

DAFTAR PUSTAKA

- A.Elavarasan, S.Chitradevi, V.Nandhakumar, S.Sivajiganesan, S.K., 2018, FT-IR Spectra, XRD and EDX Studies on the Adsorption of Methylene Blue Dye Present In Aqueous Solution onto Acid Activated Carbon Prepared From Mimusops Elengi Leaves, *IOSR-JAC*, 11, 45–51.
- Abraham, T.W. dan Höfer, R., 2012, Lipid-Based Polymer Building Blocks and Polymers,. In, *Polymer Science: A Comprehensive Reference*. Elsevier, hal. 15–58.
- Abukhadra, M.R. dan Mohamed, A.S., 2019, Adsorption Removal of Safranin Dye Contaminants from Water Using Various Types of Natural Zeolite, *Silicon*, 11, 1635–1647.
- Adebowale, K.O., Olu-Owolabi, B.I., dan Chigbundu, E.C., 2014, Removal of Safranin-O from Aqueous Solution by Adsorption onto Kaolinite Clay, *J. Encapsulation Adsorpt. Sci.*, 04, 89–104.
- Agbovi, H.K. dan Wilson, L.D., 2021, 1 - Adsorption processes in biopolymer systems: fundamentals to practical applications,. In, Kalia,S. (ed), *Natural Polymers-Based Green Adsorbents for Water Treatment*. Elsevier, hal. 1–51.
- Aiken, G.R., McKnight, D.M., Wershaw, R.L., dan MacCarthy, P., 1986, Humic Substances in Soil, Sediment, and Water. 1985, *Soil Sci.*, 142, 323.
- Al-Ghouti, M.A. dan Al-Absi, R.S., 2020, Mechanistic understanding of the adsorption and thermodynamic aspects of cationic methylene blue dye onto cellulosic olive stones biomass from wastewater, *Sci. Rep.*, 10, 1–18.
- Al-Maliky, E.A., Gzar, H.A., dan Al-Azawy, M.G., 2021, Determination of Point of Zero Charge (PZC) of Concrete Particles Adsorbents, *IOP Conf. Ser. Mater. Sci. Eng.*, 1184, 012004.
- Alam, M.N. dan Christopher, L.P., 2018, Natural Cellulose-Chitosan Cross-Linked Superabsorbent Hydrogels with Superior Swelling Properties, *ACS Sustain. Chem. Eng.*, 6, 8736–8742.
- Alimin, 2000, Fraksinasi Asam Humat dan Pengaruhnya pada Kelarutan Ion Logam Seng (II), Kadmium (II), Magnesium (II), dan Kalsium (II), *Tesis*, Program Pascasarjana, Universitas Gadjah Mada, Yogyakarta.
- Alsawy, T., Rashad, E., El-Qelish, M., dan Mohammed, R.H., 2022, A comprehensive review on the chemical regeneration of biochar adsorbent for sustainable wastewater treatment, *npj Clean Water*, 5, 29.
- Aragaw, T.A. dan Bogale, F.M., 2021, Biomass-Based Adsorbents for Removal of Dyes From Wastewater: A Review, *Front. Environ. Sci.*, 9, 1–24.

- Aravamudhan, A., Ramos, D.M., Nada, A.A., dan Kumbar, S.G., 2014b, Natural Polymers,. In, *Natural and Synthetic Biomedical Polymers*. Elsevier, hal. 67–89.
- Arifin, M., Sudiono, S., Mudasir, M., dan Triyono, T., 2021, Adsorption of Methylene Blue Dye Using Biosorbents Based on Humic Acid Cross-Linked Cellulose,884, 47–53.
- Baldacci-Cresp, F., Spriet, C., Twyffels, L., Blervacq, A.S., Neutelings, G., Baucher, M., dan Hawkins, S., 2020, A rapid and quantitative safranin-based fluorescent microscopy method to evaluate cell wall lignification, *Plant J.*, 102, 1074–1089.
- Bendjama, M., Hamdaoui, O., Ferkous, H., dan Alghyamah, A., 2022, Degradation of Safranin O in Water by UV/TiO₂/IO₄⁻ Process: Effect of Operating Conditions and Mineralization, *Catalysts*, 12, 1460.
- Benhalima, T. dan Ferfera-Harrar, H., 2019, Eco-friendly porous carboxymethyl cellulose/dextran sulfate composite beads as reusable and efficient adsorbents of cationic dye methylene blue, *Int. J. Biol. Macromol.*, 132, 126–141.
- Bensalah, J., Habsaoui, A., Dagdag, O., Lebkiri, A., Ismi, I., Rifi, E.H., Warad, I., dan Zarrouk, A., 2021, Adsorption of a cationic dye (Safranin) by artificial cationic resins Amberlite®IRC-50: Equilibrium, kinetic and thermodynamic study, *Chem. Data Collect.*, 35, 100756.
- Bono, A., Ying, P.H., Yan, F.Y., Muei, C.L., Sarbatly, R., dan Krishnaiah, D., 2009, Synthesis and characterization of carboxymethyl cellulose from palm kernel cake, *Adv. Nat. Appl. Sci.*, 3, 5–11.
- Chandane, V. dan Singh, V.K., 2014, Adsorption of safranin dye from aqueous solutions using a low-cost agro-waste material soybean hull,37–41.
- Chen, J.H., Ni, J.C., Liu, Q.L., dan Li, S.X., 2012, Adsorption behavior of Cd(II) ions on humic acid-immobilized sodium alginate and hydroxyl ethyl cellulose blending porous composite membrane adsorbent, *Desalination*, 285, 54–61.
- Chianese, S., Fenti, A., Iovino, P., Musmarra, D., dan Salvestrini, S., 2020, Sorption of organic pollutants by humic acids: A review, *Molecules*, 25, 1–17.
- Chinga-Carrasco, G., Yu, Y., dan Diserud, O., 2011, Quantitative electron microscopy of cellulose nanofibril structures from eucalyptus and pinus radiata kraft pulp fibers, *Microsc. Microanal.*, 17, 563–571.
- Elkholy, A.S., Yahia, M.S., Elnwawy, M.A., Gomaa, H.A., dan Elzaref, A.S., 2023, Synthesis of activated carbon composited with Egyptian black sand for enhanced adsorption performance toward methylene blue dye, *Sci. Rep.*, 13, 1–21.
- Eltaweil, A.S., Elgarhy, G.S., El-Subruiti, G.M., dan Omer, A.M., 2020, Carboxymethyl cellulose/carboxylated graphene oxide composite microbeads

- for efficient adsorption of cationic methylene blue dye, *Int. J. Biol. Macromol.*, 154, 307–318.
- Fan, X., Deng, L., Li, K., Lu, H., Wang, R., dan Li, W., 2021, Adsorption of malachite green in aqueous solution using sugarcane bagasse-barium carbonate composite, *Colloids Interface Sci. Commun.*, 44, 100485.
- Ghosh, R.K., Ray, D.P., Debnath, S., Tewari, A., dan Das, I., 2019, Optimization of process parameters for methylene blue removal by jute stick using response surface methodology, *Environ. Prog. Sustain. Energy*, 38, 620–634.
- Gkika, D.A., Mitropoulos, A.C., dan Kyzas, G.Z., 2022, Why reuse spent adsorbents? The latest challenges and limitations, *Sci. Total Environ.*, 822, 153612.
- Guo, Y., Deng, J., Zhu, J., Zhou, X., dan Bai, R., 2016, Removal of mercury(II) and methylene blue from a wastewater environment with magnetic graphene oxide: adsorption kinetics, isotherms and mechanism, *RSC Adv.*, 6, 82523–82536.
- Hameed, A., Khurshid, S., dan Adnan, A., 2020, Synthesis and characterization of carboxymethyl cellulose based hydrogel and its applications on water treatment, *Desalin. Water Treat.*, 196, 214–227.
- Hameed, B.H., 2008, Equilibrium and kinetic studies of methyl violet sorption by agricultural waste, *J. Hazard. Mater.*, 154, 204–212.
- Hastuti, B., Mudasir, Siswanta, D., dan Triyono, 2015, Preparation of crosslinked carboxymethyl chitosan with epichlorohydrin and its use for Pb(II) removal, In, *AIP Conference Proceedings.*, hal. 050003.
- Hidayat, S., Ardiaksa, P., Riveli, N., dan Rahayu, I., 2018, Synthesis and characterization of carboxymethyl cellulose (CMC) from salak-fruit seeds as anode binder for lithium-ion battery, *J. Phys. Conf. Ser.*, 1080, 012017.
- Hirakawa, B., 2014, Epichlorohydrin, In, *Encyclopedia of Toxicology*. Elsevier, hal. 431–432.
- Ho, Y.S. dan McKay, G., 1999, Pseudo-second order model for sorption processes, *Process Biochem.* 34 451–465, 34, 451–465.
- Hocine, T., Benabadji, K.I., Bouras, B., Zennaki, A., dan Benali, A., 2023, Enhanced Removal of Brilliant Orange by Poly(4-vinylpyridine)/Acid-Activated Bentonite Composite, *Phys. Chem. Res.*, 11, 327–339.
- Jiao, C. dan Xiong, J., 2014, Accessibility and Morphology of Cellulose Fibres Treated with Sodium Hydroxide, 9, 6504–6513.
- John L. Tymoczko Jeremy M. Berg Lubert Stryer, 2013, Biochemistry A Short Course, In, Dunning, A. dan Buese, C. (ed), *Biochemistry A Short Course*. Kate Ahr Parker, USA, hal. 1–826.

- Joshi, G., Naithani, S., Varshney, V.K., Bisht, S.S., Rana, V., dan Gupta, P.K., 2015, Synthesis and characterization of carboxymethyl cellulose from office waste paper: A greener approach towards waste management, *Waste Manag.*, 38, 33–40.
- Jung, H., Jeon, S., Jo, D.H., Huh, J., dan Kim, S.H., 2017, Effect of crosslinking on the CO₂ adsorption of polyethyleneimine-impregnated sorbents, *Chem. Eng. J.*, 307, 836–844.
- Kamel, S., El-Gendy, A.A., Hassan, M.A., El-Sakhawy, M., dan Kelnar, I., 2020, Carboxymethyl cellulose-hydrogel embedded with modified magnetite nanoparticles and porous carbon: Effective environmental adsorbent, *Carbohydr. Polym.*, 242, 116402.
- Karthik, V., Selvakumar, P., Sivarajasekar, N., Megavarshini, P., Brinda, N., Kiruthika, J., Balasubramani, K., Ahamad, T., dan Naushad, M., 2020, Comparative and Equilibrium Studies on Anionic and Cationic Dyes Removal by Nano-Alumina-Doped Catechol Formaldehyde Composite, *J. Chem.*, 2020, 1–15.
- Khan, Idrees, Saeed, K., Zekker, I., Zhang, B., Hendi, A.H., Ahmad, A., Ahmad, S., Zada, N., Ahmad, H., Shah, L.A., Shah, T., dan Khan, Ibrahim, 2022, Review on Methylene Blue: Its Properties, Uses, Toxicity and Photodegradation, *Water*, 14, 242.
- Khushbu, Vaid, V., Dagar, N., Nikhil, dan Jindal, R., 2023, Adsorption removal of Brilliant green and Safranin-O contaminants from water using a hydrogel based on carboxymethyl cellulose and sodium alginate crosslinked by epichlorohydrin, *Color. Technol.*, 139, 407–429.
- Klučáková, M. dan Pekař, M., 2005, Solubility and dissociation of lignitic humic acids in water suspension, *Colloids Surfaces A Physicochem. Eng. Asp.*, 252, 157–163.
- Krstić, V., 2021, Chapter 14 - Role of zeolite adsorbent in water treatment,. In, Bhanvase, B., Sonawane, S., Pawade, V., dan Pandit, A. (ed), *Handbook of Nanomaterials for Wastewater Treatment*, Micro and Nano Technologies. Elsevier, hal. 417–481.
- Kumar, V., Pathak, P., dan Bhardwaj, N.K., 2020, Waste paper: An underutilized but promising source for nanocellulose mining, *Waste Manag.*, 102, 281–303.
- Kyzas, G.Z. dan Kostoglou, M., 2014, Green adsorbents for wastewaters: A critical review, *Materials (Basel)*, 7, 333–364.
- Lee, J.W. dan Kim, D.K., 2021, Carboxymethyl group activation of dextran cross-linked superparamagnetic iron oxide nanoparticles, *J. Korean Ceram. Soc.*, 58, 106–115.

- Li, P., Ge, B., Zhang, S., Chen, S., Zhang, Q., dan Zhao, Y., 2008, CO₂ capture by polyethylenimine-modified fibrous adsorbent, *Langmuir*, 24, 6567–6574.
- Liu, B., Luo, H., Rong, H., Zeng, X., Wu, K., Chen, Z., Lu, H., dan Xu, D., 2019, Temperature-induced adsorption and desorption of phosphate on poly(Acrylic acid-co-N-[3-(dimethylamino)propyl]acrylamide) hydrogels in aqueous solutions, *Desalin. Water Treat.*, 160, 260–267.
- Liu, Y., Wang, W., dan Wang, A., 2010, Adsorption of lead ions from aqueous solution by using carboxymethyl cellulose-g-poly (acrylic acid)/attapulgitic hydrogel composites, *Desalination*, 259, 258–264.
- Lu, S., Liu, W., Wang, Y., Zhang, Y., Li, P., Jiang, D., Fang, C., dan Li, Y., 2019, An adsorbent based on humic acid and carboxymethyl cellulose for efficient dye removal from aqueous solution, *Int. J. Biol. Macromol.*, 135, 790–797.
- MacCarthy, P., 2001, The Principles Of Humic Substances, *Soil Sci.*, 166, 738–751.
- De Melo, B.A.G., Motta, F.L., dan Santana, M.H.A., 2016, Humic acids: Structural properties and multiple functionalities for novel technological developments, *Mater. Sci. Eng. C*, 62, 967–974.
- Mezhuev, Y.O., Vorobev, I.Y., Plyushchii, I. V., Krivoborodov, E.G., Artyukhov, A.A., Motyakin, M. V., Luss, A.L., Ionova, I.S., Kovarskii, A.L., Derevnin, I.A., Dyatlov, V.A., Alekperov, R.A., Toropygin, I.Y., Volkov, M.A., Shtilman, M.I., dan Korshak, Y. V., 2021, Chemical Oxidative Polymerization of Methylene Blue: Reaction Mechanism and Aspects of Chain Structure, *Polymers (Basel)*, 13, 2188.
- Miclescu, A. dan Wiklund, L., 2010, Methylene blue, an old drug with new indications?, *J Rom Anest Ter. Int*, 171, 35–41.
- Mishra, A., Takkar, S., Joshi, N.C., Shukla, S., Shukla, K., Singh, A., Manikonda, A., dan Varma, A., 2022, An Integrative Approach to Study Bacterial Enzymatic Degradation of Toxic Dyes, *Front. Microbiol.*, 12, 1–17.
- Mohammadzadeh Pakdel, P., Peighambari, S.J., Arsalani, N., dan Aghdasinia, H., 2022, Safranin-O cationic dye removal from wastewater using carboxymethyl cellulose-grafted-poly(acrylic acid-co-itaconic acid) nanocomposite hydrogel, *Environ. Res.*, 212, 113201.
- Momina, Mohammad, S., dan Suzylawati, I., 2020, Study of the adsorption/desorption of MB dye solution using bentonite adsorbent coating, *J. Water Process Eng.*, 34, 101155.
- Motta, F.L., Melo, B.A.G., dan Santana, M.H.A., 2016, Deprotonation and protonation of humic acids as a strategy for the technological development of pH-responsive nanoparticles with fungicidal potential, *N. Biotechnol.*, 33, 773–780.

- Oladoye, P.O., Ajiboye, T.O., Omotola, E.O., dan Oyewola, O.J., 2022, Methylene blue dye: Toxicity and potential elimination technology from wastewater, *Results Eng.*, 16, 100678.
- de Oliveira, D.M., de Bomfim, A.S.C., Benini, K.C.C. de C., Cioffi, M.O.H., Voorwald, H.J.C., dan Rodrigue, D., 2023, Waste Paper as a Valuable Resource: An Overview of Recent Trends in the Polymeric Composites Field, *Polymers (Basel)*, 15, 1–24.
- Patel, H., 2021, Review on solvent desorption study from exhausted adsorbent, *J. Saudi Chem. Soc.*, 25, 101302.
- Pushpamalar, V., Langford, S.J., Ahmad, M., dan Lim, Y.Y., 2006, Optimization of reaction conditions for preparing carboxymethyl cellulose from sago waste, *Carbohydr. Polym.*, 64, 312–318.
- Qi, X., Wei, W., Su, T., Zhang, J., dan Dong, W., 2018, Fabrication of a new polysaccharide-based adsorbent for water purification, *Carbohydr. Polym.*, 195, 368–377.
- Qiu, X., Li, N., Ma, X., Yang, S., Xu, Q., Li, H., dan Lu, J., 2014, Journal of Environmental Chemical Engineering Facile preparation of acrylic ester-based crosslinked resin and its adsorption of phenol at high concentration, *Biochem. Pharmacol.*, 2, 745–751.
- Rimadhanti Ningtyas, K., Nugraha Agassi, T., dan Gina Putri, P., 2022, Utilization of Waste Cellulose Raw Material for Making Paper Pulp, *IOP Conf. Ser. Earth Environ. Sci.*, 1012, 012091.
- Sabarudin, A. dan Madjid, A.D.R., 2021, Preparation and Kinetic Studies of Cross-Linked Chitosan Beads Using Dual Crosslinkers of Tripolyphosphate and Epichlorohydrin for Adsorption of Methyl Orange, *Sci. World J.*, 2021, 1–11.
- Safitri, D., Rahim, E.A., dan Sikanna, R., 2017, Sintesis Karboksimetil Selulosa (CMC) Dari Selulosa Kulit Durian (*Durio zibethinus*), 3, 58–68.
- Saha, D. dan Grappe, H.A., 2017, Adsorption properties of activated carbon fibers,. In, *Activated Carbon Fiber and Textiles*. Elsevier, hal. 143–165.
- Sahoo, T.R. dan Prelot, B., 2020, Chapter 7 - Adsorption processes for the removal of contaminants from wastewater: the perspective role of nanomaterials and nanotechnology,. In, Bonelli, B., Freyria, F.S., Rossetti, I., dan Sethi, R. (ed), *Nanomaterials for the Detection and Removal of Wastewater Pollutants*, Micro and Nano Technologies. Elsevier, hal. 161–222.
- Sahu, M.K. dan Patel, R.K., 2015, Removal of safranin-O dye from aqueous solution using modified red mud: kinetics and equilibrium studies, *RSC Adv.*, 5, 78491–78501.

- Salah Omer, A., El Naeem, G.A., Abd-Elhamid, A.I., Farahat, O.O.M., El-Bardan, A.A., Soliman, H.M.A., dan Nayl, A.A., 2022, Adsorption of crystal violet and methylene blue dyes using a cellulose-based adsorbent from sugarcane bagasse: characterization, kinetic and isotherm studies, *J. Mater. Res. Technol.*, 19, 3241–3254.
- Salazar-rabago, J.J., Leyva-ramos, R., Rivera-utrilla, J., Ocampo-perez, R., dan Cerino-cordova, F.J., 2017, Biosorption mechanism of Methylene Blue from aqueous solution onto White Pine (*Pinus durangensis*) sawdust: Effect of operating conditions, *Sustain. Environ. Res.*, 27, 32–40.
- Santosa, S.J., Siswanta, D., Sudiono, S., dan Utarianingrum, R., 2008, Chitin–humic acid hybrid as adsorbent for Cr(III) in effluent of tannery wastewater treatment, *Appl. Surf. Sci.*, 254, 7846–7850.
- Santoso, U.T., Santosa, S.J., Siswanta, D., Rusdiarso, B., dan Shimazu, S., 2010, Characterization Of Sorbent Produced Through Immobilization Of Humic Acid On Chitosan Using Glutaraldehyde As Cross-Linking Agent And Pb (II),10, 301–309.
- Saputra, A.H., Qadhayna, L., dan Pitaloka, A.B., 2014, Synthesis and Characterization of Carboxymethyl Cellulose (CMC) from Water Hyacinth Using Ethanol-Isobutyl Alcohol Mixture as the Solvents, *Int. J. Chem. Eng. Appl.*, 5, 36–40.
- Sarkar, A., Sengupta, K., Chatterjee, S., Seal, M., Faller, P., Dey, S.G., dan Dey, A., 2018, Metal Binding to A β Peptides Inhibits Interaction with Cytochrome c: Insights from Abiological Constructs, *ACS Omega*, 3, 13994–14003.
- Sehaqui, H., Perez De Larraya, U., Tingaut, P., dan Zimmermann, T., 2015, Humic acid adsorption onto cationic cellulose nanofibers for bioinspired removal of copper(ii) and a positively charged dye, *Soft Matter*, 11, 5294–5300.
- Shaban, M., Abukhadra, M.R., Shahien, M.G., dan Khan, A.A.P., 2017, Upgraded modified forms of bituminous coal for the removal of safranin-T dye from aqueous solution, *Environ. Sci. Pollut. Res.*, 24, 18135–18151.
- Shaltout, W.A., El-Naggar, G.A., Esmail, G., dan Hassan, A.F., 2022, Synthesis and characterization of ferric@nanocellulose/nanohydroxyapatite bio-composite based on sea scallop shells and cotton stalks: adsorption of Safranin-O dye, *Biomass Convers. Biorefinery*, 1–18.
- Shi, Y., Wang, Xisen, Wang, Xin, Carlson, K., dan Li, Z., 2021, Removal of Toluidine Blue and Safranin O from Single and Binary Solutions Using Zeolite, *Crystals*, 11, 1181.
- Sirajudheen, P., Karthikeyan, P., Vigneshwaran, S., dan Meenakshi, S., 2020, Synthesis and characterization of La(III) supported carboxymethylcellulose-clay composite for toxic dyes removal: Evaluation of adsorption kinetics,

- isotherms and thermodynamics, *Int. J. Biol. Macromol.*, 161, 1117–1126.
- Sonal, S. dan Mishra, B.K., 2021, Role of Coagulation/Flocculation Technology for the Treatment of Dye Wastewater: Trend and Future Aspects,. In, *Water Pollution and Management Practices*. Springer Singapore, Singapore, hal. 303–331.
- Souza, S.O., Silva, M.D.M., Carinhanha, J., Santos, C., dan Oliveira, L.C. De, 2016, Evaluation of different fractions of the organic matter of peat on tetracycline retention in environmental conditions : in vitro studies, *J. Soils Sediments*, 1764–1775.
- Stoller, M., Azizova, G., Mammadova, A., Vilardi, G., Di Palma, L., dan Chianese, A., 2016, Treatment of Olive Oil Processing Wastewater by Ultrafiltration, Nanofiltration, Reverse Osmosis and Biofiltration, *Chem. Eng. Trans.*, 47, 409–414.
- Su, S., Wang, W., Liu, B., Huang, Y., Yang, S., Wu, H., Han, G., dan Cao, Y., 2021, Enhancing surface interactions between humic surfactants and cupric ion: DFT computations coupled with MD simulations study, *J. Mol. Liq.*, 324, 114781.
- Sudiono, S., Yuniarti, M., Siswanta, D., Kunarti, E.S., dan Santosa, S.J., 2017, The Role of Carboxyl and Hydroxyl Groups of Humic Acid in Removing AuCl₄ – from Aqueous Solution, 17, 95–104.
- Suleman, M., Zafar, M., Ahmed, A., Rashid, M.U., Hussain, S., Razzaq, A., Mohidem, N.A., Fazal, T., Haider, B., dan Park, Y.-K., 2021, Castor Leaves-Based Biochar for Adsorption of Safranin from Textile Wastewater, *Sustainability*, 13, 6926.
- Suresh Kumar, P., Ejerssa, W.W., Wegener, C.C., Korving, L., Dugulan, A.I., Temmink, H., van Loosdrecht, M.C.M., dan Witkamp, G.J., 2018, Understanding and improving the reusability of phosphate adsorbents for wastewater effluent polishing, *Water Res.*, 145, 365–374.
- Tanzifi, M., Tavakkoli Yarak, M., Beiramzadeh, Z., Heidarpoor Saremi, L., Najafifard, M., Moradi, H., Mansouri, M., Karami, M., dan Bazgir, H., 2020, Carboxymethyl cellulose improved adsorption capacity of polypyrrole/CMC composite nanoparticles for removal of reactive dyes: Experimental optimization and DFT calculation, *Chemosphere*, 255, 127052.
- Thakur, A.K., Singh, R., Teja Pullala, R., dan Pundir, V., 2022, Green adsorbents for the removal of heavy metals from Wastewater: A review, *Mater. Today Proc.*, 57, 1468–1472.
- Ting, Z. dan Zhiyuan, P., 2018, Bio-Adsorbent from Carboxymethyl Cellulose and Tannin for Dye Adsorption, *J. Macromol. Sci. Part B*, 57, 177–186.
- Toğrul, H. dan Arslan, N., 2003, Production of carboxymethyl cellulose from sugar

- beet pulp cellulose and rheological behaviour of carboxymethyl cellulose, *Carbohydr. Polym.*, 54, 73–82.
- Udoetok, I.A., Dimmick, R.M., Wilson, L.D., dan Headley, J. V., 2016, Adsorption properties of cross-linked cellulose-epichlorohydrin polymers in aqueous solution, *Carbohydr. Polym.*, 136, 329–340.
- Unugul, T. dan Nigiz, F.U., 2020, Preparation and Characterization an Active Carbon Adsorbent from Waste Mandarin Peel and Determination of Adsorption Behavior on Removal of Synthetic Dye Solutions, *Water, Air, Soil Pollut.*, 231, 538.
- Vakili, M., Deng, S., Cagnetta, G., Wang, W., Meng, P., Liu, D., dan Yu, G., 2019, Regeneration of chitosan-based adsorbents used in heavy metal adsorption: A review, *Sep. Purif. Technol.*, 224, 373–387.
- Vikrant, K., Giri, B.S., Raza, N., Roy, K., Kim, K.H., Rai, B.N., dan Singh, R.S., 2018, Recent advancements in bioremediation of dye: Current status and challenges, *Bioresour. Technol.*, 253, 355–367.
- Wang, Q., Zhu, S., Xi, C., Jiang, B., dan Zhang, F., 2022, Adsorption and Removal of Mercury(II) by a Crosslinked Hyperbranched Polymer Modified via Sulfhydryl, *ACS Omega*, 7, 12231–12241.
- Wang, Z., Kang, S. Bin, dan Won, S.W., 2021, Selective adsorption of palladium(II) from aqueous solution using epichlorohydrin crosslinked polyethylenimine-chitin adsorbent: Batch and column studies, *J. Environ. Chem. Eng.*, 9, 105058.
- William Kajjumba, G., Emik, S., Öngen, A., Kurtulus Özcan, H., dan Aydın, S., 2019, Modelling of Adsorption Kinetic Processes—Errors, Theory and Application, *Adv. Sorption Process Appl.*, 1–19.
- Wongvitvichot, W., Pithakratanayothin, S., Wongkasemjit, S., dan Chaisuwan, T., 2021, Fast and practical synthesis of carboxymethyl cellulose from office paper waste by ultrasonic-assisted technique at ambient temperature, *Polym. Degrad. Stab.*, 184, 109473.
- Wu, Z., Zhou, P., Yang, J., dan Li, J., 2017, Determination of the optimal reaction conditions for the preparation of highly substituted carboxymethyl Cassia tora gum, *Carbohydr. Polym.*, 157, 527–532.
- Xie, L., Lu, Qiuyi, Mao, X., Wang, J., Han, L., Hu, J., Lu, Qingye, Wang, Y., dan Zeng, H., 2020, Probing the intermolecular interaction mechanisms between humic acid and different substrates with implications for its adsorption and removal in water treatment, *Water Res.*, 176, 115766.
- Yeasmin, S., 2015, Synthesis Of Carboxymethyl Cellulose From Corn Leaves Based On Particle Size – A New Aspect, 205–226.

- Youcai, Z. dan Tao, Z., 2021, Chapter 7 - New developments in nutrition recovery from food waste., In, Youcai,Z. dan Tao,Z. (ed), *Biohydrogen Production and Hybrid Process Development*. Elsevier, hal. 479–517.
- Younghyun, S., Dajun, K., Yiluo, H., In Ki, H., Moo Sung, K., dan Suenho, J., 2021, pH-Responsive Succinoglycan-Carboxymethyl Cellulose Hydrogels with Highly Improved Mechanical Strength for Controlled Drug Delivery Systems, *Polymers (Basel)*., 13, 16.
- Yu, P., Hou, Y., Zhang, H., Zhang, W., Yang, S., dan Ni, Y., 2019, Characterization and solubility effects of the distribution of carboxymethyl substituents along the carboxymethyl cellulose molecular chain, *BioResources*, 14, 8923–8934.
- Yuan, D., Zhai, Z., Zhu, E., Liu, H., Jiao, T., dan Tang, S., 2022, Humic Acid Removal in Water via UV Activated Sodium Perborate Process, *Coatings*, 12, 1–11.
- Yue, X., Huang, J., Jiang, F., Lin, H., dan Chen, Y., 2019, Synthesis and characterization of cellulose-based adsorbent for removal of anionic and cationic dyes, *J. Eng. Fiber. Fabr.*, 14, 15589.
- Zainal, S.H., Mohd, N.H., Suhaili, N., Anuar, F.H., Lazim, A.M., dan Othaman, R., 2021, Preparation of cellulose-based hydrogel: A review, *J. Mater. Res. Technol.*, 10, 935–952.
- Zhou, W., Carlson, K., Wu, Q., Wang, X., Xu, S., dan Li, Z., 2023, Sorption of Alizarin Red S and Methylene Blue on Halloysite from Single and Mixed Solutions, *Crystals*, 13, 664.
- Zhou, Y., Li, T., Shen, J., Meng, Y., Tong, S., Guan, Q., dan Xia, X., 2021, Core-Shell Structured Magnetic Carboxymethyl Cellulose-Based Hydrogel Nanosorbents for Effective Adsorption of Methylene Blue from Aqueous Solution, *Polymers (Basel)*., 13, 3054.