

DAFTAR PUSTAKA

- Abbasi, Z., Alikarami, M., Nezhad, E. R., Moradi, F., & Moradi, V. (2013). Adsorptive Removal of Co^{2+} and Ni^{2+} by Peels of Banana from Aqueous Solution. *Universal Journal of Chemistry*, 1(3), 90–95. <https://doi.org/10.13189/ujc.2013.010303>
- Abidi, N., Cabrales, L., & Haigler, C. H. (2014). Changes in the cell wall and cellulose content of developing cotton fibers investigated by FTIR spectroscopy. *Carbohydrate Polymers*, 100, 9–16. <https://doi.org/10.1016/j.carbpol.2013.01.074>
- Alau, K. K., Gimba, C. E., & Kagbu, J. A. (2010). Preparation of Activated Carbon from Neem (*Azadirachta indica*) Husk by Chemical Activation with H_3PO_4 , KOH and ZnCl_2 . *Archives of Applied Science Research*, 2(5), 451–455. www.scholarsresearchlibrary.com
- Allwar, H. (2012). Characteristics of micro- and mesoporous structure and surface chemistry of activated carbons produced by oil palm shell. *Chemical, Ecology and Environmental Sciences (ICEES'2012)*, 138–141.
- Atkins, P. (1935). Atkins' Physical Chemistry. In *Medical Journal of Australia* (Vol. 2, Issue 20). <https://doi.org/10.5694/j.1326-5377.1935.tb43364.x>
- Bhatnagar, A., Hogland, W., Marques, M., & Sillanpää, M. (2013). An overview of the modification methods of activated carbon for its water treatment applications. *Chemical Engineering Journal*, 219, 499–511. <https://doi.org/10.1016/j.cej.2012.12.038>
- Bird, T. (1987). *Kimia Fisika untuk Universitas*. Jakarta: Gramedia.
- Çeribasi, I. H., & Yetis, U. (2001). Biosorption of $\text{Ni}(\text{ii})$ and $\text{Pb}(\text{ii})$ by *Phanerochaete chrysosporium* from a binary metal system - Kinetics. *Water SA*, 27(1), 15–20. <https://doi.org/10.4314/wsa.v27i1.5004>
- Chawla, K. (1998). *Bahan Berserat*. Inggris Raya: Cambridge University Press.
- Cheng, S., Zhang, L., Ma, A., Xia, H., Peng, J., Li, C., & Shu, J. (2018). Comparison of activated carbon and iron/cerium modified activated carbon to remove methylene blue from wastewater. *Journal of Environmental Sciences (China)*, 65, 92–102. <https://doi.org/10.1016/j.jes.2016.12.027>
- D.J.D., D., A.R., N., J.N., N., & J., K. M. (2012). Adsorption of Acetic acid onto Activated Carbons obtained from Maize cobs by Chemical Activation with Zinc chloride (ZnCl_2). *Research Journal of Chemical Sciences*, 2(9), 42–49. <http://www.isca.in/rjcs/Archives/v2/i9/9.ISCA-RJCS-2012-145.php%0Awww.isca.in>
- Darmansyah, Hermida, L., Fatahillah, A., & Atrafatrin, M. Y. (2016). Sintesis Dan Aplikasi Zeolit Modifikasi Surfaktan Sebagai Adsorben Limbah Cair Tapioka (Perbandingan Dengan Zeolit Alam Kalsinasi). *Prosiding Seminar Nasional "Kontribusi Akademisi Dalam Pencapaian Pembangunan*

Berkelanjutan” Universitas Brawijaya, Malang 12 Februari 2016, 75–83.

- Demirbas, A. (2005). Pyrolysis of ground beech wood in irregular heating rate conditions. *Journal of Analytical and Applied Pyrolysis*, 73(1), 39–43. <https://doi.org/10.1016/j.jaap.2004.04.002>
- Deng, Z. L., Liang, M. N., Li, H. H., & Zhu, Z. J. (2016). Advances in preparation of modified activated carbon and its applications in the removal of chromium (VI) from aqueous solutions. *IOP Conference Series: Earth and Environmental Science*, 39(1). <https://doi.org/10.1088/1755-1315/39/1/012065>
- Duan, X., Peng, J., Srinivasakannan, C., Zhang, L., Xia, H., Yang, K., & Zhang, Z. (2011). Process optimization for the preparation of activated carbon from Jatropha hull using response surface methodology. *Energy Sources, Part A: Recovery, Utilization and Environmental Effects*, 33(21), 2005–2017. <https://doi.org/10.1080/15567030903515047>
- Effendi, H. (2003). Telaah Kualitas Air Bagi Pengelolaan Sumber Daya dan Lingkungan Perairan. Yogyakarta: Kanisius.
- Elhussien, M. H., Hussein, R. M., Nimir, S. A., & Elsaim, M. H. (2017). Preparation and Characterization of Activated Carbon from Palm Tree Leaves Impregnated with Zinc Chloride for the Removal of Lead (II) from Aqueous Solutions. *American Journal of Physical Chemistry*, 6(4), 59–69. <https://doi.org/10.11648/j.ajpc.20170604.12>
- Erman, T., Sinta, M. W., & Sugianto. (2016). Pemanfaatan Potensi Tandan Kosong Kelapa Sawit Sebagai Karbon Aktif Untuk Pembersih Air Limbah Aktivitas Penambangan Emas. *Jurnal Komunikasi Fisika Indonesia (KFI)*, 852–858.
- Fatimah, N., Prasetyo, A. T., & Sumarni, W. (2014). Penggunaan Silika Gel Terimobilisasi Biomassa Aspergillus Niger untuk Adsorpsi Ion Logam Fe(III). *Indonesian Journal of Chemical Science*, 3(3), 183–187.
- Frey, R. (2013). Budidaya Kelapa Sawit Ramah Lingkungan Untuk Petani Kecil. In *Cordaid dan Biodiversity Agriculture Commodities Program (BACP) of International Finance Cooperation* (pp. 1–23).
- Haji, A. G., Pari, G., Nazar, M., & Habibati. (2013). Characterization of activated carbon produced from urban organic waste. *International Journal of Science and Engineering*, 5(2), 89–94. <https://doi.org/10.12777/ijse.5.2.89-94>
- Handayani, D. S., Jumina, Siswanta, D., & Mustofa. (2012). Adsorpsi Ion Logam Pb(II) Dan Cr(III) Oleh Poli 5allilikaliks[4]Arena Tetraester (Adsorption of Pb(II), Cd(II), and Cr(III) by Poly-5-allyl-calix[4]arene tetraester). *J. Manusia Dan Lingkungan*, 19(3), 218–225. <https://doi.org/10.22146/jml.18459>
- Hardyanti, I. S., Nurani, I., Hardjono HP, D. S., Apriliani, E., & Wibowo, E. A. P. (2017). Pemanfaatan Silika (SiO₂) dan Bentonit sebagai Adsorben Logam Berat Fe pada Limbah Batik. *JST (Jurnal Sains Terapan)*, 3(2), 37–41. <https://doi.org/10.32487/jst.v3i2.257>

- Heidarinejad, Z., Dehghani, M. H., Heidari, M., Javedan, G., Ali, I., & Sillanpää, M. (2020). Methods for preparation and activation of activated carbon: a review. *Environmental Chemistry Letters*, 18(2), 393–415. <https://doi.org/10.1007/s10311-019-00955-0>
- Hidayu, A. R., Mohamad, N. F., Matali, S., & Sharifah, A. S. A. K. (2013). Characterization of activated carbon prepared from oil palm empty fruit bunch using BET and FT-IR techniques. *Procedia Engineering*, 68(August), 379–384. <https://doi.org/10.1016/j.proeng.2013.12.195>
- Irma, K. N., Wahyuni, N., & Zahara, T. A. (2015). Adsorpsi Fenol Menggunakan Adsorben Karbon Aktif Dengan Metode Kolom. *Jkk*, 4(1), 24–28.
- Kakavandi, B., Kalantary, R. R., Farzadkia, M., Mahvi, A. H., Esrafil, A., Azari, A., Yari, A. R., & Javid, A. B. (2014). Enhanced chromium (VI) removal using activated carbon modified by zero valent iron and silver bimetallic nanoparticles. *Journal of Environmental Health Science and Engineering*, 12(1), 1–10. <https://doi.org/10.1186/s40201-014-0115-5>
- Kanaujia, S., Singh, B., & Singh, S. K. (2015). Comparative Study on Removal of Fluoride from Groundwater by Natural and Modified Bagasse Carbon of Sugarcane. *International Research Journal of Pure and Applied Chemistry*, 8(3), 147–156. <https://doi.org/10.9734/irjpac/2015/17965>
- Karim, M. A., Juniar, H., & Ambarsari, M. F. P. (2017). Adsorpsi Ion Logam Fe Dalam Limbah Tekstil Sintesis Dengan Menggunakan Metode Batch. *Jurnal Distilasi*, 2(2), 68–81. <https://doi.org/10.32502/jd.v2i2.1205>
- Kementrian Pertanian. (2019). Statistik perkebunan Indonesia 2018-2020. In M. R. Dhani Gartina, S.Kom, & S. M. S. Lucky Lukmana Sukriya (Eds.), *Buku Statistik Perkebunan Indonesia*. Sekretariat Direktorat Jenderal Perkebunan. <https://drive.google.com/file/d/1FVxpBNihnuB3ayAALBi-FtsBShIUxMTD/view>
- Khopkar, S. M. (1990). *Konsep Dasar Kimia Analitik*. Jakarta: Universitas Indonesia (UI Press).
- Kresnawaty, I., Putra, S. M., Budiani, A., & Darmono, T. (2017). Konversi Tandan Kosong Kelapa Sawit (Tkks) Menjadi Arang Hayati Dan Asap Cair. *Jurnal Penelitian Pascapanen Pertanian*, 14(3), 171–179. <https://doi.org/10.21082/jpasca.v14n3.2017.171-179>
- Kurniawan, R., Luthfi, M., & N, W. A. (2014). Karakterisasi Luas Permukaan Bet (Braunanear , Emmelt dan Teller) Karbon Aktif dari Tempurung Kelapa dan Tandan Kosong Kelapa Sawit dengan Aktivasi Asam Fosfat. *Jurnal Keteknikaan Pertanian Tropis Dan Biosistem*, 2(1), 15–20.
- Lubis, R. E., & Lontoh, A. P. (2016). Manajemen Panen Kelapa Sawit (*Elaeis guineensis* Jacq.) di Kebun Adolina, Serdang Bedagai, Sumatera Utara. *Buletin Agrohorti*, 4(2), 144–154. <https://doi.org/10.29244/agrob.v4i2.15013>
- Maslahat, M., Hutagaol, R. P., & Lestari, S. (2017). Potensi Biosorben Tandan

- Kosong Kelapa Sawit (Tkks) Dalam Recovery Limbah Fenol. *Jurnal Sains Natural*, 2(2), 155. <https://doi.org/10.31938/jsn.v2i2.45>
- Morgan, S. W. (1996). *Aquatic Chemistry: Chemical Equilibria and Rates in Natural Waters*. New York: John Wiley & Sons.
- Mudasir, M., Baskara, R. A., Suratman, A., Yunita, K. S., Perdana, R., & Puspitasari, W. (2020). Simultaneous Adsorption of Zn(II) and Hg(II) Ions on Selective Adsorbent of Dithizone-Immobilized Bentonite in the Presence of Mg(II) Ion. *Journal of Environmental Chemical Engineering*, 8(4), 1–9. <https://doi.org/10.1016/j.jece.2020.104002>
- Mufrodi, Z., Widiastuti, N., & Kardika, R. C. (2008). Adsorpsi zat warna tekstil dengan menggunakan abu terbang (fly ash) untuk variasi massa adsorben dan suhu operasi. *Program Studi Teknik Kimia Fakultas Teknologi Industri Universitas Ahmad Dahlan*, 90–93.
- Ngadi, N., & Lani, N. S. (2014). Extraction and characterization of cellulose from empty fruit bunch (EFB) fiber. *Jurnal Teknologi (Sciences and Engineering)*, 68(5), 35–39. <https://doi.org/10.11113/jt.v68.3028>
- Noer, A. A., Awitdrus, & Malik, U. (2014). Pembuatan Karbon Aktif Dari Pelepah Kelapa Sawit Menggunakan Aktivator H₂O Sebagai Adsorben. *Jom Fmipa*, 1(2), 42–47.
- Nugroho, A. (2019). *Teknologi Agroindustri Kelapa Sawit* (Issue August). Lambung Mangkurat University.
- Nurdila, F. A., Asri, N. S., & Suharyadi, E. (2015). Adsorpsi Logam Tembaga (Cu), Besi (Fe), dan Nikel (Ni) dalam Limbah Cair Buatan Menggunakan Nanopartikel Cobalt Ferrite (CoFe₂O₄). *Jurnal Fisika Indonesia*, XIX(55), 23–27.
- Nwodika, C., & Onukwuli, O. D. (2017). Adsorption Study of Kinetics and Equilibrium of Basic Dye on Kola Nut Pod Carbon. *Gazi University Journal of Science*, 30(4), 86–102.
- Paskawati, Y. A., Susyana, Antaresti, & Retnoningtyas, E. S. (2011). Pemanfaatan sabut kelapa sebagai bahan baku pembuatan kertas komposit alternatif. *Jurnal Widya Teknik*, 9, 12–21.
- Ping, N., Lili, Y., Honghong, Y., Xiaolong, T., Hua, L., Hongyan, W., & Lina, Y. (2010). Effect of Fe/Cu/Ce loading on the coal-based activated carbons for hydrolysis of carbonyl sulfide. *Journal of Rare Earths*, 28(2), 205–210. [https://doi.org/10.1016/S1002-0721\(09\)60081-8](https://doi.org/10.1016/S1002-0721(09)60081-8)
- Pratiwi, R., & Prinajati, P. D. (2018). Adsorption for Lead Removal by Chitosan from Shrimp Shells. *Indonesian Journal of Urban and Environmental Technology*, 2(1), 35–46. <https://doi.org/10.25105/urbanenvirotech.v2i1.3554>
- Rohman, A. (2007). *Kimia Farmasi Analisis*. Yogyakarta: Rineka Cipta.
- Salamatinia, B., Kamaruddin, A. H., & Abdullah, A. Z. (2007). Removal of Zn and

- Cu from wastewater by sorption on Oil Palm tree-derived biomasses. In *Journal of Applied Sciences* (Vol. 7, Issue 15, pp. 2020–2027). <https://doi.org/10.3923/jas.2007.2020.2027>
- Sembiring, M. T., & Sinaga, T. S. (2003). Arang aktif (pengenalan dan proses pembuatannya). In *USU Digital Library*.
- Shinoj, S., Visvanathan, R., Panigrahi, S., & Kochubabu, M. (2011). Oil palm fiber (OPF) and its composites: A review. *Industrial Crops and Products*, 33(1), 7–22. <https://doi.org/10.1016/j.indcrop.2010.09.009>
- Sopiah, N., Prasetyo, D., & Aviantara, D. B. (2017). Pengaruh aktivasi karbon aktif dari tandan kosong kelapa sawit terhadap adsorpsi kadmium terlarut. *Jurnal Riset Teknologi Pencegahan Pencemaran Industri*, 8(2), 55–66. <https://doi.org/https://10.21771/jrtppi.2017.v8.no.2.p55-66> 2503-5010/2087-0965C
- Suhartati, S., Puspito, R., Rizali, F., & Anggraini, D. (2016). Analisis Sifat Fisika dan Kimia Lignin Tandan Kosong Kelapa Sawit asal Desa Sape, Kabupaten Sanggau, Kalimantan Barat. *Jurnal Kimia VALENSI*, 2(1), 24–29. <https://doi.org/10.15408/jkv.v2i1.3102>
- Supriyantini, E., & Endrawati, H. (2015). Kandungan Logam Berat Besi (Fe) Pada Air, Sedimen, Dan Kerang Hijau (*Perna viridis*) Di Perairan Tanjung Emas Semarang. *Jurnal Kelautan Tropis*, 18(1), 38–45.
- Vennilamani, N., Kadirvelu, K., Sameena, Y., & Pattabhi, S. (2005). Utilization of activated carbon prepared from industrial solid waste for the removal of chromium(VI) ions from synthetic solution and industrial effluent. *Adsorption Science and Technology*, 23(2), 145–160. <https://doi.org/10.1260/0263617054037817>
- Widayatno, T., Yuliawati, T., & Susilo, A. A. (2017). Adsorpsi Logam Berat (Pb) dari Limbah Cair dengan Adsorben Arang Bambu Aktif. *Jurnal Teknologi Bahan Alam*, 1(1), 17–23.
- Wirasnita, R., Hadibarata, T., Yusoff, A. R. M., & Mat Lazim, Z. (2015). Preparation and characterization of activated carbon from oil palm empty fruit bunch wastes using zinc chloride. *Jurnal Teknologi*, 74(11), 77–81. <https://doi.org/10.11113/jt.v74.4876>
- Yang, T., & Lua, A. C. (2003). Characteristics of activated carbons prepared from pistachio-nut shells by physical activation. *Journal of Colloid and Interface Science*, 267(2), 408–417. [https://doi.org/10.1016/S0021-9797\(03\)00689-1](https://doi.org/10.1016/S0021-9797(03)00689-1)
- Yin, C. Y., Aroua, M. K., & Daud, W. M. A. W. (2007). Review of modifications of activated carbon for enhancing contaminant uptakes from aqueous solutions. *Separation and Purification Technology*, 52(3), 403–415. <https://doi.org/10.1016/j.seppur.2006.06.009>
- Yuanita, M., Yenti, S. R., & Chairul. (2016). Kesetimbangan Adsorpsi Logam Fe (Ii) Menggunakan Karbon Aktif Dari Ampas Tebu Sebagai Adsorben. *JOM FTEKNIK*, 3(1), 1–7.

Yusoff, S. N. M., Kamari, A., Putra, W. P., Ishak, C. F., Mohamed, A., Hashim, N., & Isa, I. M. (2014). Removal of Cu(II), Pb(II) and Zn(II) Ions from Aqueous Solutions Using Selected Agricultural Wastes: Adsorption and Characterisation Studies. *Journal of Environmental Protection*, 05(04), 289–300. <https://doi.org/10.4236/jep.2014.54032>



THE
Character Building
UNIVERSITY