205-217, 1988.

Goodwin, D.G., and Mitchner, M., Fly ash radiative properties and effects on radiative heat transfer in coal-fired systems, International Journal of Heat and Mass Transfer, 32, 627-638, 1989.

Gouesbet, G., Grehan, G., and Maheu, B., *Generalised Lorentz-Mie theory and applications to optical sizing*, Combustion Measurements, N. Chigier, (Ed.), 339-382, Hemisphere, Washington DC, 1991.

Groenewold, G.H., Hassett, D.J., Koor, R.D., and Manz, O.E., Disposal of western fly ash in the northern great plains, In: Fly ash and coal conversion by-products:

characterization, utilization, and disposal, Materials Society Symposia Proceedings, Vol. 43, p. 213, Pennsylvannia, 1985.

Guiner, A., X-ray crystallographic technology, Hilger and Watts, London, 1952.

Han, I., Schlautman, M.A., and Batchelor, B., Removal of hexavalent chromium from groundwater by granular activated carbon, Water Environment Research, 72, 29-39, 2000.

Hayward, D.O., and Trapnell, B.M.W., *Chemisorption*, 2<sup>nd</sup> ed., Butterworth & Co., London, 1964.

Helfferich, F., Ion Exchange, McGraw Hill Book Company Inc., New York, 1962.

Helmuth, R., Fly ash in cement and concrete, Portland Cement Association, Illinois, 1987.

Hirleman, E.D., Oechsie, V., and Chigier, N.A., Response characteristics of laser diffraction particle size analyzers: optical sample volume extent and lens effects, Optical Engineering, 23, 610-619, 1984.

Hooton, R.D., Permeability and pore structure of cement pastes containing fly ash, slag, and silica fume, Blended Cements, ASTM STP 897, Fronhnsdorff, G., ed., American Society for Testing and Materials, Philadelphia, 128-143, 1986.

Huang, C.-P., and Blankkenship, D.W., The removal of mercury (II) from dilute aqueous solution by activated carbon, Water Research, 18, 37-46, 1984.

Huang, C.-P., Chung, Y.-C., and Liou, M.-R., Adsorption of Cu(II) and Ni(II) by pelletized biopolymer, Journal of Hazardous Materials, 45, 265-277, 1996.

Huang, C.P., and Ostovic, F.B., *Removal of cadmium (II) by activated carbon adsorption*, Journal of the Environmental Engineering Division, EE5, 863-878, 1978.

van de Hultz, H.C., Light scattering by small particles, Wiley, New York, 1957.

Ibrahim, K.M., NasserEd-Deen, T., and Khoury, H., Use of natural chabazite-phillipsite tuff in wastewater treatment from electroplating factories in Jordan, Environmental Geology, 41, 547-551, 2002.

Jarrige, A., Les cendres volantes, Paris, Editions Eyrolles, 1971.

Johansson, L., and Gustafsson, J.P., *Phosphate removal using blast furnace slags and opaka: mechanisms*, Water Research, 34(1), 259-265, 2000.

Joshi, R.C., Natt, G.S., Day, R.L., and Tilleman, D.D., Scanning electron microscopy and X-ray diffraction analysis of various size fractions of fly ash, In: Fly ash and coal conversion by-products: characterisation, utilization and disposal, Materials Research Society, Symposium Proceedings, Vol. 43, p. 31, Pennsylvania, 1985.

Joshi, A., and Chaudhuri, M., Removal of arsenic from ground water by iron oxide-coated sand, Journal of Environmental Engineering, 122, 769-771, 1996.

Kao, P.C., Tzeng, J.H., and Huang, T.L., Removal of chlorophenols from aqueous solution by fly ash, Journal of Hazardous Materials, 76(2-3), 237-249, 2000.

Khan, S.A., Rehman, R., and Khan, M.A., Adsorption of chromium (III), chromium (VI) and silver (I) on bentotite, Waste Management, 15, 271-282, 1995.

Knight, J.C., Ball, D., and Robertson, G.N., Analytical inversion for laser diffraction spectrometry giving improved resolution and accuracy in size distribution, Applied Optics, 30, 4795-4799, 1991.

Ko, D.C.K., Porter, J.F., and McKay, S., *Optimised correlations for the fixed-bed adsorption of metal ions on bone char*, Chemical Engineering Science, Vol. 55(3), 5819-5829, 2000.

Kocirik, M., Jiri, S., and Smutek, A., *The role of inert material in an adsorption bed*, Collect. Czech. Chem. Commun. Vol. 47(12), 3221-3229, 1982.

Kouloumbi, N., and Batis, G., *The anticorrosive effect of fly ash, slag and a Greek pozzolan in reinforced concrete*, Cement and Concrete Composites, 16, 253-260, 1994.

Kruger, R., South African Coal Ash Association, Personal Communication, Johannesburg, 2002.

Langmuir, I., *The adsorption of gases on plane surfaces of glass, mica and platinum,*Journal of the American Chemical Society, 40, 1361-1402, 1918.

Lea, F.M., *The chemistry of cement and concrete*, 3<sup>rd</sup> Edition, Edward Arnold (Publishers) Ltd, London, UK, 1970.

Leyva-Ramos, R., Rangel-Mendez, J.R., Mendoza-Barron, J., Fuentes-Rubio, L., and Guerrero-Coronado, *Adsorption of cadmium (II) from aqueous solution onto activated carbon*, Water Science and Technology, 35, 205-211, 1997.

Luke, W.I., Nature and distribution of particles of various sizes in fly ash, U.S. Army Engineers, Waterways Experiment Station, Technical Report No. 6-583, 21 pp., 1961.

Mantel, D.G., The manufacture, properties and applications of Portland cements, cement additives and blended cements, Pretoria Portland Cement (PPC), The Penrose Press, Johannesburg, South Africa, 1991.

Malliou, E., Loizidou, M., and Spyrellis, N., *Uptake of lead and cadmium by clonoptilolite*, Science of the Total Environment, 149, 139-144. 1994.

Malliou, E., Malamis, M., and Sakellarides, P.O., *Lead and cadmium removal by ion exchange*, Water Science and Technology, 25, 133-138, 1992.

McKay, G., Blair, H.S., and Findon, A., Equilibrium studies for the sorption of metal ions onto chitosan, Indian Journal of Chemistry Section A, 28, 356-360, 1989.

Michaels, A.S., Simplified methods of interpreting kinetic data in fixed-bed ion exchange, Industrial Engineering and Chemistry, 44(8), 1922-1930, 1952.

Michelsen, D.L., Gideon, J.A., Griffith, G.P., Pace, J.E., and Kutat, H.L., Removal of soluble mercury from wastewater by complexing techniques, Govt. Rep. Announce. Index (U.S.A), 75(24), 102, 1975.

Miller, J.C., and Miller, J.N., *Statistics for Analytical Chemistry*, 3<sup>rd</sup> ed., Ellis Horwood Ltd., Chichester, 1993.

Montemor, M.F., Simoes, A.M.P., Salta M.M., and Ferreira, M.G.S., *Carbonation of fly ash-containing concrete. Electrochemical studies*, Material Science Forum, 192-194:867, 1995.

Montemor, M.F., Simoes, A.M.P., and Salta, M.M., Effect of fly ash on concrete reinforcement corrosion studied by EIS, Cement and Concrete Composites, 22, 175-185, 2000.

Murakami, K., By-product gypsum from various chemical industries as a retarder for the setting of cement, Proc. 5<sup>th</sup> International Conference on the chemistry of cement, Tokyo, 457-510, 1968.

Namasivayam, C., and Ranganathan, K., Waste iron (III)/chromium (III) sludge as flocculant for the treatment of dairy wastewater, Environmental Pollution, 82, 255-261, 1992.

Netzer, A., and Hughes, D.E., Adsorption of copper, lead and cobalt by activated carbon, Water Research, 18, 927-933, 1984.

Noureldin, A,S., and McDaniel, R.S., Evaluation of steel slag asphalt surface mixtures, Presented at the 69<sup>th</sup> Annual Meeting, Transportation Research Board, Washington, 1990.

Nowacki, P., Lignite Technology, Noyes Data Corp., New Jersey, USA, 1980.

Ouki, S.K., Cheeseman, C.R., and Perry, R., Effects of conditioning and pretreatment of chabazite and clinoptilolite prior to lead and cadmium removal, Environmental Science and Technology, 27, 1108-1116, 1993.

Ouki, S.K., and Kavanagh, M., Performance of natural zeolites for the treatment of mixed metal-contaminated effluents, Waste Management & Research, 15, 383-394, 1997.

Panday, K.K., Prasad, G., and Singh, V.N., Removal of Cr (VI) from aqueous solution by adsorption on fly ash-wollastonite, Journal of Chemical Technology and Biotechnology, 34(A), 367-374, 1984.

Panday, K.K., Prasad, G., and Singh, V.N., Mixed adsorbents for Cu(II) removal from aqueous solution, Environmental Technology Letters, 7, 547-554, 1986.

Pansini, M., Colella, C., and De'Gennaro, M., *Chromium removal from water by ion exchange using* zeolite, Desalination, 83, 145-157, 1991.

Pettijohn, F.J., Sedimentary rocks, Harper and Bros., New York, 1957.

Piekos, R., and Paslawska, S., *Fluoride uptake characteristics of fly ash*, Fluoride, 32(1), 14-19, 1999.

Piekos, R. and Paslawska, S., *Fluoride uptake characteristics of fly ash*, Research Report, International Society for Fluoride Research, 32(1), 1-6, 1999.

Portland Cement Association, PCA: *Take a virtual plant tour*, http://www.portcement.org, 2002.

Pusch, R., Use of bentonite for isolation of radioactive waste products, Clay Minerals, 37, 353-361, 1992.

Rangel-Mendez, J.R., and Streat, M., Adsorption of cadmium by activated carbon cloth: influence of surface oxidation and solution pH, Water Research, 36, 1244-1252, 2002.

Rasmussen, H., Bruus, J.H., Keiding, K., Nielson, P.H., Observations of dewaterability and physical, chemical and microbiological changes in anaerobically stored activated sludge from a nutrient removal plant, Water Research, Vol. 28(2), 417-425, 1994.

Ray, S.S., and Parker, F.G., *Characterisation of ash from coal-fired power plants*, EPA 600/7-77-010, Chattanooga, Tennessee Valley Authority, 1977.

Recycled materials Resource Centre RMRC), University of New Hampshire, http://www.rmrc.unh.edu, 2002.

Reed, B.E., and Arunachalam, S., *Use of granular activated carbon columns for lead removal*, Journal of Environmental Engineering, 120, 416-436, 1994.

Sakadevan, K., and Bavor, H.J., *Phosphate adsorption characteristics of soils, slags and zeolite to be used as substrates in constructed wetlands systems*, Water Research, 32, 393-399, 1998.

Schmuhl, R., Krieg, H.M., and Keizer, K, Adsorption of Cu(II) and Cr(VI) ions by chitosan: Kinetics and equilibrium studies, Water S.A., 27, 1-7, 2001.

Semmens, M.J., and Martin, W.P., *The influence of pre-treatment on the capacity and selectivity of clinoptilolite for metal ions*, Water Research, 22, 537-542, 1988.

Sen, A.K., and Arnad, K.D., Adsorption of mercury (II) by coal fly ash, Water Research, 21, 885-888, 1987.

Sharma, D.C., and Forster, C.F., Removal of hexavalent chromium from aqueous solutions by granular activated carbon, Water SA, 22, 153-160, 1996.

Shimadzu Corporation, Instruction manual: Shimadzu digital double-beam spectrophotometer UV-150, Kyoto, 1994.

Skoog, D.A., and Leary, J.J., *Principles of instrumental analysis*, 4<sup>th</sup> ed., Saunders College Publishing, Orlando, 1992.

Smethurst, G., Basic Water Treatment, Thomas Telford Ltd., London, 1979.

South African Bureau of Standards, Compressive strength for concrete masonry units, Standard No. SABS 1215-1984.

Spackman, W., Davis, A., Walker, P.L., Lovell, H.L., Essenhigh, R.H.; Vastola, F.J.; and Given, P.H., *Characteristics of American coals in relation to their conversion into clean energy fuels*, Quarterly Progress Report Fe-2030-3, ERDA, Pennsylvania State University, 1976.

Srivastava, S.K., Bhattacharjee, G., Tyagi, R, Pant, N., and Pal, N., Studies on the removal of some toxic metal ions from aqueous solutions and industrial waste Part I (Removal of lead and cadmium by hydrous iron and aluminium oxide), Environmental Technolology Lettters, 9, 1173-1185, 1988.

Srivastava, S.K., Tyagi, R., and Pal, N., Studies on the removal of some toxic metal ions Part(II) (removal of lead and cadmium by montmorillonite and kaolinite, Environmental Technology Letters, 10, 275-282, 1989.

Srivastava, S.K., Tyagi, R., and Pal, N., Adsorption of heavy metal ions on carbonaceous material developed from the waste slurry generated in local fertilizer plants, Water Research, 23, 1161-1165, 1989.

Srivastava, S.K., Singh, A.K., and Sharma, A., Studies on the uptake of lead and zinc by lignin obtained from black liquor- a paper industry waste material, Environmental Technology, 15, 353-361, 1994.

Srivastava, S.K., Gupta, V.K., and Mohan, D., *Removal of lead and chromium by activated slag- a blast furnace waste*, Journal of Environmental Engineering, 123, 461-468, 1997.

Strong, F.C., Theoretical basis of the Bouger-Beer law of radiation absorption, Analytical Chemistry, 24, 338-342, 1952.

Stout, F.C., and Jensen, L.H., *X-ray structure determination*, John Wiley & Sons, New York, 1989.

Sundstrom, D.W., and Klei, H.E., *Wastewater Treatment*, Prentice Hall Inc., London, 1979.

Swithenbank, J., Beer, J.M., Taylor, M., Abbot, D., and McCreath, G.C., A laser diagnostic technique for the measurement of droplet and particle size distributions, Progress in Astronautics and Aeronautics, 53, 421-447, 1977.

Tabikh, A.A., and Miller, F.M., *The nature of phosphogypsum impurities and their influence on cement hydration*, Cement and Concrete Research, 1(6), 663-678, 1971.

Torrey, S., Coal ash utilization: fly ash, bottom ash and slag, Noyes Data Corp., New Jersey, USA, 1978.

Turriziani, R., Aspects of the chemistry of pozzolans, pp 69-86, In: The chemistry of cements, Taylor, H.F.W., Ed., Academic Press, New York, 1964.

Ulrich, G.D., Theory of particle formation and growth in oxide synthesis flames, Combustion Science Technology, Vol. 4, 47-57, 1971.

Ulrich, G.D., Milnes, B.A., and Subramanian, N.S., *Particle growth in flames, II.*Experimental results for silica particles, Combustion Science Technology, Vol. 14, 243-249, 1976.

Undaybeytia, T., Morillo, E., and Maqueda, C., Adsorption of Cd and Zn on montmorillonit in the presence of a cationic pesticide, Clay Minerals, 31, 485-490, 1996.

U.S. Department of the Interior, Bureau of Mines, Mineral Commodity Summaries 1993, Washington, DC, 1993.

Vorres, K., *Coal*, Kirk-Othmer Encyclopedia of Chemical Technology, 3<sup>rd</sup> ed., Vol. 6, 224-282, John Wiley & Sons, New York, 1979.

Wan-Ngah, W.S., Endud, C.S., and Mayanar, R., Removal of copper(II) ions from aqueous solution onto chitosan and cross-linked chitosan beads, Reactive and Functional Polymers, 50, 181-190, 2002.

Wan-Ngah, W.S., and Isa. I.M., Comparison study of copper ion adsorption on chitosan, Journal of Applied Polymer Science, 67, 1067-1070, 1998.

Washington, C., Particle size analysis in pharmaceutics and other industries: theory and practice, Ellis Horwood, London, 1992.

Watt, J.D., and Thorne, D.J., Composition and pozzolanic properties of pulverised fuel ashes, Journal of Applied Chemistry, Vol. 15, 585-594, 1965.

Williams, K.L., Introduction to X-ray spectrometry, Allen & Unwin, Boston, 1987.

Yadawa, K.P., Tyagi, B.S., and Singh, V.N., Effect of temperature on the removal of lead(II) by adsorption on China clay and wollastonite, Journal of Chemical Technology and Biotechnology, 51, 47-60, 1991.

Yamada, H., Kayama, M., Saito, K., and Hara, M., A fundamental research on phosphate removal by slag, Water Research, 20, 547-557, 1986.