

## DAFTAR PUSTAKA

- Afraz, V., Younesi, H., Bolandi, M., & Hadiani, M. R. (2020). Optimization of lead and cadmium biosorption by *Lactobacillus acidophilus* using response surface methodology. *Biocatalysis and Agricultural Biotechnology*, 29(June), 101828. <https://doi.org/10.1016/j.bcab.2020.101828>
- Ahmadi, H., Hafiz, S. S., Sharifi, H., Rene, N. N., Habibi, S. S., & Hussain, S. (2022). Low cost biosorbent (Melon Peel) for effective removal of Cu (II), Cd (II), and Pb (II) ions from aqueous solution. *Case Studies in Chemical and Environmental Engineering*, 6(August), 100242. <https://doi.org/10.1016/j.cscee.2022.100242>
- 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>
- Apelblat, A. (2014). *Citric Acid*. Springer Cham Heidelberg New York Dordrecht London. <https://doi.org/10.1007/978-3-319-11233-6>
- Arifiyana, D., & Devianti, V. A. (2021). Biosorption of Fe (II) Ions from Aqueous Solution Using Kepok Banana Peel (*Musa Acuminata*). *Jurnal Kimia Dan Pendidikan Kimia (JKPK)*, 6(2), 206–215.
- Bakatula, E. N., Richard, D., Neculita, C. M., & Zagury, G. J. (2018). Determination of point of zero charge of natural organic materials. *Environmental Science and Pollution Research*, 25(8), 7823–7833. <https://doi.org/10.1007/s11356-017-1115-7>
- Barsbay, M., Kavaklı, P. A., Tilki, S., Kavaklı, C., & Güven, O. (2018). Porous cellulosic adsorbent for the removal of Cd (II), Pb(II) and Cu(II) ions from aqueous media. *Radiation Physics and Chemistry*, 142(October 2016), 70–76. <https://doi.org/10.1016/j.radphyschem.2017.03.037>
- Basu, M., Guha, A. K., & Ray, L. (2017). Adsorption of Lead on Cucumber Peel. *Journal of Cleaner Production*, 151, 603–615. <https://doi.org/10.1016/j.jclepro.2017.03.028>

- Bilal, M., Kazi, T. G., Afridi, H. I., Arain, M. B., Baig, J. A., Khan, M., & Khan, N. (2016). Application of conventional and modified cloud point extraction for simultaneous enrichment of cadmium, lead and copper in lake water and fish muscles. *Journal of Industrial and Engineering Chemistry*, 40(February), 137–144. <https://doi.org/10.1016/j.jiec.2016.06.015>
- Boss, C. B., & Fredeen, K. J. (1997). Concepts, Instrumentation and Techniques in Atomic Absorption Spectrophotometry. In *North*. The Perkin-Elmer Corporation.
- Cheng, Y., Yang, C., He, H., Zeng, G., Zhao, K., & Yan, Z. (2015). Biosorption of Pb(II) Ions from Aqueous Solutions by Waste Biomass from Biotrickling Filters: Kinetics, Isotherms, and Thermodynamics. *Journal of Environmental Engineering*, 142(9), 1–7. [https://doi.org/10.1061/\(asce\)ee.1943-7870.0000956](https://doi.org/10.1061/(asce)ee.1943-7870.0000956)
- Deshmukh, P. D., Khadse, G. K., Shinde, V. M., & Labhasetwar, P. (2017). Cadmium Removal from Aqueous Solutions Using Dried Banana Peels as An Adsorbent: Kinetics and Equilibrium Modeling. *Journal of Bioremediation & Biodegradation*, 08(03). <https://doi.org/10.4172/2155-6199.1000395>
- Deswati, Pardi, H., Suyani, H., & Zein, R. (2016). Adsorptive cathodic stripping voltammetric method with alizarin for the simultaneous determination of cadmium, and zinc in water samples. *Oriental Journal of Chemistry*, 32(6), 3071–3080. <https://doi.org/10.13005/ojc/320628>
- Fauzia, S., Aziz, H., Dahlan, D., & Zein, R. (2018). Study of equilibrium, kinetic and thermodynamic for removal of Pb(II) in aqueous solution using Sago bark (Metroxylon sago). *AIP Conference Proceedings*, 2023(Ii). <https://doi.org/10.1063/1.5064078>
- Fauzia, S., Aziz, H., Dahlan, D., & Zein, R. (2019). The feasibility of Sago Bark (Metroxylon sago) IN Cu(II) removal: Batch and fixed bed column evaluation. *Rasayan Journal of Chemistry*, 12(4), 1889–1900. <https://doi.org/10.31788/RJC.2019.1245444>
- Fauzia, Syiffa, Aziz, H., Dahlan, D., Namieśnik, J., & Zein, R. (2019). Adsorption of Cr(VI) in aqueous solution using sago bark (metroxylon sago) as a new

- potential biosorbent. *Desalination and Water Treatment*, 147, 191–202.  
<https://doi.org/10.5004/dwt.2019.23577>
- Feng, N., Guo, X., Liang, S., Zhu, Y., & Liu, J. (2011). Biosorption of heavy metals from aqueous solutions by chemically modified orange peel. *Journal of Hazardous Materials*, 185(1), 49–54.  
<https://doi.org/10.1016/j.jhazmat.2010.08.114>
- García, R., & Báez, A. P. (2012). Atomic Absorption Spectrometry (AAS). In Dr. Muhammad Akhyar Farrukh (Ed.), *InTech*. InTech.  
<https://doi.org/10.5505/adlitip.2013.70299>
- Gautam, R. K., Mudhoo, A., Lofrano, G., & Chattopadhyaya, M. C. (2014). Biomass-derived biosorbents for metal ions sequestration: Adsorbent modification and activation methods and adsorbent regeneration. *Journal of Environmental Chemical Engineering*, 2(1), 239–259.  
<https://doi.org/10.1016/j.jece.2013.12.019>
- Guiza, S. (2017). Biosorption of heavy metal from aqueous solution using cellulosic waste orange peel. *Ecological Engineering*, 99, 134–140.  
<https://doi.org/10.1016/j.ecoleng.2016.11.043>
- Harmiwati, Salmariza, S., Kurniawati, D., Lestari, I., Chaidir, Z., Desmiarti, R., & Zein, R. (2017). Biosorption of Pb(II) and Zn(II) metal ions from aqueous solutions by stem tree of soybean using continuous flow method. *ARPJ Journal of Engineering and Applied Sciences*, 12(18), 5258–5262.
- He, H. J., Xiang, Z. H., Chen, X. J., Chen, H., Huang, H., Wen, M., & Yang, C. P. (2018). Biosorption of Cd(II) from synthetic wastewater using dry biofilms from biotrickling filters. *International Journal of Environmental Science and Technology*, 15(7), 1491–1500. <https://doi.org/10.1007/s13762-017-1507-8>
- Hevira, L., Munaf, E., & Zein, R. (2015). The use of terminalia catappa L. Fruit shell as biosorbent for the removal of Pb(II), Cd(II) and Cu(II) ion in liquid waste. *Journal of Chemical and Pharmaceutical Research*, 7(10), 79–89.  
<https://doi.org/https://www.researchgate.net/publication/306139745>
- Hevira, Linda, 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*, 97, 188–199. <https://doi.org/10.1016/j.jiec.2021.01.028>

- Jawad, A. H., Rashid, R. A., Ishak, M. A. M., & Ismail, K. (2018). Adsorptive removal of methylene blue by chemically treated cellulosic waste banana ( *Musa sapientum* ) peels . *Journal of Taibah University for Science*, 12(6), 809–819. <https://doi.org/10.1080/16583655.2018.1519893>
- Khairan, K., Makstum, A., & Yulvizar, C. (2019). Utilization of banana peel waste for citric acid production by *Aspergillus niger*. *IOP Conference Series: Earth and Environmental Science*, 364(1), 3–10. <https://doi.org/10.1088/1755-1315/364/1/012005>
- Kurniawaty, D., Lestari, I., Sy., S., Harmiwati, Aziz, H., Chaidir, Z., & Zein, R. (2019). Effect of Cadmium in Biosorption of Lead by Lengkek Seed and Shell (*Euphoria logan lour*). *Journal of Chemical Natural Resources*, 1(2), 23–29. <https://doi.org/10.32734/jcnar.v1i2.1250>
- 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>
- Mahir, T., Khusaibi, A., Dumarani, J., Devi, M. G., Rao, L. N., & Feroz, S. (2015). Treatment of Dairy Wastewater using Orange and Banana Peels. *Available Online Wwww.Jocpr.Com Journal of Chemical and Pharmaceutical Research*, 7(4), 1385–1391. [www.jocpr.com](http://www.jocpr.com)
- Munaf, E., Andalas, U., Hermansyah, A., Andalas, U., Tjong, D. H., Andalas, U., Zein, R., Andalas, U., & Variation, G. (2015). Removal of Pb ( II ) ions by using papaya ( *Carica Papaya L* ) leaves and Petai ( *Parkia Speciosa Hassk* ) peels as biosorbent Removal of Pb ( II ) ions by using Papaya ( *Carica papaya L* ) leaves and Petai ( *Parkia Speciosa Hassk* ) peels as biosorbent. *Journal of Chemical and Pharmaceutical Research*, 7(9), 100–106.
- Nasution, A. N., Amrina, Y., Zein, R., Aziz, H., & Munaf, E. (2015). Biosorption characteristics of Cd (II) ions using herbal plant of mahkota dewa ( *Phaleria macrocarpa* ). *Journal of Chemical and Pharmaceutical Research*, 7(7), 189–196.



- Nurain, A., Sarker, P., Rahaman, M. S., Rahman, M. M., & Uddin, M. K. (2021). Utilization of Banana (*Musa sapientum*) Peel for Removal of Pb<sup>2+</sup> from Aqueous Solution. *Journal of Multidisciplinary Applied Natural Science*, 1(2), 117–128. <https://doi.org/10.47352/jmans.v1i2.89>
- Okoli, C. P., Diagboya, P. N., Anigbogu, I. O., Olu-Owolabi, B. I., & Adebawale, K. O. (2017). Competitive biosorption of Pb(II) and Cd(II) ions from aqueous solutions using chemically modified moss biomass (*Barbula lambarenensis*). *Environmental Earth Sciences*, 76(1), 1–10. <https://doi.org/10.1007/s12665-016-6368-9>
- Patriani, P. (2019). *Utilization of Kepok Banana Peel Waste Fermented Using EM4 as Sheep Feed in Medan Tuntungan Sub District*. 2(2), 142–149.
- Peraturan Menteri Lingkungan Hidup dan Kehutanan No. 6. (2021). Peraturan Menteri Lingkungan Hidup dan Kehutanan Republik Indonesia Nomor 6 Tahun 2021. *Kementrian Lingkungan Hidup Dan Kehutanan Republik Indonesia*, 1–301.
- Putra, A., Fauzia, S., Deswati, Arief, S., & Zein, R. (2022). Preparation, characterization, and adsorption performance of activated rice straw as a bioadsorbent for Cr(VI) removal from aqueous solution using a batch method. *Desalination and Water Treatment*, 264(32), 121–132. <https://doi.org/10.5004/dwt.2022.28562>
- Sadeghalvad, B., & Azadmehr, A. (2016). Comparative study effects of calcinations, electrolytes, and Fe-bentonite, CaCO<sub>3</sub>-bentonite on the removal of Cd(II) ions from aqueous solution. *Desalination and Water Treatment*, 57(25), 11879–11892. <https://doi.org/10.1080/19443994.2015.1046146>
- Sreenivas, K. M., Inarkar, M. B., Gokhale, S. V., & Lele, S. S. (2014). Re-utilization of ash gourd (*Benincasa hispida*) peel waste for chromium (VI) biosorption: Equilibrium and column studies. *Journal of Environmental Chemical Engineering*, 2(1), 455–462. <https://doi.org/10.1016/j.jece.2014.01.017>
- Suhaili, R., Muliati, A., Ferawati, Hidayat, & Zein, R. (2016). Biosorption of Cadmium and Zinc by Tanjung Fruit Husk (*Mimusops elengi* L.). *Der Pharma Chemica*, 8(7), 55–61.

- Surbakti, S. R. (2016). Sintesis Selulosa Sitrat dari Selulosa Daun Nenas (Ananas comosus (L) Merr ) Melalui Reaksi Esterifikasi dengan Asam Sitrat Sebagai Pengadsorpsi Ion Kadmium ( $\text{Cd}^{2+}$ ). In *Universitas Sumatera Utara*. Universitas Sumatera Utara Press.
- Thanh, N. D., & Nhung, H. L. (2009). CELLULOSE MODIFIED WITH CITRIC ACID AND ITS ABSORPTION OF  $\text{Pb}^{2+}$  and  $\text{Cd}^{2+}$  IONS. *The 13th International Electronic Conference on Synthetic Organic Chemistry*, 1–13.
- Uche Augustine, A., Ishaq, B., Akpomie, T. M., & Odoh, R. (2019). Removal of Lead (II) and Iron (II) ions from Aqueous Solutions Using Watermelon (Citrillus Lanatus) Peels as Adsorbent. *Open Access Journal of Chemistry*, 3(1), 1–7.
- Van Thuan, T., Quynh, B. T. P., Nguyen, T. D., Ho, V. T. T., & Bach, L. G. (2017). Response surface methodology approach for optimization of  $\text{Cu}^{2+}$ ,  $\text{Ni}^{2+}$  and  $\text{Pb}^{2+}$  adsorption using KOH-activated carbon from banana peel. *Surfaces and Interfaces*, 6, 209–217. <https://doi.org/10.1016/j.surfin.2016.10.007>
- Vilardi, G., Di Palma, L., & Verdone, N. (2018). Heavy metals adsorption by banana peels micro-powder: Equilibrium modeling by non-linear models. *Chinese Journal of Chemical Engineering*, 26(3), 455–464. <https://doi.org/10.1016/j.cjche.2017.06.026>
- Wang, K., Gu, J., & Yin, N. (2017). Efficient Removal of  $\text{Pb}(\text{II})$  and  $\text{Cd}(\text{II})$  Using  $\text{NH}_2$ -Functionalized Zr-MOFs via Rapid Microwave-Promoted Synthesis. *Industrial and Engineering Chemistry Research*, 56(7), 1880–1887. <https://doi.org/10.1021/acs.iecr.6b04997>
- WHO. (2022). Guidelines for drinking-water quality. In *World Health Organization* (Fourth edi). World Health Organization.
- Zein, R., Syukri, S., Muhammad, M., Pratiwi, I., & Yutaro, D. R. (2018). The ability of Pensi (Corbicula moltkiana) shell to adsorb  $\text{Cd}(\text{II})$  and  $\text{Cr}(\text{VI})$  ions. *AIP Conference Proceedings*, 2023(October 2018). <https://doi.org/10.1063/1.5064096>

- Zein, Rahmiana, Nofita, D., Refilda, R., & Aziz, H. (2019). Penyerapan Timbal(II) dan Cadmium(II) di dalam Larutan Menggunakan Limbah Kulit Buah Kapuk. *Chimica et Natura Acta*, 7(1), 37. <https://doi.org/10.24198/cna.v7.n1.20813>
- Zein, Rahmiana, Satrio Purnomo, J., Ramadhani, P., Safni, Alif, M. F., & Putri, C. N. (2023). Enhancing sorption capacity of methylene blue dye using solid waste of lemongrass biosorbent by modification method. *Arabian Journal of Chemistry*, 16(2), 104480. <https://doi.org/10.1016/j.arabjc.2022.104480>
- Zein, Rahmiana, Suciandica, M., & Fauzia, S. (2022). Modification Leaf Dregs of Lemongrass With Citric. *Jurnal Katalisator*, 7(1), 63–81.
- Zein, Rahmiana, Suhaili, R., Mawardi, Munaf, E., & Bavestrello, G. (2009). Chemical modification of some functional groups on marine algae (sargassum crasifolium) powder for the evaluation of lead(II) uptake. *Asian Journal of Chemistry*, 21(3), 2032–2036.
- Zein, Rahmiana, 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*, 17(10), 2599–2612. <https://doi.org/10.1007/s13738-020-01955-6>
- Zein, Rahmiana, Wardana, N., Refilda, & Aziz, H. (2018). Kulit Salak sebagai Biosorben Potensial untuk Pengolahan Timbal(II) dan Cadmium(II) dalam Larutan. *Chimica et Natura Acta*, 6(2), 56–64. <https://doi.org/https://doi.org/10.24198/cna.v6.n2.17857>
- 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>
- Zubaidah, S., Khaldun, I., & Hanum, L. (2017). Uji Daya Serap Serbuk Gergaji Kayu Pinus ( Pinus mercusii ) Terhadap Logam Timbal ( II ) Menggunakan Metode Spektrofotometri Serapan Atom ( SSA ) Abstrak. *Ilmiah Mahasiswa Pendidikan Kimia ( JIMPK)*, 2(2), 107–116.