

## DAFTAR PUSTAKA

- Abegunde, S. M., Idowu, K. S., Adejuwon, O. M., & Adeyemi-Adejolu, T. (2020). A review on the influence of chemical modification on the performance of adsorbents. *Resources, Environment and Sustainability*, 1(July), 100001. <https://doi.org/10.1016/j.resenv.2020.100001>
- Adeniyi, A. G., & Ighalo, J. O. (2019). Biosorption of pollutants by plant leaves: An empirical review. *Journal of Environmental Chemical Engineering*, 7(3), 103100. <https://doi.org/10.1016/j.jece.2019.103100>
- Ahmad, A., Khan, N., Giri, B. S., Chowdhary, P., & Chaturvedi, P. (2020). Removal of methylene blue dye using rice husk, cow dung and sludge biochar: Characterization, application, and kinetic studies. *Bioresource Technology*, 306(March), 123202. <https://doi.org/10.1016/j.biortech.2020.123202>
- Ahmad, M. A., Ahmed, N. B., Adegoke, K. A., & Bello, O. S. (2019). Sorption studies of methyl red dye removal using lemon grass (*Cymbopogon citratus*). *Chemical Data Collections*, 22, 100249. <https://doi.org/10.1016/j.cdc.2019.100249>
- Al-Aoh, H. A., Aljohani, M. M. H., Darwish, A. A. A., Ayaz Ahmad, M., Bani-Atta, S. A., Alsharif, M. A., Mahrous, Y. M., Mustafa, S. K., Al-Shehri, H. S., Alrawashdeh, L. R., & Al-Tweher, J. N. (2021). A potentially low-cost adsorbent for methylene blue removal from synthetic wastewater. *Desalination and Water Treatment*, 213, 431–440. <https://doi.org/10.5004/dwt.2021.26732>
- Al-Ghouti, M. A., & 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. *Scientific Reports*, 10(1), 1–18. <https://doi.org/10.1038/s41598-020-72996-3>
- Al-Ghouti, M. A., & Da'ana, D. A. (2020). Guidelines for the use and interpretation of adsorption isotherm models: A review. *Journal of Hazardous Materials*, 393(November 2019), 122383. <https://doi.org/10.1016/j.jhazmat.2020.122383>
- Al-Maliky, E. A., Gzar, H. A., & Al-Azawy, M. G. (2021). Determination of Point of Zero Charge (PZC) of Concrete Particles Adsorbents. *IOP Conference Series: Materials Science and Engineering*, 1184(1), 012004. <https://doi.org/10.1088/1757-899x/1184/1/012004>
- Anh, N. T. H., Phuc, T. T., An, T. N. M., Hue, P. Q., & Van Cuong, N. (2020). Microwave-assisted preparation of magnetic citric acid-sugarcane bagasse for removal of textile dyes. *Indonesian Journal of Chemistry*, 20(5), 1101–1109. <https://doi.org/10.22146/ijc.48713>

- Asgher, M. (2012). Biosorption of Reactive Dyes : A Review. *Water Air Soil Pollution, March 2011*, 2417–2435. <https://doi.org/10.1007/s11270-011-1034-z>
- Banat, F., Al-Asheh, S., & Al-Makhadmeh, L. (2003). Evaluation of the use of raw and activated date pits as potential adsorbents for dye containing waters. *Process Biochemistry*, 39(2), 193–202. [https://doi.org/10.1016/S0032-9592\(03\)00065-7](https://doi.org/10.1016/S0032-9592(03)00065-7)
- Bekele, L. D., Zhang, W., Liu, Y., Duns, G. J., Yu, C., Jin, L., Li, X., Jia, Q., & Chen, J. (2017). Preparation and Characterization of Lemongrass Fiber (*Cymbopogon* species) for Reinforcing Application in Thermoplastic Composites. *Bioresources*, 12(3), 5664–5681. <https://doi.org/10.2307/3708612>
- Bernal-Jácome, L. A., Olvera-Izaguirre, L., García, M. G., Delgado-Delgado, R., & Rodríguez, M. Á. E. (2020). Adsorption of lead (II) from aqueous solution using adsorbents obtained from nanche stone (*byrsonima crassifolia*). *Journal of the Mexican Chemical Society*, 64(4), 301–315. <https://doi.org/10.29356/jmcs.v64i4.1201>
- Bhatti, H. N., Safa, Y., Yakout, S. M., Shair, O. H., Iqbal, M., & Nazir, A. (2020). Efficient removal of dyes using carboxymethyl cellulose / alginate / polyvinyl alcohol / rice husk composite : Adsorption / desorption , kinetics and recycling studies. *International Journal of Biological Macromolecules*, 150, 861–870. <https://doi.org/10.1016/j.ijbiomac.2020.02.093>
- Boehm, H. P. (2002). Surface oxides on carbon and their analysis: A critical assessment. *Carbon*, 40(2), 145–149. [https://doi.org/10.1016/S0008-6223\(01\)00165-8](https://doi.org/10.1016/S0008-6223(01)00165-8)
- Bota, W., & Martosupono, M. (2015). POTENSI SENYAWA MINYAK SEREH WANGI ( CITRONELLA OIL ) DARI TUMBUHAN *Cymbopogon nardus* L . SEBAGAI AGEN ANTIBAKTERI. *Jurnal FT UMJ, November*, 1–8.
- Bulgariu, L., Belén, L., Solomon, O., Iqbal, M., Nisar, J., Adesina, K., Alakhras, F., Kornaros, M., & Anastopoulos, I. (2019). The utilization of leaf-based adsorbents for dyes removal : A review. *Journal of Molecular Liquids*, 276, 728–747. <https://doi.org/10.1016/j.molliq.2018.12.001>
- Bulut, Y., & Aydin, H. (2006). A kinetics and thermodynamics study of methylene blue adsorption on wheat shells. *Desalination*, 194(1–3), 259–267. <https://doi.org/10.1016/j.desal.2005.10.032>
- Chaidir, Z., Furqani, F., Zein, R., & Munaf, E. (2015). Utilization of *Annona muricata* L . seeds as potential adsorbents for the removal of rhodamine B from aqueous solution. *Journal of Chemical and Pharmaceutical Research*, 7(4), 879–888.

- Chaidir, Z., Sagita, D. T., Zein, R., & Munaf, E. (2015). Bioremoval of methyl orange dye using durian fruit ( *Durio zibethinus* ) Murr seeds as biosorbent. *Journal of Chemical and Pharmaceutical Research*, 7(1), 589–599.
- Chen, S., Qin, C., Wang, T., Chen, F., Li, X., Hou, H., & Zhou, M. (2019). Study on the adsorption of dyestuffs with different properties by sludge-rice husk biochar : Adsorption capacity , isotherm , kinetic , thermodynamics and mechanism. *Journal of Molecular Liquids*, 285, 62–74. <https://doi.org/10.1016/j.molliq.2019.04.035>
- Deka, J., Barman, P., Singh, A., Das, H., & Bhattacharyya, K. G. (2021). Plumeria alba (white frangipani) leaf powder as a biomass-based adsorbent for removal of methylene blue in water. *Separation Science and Technology (Philadelphia)*, 00(00), 1–17. <https://doi.org/10.1080/01496395.2021.1928198>
- Derakhshan, Z., Baghapour, M. A., Ranjbar, M., & Faramarzian, M. (2013). Adsorption of Methylene Blue Dye from Aqueous Solutions by Modified Pumice Stone: Kinetics and Equilibrium Studies. *Health Scope*, 2(3), 136–144. <https://doi.org/10.17795/jhealthscope-12492>
- Dinh, V. P., Huynh, T. D. T., Le, H. M., Nguyen, V. D., Dao, V. A., Hung, N. Q., Tuyen, L. A., Lee, S., Yi, J., Nguyen, T. D., & Tan, L. v. (2019). Insight into the adsorption mechanisms of methylene blue and chromium(III) from aqueous solution onto pomelo fruit peel. *RSC Advances*, 9(44), 25847–25860. <https://doi.org/10.1039/c9ra04296b>
- Djenouhat, M., Bendebane, F., Bahloul, L., Samar, M. E. H., & Ismail, F. (2018). Optimization of methylene blue removal by stable emulsified liquid membrane using plackett–burman and box–behnken designs of experiments. *Royal Society Open Science*, 5(2). <https://doi.org/10.1098/rsos.171220>
- Dotto, G. L., Santos, J. M. N., Rodrigues, I. L., Rosa, R., Pavan, F. A., & Lima, E. C. (2015). Adsorption of Methylene Blue by ultrasonic surface modified chitin. *Journal of Colloid and Interface Science*, 446, 133–140. <https://doi.org/10.1016/j.jcis.2015.01.046>
- Elgarahy, A. M., Elwakeel, K. Z., Mohammad, S. H., & Elshoubaky, G. A. (2021). A critical review of biosorption of dyes, heavy metals and metalloids from wastewater as an efficient and green process. *Cleaner Engineering and Technology*, 4(November 2020), 100209. <https://doi.org/10.1016/j.clet.2021.100209>
- El-Naggar, N. E. A., & Rabei, N. H. (2020). Bioprocessing optimization for efficient simultaneous removal of methylene blue and nickel by *Gracilaria* seaweed biomass. *Scientific Reports*, 10(1), 1–21. <https://doi.org/10.1038/s41598-020-74389-y>

- Emam, A. A., Abo Faraha, S. A., Kamal, F. H., Gamal, A. M., & Basseem, M. (2020). Modification and characterization of Nano cellulose crystalline from Eichhornia crassipes using citric acid: An adsorption study. *Carbohydrate Polymers*, 240(March), 116202. <https://doi.org/10.1016/j.carbpol.2020.116202>
- Essekri, A., Hsini, A., Naciri, Y., Laabd, M., Ajmal, Z., el Ouardi, M., Ait Addi, A., & Albourine, A. (2021). Novel citric acid-functionalized brown algae with a high removal efficiency of crystal violet dye from colored wastewaters: insights into equilibrium, adsorption mechanism, and reusability. *International Journal of Phytoremediation*, 23(4), 336–346. <https://doi.org/10.1080/15226514.2020.1813686>
- Fauzia, S., Aziz, H., Dahlan, D., & Zein, R. (2021). Modelling for removal of Cr (VI) and Pb (II) using sago bark (metroxylon sagu) by fixed-bed column method. *Egyptian Journal of Chemistry*, 64(8), 3981–3989. <https://doi.org/10.21608/ejchem.2020.20172.2212>
- Foo, K. Y., & Hameed, B. H. (2010). Insights into the modeling of adsorption isotherm systems. *Chemical Engineering Journal*, 156(1), 2–10. <https://doi.org/10.1016/j.cej.2009.09.013>
- Giraldo, G. A. G., Mantovan, J., Marim, B. M., Kishima, J. O. F., & Mali, S. (2021). Surface Modification of Cellulose from Oat Hull with Citric Acid Using Ultrasonication and Reactive Extrusion Assisted Processes. *Polysaccharides*, 2, 218–233.
- Girão, A. V., Caputo, G., & Ferro, M. C. (2017). Application of Scanning Electron Microscopy–Energy Dispersive X-Ray Spectroscopy (SEM-EDS). *Comprehensive Analytical Chemistry*, 75(November), 153–168. <https://doi.org/10.1016/bs.coac.2016.10.002>
- Girish, C. R. (2019). *Various Impregnation Methods Used for the Surface Modification of the Adsorbent : A Review*. April.
- Guarín, J. R., Moreno-Pirajan, J. C., & Giraldo, L. (2018). Kinetic Study of the Bioadsorption of Methylene Blue on the Surface of the Biomass Obtained from the Algae *D. antarctica*. *Journal of Chemistry*, 2018. <https://doi.org/10.1155/2018/2124845>
- Guo, Y., Liu, C., Ye, R., & Duan, Q. (2020). Advances on water quality detection by uv-vis spectroscopy. *Applied Sciences (Switzerland)*, 10(19), 1–18. <https://doi.org/10.3390/app10196874>
- Gupta, N. K., Gupta, A., Ramteke, P., Sahoo, H., & Sengupta, A. (2019). Biosorption-a green method for the preconcentration of rare earth elements (REEs) from waste solutions: A review. *Journal of Molecular Liquids*, 274, 148–164. <https://doi.org/10.1016/j.molliq.2018.10.134>

- Haque, A. N. M. A., Remadevi, R., & Naebe, M. (2018). Lemongrass (*Cymbopogon*): a review on its structure, properties, applications and recent developments. *Cellulose*, 25(10), 5455–5477. <https://doi.org/10.1007/s10570-018-1965-2>
- Hevira, L., Ighalo, J. O., & Zein, R. (2020). Biosorption of indigo carmine from aqueous solution by Terminalia Catappa shell. *Journal of Environmental Chemical Engineering*, 8(5), 104290. <https://doi.org/10.1016/j.jece.2020.104290>
- Hevira, L., Zilfa, Rahmayeni, Ighalo, J. O., Aziz, H., & Zein, R. (2021). Terminalia catappa shell as low-cost biosorbent for the removal of methylene blue from aqueous solutions. *Journal of Industrial and Engineering Chemistry, September 2020*. <https://doi.org/10.1016/j.jiec.2021.01.028>
- Ho, Y. S., & McKay, G. (1998). A Comparison of chemisorption kinetic models applied to pollutant removal on various sorbents. *Process Safety and Environmental Protection*, 76(4), 332–340. <https://doi.org/10.1205/095758298529696>
- Hoang, M. T., Pham, T. D., Pham, T. T., Nguyen, M. K., Nu, D. T. T., Nguyen, T. H., Bartling, S., & van der Bruggen, B. (2021). Esterification of sugarcane bagasse by citric acid for Pb<sup>2+</sup> adsorption: effect of different chemical pretreatment methods. *Environmental Science and Pollution Research*, 28(10), 11869–11881. <https://doi.org/10.1007/s11356-020-07623-9>
- Hokkanen, S., Bhatnagar, A., & Sillanpää, M. (2016). A review on modification methods to cellulose-based adsorbents to improve adsorption capacity. *Water Research*, 91, 156–173. <https://doi.org/10.1016/j.watres.2016.01.008>
- Hu, Q., & Zhang, Z. (2019). Application of Dubinin–Radushkevich isotherm model at the solid/solution interface: A theoretical analysis. *Journal of Molecular Liquids*, 277, 646–648. <https://doi.org/10.1016/j.molliq.2019.01.005>
- Hussain, M. S., Rehman, R., & Imran, M. (2021). *Isothermal and Kinetic Investigation of Exploring the Potential of Citric Acid-Treated Trapa natans and Citrullus lanatus Peels for Biosorptive Removal of Brilliant Green Dye from Water*. 2021.
- Jawad, A. H., Abdulhameed, A. S., & Mastuli, M. S. (2020). Acid-functionalized biomass material for methylene blue dye removal: a comprehensive adsorption and mechanism study. *Journal of Taibah University for Science*, 14(1), 305–313. <https://doi.org/10.1080/16583655.2020.1736767>
- Jiaqi, Z., Yimin, D., Danyang, L., Shengyun, W., Liling, Z., & Yi, Z. (2019). Synthesis of carboxyl-functionalized magnetic nanoparticle for the removal of methylene blue. *Colloids and Surfaces A: Physicochemical and*

- Engineering Aspects*, 572(March), 58–66.  
<https://doi.org/10.1016/j.colsurfa.2019.03.095>
- Jin, Y., Zeng, C., Lü, Q. F., & Yu, Y. (2019). Efficient adsorption of methylene blue and lead ions in aqueous solutions by 5-sulfosalicylic acid modified lignin. *International Journal of Biological Macromolecules*, 123, 50–58. <https://doi.org/10.1016/j.ijbiomac.2018.10.213>
- Karna, R. R., Noerpel, M. R., Luxton, T. P., & Scheckel, K. G. (2018). Point of zero charge: Role in pyromorphite formation and bioaccessibility of lead and arsenic in phosphate-amended soils. *Soil Systems*, 2(2), 1–19. <https://doi.org/10.3390/soilsystems2020022>
- Kassimi, A. El, Achour, Y., Himri, M. El, Laamari, M. R., & Haddad, M. El. (2021). High efficiency of natural Safiot Clay to remove industrial dyes from aqueous media: Kinetic, isotherm adsorption and thermodynamic studies. *Biointerface Research in Applied Chemistry*, 11(5), 12717–12731. <https://doi.org/10.33263/BRIAC115.1271712731>
- Kavci, E., Erkmen, J., & Bingöl, M. S. (2021). Removal of methylene blue dye from aqueous solution using citric acid modified apricot stone. *Chemical Engineering Communications*, 0(0), 1–16. <https://doi.org/10.1080/00986445.2021.2009812>
- Keirudin, A. A., Zainuddin, N., & Yusof, N. A. (2020). Crosslinked carboxymethyl sago starch/citric acid hydrogel for sorption of  $Pb^{2+}$ ,  $Cu^{2+}$ ,  $Ni^{2+}$  and  $Zn^{2+}$  from aqueous solution. *Polymers*, 12(11), 1–21. <https://doi.org/10.3390/polym12112465>
- KLHK. (2021). Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia No. 6 Tahun 2021 Tentang Tata Cara dan Persyaratan Pengelolaan Limbah Bahan Berbahaya dan Beracun. *KLHK*, 2013–2015.
- Kumar, A., Singh, R., Kumar Upadhyay Sanjay Kumar, S., & Charaya, M. U. (2021). Biosorption: the Removal of Toxic Dyes From Industrial Effluent Using Phytobiomass- a Review. *Plant Archives*, 21(Suppliment-1), 1320–1325. <https://doi.org/10.51470/plantarchives.2021.v21.s1.207>
- Kumoro, A. C., Wardhani, D. H., Retnowati, D. S., & Haryani, K. (2021). A brief review on the characteristics, extraction and potential industrial applications of citronella grass (*Cymbopogon nardus*) and lemongrass (*Cymbopogon citratus*) essential oils. *IOP Conference Series: Materials Science and Engineering*, 1053(1), 012118. <https://doi.org/10.1088/1757-899x/1053/1/012118>
- Kurniawati, D., Bahrizal, Sari, T. K., Adella, F., & Sy, S. (2021). Effect of Contact Time Adsorption of Rhodamine B, Methyl Orange and Methylene Blue Colours on Langsat Shell with Batch Methods. *Journal of Physics:*

- Conference Series*, 1788(1). <https://doi.org/10.1088/1742-6596/1788/1/012008>
- Labaran, A. N., Zango, Z. U., Armaya'u, U., & Garba, Z. N. (2019). Rice Husk as Biosorbent for the Adsorption of Methylene Blue. *Science World Journal*, 14(2), 66–70.
- Lebron, Y. A. R., Moreira, V. R., & Santos, L. V. S. (2019). Studies on dye biosorption enhancement by chemically modified *Fucus vesiculosus*, *Spirulina maxima* and *Chlorella pyrenoidosa* algae. *Journal of Cleaner Production*, 240, 118197. <https://doi.org/10.1016/j.jclepro.2019.118197>
- Lee, S. H., Tahir, P. M., Lum, W. C., Tan, L. P., Bawon, P., Park, B. D., Al Edrus, S. S. A. O., & Abdullah, U. H. (2020). A review on citric acid as green modifying agent and binder for wood. *Polymers*, 12(8). <https://doi.org/10.3390/POLYM12081692>
- Leyva-Ramos, R., Landin-Rodriguez, L. E., Leyva-Ramos, S., & Center, N. A. M.-C. (2012). Modification of corncob with citric acid to enhance its capacity for adsorbing cadmium (II) from water solution. *Chemical Engineering Journal*, 180, 113–120. <https://doi.org/10.1016/j.cej.2011.11.021>
- Liu, L., Fan, S., & Li, Y. (2018). Removal behavior of methylene blue from aqueous solution by tea waste: Kinetics, isotherms and mechanism. *International Journal of Environmental Research and Public Health*, 15(7). <https://doi.org/10.3390/ijerph15071321>
- Lombardo, S., & Thielemans, W. (2019). Thermodynamics of adsorption on nanocellulose surfaces. In *Cellulose* (Vol. 2). Springer Netherlands. <https://doi.org/10.1007/s10570-018-02239-2>
- López, J., Loida, L., Montes, E. R., Martínez, S., & Arturo, V. (2019). Linear and nonlinear kinetic and isotherm adsorption models for arsenic removal by manganese ferrite nanoparticles. *SN Applied Sciences*, 1(8), 1–19. <https://doi.org/10.1007/s42452-019-0977-3>
- Maazinejad, B., Mohammadnia, O., Ali, G. A. M., Makhlof, A. S. H., Nadagouda, M. N., Sillanpää, M., Asiri, A. M., Agarwal, S., Gupta, V. K., & Sadegh, H. (2020). Taguchi L9 (34) orthogonal array study based on methylene blue removal by single-walled carbon nanotubes-amine: Adsorption optimization using the experimental design method, kinetics, equilibrium and thermodynamics. *Journal of Molecular Liquids*, 298, 112001. <https://doi.org/10.1016/j.molliq.2019.112001>
- Madhu, P., Livingston, T. S., & Kanagasabapathy, H. (2018). Flash Pyrolysis of Lemon Grass (*Cymbopogon flexuosus*) for Bio-oil Production in an Electrically Heated Fluidized Bed Reactor. *Waste and Biomass Valorization*, 9(6), 1037–1046. <https://doi.org/10.1007/s12649-017-9872-6>

- Mahadeo, K., & Ejazuddin, D. (2013). Adsorption thermodynamics to clean up wastewater ; critical review. *Review Environment Science Biotechnology*, 25–44. <https://doi.org/10.1007/s11157-012-9273-z>
- Majewska, E., Kozlowska, M., Gruczynska-Sekowska, E., Kowalska, D., & Tarnowska, K. (2019). Lemongrass (*Cymbopogon citratus*) essential oil: Extraction, composition, bioactivity and uses for food preservation - A review. *Polish Journal of Food and Nutrition Sciences*, 69(4), 327–341. <https://doi.org/10.31883/pjfns/113152>
- Mashkoor, F., & Nasar, A. (2020). Magnetized *Tectona grandis* sawdust as a novel adsorbent: preparation, characterization, and utilization for the removal of methylene blue from aqueous solution. *Cellulose*, 27(5), 2613–2635. <https://doi.org/10.1007/s10570-019-02918-8>
- Melo, B. C., Paulino, F. A. A., Cardoso, V. A., Pereira, A. G. B., Fajardo, A. R., & Rodrigues, F. H. A. (2018). Cellulose nanowhiskers improve the methylene blue adsorption capacity of chitosan-g-poly(acrylic acid) hydrogel. *Carbohydrate Polymers*, 181(August 2017), 358–367. <https://doi.org/10.1016/j.carbpol.2017.10.079>
- Mendes, E., & Duarte, N. (2021). Mid-infrared spectroscopy as a valuable tool to tackle food analysis: A literature review on coffee, dairies, honey, olive oil and wine. *Foods*, 10(2), 1–32. <https://doi.org/10.3390/foods10020477>
- Mohammed MA, Shitu A, & Ibrahim A. (2014). Removal of Methylene Blue Using Low Cost Adsorbent: A Review. *Research Journal of Chemical Sciences*, 4(1), 91–102. [www.isca.me](http://www.isca.me)
- Mousavi, S. A., Mehralian, M., Khashij, M., & Parvaneh, S. (2017). Methylene blue removal from aqueous solutions by activated carbon prepared from N. Microphyllum (AC-NM): RSM analysis, isotherms and kinetic studies. *Global Nest Journal*, 19(4), 697–705. <https://doi.org/10.30955/gnj.002422>
- Mpatani, F. M., Aryee, A. A., Kani, A. N., Wen, K., Dovi, E., Qu, L., Li, Z., & Han, R. (2020). Removal of methylene blue from aqueous medium by citrate modified bagasse: Kinetic, Equilibrium and Thermodynamic study. *Bioresource Technology Reports*, 11(May), 100463. <https://doi.org/10.1016/j.biteb.2020.100463>
- Muniyasamy, A., Sivaporul, G., Gopinath, A., Lakshmanan, R., Altaee, A., Achary, A., & Velayudhaperumal Chellam, P. (2020). Process development for the degradation of textile azo dyes (mono-, di-, poly-) by advanced oxidation process - Ozonation: Experimental & partial derivative modelling approach. *Journal of Environmental Management*, 265(April), 110397. <https://doi.org/10.1016/j.jenvman.2020.110397>
- Mushtaq, M., Bhatti, H. N., Iqbal, M., & Noreen, S. (2016). *Eriobotrya japonica* seed biocomposite efficiency for copper adsorption: Isotherms, kinetics,

- thermodynamic and desorption studies. *Journal of Environmental Management*, 176, 21–33. <https://doi.org/10.1016/j.jenvman.2016.03.013>
- Nguyen, D. T., & Pham, Q. T. (2020). A Theoretical and Experimental Study on Esterification of Citric Acid with the Primary Alcohols and the Hydroxyl Groups of Cellulose Chain ( $n = 1\text{--}2$ ) in Parched Condition. *Journal of Chemistry*, 2020. <https://doi.org/10.1155/2020/8825456>
- Nodehi, R., Shayesteh, H., & Rahbar-Kelishami, A. (2021).  $\text{Fe}_3\text{O}_4@\text{NiO}$  core-shell magnetic nanoparticle for highly efficient removal of Alizarin red S anionic dye. *International Journal of Environmental Science and Technology*, 0123456789. <https://doi.org/10.1007/s13762-021-03399-8>
- Oshina, I., & Spigulis, J. (2021). Beer–Lambert law for optical tissue diagnostics: current state of the art and the main limitations. *Journal of Biomedical Optics*, 26(10), 1–17. <https://doi.org/10.1117/1.jbo.26.10.100901>
- Pandey, L. M. (2019). Enhanced adsorption capacity of designed bentonite and alginate beads for the effective removal of methylene blue. *Applied Clay Science*, 169(October 2018), 102–111. <https://doi.org/10.1016/j.clay.2018.12.019>
- Patawat, C., Silakate, K., Chuan-Udom, S., Supanchaiyamat, N., Hunt, A. J., & Ngernyen, Y. (2020). Preparation of activated carbon from *Dipterocarpus alatus* fruit and its application for methylene blue adsorption. *RSC Advances*, 10(36), 21082–21091. <https://doi.org/10.1039/d0ra03427d>
- Patil, S. A., Kumbhar, P. D., Satvekar, B. S., Harale, N. S., Bhise, S. C., Patil, S. K., Sartape, A. S., Kolekar, S. S., & Anuse, M. A. (2022). Adsorption of toxic crystal violet dye from aqueous solution by using waste sugarcane leaf-based activated carbon: isotherm, kinetic and thermodynamic study. *Journal of the Iranian Chemical Society*, 0123456789. <https://doi.org/10.1007/s13738-022-02500-3>
- Putri, K. N. A., Keereerak, A., & Chinpa, W. (2020). Novel cellulose-based biosorbent from lemongrass leaf combined with cellulose acetate for adsorption of crystal violet. *International Journal of Biological Macromolecules*, 156, 762–772. <https://doi.org/10.1016/j.ijbiomac.2020.04.100>
- Rahman-Setayesh, M., Kelishami, A. R., & Shayesteh, H. (2020). *Equilibrium, kinetic, and thermodynamic applications for methylene blue removal using Buxus sempervirens leaf powder as a powerful low-cost adsorbent*. 5(2019), 161–170. <https://doi.org/10.22104/JPST.2020.3909.1160>
- Rahmi, Ismaturrahmi, & Mustafa, I. (2019). Methylene blue removal from water using  $\text{H}_2\text{SO}_4$  crosslinked magnetic chitosan nanocomposite beads. *Microchemical Journal*, 144(July 2018), 397–402. <https://doi.org/10.1016/j.microc.2018.09.032>

- Ramadhani, P., Chaidir, Z., Billian, Z., & Rahmiarti, D. (2020). Shrimp shell (Metapenaeus monoceros) waste as a low-cost adsorbent for metanil yellow dye removal in aqueous solution. *Desalination and Water Treatment*, 197, 413–423. <https://doi.org/10.5004/dwt.2020.25963>
- Saadatkah, N., Carillo Garcia, A., Ackermann, S., Leclerc, P., Latifi, M., Samih, S., Patience, G. S., & Chaouki, J. (2020). Experimental methods in chemical engineering: Thermogravimetric analysis—TGA. *Canadian Journal of Chemical Engineering*, 98(1), 34–43. <https://doi.org/10.1002/cjce.23673>
- Safni, S., Fardila, S., Maizatisna, M., & Zulfarman, Z. (2008). Degradasi Zat Warna Metanil Yellow Secara Sonolisis Dan Fotolisis Dengan Penambahan Tio2-Anatase. *Jurnal Sains Dan Teknologi Farmasi*, 47–51.
- Sahu, S., Pahi, S., Tripathy, S., Singh, S. K., Behera, A., Sahu, U. K., & Patel, R. K. (2020). Adsorption of methylene blue on chemically modified lychee seed biochar: Dynamic, equilibrium, and thermodynamic study. *Journal of Molecular Liquids*, 315, 113743. <https://doi.org/10.1016/j.molliq.2020.113743>
- Sandollah, N. A. S. M., Ghazali, S. A. I. S. M., Wan Ibrahim, W. N., & Rusmin, R. (2020). Adsorption-desorption profile of methylene blue dye on raw and acid activated kaolinite. *Indonesian Journal of Chemistry*, 20(4), 755–765. <https://doi.org/10.22146/ijc.43552>
- Saravanan, A., Sundararaman, T. R., Jeevanantham, S., Karishma, S., Kumar, P. S., & Yaashikaa, P. R. (2020). Effective adsorption of Cu(II) ions on sustainable adsorbent derived from mixed biomass (*Aspergillus campestris* and agro waste): Optimization, isotherm and kinetics study. *Groundwater for Sustainable Development*, 11(June). <https://doi.org/10.1016/j.gsd.2020.100460>
- Soldatkina, L., & Yanar, M. (2021). Equilibrium, kinetic, and thermodynamic studies of cationic dyes adsorption on corn stalks modified by citric acid. *Colloids and Interfaces*, 5(4). <https://doi.org/10.3390/colloids5040052>
- Stavrinou, A., Aggelopoulos, C. A., & Tsakiroglou, C. D. (2018). Exploring the adsorption mechanisms of cationic and anionic dyes onto agricultural waste peels of banana, cucumber and potato: Adsorption kinetics and equilibrium isotherms as a tool. *Journal of Environmental Chemical Engineering*, 6(6), 6958–6970. <https://doi.org/10.1016/j.jece.2018.10.063>
- Sulaswatty, A., Rusli, M. S., Abimanyu, H., & Tursiloadi, S. (2019). Minyak serai wangi: Potensi besar yang perlu perhatian. In *LIPPI Press* (Vol. 9, Issue 2).
- Sutton, M. A., Li, N., Joy, D. C., Reynolds, A. P., & Li, X. (2007). Scanning electron microscopy for quantitative small and large deformation measurements Part I: SEM imaging at magnifications from 200 to 10,000.

- Experimental Mechanics*, 47(6), 775–787. <https://doi.org/10.1007/s11340-007-9042-z>
- Tehrim, A., Dai, M., Wu, X., Umair, M. M., Ali, I., Amjad, M. A., Rong, R., Javaid, S. F., & Peng, C. (2021). Citric acid modified waste cigarette filters for adsorptive removal of methylene blue dye from aqueous solution. *Journal of Applied Polymer Science*, 138(27), 1–12. <https://doi.org/10.1002/app.50655>
- Uddin, Md. T., Rahman, Md. A., Rukanuzzaman, Md., & Islam, Md. A. (2017). A potential low cost adsorbent for the removal of cationic dyes from aqueous solutions. *Applied Water Science*, 7(6), 2831–2842. <https://doi.org/10.1007/s13201-017-0542-4>
- Ullah, R., Ahmad, W., Ahmad, I., Khan, M., Iqbal Khattak, M., & Hussain, F. (2021). Adsorption and recovery of hexavalent chromium from tannery wastewater over magnetic max phase composite. *Separation Science and Technology (Philadelphia)*, 56(3), 439–452. <https://doi.org/10.1080/01496395.2020.1717531>
- Verma, G., & Mishra, M. (2018). Development and Optimization Of UV-Vis Spectroscopy - A Review. *World Journal of Pharmaceutical Research*, 7(11), 1170–1180. <https://doi.org/10.20959/wjpr201811-12333>
- Vifttaria, M., Nurhayati, N., & Anita, S. (2019). Surface Acidity of Sulfuric Acid Activated Maredan Clay Catalysts with Boehm Titration Method and Pyridine Adsorption-FTIR. *Journal of Physics: Conference Series*, 1351(1). <https://doi.org/10.1088/1742-6596/1351/1/012040>
- Wang, R., & Wang, Y. (2021). *Fourier Transform Infrared Spectroscopy in Oral Cancer Diagnosis*.
- Wang, X. S., & Qin, Y. (2005). Equilibrium sorption isotherms for of Cu 2+ on rice bran. *Process Biochemistry*, 40(2), 677–680. <https://doi.org/10.1016/j.procbio.2004.01.043>
- Wifek, M., Saeed, A., Rehman, R., & Nisar, S. (2016). Lemongrass: a review on its botany, properties, applications and active components. *Ijcb*, 9(October 2019), 79–84. [www.iscientific.org/Journal.html](http://www.iscientific.org/Journal.html)
- Wong, S., Tumari, H. H., Ngadi, N., Mohamed, N. B., Hassan, O., Mat, R., & Saidina Amin, N. A. (2019). Adsorption of anionic dyes on spent tea leaves modified with polyethyleneimine (PEI-STL). *Journal of Cleaner Production*, 206, 394–406. <https://doi.org/10.1016/j.jclepro.2018.09.201>
- Wu, H., Lu, W., Chen, Y., Zhang, P., & Cheng, X. (2020). Application of Boehm Titration for the Quantitative Measurement of Soot Oxygen Functional Groups. *Energy and Fuels*, 34(6), 7363–7372. <https://doi.org/10.1021/acs.energyfuels.0c00904>

- Xia, X., Lan, S., Li, X., Xie, Y., Liang, Y., Yan, P., Chen, Z., & Xing, Y. (2018). Characterization and coagulation-flocculation performance of a composite flocculant in high-turbidity drinking water treatment. *Chemosphere*, 206, 701–708. <https://doi.org/10.1016/j.chemosphere.2018.04.159>
- Xu, Y., Liu, Y., Liu, S., Tan, X., Zeng, G., Zeng, W., Ding, Y., Cao, W., & Zheng, B. (2016). Enhanced adsorption of methylene blue by citric acid modification of biochar derived from water hyacinth (*Eichornia crassipes*). *Environmental Science and Pollution Research*, 23(23), 23606–23618. <https://doi.org/10.1007/s11356-016-7572-6>
- Zein, R., Astuti, A. W., Wahyuni, D., Furqani, F., & June, M. (2015). Removal of Methyl Red from Aqueous Solution by Neplhelium lappaceum. *Research Journal of Pharmaceutical, Biological and Chemical Sciences*, October 2019, 86–94.
- Zein, R., Purnomo, J. S., Ramadhani, P., Alif, M. F., & Safni, S. (2022). Lemongrass (*Cymbopogon nardus*) leaves biowaste as an effective and low-cost adsorbent for methylene blue dyes removal: isotherms, kinetics, and thermodynamics studies. *Separation Science and Technology*, 1–17. <https://doi.org/10.1080/01496395.2022.2058549>
- Zein, R., Ramadhani, P., Aziz, H., & Suhaili, R. (2019). Biosorben cangkang pensi (*Corbicula moltkiana*) sebagai penyerap zat warna metanil yellow ditinjau dari pH dan model kesetimbangan adsorbs. *Jurnal Litbang Industri*, 15–22.
- Zein, R., Tomi, Z. B., Fauzia, S., & Zilfa, Z. (2020). Modification of rice husk silica with bovine serum albumin (BSA) for improvement in adsorption of metanil yellow dye. *Journal of the Iranian Chemical Society*, 0123456789. <https://doi.org/10.1007/s13738-020-01955-6>
- Zhang, H., Zhou, J., Muhammad, Y., Tang, R., Liu, K., & Zhu, Y. (2019). Citric Acid Modified Bentonite for Congo Red Adsorption. 6(February), 1–11. <https://doi.org/10.3389/fmats.2019.00005>
- Zhou, Y., Zhang, R., Gu, X., & Lu, J. (2015). Adsorption of Divalent Heavy Metal Ions from Aqueous Solution by Citric Acid Modified Pine Sawdust. *Separation Science and Technology (Philadelphia)*, 50(2), 245–252. <https://doi.org/10.1080/01496395.2014.956223>
- Zoroufchi, K., Motalebi, A., Mcphedran, K. N., & Soltan, J. (2020). Treatment of aqueous arsenic – A review of biosorbent preparation methods. *Journal of Environmental Management*, 273(June), 111126. <https://doi.org/10.1016/j.jenvman.2020.111126>

# Tesis Jofi Satrio Purnomo

by Jofi Satrio

**Submission date:** 16-Jul-2022 12:16PM (UTC +0800)

**Submission ID:** 1871115797

**File name:** Tesis\_OKE.pdf (2.32M)

**Word count:** 29225

**Character count:** 161704

# Tesis Jofi Satrio Purnomo

## ORIGINALITY REPORT

0  
%

SIMILARITY INDEX

0  
%

INTERNET SOURCES

0  
%

PUBLICATIONS

0  
%

STUDENT PAPERS

PRIMARY SOURCES

Exclude quotes      On

Exclude matches      < 3%

Exclude bibliography      On

Padang, 26 Juli 2022

Validator Turnitin

Departemen Kimia FMIPA Universitas Andalas



Dr. Eng. Matlal Fajri Alif, M.Si

NIP. 198207242014041002