

## DAFTAR PUSTAKA

- Adamson, A.W., 1990, *Physical Chemistry of Surface*, 5th Ed., John Wiley and Sons Inc, New York.
- Agnes, M., 2014, Modifikasi Zeolit Alam dengan CTAB Sebagai Adsorben Multifungsi untuk Kation  $\text{Cu}^{2+}$ , Anion  $\text{SO}_4^{2-}$  dan Senyawa Organik Metil Merah, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Atkins, P.W., 1999, *Kimia Fisika*, diterjemahkan oleh Dra. Irma dan Kartohadiprodjo, I., Edisi Keempat, Penerbit Erlangga, Jakarta.
- Avery, H.E., 1974, *Basic Reaction Kinetics and Mechanisms*, The Macmillan Press Ltd., London and Basingstoke.
- Aydin, H., and Baysal, G., 2006, Adsorption of Acid Dyes in Aqueous Solutions by Shells of Bittim (*Pistacia khinjuk Stocks*), *Desalination*, 196, 248–259.
- Azizian, S., 2004, Kinetic Models of Sorption: A Theoretical Analysis, *J. Colloid Interface Sci.*, 276, 47–52.
- Bansiwal, A.K., Rayalu, S.S., Labhasetwar, N.K., Juwarkar, A.A., and Devotta, S., 2006, Surfactant-Modified Zeolite as A Slow Release Fertilizer for Phosphorus, *J. Agric. Food Chem.*, 54, 4773-4779.
- Baralangi, S., 2009, Modifikasi Zeolit Alam dengan Propilamina dan N-Cetil-N,N,N-Trimetilammonium Bromida (CTAB) dan Aplikasinya untuk Adsorpsi Anion  $\text{MnO}_4^-$  dan  $\text{Cr}_2\text{O}_7^{2-}$ , *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Bhardwaj, D., and Tomar, R., 2011, Use of Surface Modified Inorganic NanoMaterials as Slow Release Nitrogen Fertilizer, *Sustainable Agricultural Development.*, 171-184.
- Bhargava, D.S., and Sheldarkar, S.B., 1993, Use of TNSAC in Phosphate Adsorption Studies and Relationships. Literature, Experimental Methodology, Justification and Effects of Process Variables. *Water Res.*, 27, 303–312.
- Bhattacharya, I., Bandyopadhyay, S., Varadachari, C., and Ghosh, K., 2007, Development of A Novel Slow-Releasing Iron-Manganese Fertilizer Compound, *Ind. Eng. Chem. Res.*, 46, 2870-2876.
- Breck, D.W., 1974, *Zeolite Molecular Sieves*, John Wiley and Sons, Inc, New York.

- Cakicioglu-Ozkan, F., and Ulku, S., 2005, The Effect of HCl Treatment on Water Vapor Adsorption Characteristics of Clinoptilolite Rich Natural Zeolite, *Microporous and Mesoporous Mater.*, 77, 47-53.
- Chandra, P.K., Ghosh, K., and Varadachari, C., 2009, A New Slow-Releasing Iron Fertilizer, *Chem. Eng. J.*, 155, 451-456.
- Chitrakar, R., Tezuka, S., Sonoda, A., Sakane, K., Ooi, K., and Hirotsu, T., 2006, Phosphate Adsorption on Synthetic Goethite and Akaganeite, *J. Colloid Interface Sci.*, 298, 602-608.
- Correa, H.S., and Lara, J.G., 1987, Approximation of Spherical Polyatomic Thermochemical Radii of General Formula  $MX_n^{Z-}$ , *J. Chem. Educ.*, 11(64), 942-943.
- Choi, J., Lee, S., Lee, S., Kim, J., Park, K., Kim, D., and Hong, S., 2012, Comparison of Surface-Modified Adsorbents for Phosphate Removal in Water, *Water, Air, Soil Pollut.*, 223, 2881-2890.
- Datnyer, A., 1983, *Surfactants In Textile Processing*, Marcel Dekker, Inc., New York.
- Delaney, P., McMannamon, C., Hanrahan, J.P., Copley, M.P., Holmes, J.D., and Morris, M.A., 2011, Development of Chemically Engineered Porous Metal Oxides for Phosphate Removal, *J. Hazard. Mater.*, 185, 382-391.
- Erdem, E., Karapinar, N., and Donat, R., 2004, The Removal of Heavy Metal Cations by Natural Zeolites, *J. Colloid Interface Sci.*, 280, 309-314.
- Ertan, A., and Cakicioglu-Ozkan, F., 2005, CO<sub>2</sub> and N<sub>2</sub> Adsorption on The Acid (HCl, HNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub> and H<sub>3</sub>PO<sub>4</sub>) Treated Zeolites, *Adsorption*, 11, 151-156.
- Farisuna, N., 2013, Modifikasi Zeolit Alam dengan Cetiltrimetilammonium Bromida Sebagai Adsorben NO<sub>3</sub><sup>-</sup>, Pb(II), dan Metil Orange, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Guan, H., Bestland, E., Zhu, C., Zhu, H., Albertsdottir, D., Hutson, J., Simmons, C.T., Ginic-Markovic, M., Tao, X., and Ellis, A.V., 2010, Variation in Performance of Surfactant Loading and Resulting Nitrate Removal among Four Selected Natural Zeolites, *J. Hazard. Mater.*, 183, 616-621.
- Haggerty, G.M., and Bowman, R.S., 1994, Sorption of Chromate and Other Inorganic Anions by Organo-Zeolite, *Environ. Sei. Technol.*, 28, 452-458.

- Haghsheno, R., Mohebbi, A., Hashemipour, H., and Sarrafi, A., 2009, Research article: Study of Kinetic and Fixed Bed Operation of Removal of Sulfate Anions from An Industrial Wastewater by An Anion Exchange Resin, *J. Hazard. Mater.*, 166, 961–966.
- Hamdan, H., 1992, *Introduction to Zeolites: Synthesis, Characterization, and Modification*, Universitas Teknologi Malaysia.
- Hamoudi, S., Belkacemi, K., and Saad, R., 2007, Adsorption of Phosphate and Nitrate Anions on Ammonium-Functionalized MCM-48: Effects of Experimental Conditions, *J. Colloid Interface Sci.*, 311, 375–381.
- Hashimoto, S., 2003, Review: Zeolite photochemistry: impact of zeolites on photochemistry and feedback from photochemistry to zeolite science, *J. Photochem. Photobiol., C: Photochemistry Reviews.*, 4, 19–49.
- Ho, Y.S., and McKay, G., 1998, A Comparison of Chemisorption Kinetic Models Applied to Pollutant Removal on Various Sorbents, *Trans IChemE*, Vol.76, Part B, 332–340.
- Hrenovic, J., Rozic, M., Sekovanic, L., and Anic-Vucinic, A., 2008, Interaction of Surfactant-Modified Zeolites and Phosphate Accumulating Bacteria, *J. Hazard. Mater.*, 156, 576–582.
- Huo, H., Lin, H., Dong, Y., Cheng, H., Wang, H., and Cao, L., 2012, Ammonia-Nitrogen and Phosphates Sorption From Simulated Reclaimed Waters by Modified Clinoptilolite, *J. Hazard. Mater.*, 229–230, 292–297.
- Hussein, M.M., Khader, K.M., and Musleh, S.M., 2014, Characterization of Raw Zeolite and Surfactant-Modified Zeolite and Their Use in Removal of Selected Organic Pollutants from Water, *Int. J. Chem. Sci.*, 12(3), 815–844.
- Karageorgiou, K., Paschalis, M., Anastassakis, G.N., 2007, Removal of Phosphate Species from Solution by Adsorption onto Calcite Used as Natural Adsorbent, *J. Hazard. Mater.*, A139, 447–452.
- Ketterings, Q., Reid, S., and Rao, R., 2007, Cation Exchange Capacity (CEC), *Cornell University Cooperative Extension Agronomy Fact Sheet.*, 22, 1–2.
- Khan, M.A., Ki-Wook, K., Mingzhi, W., Bu-Kug, L., Weon-Hee, L., and Jong-Yoon, L., 2008, Nutrient-Impregnated Charcoal: An Environmentally Friendly Slow-Release Fertilizer, *Environmentalist*, 28, 231–235.
- Korkuna, O., Leboda, R., Skubiszewska-Zieba, J., Vrublevska, T., Gun'ko, V.M., and Ryczkowski, J., 2006, Structural and Physicochemical Properties of Natural Zeolites: Clinoptilolite and Mordenite, *Microporous Mesoporous Mater.*, 87, 243–254.

- Li, Z., 2003, Use of Surfactant-modified zeolite as Fertilizer Carriers to Control Nitrate Release, *Microporous Mesoporous Mater.*, 61, 181–188.
- Li, Z., and Zhang, Y., 2010, Use of Surfactant-Modified Zeolite to Carry and Slowly Release Sulphate, *Desalination and Water Treatment*, 21, 73-78.
- Mumpton, F.A., 1999, La roca magica: Uses of Natural Zeolites in Agriculture and Industry, *Proc. Natl. Acad. Sci. USA*, November 8–9, 1998, Irvine, CA.
- Namasivayam, C., and Sangeetha, S., 2008, Application of Coconut Coir Pith for The Removal of Sulfate and Other Anions from Water, *Desalination.*, 219, 1–13.
- Naseem, R., and Tahir, S.S., 2001, Removal of Pb(II) from Aqueous/Acidic Solutions by Using Bentonite as An Adsorbent, *Water Res.*, 16(35), 3982–3986.
- Oliveira, C.R., and Rubio, J., 2007, New Basis for Adsorption of Ionic Pollutants onto Modified Zeolites, *Miner. Eng.*, 20, 552–558.
- Onyango, M.S., Kuchar, D., Kubota, M., and Matsuda, H., 2007, Adsorptive Removal of Phosphate Ions from Aqueous Solution Using Synthetic Zeolite, *Ind. Eng. Chem. Res.*, 3(46), 894-900.
- Onyango, M.S., Masukume, M., Ochieng, A., and Otieno, F., 2010, Functionalised Natural Zeolite and Its Potential for Treating Drinking Water Containing Excess Amount of Nitrate, *Water SA*, 5(36), 655-662.
- Oscik, J., 1982, *Adsorption*, 1<sup>st</sup> ed., John Wiley & Sons, New York.
- Öztürk, N., and Bektas, T.E., 2004, Nitrate Removal from Aqueous Solution by Adsorption onto Various Materials, *J. Hazard. Mater.*, B(112), 155–162.
- Pengthamkeerati, P., Satapanajaru, T., and Chularuengsoaksorn, P., 2008, Chemical Modification of Coal Fly Ash for The Removal of Phosphate from Aqueous Solution, *Fuel.*, 87, 2469–2476.
- Ping, N., Hans-Jorg, B., Bing, L., Xiwu, L., and Yong, Z., 2008, Phosphate Removal from Wastewater by Model-La(III) Zeolite Adsorbents, *J. Environ Sci.*, 20, 670–674.
- Selva, P.P., Subramanian, K.S., and Sharmila, R.C., 2014, Sorption Characteristics of Nano Zeolite Based Slow Release Sulphur Fertilizer, *Int. J. Dev.Res.*, 4(2), 225-228.

- Rahmayani, R.F.I., 2014, Sintesis dan Karakterisasi Komposit Kitosan-Zeolit Teraktivasi Basa-Fe sebagai Sistem Lepas Lambat Fe(III), *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Ruthven, D.M., 2008, Fundamentals of Adsorption Equilibrium and Kinetics in Microporous Solids, *Mol Sieves*, 7, 1–43.
- Salvestrini, S., Sagliano, P., Iovino, P., Capasso, S., and Colella, C., 2010, Note: Atrazine Adsorption by Acid-Activated Zeolite-Rich Tuffs, *Appl. Clay Sci.*, 49, 330–335.
- Schick, J., Caullet, P., Jean-Louis, P., Patarin, J., and Mangold-Callarec, C., 2010, Batch-wise Nitrate Removal from Water on A Surfactant-Modified Zeolite, *Microporous Mesoporous Mater.*, 132, 395–400.
- Schick, J., Caullet, P., Jean-Louis, P., Patarin, J., and Mangold-Callarec, C., 2011, Nitrate Sorption from Water on A Surfactant-Modified Zeolite. Fixed-bed Column Experiments, *Microporous Mesoporous Mater.*, 142, 549–556.
- Sun, Y., Lin, J., and Zhan, Y., 2013, Adsorption of Congo Red from Aqueous Solution on Surfactant-Modified Zeolites with Different Coverage Types: Behavior and Mechanism, *Sep. Sci. Technol.*, 48, 2036–2046.
- Taffarel, S.R., and Rubio, J., 2010, Adsorption of Sodium Dodecyl Benzene Sulfonate from Aqueous Solution Using A Modified Natural Zeolite with CTAB, *Miner. Eng.*, 23, 771–779.
- Thirunavukkarasu, M., and Subramanian, K.S., 2014, Surface Modified Nano-Zeolite Used as Carrier for Slow Release of Sulphur, *J. Appl. & Nat. Sci.*, 6 (1), 19-26.
- Tian, S., Jiang, P., Ning, P., and Su, Y., 2009, Enhanced Adsorption Removal of Phosphate from Water by Mixed Lanthanum/Aluminum Pillared Montmorillonite, *Chem. Eng. J.*, 151, 141–148.
- Toran, L., 1987, Sulfate Contamination in Groundwater from A Carbonate-Hosted Mine, *J. Contam. Hydrol.*, 2, 1-29.
- Trisunayanti, W., 2015, *Material Katalis dan Karakternya*, Gadjah Mada University Press, Yogyakarta.
- Tsai, W., Hsu, H., Su, T., Lin, K., and Lin, C., 2006, Adsorption Characteristics of Bisphenol-A in Aqueous Solutions onto Hydrophobic Zeolite, *J. Colloid Interface Sci.*, 299, 513–519.

- Utami, M., 2014, Adsorpsi Ion  $Pb^{2+}$  dan  $SO_4^{2-}$  pada Bentonit Termodifikasi Cetiltrimetilammonium, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Vicente-Rodriguez, M.A., Suarez, M., Bafiares-Mufioz, M.A., and Lopez-Gonzalez, J.D., 1996, Comparative FT-IR Study of The Removal and Structural Modifications during Acid Silicates of Octahedral Cations Treatment of Several Silicates, *Spectrochim. Acta, Part A.*, 52, 1685-1694.
- Vujakovic, A.D., Tomasevic-Canovic, M.R., Dakovic, A.S., and Dondur, V.T., 2000, The Adsorption of Sulphate, Hydrogenchromate and Dihydrogenphosphate Anions on Surfactant-Modified Clinoptilolite, *Appl. Clay Sci.*, 17, 265–277.
- Wang, S., and Peng, Y., 2010, Review Natural Zeolites as Effective Adsorbents in Water and Wastewater Treatment, *Chem. Eng. J.*, 156, 11–24.
- Yousef, R.I., El-Eswed, B., and Al-Muhtaseb, A.H., 2011, Adsorption Characteristics of Natural Zeolites as Solid Adsorbents for Phenol Removal from Aqueous Solutions: Kinetics, Mechanism, and Thermodynamics Studies, *Chem. Eng. J.*, 171, 1143–1149.
- Zamparas, M., Gianni, A., Stathi, P., Deligiannakis, Y., and Zacharias, I., 2012 Research Paper: Removal of Phosphate from Natural Waters Using Innovative Modified Bentonites, *Appl. Clay Sci.*, 62–63, 101–106.
- Zeng, Y., Woo, H., Lee, G., and Park, J., 2010, Adsorption of Cr(VI) on Hexadecylpyridinium Bromide (HDPB) Modified Natural Zeolites, *Microporous Mesoporous Mater.*, 130 (2010) 83–91.
- Zhan, Y., Lin, J., and Zhu, Z., 2011, Removal of Nitrate from Aqueous Solution Using Cetylpyridinium Bromide (CPB) Modified Zeolite as Adsorbent, *J. Hazard. Mater.*, 186, 1972–1978.
- Zhao, G., Liu, Y., Tian, Y., Sun, Y., and Cao, Y., 2010, Preparation and Properties of Macromolecular Slow-Release Fertilizer Containing Nitrogen, Phosphorus and Potassium, *J Polym Res.*, 17, 119–125.