

DAFTAR PUSTAKA

- Abid, M.F., Zablouk, M.A., and Abid-Alameer, A.M., 2012, Experimental Study of Dye Removal from Industrial Wastewater by Membrane Technologies of Reverse Osmosis and Nanofiltration, *J. Environ. Health Sci. Eng.*, 9(1), 1-9.
- Aisah, S., Zulfikar, dan Sulistiyo, Y.A., 2018, Sintesis Silika Gel Berbasis Fly Ash Batu Bara PLTU Paiton sebagai Adsorben Zat Warna Rhodamin B, *Berkala Sainstek*, 6(1), 31-35.
- Al-Farhan, B.S., 2015, Potential Removal of Crystal Violet (CV), Acid Red (AR) and Methyl Orange (MO) from Aqueous Solution by Magnetic Nanoparticles, *Int. J. Nano. Chem.*, 1(3), 97-102.
- Alves, R.H., Reis, T.V. da S., Rovani, S., and Fungaro, D.A., 2017, Green Synthesis and Characterization of Biosilica Produced from Sugarcane Waste Ash, *J. Chem.*, 2017, 1-9.
- Amrhar, O., Nassali, H., and Elyoubi, M.S., 2015, Two and Three-Parameter Isothermal Modeling for Adsorption of Crystal Violet Dye onto Natural Illitic Clay: Nonlinear Regression Analysis, *J. Chem. Pharm.*, 7(9), 892-903.
- Anonim, 2014, *Gunung Semeru - Geokimia*, Pusat Vulkanologi dan Mitigasi Bencana Geologi, Bandung.
- Asses, N., Ayed, L., Hkiri, N., dan Hamdi, M., 2018, Congo Red Decolorization and Detoxification by *Aspergillus niger*: Removal Mechanisms and Dye Degradation Pathway, *Biomed Res. Int.*, 1, 1-9.
- Aziztyana, A.P., Wardhani, S., Prananto, Y.P., Purwonugroho, D., and Darjito, 2019, Optimisation of Methyl Orange Photodegradation Using TiO₂-Zeolite Photocatalyst and H₂O₂ in Acid Condition, *IOP Conf. Ser.: Mater. Sci. Eng.*, 546(4), 042047.
- Banerjee, S., and Chattopadhyaya, M.C., 2017, Adsorption Characteristics for The Removal of A Toxic Dye, Tartrazine From Aqueous Solutions by A Low Cost Agricultural By-Product, *Arab. J. Chem.*, 10, S1629-S1638.
- Behrens, S.H., and Grier, D.G., 2001, The Charge of Glass and Silica Surfaces, *Chem. Phys.*, 115(14), 6716-6721.
- Bhatnagar, A., and Jain, A.K., 2005, A Comparative Adsorption Study with Different Industrial Wastes as Adsorbents for The Removal of Cationic Dyes from Water, *J. Colloid Interface Sci.*, 281(1), 49-55.
- Bonilla-Petriciolet, A., Mendoza-Castillo, D.I., and Reynel-Avila, H.E., 2017, *Adsorption Processes of Water Treatment and Purification*, Springer, Swiss.

- Chen, S., Zhang, J., Zhang, C., Yue, Q., Li, Y., and Li, C., 2010, Equilibrium and Kinetic Studies of Methyl Orange and Methyl Violet Adsorption on Activated Carbon Derived from *Pharagmites australis*, *Desalination.*, 252, 149-156.
- Cheruiyot, G.K., Wanyonyi, W.C., Kiplimo, J.J., and Maina, E.N., 2019, Adsorption of Toxic Crystal Violet Dye Using Coffee Husks: Equilibrium, Kinetics and Thermodynamics Study, *Sci. Afr.*, 5, 1-11.
- Choudhary, B.A.L.R.A.M., Goyal, A., and Khokra, S.L., 2009, New Visible Spectrophotometric Method for Estimation of Itopride Hydrochloride from Tablets Formulations Using Methyl Orange Reagent, *Int. J. Pharm. Pharm. Sci.*, 1(1), 159-162.
- Crini, G., and Badot, P.M., 2008, Application of Chitosan A Natural Aminopolysaccharide, for Dye Removal from Aqueous Solutions by Adsorption Processes using Batch Studies: A Review of Recent Literature, *Prog. Polym. Sci.*, 33, 399-447.
- Dada, A.O., Olalekan, A.P., Olatunya, A.M., and Dada, O., 2012, Langmuir, Freundlich, Temkin and Dubinin-Radushkevich, Isotherms Studies of Equilibrium Sorption of Zn^{2+} Unto Phosphoric Acid Modified Rice Husk, *J. Appl. Chem.*, 3(1), 38-45.
- Dahliyanti, A., Yunitama, D.A., Rofiqoh, I.M., and Mustapha, M., 2022, Synthesis and Characterization of Silica Xerogel From Corn Husk Waste as Cationic Dyes Adsorbent, *F1000research*, 11(305), 305.
- De Gisi, S., Lofrano, G., Grassi, M., and Notarnicola, M., 2016, Characteristics and Adsorption Capacities of Low-Cost Sorbents for Wastewater Treatment: A Review, *Sustain. Mater. Technol.*, 9, 10-40.
- Dutta, S.K., Amin, M.K., Ahmed, J., Elias, M. and Mahiuddin, M., 2022, Removal of Toxic Methyl Orange by A Cost-Free and Eco-Friendly Adsorbent: Mechanism, Phytotoxicity, Thermodynamics, and Kinetics, *S. Afr. J. Chem. Eng.*, 40, 195-208.
- Guzel-Kaya, G., Yilmaz, E., and Deveci, H., 2019, A Novel Silica Xerogel Synthesized from Volcanic Tuff as An Adsorbent for High-Efficient Removal of Methylene Blue: Parameter Optimization Using Taguchi Experimental Design, *J.Chem.Technol.Biotechnol*, 94(8), 2729-2737.
- Ginting, R.D., Simamora, W.S., Ramadhan, A., dan Simatupang, L., 2018, Pengaruh Metode Perendaman Dan Refluks Dalam Meningkatkan Kadar Silika Abu Vulkanik Gunung Sinabung, *Sains dan Terapan Kimia*, 12(2), 84-92.
- Guo, S., Li, W., Zhang, L., Peng, J., Xia, H., and Zhang, S., 2009, Kinetics and Equilibrium Adsorption Study of Lead (II) onto The Low Cost Adsorbent—

Eupatorium Adenophorum Spreng, Process. Saf. Environ. Prot., 87(5), 343–351.

Hamdaoui, O., and Chiha, M., 2007, Removal of Methylene Blue from Aqueous Solutions by Wheat Bran, *Acta Chim. Slov.*, 54, 407-418.

Hanafi, M.F., and Sapawe, N., 2020, A Review on The Water Problem Associate with Organic Pollutants Derived from Phenol, Methyl Orange, and Remazol Brilliant Blue Dyes, *Materials Today: Proceedings*, 31, A141-A150.

Homagai, P.L., Poudel, R., Poudel, S., and Bhattarai, A., 2022, Adsorption and Removal of Crystal Violet Dye from Aqueous Solution by Modified Rice Husk, *Heliyon*, 8(4), e09261.

Hu, Y., and Gao, Z., 2020, Yellow Emissive Se,N-Codoped Carbon Dots Toward Sensitive Fluorescence Assay of Crystal Violet, *J. Hazard. Mater.*, 388, 122073.

Irawan, C., Dahlan, B., dan Retno, N., 2015, Pengaruh Massa Adsorben, Lama Kontak dan Aktivasi Adsorben Menggunakan HCl Terhadap Efektivitas Penurunan Logam Berat (Fe) Dengan Menggunakan Abu Layang Sebagai Adsorben, *J. T. T.*, 2(3), 107.

Jain, N., Dwivedi, M.K., and Waskle, A., 2016, Adsorption of Methylene Blue Dye from Industrial Effluents using Coal Fly Ash, *Int. J. Adv. Eng. Res. Sci.*, 3(4), 258854.

Jalil, A.A., Triwahyono, S., Adam, S.H., Rahim, N.D., Aziz, M.A.A., Hairom, N.H.H., Razali, N.A.M., Abidin, M.A., and Mohamadiah, M.K.A., 2010, Adsorption of Methyl Orange from Aqueous Solution onto Calcined Lapindo Volcanic Mud, *J. Hazard. Mater.*, 181(1-3), 755-762.

Jarusiripot, C., 2014, Removal of Reactive Dye by Adsorption over Chemical Pretreatment Coal Based Bottom Ash, *Procedia Chemistry*, 9, 121-130.

Juwono, A.M., 2020, Physical and Chemical Characterization of Volcanic Dust Particles from Mt. Semeru and Mt. Bromo, and the Research of Their Influences on the Productivity of Nearby Agricultural Lands, *IJITEE*, 9(3), 158-162.

Koner, S., Pal, A., and Adak, A., 2014, Application of Silica Gel Factory Waste for Methyl Orange Dye Removal, *Int. J. Environ. Waste. Manag.*, 13(1), 37-49.

Kristianingrum, S., Siswani, E.D., and Sulistyani, S., 2018, Modification of Volcanic Ash of Kelud as Selective Adsorbent Material for Zn (II) and Cr (VI) Metal Ions, *J. Sains. Dasar.*, 7(1), 35-43.

Kristianingrum, S., Siswani, E.D., dan Suyanta, 2016, Modifikasi Abu Vulkanik Kelud 2014 Sebagai Bahan Adsorben Selektif Ion Logam Tembaga (II), *J. Sains. Dasar.*, 5(1), 7-16.

- Kukwa, R.E., Kukwa, D.T., Oklo, A.D., Ligom, T.T., Ishwah, B., Omenka, J.A., 2020, Adsorption Studies of Silica Adsorbent Using Rice Husk as a Base Material for Metal Ions Removal from Aqueous Solution, *AJCHE*, 8(2), 48-53.
- Langmann, B., 2013, Volcanic Ash versus Mineral Dust: Atmospheric Processing and Environmental and Climate Impacts, *Int.Sch. Res. Notices.*, 2013, 1-17.
- Li, W., Zhang, L., Peng, J., Li, N., Zhang, S., and Guo, S., 2008, Tobacco Stems as A Low Cost Adsorbent for The Removal of Pb(II) From Wastewater: Equilibrium and Kinetic Studies, *Industrial Crops and Products*, 28(3), 294–302.
- Liew, Y.M., Kamarudin, H., Bakri, A.M.M.A., Binhussain, M., Luqman, M., Nizar, I. K., Ruzaidi, C.M., and Heah, C.Y., 2011, Influence of Solids-to-Liquid and Activator Ratios on Calcined Kaolin Cement Powder, *Physics Procedia*, 22, 312-317.
- Lima, L.F. de S., Coelho, C.R., Gomes, G.H.M., and Mohallem, N.D.S., 2019, Nb₂O₅/SiO₂ Mesoporous Monoliths Synthetized by Sol–Gel Process Using Ammonium Niobate Oxalate Hydrate as Porogenic Agent, *JSSST*, 93, 168-174.
- Liu, Q.Q., and Pan, C.Y., 2012, A Novel Route to Treat Wastewater Containing Cationic Dyes, *Sep. Sci. Technol.*, 47, 630.
- Maknun, L., Nazriati, Farida, I., Kholila, N., and Muyas Syufa, R. B., 2018, Synthesis of Silica Xerogel based Bagasse Ash as a Methylene Blue Adsorbent on Textile Waste, *J. Phys. Conf. Ser.*, 1093, 1-5.
- Mani, S. dan Bharagava, R.N., 2016, Exposure to Crystal Violet, Its Toxic, Genotoxic and Carcinogenic Effects on Environment and Its Degradation and Detoxification for Environmental Safety, *Rev. Environ. Contam. Toxicol.*, 237, 71-104.
- Maria, D., 2009, Pemanfaatan Silika Gel dari Abu Sekam Padi untuk Adsorpsi Zat Warna *Direct Red 12B*, *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Milea, C.A., Bogatu, C., and Duta, A., 2011, The Influence of Parameters in Silica Sol-Gel Process, *Bull. Transilv. Univ. Bras. I: Eng. Sci.*, 4(53), 59-66.
- Mittal, A., Mittal, J., Malviya, A., Kaur, D., and Gupta, V.K., 2010, Adsorption of Hazardous Dye Crystal Violet from Wastewater by Waste Materials, *J. Colloid Interface Sci.*, 343(2), 463–473.
- Miyah, Y., Lahrichi, A., Idrissi, M., Boujraf, S., Taouda, H., and Zerrouq, F., 2017, Assessment of Adsorption Kinetics for Removal Potential of Crystal Violet Dye from Aqueous Solutions Using Moroccan Pyrophyllite, *J. Assoc. Arab Univ. Basic Appl. Sci.*, 23(1), 20–28.

- Ocholi O.J., Gimba C.E., Ndukwe G.I., Turoti M., Abechi S.E., and Edogbanya P.R.O., 2016, Effect of Time on the Adsorption of Methylene Blue, Methyl Orange and Indigo Carmine onto Activated Carbon, *Journal of Applied Chemistry.*, 9, 55-62.
- Oscik, 1982, *Adsorption*, Ellis Horwood Limited, London.
- Ozkaraova, E.B., Akbal, F., dan Kuleyin, A., Potensial Reuse of Treated Industrial Wastewater in Agriculture: Textile Wastewater, *Mech. Agric. Conserv. Resour.*, 4, 138-140.
- Peres, E.C., Favarin, N., Slaviero, J., Almeida, A.R., Enders, M.P., Muller, E.I., and Dotto, G.L., 2018, Bio-nanosilica Obtained from Rice Husk Using Ultrasound and Its Potential for Dye Removal, *Materials Letters*, 231, 72-75.
- Prasad, R., and Pandey, M., 2012, Rice Husk Ash as A Renewable Source for The Production of Value Added Silica Gel and Its Application: An Overview, *Bull. Chem. React. Eng. Catal.*, 7(1), 1-25.
- Rao, B., Dai, H., Gao, L., Xie, H., Gao, G., Peng, K., Zhang, M., He, F., and Pan, Y., 2022, Surprisingly Highly Reactive Silica That Dissolves Rapidly in Dilute Alkali (NaOH) Solution Even at Ambient Temperatures (25°C), *Journal of Cleaner Production*, 341, 130779.
- Saha, P.D., Chakraborty, S., and Chowdhury, S., 2012, Batch and Continuous (Fixed-Bed Column) Biosorption of Crystal Violet by *Artocarpus heterophyllus* (Jackfruit) Leaf Powder, *Colloid. Surface. B.*, 92, 262–270.
- Salahudeen, N., and Rasheed, A.A., 2020, Kinetics and Thermodynamics of Hydrolysis of Crystal Violet at Ambient and Below Ambient Temperatures, *Scientific Reports*, 10(1), 1-9.
- Sarma, G.K., Sen Gupta, S., and Bhattacharyya, KG, 2016, Adsorption of Crystal Violet on Raw and Acid-Treated Montmorillonite, K10, In Aqueous Suspension, *J. Environ Manage.*, 171, 1-10.
- Selvasekarapandian, S., Baskaran, R., Kamishima, O., Kawamura, J., and Hattori, T., 2006, Laser Raman and FTIR studies on Li⁺ Interaction in PVAc–LiClO₄ Polymer Electrolytes, *Spectrochim. Acta. A. Mol. Biomol. Spectrosc.*, 65(5), 1234-1240.
- Simatupang, L., dan Rahmadani, S., 2016, Preparasi Abu Vulkanik Gunung Sinabung Sebagai Bahan Dasar Pembuatan Adsorben Berbasis Silika dan Karakterisasinya, *Prosiding Seminar Nasional Kimia dan Pendidikan Kimia*, 30-31 Mei 2016, Medan.
- Simatupang, L., Siburian, R., Sitanggang, P., Doloksaribu, M., Situmorang, M., and Marpaung, H., 2018, Synthesis and Application of Silica Gel Based on Mount Sinabung's Fly Ash for Cd (II) Removal with Fixed Bed Column, *Rasayan. J. Chem.*, 11 (2), 819-827.

- Simatupang, L., 2021, *Material Silika Abu Vulkanik Sinabung: Karakteristik dan Aplikasi*, Penerbit Media Sains Indonesia, Bandung.
- Sudarmadji dan Hamdi, 2014, Pengaruh Penggunaan Abu Vulkanik Sebagai Filler Terhadap Campuran Aspal Beton Lapis Asphalt Concrete – Wearing Course (AC-WC), *Jurnal Teknik Sipil*, 10(2), 179-188.
- Sulistiyo, Y.A., Andriana, N., Harto, B.P., and Zulfikar, Z., 2017, Silica Gels from Coal Fly Ash as Methylene Blue Adsorbent: Isotherm and Kinetic Studies, *Bull. Chem. React. Eng. Catal.*, 12 (2), 263-272.
- Tahir, N., Bhatti, H.N., Iqbal, M., and Noreen, S., 2017, Biopolymers Composites with Peanut Hull Waste Biomass and Application for Crystal Violet Adsorption, *Int. J. Biol. Macromol.*, 94, 210-220.
- Toscano, G., Caristi, C., and Cimino, G., 2008, Sorption of Heavy Metal from Aqueous Solution by Volcanic Ash, *C. R. Chim*, 11(6), 765–771.
- Utari, N. P. S. N, Sudiarta, I. W., dan Suarya, P., 2020, Sintesis dan Karakterisasi Silika Gel dari Abu Vulkanik Gunung Agung Melalui Teknik Sol-Gel, *Journal of Chemistry*, 14(1), 30-36.
- Valdes-Solis, T., and Fuertes, A.B., 2006, High-Surface Area Inorganic Compounds Prepared by Nanocasting Techniques, *Mater. Res. Bull.*, 41, 2187-2197.
- Wahshi, F.S., Alqahtani, M.D., Abdulla, M., Ramachandran, T., Hamed, F., and Thiemann, T., 2020, Adsorption of Model Dyes on Recycled Silica Gel. *Proceedings*, 48(1), 10-15.
- Wang, J., and Guo, X., 2020, Adsorption Kinetic Models: Physical Meanings, Applications, and Solving Methods, *J. Hazard. Mater.*, 390, 122156.
- Yao, Y., B., Xu, F., and Chen, X., 2011, Equilibrium and Kinetics Studies of Methyl Orange Adsorption on Multiwalled Carbon Nanotubes, *Chem. Eng.*, 170, 82-89.
- Youssef, N.A., Shaban, S.A., Ibrahim, F.A., and Mahmoud, A.S., 2016, Degradation of Methyl Orange Using Fenton Catalytic Reaction. *Egypt. J. Pet.*, 25(3), 317-321.
- Zhao, Y., Qi, W., Chen, G., Ji, M., and Zhang, Z., 2015, Behavior of Cr(VI) Removal from Wastewater by Adsorption onto HCl Activated Akadama Clay, *J. Taiwan. Inst. Chem. Eng.*, 50, 190-197.