



DAFTAR PUSTAKA

- Abdullahi, Y., Ali, E.A., and Lawal, A.O., 2013, Roast-Alkaline Leaching of Silica from Kaolinitic Clay, *ARPEN J. Eng. Appl. Sci.*, 8, 10.
- Abidin, M.A.Z., Jalil, A.A., Triwahyono, S., Adam, S.H., and Kamarudin, N.H.N., 2011, Recovery of Gold(III) from Aqueous Solution onto a Durio Zibethinus Husk. *Biochem. Eng. J.*, 54, 124-131.
- Akita, S., Yang, L., and Takeuchi, H., 1996, Solvent Extraction of Gold(III) from Hydrochloric Acid Media by Nonionic Surfactants. *Hydrometallurgy*, 43, 37-46.
- Al-Saidi, H.M., 2016, The Fast Recovery of Gold(III) Ions from Aqueous Solutions using Raw Date Pits: Kinetic, Thermodynamic and Equilibrium Studies, *J. of Saudi. Chem. Soc.*, 20, 615-624.
- Araghi, S.H., and Entezari, M.H., 2015, Amino-functionalized Silica Magnetite Nanoparticles for Simultaneous Removal of Pollutants from Aqueous Solution, *Appl. Surf. Sci.*, 333, 68-77.
- Awual, R.M., Khaleque, A.M., Ferdows, M., Chowdhury, A.M.S., and Yaita, T., 2013, Rapid Recognition and Recovery of Gold(III) with Functional Ligand Immobilized Novel Mesoporous Adsorbent, *Microchem. J.*, 110, 591-598.
- Bayat, M., Beyki, M.H., and Shemirani, F., 2015, One-step and Biogenic Synthesis of Magnetic Fe₃O₄-Fir Sawdust Composite: Application for Selective Preconcentration and Determination of Gold Ions, *J. Ind. Eng. Chem.*, 21, 912-919.
- Bilalodin, 2013, Analisis Kandungan Senyawa Kimia dan Uji Sifat Magnetik Pasir Besi Pantai Ambal, *Jurnal Fisika Indonesia*, 50, 29-31.
- Chan, C.C.P., Gallard, H., and Majewski, P., 2012, Fabrication of Amine-Functionalized Magnetite Nanoparticles for Water Treatment Processes, *J. Nanopart. Res.*, 14, 828.
- Chirita, M and Grozescu, I., 2009, Fe₂O₃-Nanoparticle, Physical Properties and their Photochemical and Photoelectrochemical Applications. *Chem. Bull.*, 54, 1-8.
- Chung, J., Chun, J., Lee, S.H., Lee, Y.J., and Hong, S.W., 2012, Sorption of Pb(II), and Cu(II) Onto Multi-amine Grafted Mesoporous Silica Embedded with Nano-magnetite: Effect of Steric Factors, *J. Hazard. Mater.*, 239-240, 183-191.
- Cornell, R.M., and Schwertmann, U., 2003, *The Iron Oxide: Structure, Properties, Reaction, Occurrences and Uses*, Second edition, Wiley-VCH GmbH & KGaA.



- Dang, F., Enomoto, N., Hojo, J and Enpuku, K., 2010, Sonochemical Coating of Magnetic Nanoparticles with Silica, *Ultrason. Sonochem.*, 17, 193-199.
- Dewi, S.H. and Ridwan, 2012, Sintesis dan Karakterisasi Nanopartikel Fe_3O_4 Magnetik untuk Adsorpsi Kromium Heksavalen, *Indo. J. Mater. Sci.*, 13, 136-140.
- Donia, A.M., Atia, A.A., and Elwakeel, K.Z., 2005, Gold(III) Recovery using Synthetic Chelating Resins with Amine, Thio and Amine/Mercaptan Functionalities, *Sep. Purif. Technol.*, 42, 111-116.
- Durdureanu-Angheluta, A., Ardeleanu, R., Pinteala, M., Harabagiu, V., Chiriac, H., and Simionescu, B.C., 2008, Silane Covered Magnetite Particles, Preparation and Characterization, *Dig. J. Nanomater. Bios.*, 3, 33–40.
- Ebrahimzadeh, H., Tavassoli, N., Amini, M.M., Fazaeli, Y., and Abedi, H., 2010, Determination of Very Low Levels of Gold and Palladium in Wastewater and Soil Samples by Atomis Absorption After Preconcentration on Modified MCM-48 and MCM-41 Silica, *Talanta*, 81, 1183-1188.
- Fajaroh, F., Setyawan, H., Winardi, S., Enggawati, R., Wardhani, I.G., Utomo, R.Y., and Kartikasari, 2010, Stabilisasi Nanopartikel Magnetik Hasil Sintesis dengan Metode Elektrokimia Melalui Pelapisan Silika Secara In-Situ, *Seminar Rekayasa Kimia dan Proses*.
- Foo, K.Y., and Hameed, B.H., 2010, Insights into the modeling of adsorption isotherm systems, *Chem. Eng. J.*, 156, 2–10
- Georgiadis, A., Sauer, D., Breuer, J., and Hermann, L., 2015, Optimising the Extraction of Amorphous Silica by NaOH from Soil of Temperate-humid Climate, *Soil Research*, 53, 392-400.
- Girginova, P., Daniel, D.A., Lopes, C, Figueira, P, Otero, M, Amaral, V, Pereira,E, and Trindade, T., 2010, Silica Coated Magnetite Particles for Magnetic Removal of Hg^{2+} from Water, *J. Colloid. Interf. Sci.*, 345, 234-240.
- Gomes, C.P., Almeida, M.F., and Loureiro, J.M., 2001, Gold Recovery with Ion Exchange Resins. *Sep. Purif. Technol.*, 24, 35-57.
- Hakami, O., Zhang, Y., and Banks, C.J., 2012, Thiol-Functionalized Mesoporous Silica-Coated Magnetite Nanoparticles for High Afficiency Removal and Recovery of Hg from Water, *Water Research*, 46, 3913-3922.
- Hong, R.Y., Li, J.H., Zhang, S.Z., Li, H.Z., Zheng, Y, Ding, J.M., and Wei, DG., 2009, Preparation and Characterization of Silica-coated Fe_3O_4 Nanoparticles used as Precursor of Ferrofluids, *Appl. Surf. Sci.*, 255, 3485-3492.
- Hu, J., Chen, G., and Lo, I.M.C., 2005, Removal and Recovery of Cr(VI) from Wastewater by Maghemite Nanoparticles, *Water Research*, 39, 4528-4536.



- Huang, C and Hu, B., 2008, Silica-Coated Magnetic Nanoparticle Modified with γ -mercaptopropyltrimetoxysilane for Fast and Selective Solid Phase Extraction of Trace Amounts of Cd, Cu, Hg and Pb in Environmental and Biological Samples Prior to Their Determination by Inductively Coupled Plasma Mass Spectrometry, *Spectrochim. Acta.*, 63B, 437-444.
- Huang, X., Wang, Y., Liao, X., and Shi, B., 2010, Adsorptive Recovery of Au³⁺ from Aqueous Solution using Bayberry Tannin-Immobilized Mesoporous Silica, *J. Hazard. Mater.*, 183, 793-798.
- Iida, H., Takayanagi, K., Nakanishi, T., and Osaka, T., 2007, Synthesis of Fe₃O₄ Nanoparticles with Various Sizes and Magnetic Properties by Controlled Hydrolysis, *J. Coll. Inter. Sci.*, 314, 274-280.
- Indira, T.K., and Lakshmi, P.K., 2010, Magnetic Nanoparticles-a Review, *Int. J. Pharm. Sci. Nanotech.*, 3, 1035-1042.
- Indriyanti, N.M., Nuryono, and Narsito, 2011, Kajian Adsorpsi-desorpsi Au(III) dalam Sistem Au/Cu/Ag pada Kolom Hibrida Merkapto-silika, Prosiding Semnas Kimia dan Pendidikan Kimia, Surakarta, 2011.
- Kalapathy, U., Proctor, A., and Shultz, J., 2000, A Simple Method for Producing of Pure Silica from Rice Hull Ash, *Biosource Technology*, 73, 257-262.
- Kim, M.L and Tudino, M.B., 2010, Evaluation of Performance of Three Different Hybrid Mesoporous Solids Based on Silica for Preconcentration Purposes in Analytical Chemistry: From the Study of Sorption Features to the Determination of Elements of Group IB, *Talanta*, 82, 923-930.
- Kornak, R., Niznasky, D., Haimann, K., Tylus, W and Maruszewski, K., 2005, Synthesis of Magnetic Nanoparticles via the Sol-gel Technique, *Materials Science-Poland.*, 23, 1, 87-92.
- Lam, K.F., Fong, C.M., and Yeung, K.L., 2007, Separation of Precious Metals using Selective Mesoporous Adsorbents. *Gold Bull.*, 40, 192-198.
- Lin, Y.F., Chen, H.W., Chien, P.S., Chiou, C.S., and Liu, C.C., 2011, Application of Bifunctional Magnetic Adsorbent to Adsorb Metal Cations and Anionic Dyes in Aqueous Solution, *J. Hazard. Mater.*, 185, 1124-1130.
- Li, X., Zhang, C., Zhao, R., Lu, X., Xu, X., Jia, X., Wang, C., and Li, L., 2013, Efficient Adsorption of Gold Ions from Aqueous System with Thioamide-group Chelating Nanofiber Membranes. *Chem. Eng. J.*, 229, 420-428.
- Liu, W., Yin, P., Liu, X., Dong, X., Zhang, J., and Xu, Q., 2013, Thermodynamic, Kinetics, and Isotherms Studies for Gold(III) Adsorption using Silica Functionalized by Diethylenetriaminemethylenephosphonic Acid, *Chem. Eng. Res. Des.*, 91, 2748-2758.
- Mohammad-Beigi, H., Yaghmaei, S., Roostaazad, R., and Arpanaei, A., 2013, Comparison of Different Strategies for the Assembly of Gold Colloids onto Fe₃O₄@SiO₂ Nanocomposite Particles, *Physica E.*, 49, 30-38.



- Mufit, Fatni, Fadhillah, Amr, H and Bijaksana, S., 2006, Kajian Tentang Sifat Magnetik Pasir Besi dari Pantai Sunur Pariaman Sumatera Barat, *Jurnal Geofisika*.
- Nuryono, N., Syukur, M., Kuncaka, A., and Sakti, S.C.W., 2016, Functionalization of $\text{Fe}_3\text{O}_4/\text{SiO}_2$ with N-(2-Aminoethyl)-3-aminopropyl for Sorption of $[\text{AuCl}_4]^-$, *Indones. J. Chem.*, 16 (2), 130-137.
- Nuryono, N., Muliaty, E., Rusdiarso, B., Sakti, S.C.W., and Tanaka, S., 2014, Adsorption of Au(III), Cu(II), and Ni(II) on Magnetite Coated with Mercapto Groups Modified Rice Hull Ash Silica, *J. Ion Exchange*, 25, 114-121.
- Nuryono, N., Rosiati, N.M., Rusdiarso, B., Sakti, S.C.W., and Tanaka, S., 2014, Coating of Magnetite with Mercapto Modified Rice Hull Ash Silica in a One-pot Process, *Springer Plus*, 3, 515.
- Pyrzynska, K., 2012, Sorbent Materials for Separation and Preconcentration of Gold in Environmental and Geological Samples-A Review, *Anal. Chim. Acta.*, 741, 9-14.
- Razak, N.F.A., Shamsuddin, M., and Lee, S.L., 2018, Adsorption Kinetics and Thermodynamics Studies of Gold(III) Ions using Thiotic Acid Functionalized Silica Coated Magnetite Nanoparticles, *Chem. Eng. J.*, 130, 18-28.
- Qu, R., Wang, M., Sun, C., Zhang, Y., Ji, C., Chen, H., Meng, Y., and Yin, P., 2008, Chemical Modification of Silica-gel with Hydroxyl- or Amino-terminated Polyamine for Adsorption of Au(III), *Appl. Surf. Sci.*, 255, 3361-3370.
- Quang, D.V., Lee, J.E., Kim, J.K., Kim, Y.N., Shao, G.N., and Kim, H.T., 2013, A Gentle Method to Graft Thiol-functional Groups onto Silica Gel for Adsorption of Silver Ions and Immobilization of Silver Nanoparticles, *Powder Technol.*, 235, 221-227.
- Roto, R., Yusran, Y., and Kuncaka, A., 2016, Magnetic Adsorbent of $\text{Fe}_3\text{O}_4@\text{SiO}_2$ Core-shell Nanoparticles Modified with Thiol Group for Chloroauric Ion Adsorption, *Appl. Surf. Sci.*, 377, 30-36.
- Sakti, S.C.W., Siswanta, D., and Nuryono, 2013, Adsorption of Gold(III) on Ionic Imprinted Amino-silica Hybrid Prepared from Rice Hull Ash, *Pure Appl. Chem.*, 85, 211-223.
- Salazar-Camacho, C., Villalobos, M., Rivas-Sánchez, M., Arenas-Alatorre, J., Alcaraz-Cienfuegos, J., and Gutiérrez-Ruiz, M. E., 2013, Characterization and Surface Reactivity of Natural and Synthetic Magnetites, *Chem. Geol.*, 347, 233-245.
- Setyawan, H., Fajaroh, F., Widiastuti, W., Winard,S, Lenggoro, I.W., and Mufti, N., 2012, One-step Synthesis of Silica-coated Magnetite Nanoparticles by



Electrioxidation of Iron in Sodium Silicate Solution, *J. Nanopart. Res.*, 14, 807-816.

Shen, Y.F., Tang, J., Nie, Z.H., Wang, Y.D., Ren, Y., and Zuo, I., 2009, Preparation and Application of Magnetic Fe₃O₄ Nanoparticles for Wastewater Purification, *Sep. Purif. Technol.*, 68, 312-319.

Shishehbore M.R., Afkhami A, and Bagheri H., 2011, Salicylic Acid Functionalized Silica-coated Magnetite Nanoparticles for Solid Phase Extraction and Preconcentration of Some Heavy Metal Ions from Various Real Samples. *Chem. Cent. J.*, 5, 41-5.

Sun, X., Yang, L., Li, Q., Zhao, J., Li, X., Wang, X., and Liu, H., 2014, Amino-functionalized Magnetic Cellulose Nanocomposite as Adsorbent for Removal of Cr(VI): Synthesis and Adsorption Studies, *Chem. Eng. J.*, 241, 175-183.

Sufiandi, D., 2011, Konsentrasi Pasir Besi Titan dari Pengotornya dengan Cara Magnetik, Majalah Metalurgi, V 26.1, ISSN 0126-3188, 15-20.

Sui, D.P., Chen, H.X., Liu, L., Liu, M.X., Huang, C.C., and Fan, H.T., 2016, Ion Imprinted Silica Adsorbent Modified Diffusive Gradients in Thin Films Technique: Tool for Speciation Analysis of Free Lead Species, *Talanta*, 148, 285-291.

Sulastri, S., Kristianingrum, S., and Arianingrum, R., 2004, Pengaruh Perendaman Pasir Malelo dengan HNO₃ Terhadap Efisiensi Penyerapan Kromium, *J. Penelitian Saintek*, 9, 51-68.

Tang, Y., Liang, S., Wang, J., Yu, S., and Wang, Y., 2013, Amino Functionalized Core-shell Magnetic Mesoporous Composite Microsphere for Pb(II) and Cd(II) Removal, *J. Environ. Sci.*, 25, 830-837.

Teja, A.S and Koh, P.Y., 2009, Synthesis, Properties and Applications of Magnetic Iron Oxide Nanoparticles, Progress in Crystal Growth and Characterization of Materials, 55, 22-45.

Yulianto, A., Bijaksana, S and Loeksmanto, W., 2002, Karakterisasi Magnetit dari Pasir Besi Cilacap, *Jurnal Fisika HFI Suplemen Prosiding A5*.

Wang, J., Zheng, S., Shao, Y., Liu, J., Xu, Z., and Zhu, D., 2010, Amino-functionalized Fe₃O₄@SiO₂ Core-shell Magnetic Nanomaterial as a Novel Adsorbent for Aqueous Heavy Metals Removal, *J. Coll. Inter. Sci.*, 349, 293-299.

Widihati, I.A.G., 2008, Adsorpsi Anion Cr(VI) oleh Batu Pasir Teraktivasi Asam dan Tersalut Fe₂O₃, *J. Kim.*, 2, 25-30.

Wojnicki, M., Rudnik, E., Luty-Blocho, M., Paclawsky, K., and Fitzner, K., 2012, Kinetic Studies of Gold(III) Chloride Complex Reduction and Solid Phase Precipitation in Acidic Aqueous System Using Dimethylamine Borane as Reducing Agent, *Hydrometallurgy*, 127-128, 43-53.



Yang, Z., 2011, Magnetic and Luminescent Dual-functional SiO_2 Beads Created through Controlled Sol-gel Process, *Adv. Mat. Lett.*, 2, 195-199.

Yulianto, A., Bijaksana, S., Loeksmanto, W., and Kurnia, D., 2003, Produksi Hematit ($\alpha\text{-Fe}_2\text{O}_3$) dari Pasir Besi: Pemanfaatan Potensi Alam Sebagai Bahan Industri Berbasis Sifat Kemagnetan, *J. Sains Materi Indonesia*, 5, 51-54.

Zhad, H.R.L.Z., Sadeghi, O., Amani, V., Najafi, E and Tavassoli, N., 2013, Tris(2-aminoethyl)amine-functionalized Fe_3O_4 Magnetic Nanoparticles as a Selective Sorbent for Separation of Silver and Gold Ions in Different pHs. *Journal of Chemistry*, Hindawi Publishing Corporation, <http://dx.doi.org/10.1155/2013/482793>.

Zhang, J., Zhai, S., Li, S., Xiao, Z., Song, Y., An, Q., and Tian, G., 2013, Pb(II) Removal of $\text{Fe}_3\text{O}_4@\text{SiO}_2\text{-NH}_2$ Core-shell Nanomaterials Prepared Via Controllable Sol-gel Process, *Chem. Eng. J.*, 215-216, 461-471.

Zhang, Y., Xu, Q., Zhang, S., Liu, J., Zhou, J., Xu, H., Xiao, H., and Li, J., 2013, Preparation of Thiol-modified $\text{Fe}_3\text{O}_4@\text{SiO}_2$ Nanoparticles and their Application for Gold Recovery from Dilute Solution, *Sep. and Purif. Technol.*, 116, 391-397.

Zhao, Y.G., Shen, H.Y., Pan, S.D., and Hu, M.Q., 2010, Synthesis, Characterization and Properties of Ethylenediamine-functionalized Fe_3O_4 Magnetic Polymers for Removal of Cr(VI) in Wastewater, *J. Hazard. Mater.*, 182, 295–302.

Zulfalina and Manaf, A., 2004, Identifikasi Senyawa Mineral dan Ekstraksi Titanium Dioksida dari Pasir Mineral, *Indo. J. Mater. Sci.*, 5, 46-50.