DAFTAR PUSTAKA

Adamson, A.W., 1990, *Physical Chemistry of Surface*, 5th Edition, John Willey and Sons Inc., New York.

Alimin, 2000, Fraksinasi Asam Humat dan Pengaruhnya Pada Kelarutan Ion Logam Seng(II), Kadmium(II), Magnesium(II) dan Kalsium(II), *Tesis,* Program Pascasarjana UGM.

Anonim, 2007, what are humic substances?, *http://www.humicsubstances.org/whatarehs.html*, diakses pada 28 november 2016.

Barreiro, L.C., Paradelo, R., Soto, A.I., Delgado, A.N., Sanjurjo, M.J.F., Rodriguez, E.A., Munoz, J.C.N. dan Estevez, M.A., 2016, Valorization of Biosorbent Obtained from A Forestry Waste: Competitive Adsorption, Desorption and Transport of Cd, Cu, Ni, Pb and Zn*, Ecotoxicol. Envinron. Saf.*, 131, 118-126.

Bhattacharyya, K.G. dan Gupta, S.S., 2008, Kaolinite and Montmorillonite as Adsorbents for Fe(II), Co(II) and Ni(II) in Aqueous Medium, *Appl. Clay Sci.,* 41, 1-9.

Bernard, A. dan Lauwerys, R., 1986, Effects of Cadmium Exposure In Humans. In: Handbook of experimental pharmacology, E.C. Foulkes, editors Berlin: Springer-Verlag.

Bohli, T., Villaescusa, I. dan Ouederni, A., 2013, Comparative Study of Bivalent Cationic Metals Adsorption Pb(II), Cd(II), Ni(II) and Cu(II) on Olive Stones Chemically Activated Carbon, *J. Chem. Eng. Process Technol.,*4, 158.

Bonomo, R. P., Cucinotta, V., Giuffrida, A., Impellizzeri, G., Magri, A., Pappalardo, G., Rizzarelli, E., Santoro, A.M., Tabbi, G. dan Vagliasindi, L.I., 2005, A re-investigation of copper coordination in the octa-repeats region of the prion protein, *J. Chem. Soc. Dalton Trans*, 150–158.

Borba, E.R., Guirardello, E.A., Silva, M.T., Veit dan Tavares, C.R.G., 2006, Removal of Nickel(II) Ions from Aqueous Solution by Biosorption in A Fixed Bed Column: Experimental and Theoretical Breakthrough Curves, *Biochem. Eng. J.*, 30, 184-191.

Carabante, I., 2012, Arsenic (V) Adsorption on Iron Oxide: Implification for Soil Remediation and Water Purification, *Doctoral thesis*, Universitet Stryckereriet, Lulea, Sweden.

Chang, T.W., Wang, M.K. dan Lin, C., 2002, Adsorption of Copper in the Different Sorbent/Water Ratios of Soil System, *Water Air Soil Pollut.*, 138, 199-209.

Cheng-Fang, L. dan Hsing-Cheng, H., 1995, Resource Recovery of Waste Fly Ash : Synthesis of Zeolite-like Materials, *Environ. Sci. Technol*., 29, 1109-1117.

Choi, J., Troung, Y.B., Kyratzis, I.L., dan Caruso, R.A., 2013, High Surface Area Mesoporous Titanium-Zirconium Oxide Nanofibrous, *J. Mater. Chem. A*., 1, 19, 2050-7488.

Coscione, A.R., de Abreu, C.A. dan Santos, G.C.G., 2009, Chelating Agents to Solubilize Heavy Metals from Oxisols Contaminated by the Additiion of Organic and Inorganic Residues. *Sci. Agric.*, 66, 64-70.

Cozmuta, L.M., Cozmuta, A.M., Peter, A., Nicula, C., Tutu, H., Silipas, D. dan Indrea, E., 2014, Adsorption of Heavy Metal Cations by Na-clinoptilolite: Equilibrium and Selectivity Studies, *J. Environ. Manage.,* 137, 69-80.

Denkhaus, E. dan Salnikow, K., 2002, Nickel Essentiality, toxicity, and carcinogenity, *Crit. Rev. Oncol. Hematol.,* 42, 35-56.

Dwi, A.N., 2015, Pengaruh pH Teradsorpsi Au(III) dan Cu(II) oleh Asam Humat Teresterifikasi, *Skripsi,* FMIPA, Universitas Gadjah Mada, Yogyakarta.

Echeverria, J.C., Morera, M.T., Mazkiaran, C. dan Garido, J.J., 1998, Competitive Sorption of Heavy Metal by Soils. Isotherm and Fractional Factorial Experiments, *Environ. Pollut.,* 101, 275-284.

Fiol, N., Villaescusa, I., Martinez, M., Miralles, N., Poch, J. dan Serarols, J., 2006, Sorption of Pb(II), Ni(II), Cu (II) and Cd(II) from Aqueous Solution by Olive Stone Waste, *Sep. Purif. Technol.,* 10, 132-140.

Fontes, M.P.F. dan Gomes, P.,C., 2003, Simoultaneous Competitive Adsorption of Heavy Metals by The Mineral Matrix of Tropical Soils, *Appl. Geochem.,* 18, 795-804.

Gaffney, J.S., Marley., N.A., dan Clark, S.B., 1996, *Humic and Fulvic Acids and Organic Colloidal Materials in the Environment*, Chapter 1, American Chemical Society, Washington DC.

Goenadi, D.H., 1997, Interaksi Mineral Tanah dengan Organik Alami dan Mikroba, (diterjemahkan dari Huang, P.M., dan Schnitzer, M., 1986, Interaction of Soil Mineral with Natural Organic and Microbes, Soil Science Soxiety of America, Inc., Madison) Gadjah Mada University Press, Yogyakarta.

Gomes, P.C., Fontes, M.P.F., Silva, A.G., Mendonca, E.S. dan Netto, A.R., 2001, Selectivity Sequence and Competitive Adsorption of Heavy Metals by Brazilian Soils, *Soils Sci. Soc. Am. J.,* 65, 1115-1121.

Hagino, N. dan Yoshioka, Y.A., 1961, Study of the Etiology of Itai-Itai Disease, *J. Jpn Orthop. Assoc.,* 35, 812-5.

Ho, Y.S. dan Mckay, G., 1999, Pesudo-second Order Model for Sorption Processes, *J. Biochem*., 34, 451-465.

Ho, Y.S., 2004, Citation Review of Lagergren Kinetic Rate Equation on Adsorption Reaction*, J. Scientometric*, 59(1), 171-177.

Huang, P.M. dan Schnitzer, M., 1986, Interactions of Soil Minerals with Natural Organic and Microbes, *Soil. Sci. Soc. Am.*, Inc., USA.

Kadirvelu, K., Thamaraiselvi, K. dan Namasivayam, C., 2001, Removal of Heavy Metal from Industrial Wastewater by Adsorption onto Activated Carbon Prepared from an Agricultural Solid Waste, *Bioresour. Technol.*, 76, 63-65.

Kadirvelu, K., 1998, Preparation and characterization of activated carbon, from coir pith and its application to metal bearing wastewater, *Ph.D. Thesis*, Bharathiar University, Coimbatore, India.

Kendorff, H. dan Schnitzer, M., 1980, Sorption of Metal on Humic Acid, *Geochim. Cosmochim. Acta*, 44, 1577-1581.

Kulikowska, D., Gusiatin, Z.M., Bulkowska, K. dan Klik, B., 2015, Feasibility of Using Humic Subtances from Compost to Remove Heavy Metals (Cd, Cu, Ni, Pb, Zn) from Contaminated Soil Aged for Different Periods of Time*, J. Hazard Mater*., 300, 882-891.

Kulkarni, M. dan Kaware, J.P., 2013, Review on Research for Removal of Phenol from Wastewater, *Int. J. Sci. Res. Publ.,* 3(4), 1-5.

Kumar, P.S. dan Gayathri, R., 2009, Adsorption of Pb^{2+} Ions from Aqueous Solution onto Bael Tree Leaf Powder : Isotherms, Kinetics and Thermodynamics Study, *Eng. Sci. Technol.,* 4(4), 381-399.

Ligwa, J.C. dan Addiat, A.A., 2003, Maize and Husk as Adsorbent for Removal of Cd, Pb and Zn from Wastewater*, Phys. Sci*., 2, 210-215.

Liu, H.L., Li, L.Q., Yin, C.Q dan Shan, B.Q., 2008 Fraction Disttributionn and Risk Assessment of Heavy Metals in Sediment of Moshui Lake, *J. Environ. Sci*., 20(4), 390-397.

Lyman, M.M., Kliduff, J.E. dan Weber, W.J., 1995, Adsorption of p-Nitrophenol from Dilute Aqueous Solution, *J. Chem. Educ*., 72, 80-84.

Mahavi A.H., Naghipour D., Vaezi F. dan Nazmara S., 2005, Teawaste as an Adsorbent for Heavy Metal Removal From Industrial Wastewaters, *Am. J. App. Sci.,* 2(1), 372-375.

Manahan, S.E., 2000, *Environmental Chemistry*, 7th Edition, Lewis Publishers, Boca Raton.

Martins, R.J.E., Pardo, R. dan Boaventura, R.A.R., 2004, Cadmium(II) and Zinc(II) Adsorption by the Aquatic Moss Fontinalis Antipyretica: Effect of Temperature, pH and Water Hardness, *Water Res*., 38, 693-699.

Martyniuk, H. dan Wieckowska, J., 2003, Adsorption of Metal Ions on Humic Acids Extracted from Brown Coals, *Fuel Process. Technol.,* 84, 23-36.

Mattel, C.L., 1991, *Adsorption*, 2nd Edition, McGraw-Hill Company Inc., New York.

Merrikhpour, H. dan Jalali, M., 2013, Comparative and Competitive Adsorption of Cadmium, Copper, Nickel and Lead Ions by Iranian Natural Zeolite, *Clean Technol. Environ. Policy*, 15, 303.

Moore, J. W. dan Ramamoorthy, S., 1984, *Heavy metal in Natural Water*, Springer-Verlag, New York.

Moreira, C.S. dan Alleoni, L.R.F., 2010, Adsorption of Cd, C, Ni and Zn in Tropical Soils Under Competitive and Non-Competitive Systems, *Sci. Agric.,* 67, 301-307.

Naidu, R., Kookana, R.S., Sumner, M.E., Harter, R.D. dan Tiller, K.G., 1997, Cadmium Sorption and Transport in Variable Charge Soils : a Review, *J. Environ. Qual.,* 26, 602-617.

Naseem, R. dan Tahir, S.S., 2001. Removal of Pb(II) from Aqueous Solution by Using Bentonite as an Adsorbent, *Water Research*, 35, 3982-3986.

Oscik, J., 1982, *Adsorption*, John Wiley & Sons, New York.

Oscik, J., 1994, *Adsorption*, Ellis Horwood, New York.

Ouki, S.K. dan Kavannagh, M., 1999, Treatment of Metal-contaminated Waste Waters by Use of Natural Zeolites, *Water Sci. Technol.,* 39, 115-122.

Panday, K.K., Prasad, G. dan Singh, V.N., 1985, Copper(II) Removal From Aqueous Solutions by Fly Ash, *Water Res.,* 19, 869-873.

Papini, M.P., Saurini, T., Bianchi, A., Majone, M. dan Beccari, M., 2004, Modeling the Competitive Adsorption of Pb, Cu, Cd and Ni onto a Natural Heterogeneous Sorbent Material (Italian Red Soil), *Ind. Eng. Chem. Res.,* 43, 5032-5041.

Pearson, R. G., 1968, Hard and soft acids and bases (HSAB). I. **Fu**ndamental principles, *J. Chem. Educ.*, 45(9), 581–587.

Piccolo, A. dan Stevenson, F.J., 1982, Infrared Spectra of Cu^{2+}, Pb^{2+}, and Ca^{2+} Complexes of Soil Humic Substances, *Geoderma*, 27, 195-208.

Poernomosidi, D.N., Imelda, Hartono, S.B. dan Ismadji, S., 2005, *Kesetimbangan dan Kinematika Adsorpsi dari Cr(VI) pada Limbah Sintetik dengan Menggunakan Lumpur Aktif Kering*, The 4^{th} National Conference: Design and Application of Technology, 27 Juni, Surabaya.

Rahmawati, A. dan Santosa S.J., 2012, Adsorpsi logam Pb(II) dan Cd(II) pada Asam Humat dalam Medium Air, *Alchemy,* 2(1), 46-57.

Santosa, S.J., Sudiono, S. dan Sujandi, S., 2006, Peat Soil Humic Acid Immobilization on Silica Gel and its Application as an Adsorbent for the Selective Adsorption of Copper, *J. Surf. Sci. Nanotechnol.,* 4, 602-608.

Schnitzer, M. dan Huang, P.M., 1997, *Interaksi Mineral Tanah dengan Organik Alam dan Mikroba*, diterjemahkan oleh Goenadi, D.H., Gadjah Mada University Press, Yogyakarta.

Schnitzer, M., 1986*, Pengikatan Bahan Humat oleh Koloid Mineral Tanah*, (dalam Huang, P.M, dan Schnitzer, M., 1986, Interaksi Mineral Tanah dengan Organik Alami dan Mikroba, terjemahan: Goenadi, D.H., 1997), Gadjah Mada University Press, Yogyakarta.

Seilkop, S.K. dan Oller, A.R., 2003, Respiratory Cancer Risks Associated With Low-level Nickel Exposure: an Integrated Assessment Based on Animal, Epidemiological, and Mechanistic Data, *Regul. Toxicol. Pharmacol*., 37, 173-190.

Selveira, M.L.A., Alleoni, L.R.F., Casagrande, J.C. dan Camargo, O.A., 2002, Copper Adsorption in Oxidic Soils After Removal of Organic Matter and Iron Oxides, *Commun. Soil Sci. Plant Anal.,* 33, 3581-3592.

Senesi, N., 1992, *Spectroscopic Studies of Metal Ion Humic Substance Complexation in Soil,* In : 15th World Congress of Soil Sci, Acapulco, Mexico.

Shaheen, S.M., Tsadilas, C.D. dan Rinklebe, J., 2013, A Review of The Distribution Coefficients of Trace Elements in Soils: Influence of Sorption System, Element Characteristics and Soil Colloidal Properties, *Adv. Colloid Interface,* 201-202, 43-56.

Sheng, G., Yang, S., Sheng, J., Zhao, D. dan Wang, X., 2010, Influence of Solution Chemistry on the removal of Ni(II) from Aqueous Solution to Titranate Nanotubes, *Chem. Eng. J*., 168, 178-182.

Sitting, M., 1976, *Toxic Metals—Pollution Control and Worker Protection*, Noyes Data Corporation, New Jersey.

Spark, K.M., Wells, J.D. dan Johnson, B.B., 1997, The Interaction of a Humic Acid with Heavy Metals*, Aust. J. Soil. Res*., 35, 89-101.

Stevenson, F.J., 1994, *Humic Chemistry : Genesis, Composition, Reactions*, John Wiley & Sons. Inc, New York.

Stumm, W dan Morgan, J.J., 1996, *Aquatic Chemistry*, Third Edition, John Wiley & Sons, Inc, New York.

Sudiono, S., 2001, Sifat Asam-Basa Asam Humat dan Interaksinya Dengan Kromium(II) Tembaga(II) Kobalt(II) Nikel(II), *Tesis*, Program Pascasarjana, UGM, Yogyakarta.

Taylor, J., DeWoskin, R. dan Ennever, F.K., 1999, *Toxycological Profile for Cadmium Agency for Toxic Substances and Disease Registry,* Federal Register Publ., Georgia.

Terada, K., Matsumoto K. dan Kimura, H., 1983, Sorption of Copper(II) by some Complexing Agents Loaded on Various Supports, *Anal. Chim. Acta,* 153, 237-247.

Thomas, W.J. dan Crittenden, B., 1998, *Adsorption Technology and Design*, Elsevier Science & Technology Books.

Tosun, I., 2012, Ammonium Removal from Aqueous Solution by Clinoptilote: Determination of Isotherm and Thermodynamic Parameters and Comparison of Kinetics by the Double Exponential Model and Conventional Kinetics Models, *Intern. J. Environ. Res. Publich Health,* 9, 970-984.

Uren, N.C., 1992, Forms, Reaction, and Availability of Nickel in Soils, *Adv. Agro.,* 48, 141-203.

Vega, F.A., Covelo, E.F. dan Andrade, M.L., 2006, Competitive Sorption and Desorption of Heavy Metals in Mine Soils: Influence of Mine Soil Characteristics*, J. Colloid Interface Sci*., 298, 582-592.

Vidal, M., Santos, M.J., Abrao, T., Rodrigez, J. dan Rigol, A., 2009, Modeling Competitive Metal Sorption in a Mineral Soil, *Geoderma,* 149, 189 – 198.

Wang, S., Jun, H., Li, J. dan Dong, Y., 2009, Influence of pH, Soil Humic/Fulvic Acid, Ionic Strength, Foreign Ions and Addition Sequence on Adsorption of Pb(II) onto GMZ Bentonite, *J. Hazard. Mater*., 167, 44-51.

Yang, C., 1998, Satistical Mechanical Study on the Freundlich Isotherm Equation, *J. Colloid. Interface Sci.,* 208, 379-387.

Zein, R., Suhaili, R., Earnestly, F., Indravari dan Munaf, E., 2010, Removal of Pb(II), Cd(II) and Co(II) from aqueous solution using *Garnicia Mangostana* L. Fruit Shell*, J. Hazard. Mater*., 181, 52-60.