

DAFTAR PUSTAKA

1. Indrayani, L. Pengolahan Limbah Cair Industri Batik Sebagai Salah Satu Percontohan IPAL Batik Di Yogyakarta. 2018, 12 (2), 173–184.
2. Amal MSK; Febiyanto F; Soleh A; Afif M. Elektrodekolorisasi Limbah Cair Pewarna Batik dengan Memanfaatkan Batang Karbon dari Limbah Baterai Bekas. *J. MIPA* 2016, 39 (2), 135–142.
3. Saigl, Z. M. Various Adsorbents for Removal of Rhodamine B Dye: A Review. *Indones. J. Chem.* 2021, 21 (4), 1039–1056.
4. Wierzbicka, E.; Ku mierek, K.; wi tkowski, A.; Legocka, I. Efficient Rhodamine B Dye Removal from Water by Acid- and Organo-Modified Halloysites. *Minerals* 2022, 12 (3).
5. Ulya, A.; Nasra, E.; Amran, A.; Kurniawati, D. Adsorpsi Zat Warna Rhodamine B Dengan Karbon Aktif Kulit Durian Sebagai Adsorben. *Periodic* 2022, 11 (2), 74–77.
6. Sausan, F. W.; Puspitasari, A. R.; Yanuarita P, D. Studi Literatur Pengolahan Warna pada Limbah Cair Industri Tekstil Menggunakan Metode Proses Adsorpsi, Filtrasi, dan Elektrolisis. *J. Tecnoscienza* 2021, 5 (2), 213.
7. RI, K. L. H. Keputusan Menteri Lingkungan Hidup KEP-51/MENLH/10/1995. *Kementeri. Lingkung. Hidup* 1995, 49.
8. Vigneshwaran, S.; Sirajudheen, P.; Karthikeyan, P.; Meenakshi, S. Fabrication of Sulfur-Doped Biochar Derived from Tapioca Peel Waste with Superior Adsorption Performance for The Removal of Malachite Green and Rhodamine B dyes. *Surfaces and Interfaces* 2021, 23 (November 2020), 100920.
9. Yu, Y.; Murthy, B. N.; Shapter, J. G.; Constantopoulos, K. T.; Voelcker, N. H.; Ellis, A. V. Benzene Carboxylic Acid Derivatized Graphene Oxide Nanosheets on Natural Zeolites as Effective Adsorbents for Cationic Dye Removal. *J. Hazard. Mater.* 2013, 260, 330–338.
10. Ramadhani, P.; Chaidir, Z.; Zilfa; Tomi, Z. B.; Rahmiarti, D.; Zein, R. Shrimp Shell (*Metapenaeus monoceros*) Waste as a Low-cost Adsorbent for Metanil Yellow Dye Removal in Aqueous Solution. *Desalin. Water Treat.* 2020, 197, 413–423.
11. Zein, R.; Wardana, N.; Refilda, R.; Aziz, H. Kulit Salak Sebagai Biosorben Potensial Untuk Pengolahan Timbal(II) Dan Cadmium(II) Dalam Larutan. *Chim. Nat. Acta* 2018, 6 (2), 56.
12. Purnomo, Jofi Satrio, Zein, Rahmiana Ramadhani, Putri, Alif, Matlal Fajri, S. Lemongrass (*Cymbopogon nardus*) Leaves Biowaste as an Effective and Low-cost Adsorbent for Methylene Blue Dyes Removal: Isotherms, Kinetics, and Thermodynamics Studies. *Pesqui. Vet. Bras.* 2022, 26 (2), 173–180.
13. Kurniawati, D.; Zein, R.; Chaidir, Z.; Aziz, H. The Study of Blocking Agent on Lengkeng (*Euphoria Logan Lour*) Fruit Shell and Seed for Adsorption of Pb (II) from Aqueous Solution. *IOP Conf. Ser. Mater. Sci. Eng.* 2018, 335 (1).
14. Fauzia, S.; Aziz, H.; Dahlan, D.; Zein, R. Study of Equilibrium, Kinetic and Thermodynamic for Removal of Pb(II) in Aqueous Solution Using Sago Bark (*Metroxylon sago*). *AIP Conf. Proc.* 2018, 2023 (li).
15. Rahmiana Zein, Imran Nazar, Z. Aplikasi Teknik Biosorpsi Menggunakan Biosorben Kulit Batang Sagu, Arang Aktif Kulit Buah Kakao dan Cangkang Langkitang untuk Mengolah Air Limbah CPO. 2018, 2014 (2), 73–81.
16. Hevira, L.; Rahmi, A.; Zein, R.; Zilfa, Z.; Rahmayeni, R. The Fast and of Low-Cost-Adsorbent to The Removal of Cationic and Anionic Dye Using Chicken Eggshell With Its Membrane. *Mediterr. J. Chem.* 2020, 10 (3), 294–301.
17. Zein, R.; Syukri, S.; Muhammad, M.; Pratiwi, I.; Yutaro, D. R. The ability of Pensi

- (Corbicula moltkiana) Shell to Adsorb Cd(II) and Cr(VI) Ions. *AIP Conf. Proc.* 2018, 2023 (October 2018).
18. Chaidir, Z.; Furqani, F.; Zein, R.; Munaf, E. Utilization of *Annona muricata L.* Seeds as Potential Adsorbents for The Removal of Rhodamine B from Aqueous Solution. *J. Chem. Pharm. Res.*, 2015, 7 (4) 879-888 2015, 7 (4), 879–888.
 19. Rahmiana Zein, Mutia Khuratul Aini, H. A. *Pemanfaatan Cangkang Pensi (Corbicula Moltkiana) sebagai Bahan Penyerap Zat Warna Rhodamin B dalam Larutan*; Universitas Sumatera Utara, 2017; Vol. 87.
 20. Kooh, M. R. R.; Dahri, M. K.; Lim, L. B. L. The Removal of Rhodamine B Dye from Aqueous Solution using *Casuarina equisetifolia* Needles as Adsorbent. *Cogent Environ. Sci.* 2016, 2 (1), 1–14.
 21. Debora Luiza Postai, Carla Albertina Demarchi, Francielle Zenatta, Danielle Caroline Cipriani Melo, C. A. R. Adsorption of Rhodamine B and Methylene Blue Dyes using Waste of Seeds *Aleurites Moluccane*, a Low Cost Adsorbent. Elsevier 2016, hal 1713–1723.
 22. Matias, C. A.; Guisolphi Gomes De Oliveira, L. J.; Geremias, R.; Stolberg, J. Biosorption of Rhodamine B from Aqueous Solution using *Araucaria angustifolia* Sterile Bracts. *Rev. Int. Contam. Ambient.* 2020, 36 (1), 97–104.
 23. Kurniawati, S.; Indriyanti, N. Y. Adsorption of Anionic and Cationic Dyes in Batik Wastewater Using Biomass Adsorbents: Literature Review. *JKPK (Jurnal Kim. dan Pendidik. Kim.* 2021, 6 (3), 274.
 24. Mohd-Asharuddin, S.; Othman, N.; Mohd Zin, N. S.; Tajarudin, H. A. A Chemical and Morphological Study of Cassava Peel: A Potential Waste as Coagulant Aid. *MATEC Web Conf.* 2017, 103 (April).
 25. Irawati, H.; Aprilita, N. H.; Sugiharto, E. Adsorpsi Zat Warna Kristal Violet Menggunakan Limbah Kulit Singkong (*Manihot esculenta*). *Bimipa* 2018, 25 (1), 17–31.
 26. Firdaus, N. R.; Hayati, P. D.; Yusniwati. Karakterisasi Fenotipik Ubi Kayu (*Manihot esculenta* Crantz) Lokal Sumatera Barat. *J. Agroteknologi* 2016, 10 (01), 104–116.
 27. Ilham, K. P. Pengaruh Konsentrasi Ragi Tempe dan Lama Fermentasi Terhadap Kualitas Tepung Mocaf (Modified Cassava Flour). *Dr. Dissertation, Univ. UMP* 2017, 7–27.
 28. Devy, N. F.; Syarif, A. A.; Aryawita. Identification of Morphology and Quality Character Determinant of Local Cassava (*Manihot esculenta* Crantz) Germplasm from West Sumatra. *Bul. Plasma Nutfah* 2018, 24 (1), 53–62.
 29. Masadatul Jannah. Penambahan Jenis Serbuk Kayu Pada Penjernihan Limbah Cair Industri Batik Dengan Penerapannya Sebagai Bahan Pembelajaran Masyarakat Pengrajin Batik. *J. Pendidik. dan Pemebelajaran Biol.* 2017, 87 (1,2), 149–200.
 30. Laili, N. N.; Aji, M. P.; Sulhadi, S. Analisis Sifat Adsorpsi Karbon Aktif Kayu Dan Tempurung Kelapa Pada Limbah Cair Batik Di Kota Pekalongan. 2017, VI, SNF2017-MPS-87-SNF2017-MPS-92.
 31. Herfiani, Z. H.; Rezagama, A.; Nur, M. Pengolahan Limbah Cair Zat Warna Jenis Indigosol Blue (C.I Vat Blue 4) Sebagai Hasil Produksi Kain Batik Menggunakan Metode Ozonasi Dan Adsorpsi Arang Aktif Batok Kelapa Terhadap Parameter Cod Dan Warna. *J. Tek. Lingkung.* 2017, 6 (3), 1–10.
 32. Wulandari, S.; Rahma, A. N. U. R.; Wahyuni, S. Analisa Zat Warna Rhodamin B Pada Liptint dengan Metode Spektrofotometri UV-VIS Analysis Of Rhodamine B Dyestuffs On Liptint Using Uv-Vis Spectrophotometry Method. 2023, 5 (2).
 33. Hevira, L.; Zilfa; Rahmayeni; Ighalo, J. O.; Zein, R. Biosorption of Indigo Carmine from Aqueous Solution by *Terminalia Catappa* shell. *J. Environ. Chem. Eng.*

- 2020, 8 (5), 104290.
34. Gupta, N. K.; Gupta, A.; Ramteke, P.; Sahoo, H.; Sengupta, A. Biosorption-a Green Method for The Preconcentration of Rare Earth Elements (REEs) from Waste Solutions: A review. *J. Mol. Liq.* 2019, 274, 148–164.
 35. Papaoikonomou, L.; Labanaris, K.; Kaderides, K.; Goula, A. M. Adsorption–Desorption of Phenolic Compounds from Olive Mill Wastewater Using a Novel Low-cost Biosorbent. *Environ. Sci. Pollut. Res.* 2021, 28 (19), 24230–24244..
 36. Hevira, L.; Zilfa; Rahmayeni; Ighalo, J. O.; Aziz, H.; Zein, R. Terminalia Catappa Shell as Low-cost Biosorbent for The Removal of Methylene Blue from Aqueous Solutions. *J. Ind. Eng. Chem.* 2021, 97, 188–199.
 37. Apriliani, A. Pemanfaatan Arang Ampas Tebu sebagai Adsorben Ion Logam Cd, Cr, Cu dan Pb dalam Air Limbah. *Repositoy UIN* 2010, 54–56.
 38. Al-Maliky, E. A.; Gzar, H. A.; Al-Azawy, M. G. Determination of Point of Zero Charge (PZC) of Concrete Particles Adsorbents. *IOP Conf. Ser. Mater. Sci. Eng.* 2021, 1184 (1), 012004.
 39. Yadav, V. B.; Gadi, R.; Kalra, S. Adsorption of Lead on Clay-CNT Nanocomposite in Aqueous Media by UV-Vis Spectrophotometer: Kinetics and Thermodynamic Studies. *Emergent Mater.* 2019, 2 (4), 441–451.
 40. Rahmiana Zein, Putri Ramadhani, Hermansyah Aziz, R. S. Biosorben Cangkang Pensi (*Corbicula moltkiana*) sebagai Penyerap Zat Warna Metanil Yellow Ditinjau dari pH dan Model Kesetimbangan Adsorpsi. *J. Litbang Ind.* 2019, 9 (2), 23–31.
 41. Zein, R.; Chadir, Z.; Zilfa, Z.; Fauzia, S.; Ramadhani, P. Isotherm and Kinetic Studies on the Adsorption Behavior of Metanil Yellow Dyes onto Modified Shrimp Shell-Polyethylenimine (SS-PEI). *J. Kim. Val.* 2022, 8 (1), 10–22.
 42. Elayadi, F.; Boumya, W.; Achak, M.; Chhiti, Y.; Alaoui, F. E. M. hamd.; Barka, N.; Adlouni, C. El. Experimental and Modeling Studies of The Removal of Phenolic Compounds from Olive Mill Wastewater by Adsorption on Sugarcane Bagasse. *Environ. Challenges* 2021, 4 (April), 100184.
 43. Mandal, A.; Mukhopadhyay, P.; Das, S. K. Adsorptive Removal of Phenol From Wastewater Using Guava Tree Bark. *Environ. Sci. Pollut. Res.* 2020, 27 (19), 23937–23949.
 44. Abubakar, A.; Sabo, I. A.; Yahuza, S. Thermodynamics Modelling of Lead (II) Biosorption using *Cystoseira stricta* Biomass. *Bioremediation Sci. Technol. Res.* 2020, 8 (2), 21–23.
 45. Zaib, M.; Athar, M. M.; Saeed, A.; Farooq, U.; Salman, M.; Makshoof, M. N. Equilibrium, Kinetic and Thermodynamic Biosorption Studies of Hg(II) on Red Algal Biomass of *Porphyridium Cruentum*. *Green Chem. Lett. Rev.* 2016, 9 (4), 179–189.
 46. Zghal, S.; Jedidi, I.; Cretin, M.; Cerneaux, S.; Abdelmouleh, M. Adsorptive Removal of Rhodamine B Dye Using Carbon Graphite/CNT Composites as Adsorbents: Kinetics, Isotherms and Thermodynamic Study. *Materials (Basel).* 2023, 16 (3).
 47. Angraini, N.; Yanti, F. Penggunaan Spektrofotometer Uv-Vis Untuk Analisis Nutrien Fosfat Pada Sedimen Dalam Rangka Pengembangan Modul Praktikum Oseanografi Kimia. *J. Penelit. Sains* 2021, 23 (2), 78.
 48. Suhartati, T. Dasar - Dasar Spektrofotometri Massa untuk Penentuan Struktur Senyawa Organik. *Perpust. Nas. RI Katalog Dalam Terbit.* 2017, 4 (1), 88–100.
 49. Fahira, S. M.; Dwi Ananto, A.; Hajrin, W. Analisis Kandungan Hidrokuinon dalam Krim Pemutih yang Beredar di Beberapa Pasar Kota Mataram dengan Spektrofotometri Ultraviolet-Visibel. *Spin* 2021, 3 (1), 75–84.
 50. Warono, D.; Syamsudin. Unjuk Kerja Spektrofotometer Analisa Zat Aktif Ketoprofein. *Konversi* 2013, 2, 60.

51. Nurazzi, N. M.; Asyraf, M. R. M.; Rayung, M.; Norrrahim, M. N. F.; Shazleen, S. S.; Rani, M. S. A.; Shafi, A. R.; Aisyah, H. A.; Radzi, M. H. M.; Sabaruddin, F. A.; Ilyas, R. A.; Zainudin, E. S.; Abdan, K. Thermogravimetric analysis properties of cellulosic natural fiber polymer composites: A review on influence of chemical treatments. *Polymers (Basel)*. 2021, 13 (16).
52. Sulistyani, M.; Huda, N. Perbandingan Metode Transmisi dan Reflektansi Pada Pengukuran Polistirena Menggunakan Instrumentasi Spektroskopi Fourier Transform Infra Red. *Indones. J. Chem. Sci.* 2018, 7 (2), 195–198.
53. Komar Sutriah, Zainal Alim Mas'ud, T. T. I. Pengaruh Teknik Sintesis Terhadap Kualitas Produk Fattyamina Sekunder. 2011.
54. Kiswandono, A. A.; Girsang, E.; Pulungan, Ahmad Nasir Sihombing, J. L.; Siswanta, D.; Aprilita, N. H.; Santosa, S. J.; Hayashita, T. Kajian Spektra FTIR pada Membran Kopoli (Eugenol-Divinilbenzena), Co-Edvb Sebagai Senyawa Pembawa untuk Transpor Fenol. *Pros. Semin. Nas. Pendidik. Sains* 2015, No. November, 543–554.
55. Mohammad Rafi, Widia Citra Anggundari, T. T. I. Potensi Spektroskopi FT-IR_ATR dan Kemometrik untuk Membedakan Rambut Babi, Kambing dan Sapi. *Edaj* 2016, 5 (3), 3–8.
56. Nandiyanto, A. B. D.; Oktiani, R.; Ragadhita, R. How to Read and Interpret FTIR Spectroscopic of Organic Material. *Indones. J. Sci. Technol.* 2019, 4 (1), 97–118.
57. Sari, W. P.; Sumantri, D.; Imam, D. N. A. Pemeriksaan Komposisi Glass Fiber Komersial Dengan Teknik X-Ray Fluorescence Spectrometer (Xrf). *B-Dent, J. Kedokt. Gigi Univ. Baiturrahmah* 2018, 1 (2), 155–160.
58. Muliawan, A. Studi Awal Bahan Dasar Piranti Solar Cell Pada Pasir Sambera Muara Badak Menggunakan XRF dan XRD. *J. Tek. Mesin Univ. Muhammadiyah Metro* 2017, 6 (2), 117–122.
59. Julinawati, J.; Marlina, M.; Nasution, R.; Sheilatina, S. Applying SEM-EDX Techniques to Identifying the Types of Mineral of Jades (Giok) Takengon, Aceh. *J. Nat. Unsyiah* 2015, 15 (2), 116128.
60. Mohan, C. *A Guide for The Preparation and Use of Buffers in Biological Systems*; 2003.
61. Inyinbor, A. A.; Adekola, F. A.; Olatunji, G. A. Adsorption of rhodamine b dye from aqueous solution on Irvingia gabonensis biomass: Kinetics and thermodynamics studies. *South African J. Chem.* 2015, 68 (1), 115–125.
62. Yulianto, M.; Sitorus, S.; Gunawan, R. Decreasing of Phenol Concentration in Balikpapan Sea Water Polluted. *J. At.* 2020, 5 (1), 6–10.
63. Munaf, E.; Zein, R.; Kurniadi, R.; Kurniadi, I. The Use of Rice Husk for Removal of Phenol from Waste Water as Studied using 4-aminoantipyrine Spectrophotometric Method. *Environ. Technol. (United Kingdom)* 1997, 18 (3), 355–358.
64. Mousavi, S. A.; Kamarehie, B.; Almasi, A.; Darvishmotevalli, M.; Salari, M.; Moradnia, M.; Azimi, F.; Ghaderpoori, M.; Neyazi, Z.; Karami, M. A. Removal of Rhodamine B from Aqueous Solution by Stalk Corn Activated Carbon: Adsorption and Kinetic Study. *Biomass Convers. Biorefinery* 2021.
65. Topare, N. S.; Surange, S.; Chaudhari, A.; Raut-jadhav, S.; Khedkar, S. V; Bokil, S. A. Adsorption of Rhodamine-B by using Citrus Peel Powder: Influence of Operating Parameters. 2020, 97 (11), 2188–2194.
66. Selvakumar, A.; Rangabhashiyam, S. Biosorption of Rhodamine B onto Novel Biosorbents from Kappaphycus alvarezii, Gracilaria salicornia and Gracilaria edulis. *Environ. Pollut.* 2019, 255, 113291.
67. enol, Z. M.; Messaoudi, N. El; Fernine, Y.; Keskin, Z. S. Bioremoval of Rhodamine B Dye from Aqueous Solution by using Agricultural Solid Waste

- (Almond Shell): Experimental and DFT Modeling Studies. *Biomass Convers. Biorefinery* 2023, No. February.
68. Purwiandono, G.; Lestari, P.; Widodo, W.; Marlina, M.; Aprilia, N. Adsorption Isotherm Studies of Rhodamine B on Citrus sinesis Peel. *Indones. J. Chem. Res.* 2018, 3 (1), 47–53.
 69. Saruchi; Kumar, V. Adsorption Kinetics and Isotherms for The Removal of Rhodamine B Dye and Pb+2 Ions from Aqueous Solutions by a Hybrid Ion-Exchanger. *Arab. J. Chem.* 2019, 12 (3), 316–329.
 70. Gul, S.; Gul, H.; Gul, M.; Khattak, R.; Rukh, G.; Khan, M. S.; Aouissi, H. A. Enhanced Adsorption of Rhodamine B on Biomass of Cypress/False Cypress (*Chamaecyparis lawsoniana*) Fruit: Optimization and Kinetic Study. *Water (Switzerland)* 2022, 14 (19).
 71. Daouda, A.; Tokodne Honorine, A.; Guy Bertrand, N.; Richard, D. Adsorption of Rhodamine B onto Orange Peel Powder. *Am. J. Chem.* 2019, 2019 (5), 142–149.
 72. Prakasam, T.; Reddy, P. N. Correlation Investigation on The Adsorption Kinetics and Thermodynamics of Dyes onto Acid Triggered Low Cost Carbon. 2014, 2 (3).
 73. Kausar, A.; Shahzad, R.; Asim, S.; BiBi, S.; Iqbal, J.; Muhammad, N.; Sillanpaa, M.; Din, I. U. Experimental and Theoretical Studies of Rhodamine B Direct Dye Sorption onto Clay-Cellulose Composite. *J. Mol. Liq.* 2021, 328, 115165.
 74. Alvarado, N.; Abarca, R. L.; Urdaneta, J.; Romero, J.; Galotto, M. J.; Guarda, A. Cassava Starch: Structural Modification for Development of a Bio-Adsorber for Aqueous Pollutants. Characterization and Adsorption Studies on Methylene Blue. *Polym. Bull.* 2021, 78 (2), 1087–1107.
 75. Beakou, B. H.; El Hassani, K.; Houssaini, M. A.; Belbahloul, M.; Oukani, E.; Anouar, A. Novel activated carbon from Manihot esculenta Crantz for Removal of Methylene Blue. *Sustain. Environ. Res.* 2017, 27 (5), 215–222.
 76. Oyekanmi, A. A.; Ahmad, A.; Hossain, K.; Rafatullah, M. Adsorption of Rhodamine B Dye from Aqueous Solution onto Acid Treated Banana Peel: Response Surface Methodology, Kinetics and Isotherm Studies. *PLoS One* 2019, 14 (5), 1–20.
 77. Dahri, M. K.; Kooh, M. R. R.; Lim, L. B. L. Application of Casuarina equisetifolia Needle for The Removal of Methylene Blue and Malachite Green Dyes from Aqueous Solution. *Alexandria Eng. J.* 2015, 54 (4), 1253–1263.
 78. Z. M. Abou-Gamra and H. A.A. Medien. Kinetic , Thermodynamic and Equilibrium Studies of Rhodamine B Adsorption By Low Cost Biosorbent Sugar Cane Bagasse. 2013, 2 (7), 417–422.
 79. Baig, M. M.; Yousuf, M. A.; Alsafari, I. A.; Ali, M.; Agboola, P. O.; Shakir, I.; Haider, S.; Warsi, M. F. New Mesostructured Origami Silica Matrix: A Nano-Platform for Highly Retentive and pH-Controlled Delivery System. *J. Taibah Univ. Sci.* 2021, 15 (1), 133–144.