

DAFTAR PUSTAKA

- Abdul Rani, N. H., Mohamad, N. F., Matali, S., & Kadir, S. A. S. A. (2014). Preparation and characterization of activated carbon made from oil palm empty fruit bunch (Vol. 594, pp. 44-48). Trans Tech Publications Ltd.
- Abka-khajouei, R., Tounsi, L., Shahabi, N., Patel, A. K., Abdelkafi, S., & Michaud, P. (2022). Structures, Properties and Applications of Alginates. *Marine Drugs*, 20(6), 364.
- Abou-Zeid, R. E., Ali, K. A., Gawad, R. M., Kamal, K. H., Kamel, S., & Khiari, R. (2021). Removal of Cu (II), Pb (II), Mg (II), and Fe (II) by adsorption onto alginic/nanocellulose beads as bio-sorbent. *Journal of Renewable Materials*, 9(4), 601.
- Ali, R., Aslam, Z., Shawabkeh, R. A., Asghar, A., & Hussein, I. A. (2020). BET, FTIR, and RAMAN characterizations of activated carbon from waste oil fly ash. *Turkish journal of chemistry*, 44(2), 279-295.
- Arora,S.(2014). *Introduction to atomic absorption spectroscopy*.Lab Training. Kirti Nagar Industrial Area. New Delhi
- Ayu, G. E., Nasution, H., Lubis, M., Harahap, H., & Fath, M. A. (2020, September). The production of nanocrystalline cellulose from oil palm fruit fibers using chemical treatment. In *AIP Conference Proceedings* (Vol. 2267, No. 1, p. 020036). AIP Publishing LLC.
- Bergaya, F., & Lagaly, G. (2013). *Handbook of clay science*. Newnes.
- Bertagnolli, C., Grishin, A., Vincent, T., & Guibal, E. (2016). Recovering heavy metal ions from complex solutions using polyethylenimine derivatives encapsulated in alginate matrix. *Industrial & Engineering Chemistry Research*, 55(8), 2461-2470.

- Bunaciu, A. A., UdriŞTioiu, E. G., & Aboul-Enein, H. Y. (2015). X-ray diffraction: instrumentation and applications. *Critical reviews in analytical chemistry*, 45(4), 289-299.
- Campbell,F.C. (2010). *Structural Composite Materials*. ASM International
- Chakraborty, B., Chakraborty, K., & Bhaduri, D. (2016). An insight of iron chlorosis in horticultural crops: physiological and molecular basis, and possible management strategies. *Plant Stress Tolerance Physiological & Molecular Strategies*, 239.
- Chandra, P. K., Ghosh, K., & Varadachari, C. (2009). A new slow-releasing iron fertilizer. *Chemical Engineering Journal*, 155(1-2), 451-456.
- Chawla, K. K. (2012). *Composite materials: science and engineering*. Springer Science & Business Media.
- Cholifah, S. (2009). *Penggunaan Metode Ftir (Fourier Transform Infra Red) Untuk Studi Analisis Gugus Fungsi Sampel Minyak Goreng Dengan Perlakuan Variasi Pemanasan* (Doctoral dissertation, Department of Physics, Diponegoro University).
- Daemi, H., & Barikani, M. (2012). Synthesis and characterization of calcium alginate nanoparticles, sodium homopolymannuronate salt and its calcium nanoparticles. *Scientia Iranica*, 19(6), 2023-2028.
- Demiral, İ., & Şamdan, C. A. (2016). Preparation and characterisation of activated carbon from pumpkin seed shell using H₃PO₄. *Anadolu University Journal of Science and Technology A-Applied Sciences and Engineering*, 17(1), 125-138.
- Dunlop, M. J., Acharya, B., & Bissessur, R. (2018). Isolation of nanocrystalline cellulose from tunicates. *Journal of Environmental Chemical Engineering*, 6(4), 4408-4412.
- Effendi, D. B., Rosyid, N. H., Nandiyanto, A. B. D., & Mudzakir, A. (2015). Sintesis Nanoselulosa. *Jurnal integrasi proses*, 5(2).

- Eletta, O. A., Ayandele, F. O., & Ighalo, J. O. (2021). Adsorption of Pb (II) and Fe (II) by mesoporous composite activated carbon from Tithonia diversifolia stalk and Theobroma cacao pod. *Biomass Conversion and Biorefinery*, 1-10.
- Ellingham, S. T., Thompson, T. J., & Islam, M. (2018). Scanning Electron Microscopy–Energy-Dispersive X-Ray (SEM/EDX): A Rapid Diagnostic Tool to Aid the Identification of Burnt Bone and Contested Cremains. *Journal of forensic sciences*, 63(2), 504-510.
- Farrukh, M. A. (Ed.). (2012). *Atomic absorption spectroscopy*. BoD–Books on Demand.
- Fatriasari,F., Masruchin,N., & Hermati,E,. (2019). *Selulosa Karakteristik dan Pemanfaatannya*. Jakarta. LIPI Press
- Fauziyah, B., Yuwono, M., & Isnaeni, I. (2021). Bagasse nanocellulose (Saccharum officinarum L.): process optimization and characterization. *Annals of the Romanian Society for Cell Biology*, 25(2), 989-1001.
- Florentino, K. A., Santos, T. T. F., & Templonuevo, C. D. (2020). *Comparison of Sodium Alginate-Based Slow-Release Beads with Varying Calcium Chloride Concentrations*.
- Flórez-Fernández, N.; Domínguez, H.; Torres, M.D. (2019). A green approach for alginate extraction from Sargassum muticum brown seaweed using ultraso und-assisted technique. *International Journal of Biological Macromolecules*, 124(), 451–459.doi:10.1016/j.ijbiomac.2018.11.232
- Girão, A. V., Caputo, G., & Ferro, M. C. (2017). Application of scanning electron microscopy–energy dispersive X-ray spectroscopy (SEM-EDS). In *Comprehensive analytical chemistry*,75,153-168.Elsevier.
- Hastati, D. Y., Hambali, E., Syamsu, K., & Warsiki, E. (2019). Preparation and characterization of nanocelluloses from oil palm empty fruit bunch cellulose. *Journal of the Japan Institute of Energy*, 98(8), 194-201.

- 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, 393-415.
- Helmiyati, H., & Wahyuningrum, K. D. (2018, October). Synthesis and photocatalytic activity of nanocomposite based on sodium alginate from brown algae with ZnO impregnation. In *AIP Conference Proceedings* (Vol. 2023, No. 1). AIP Publishing.
- Hidayah, N., & Wusko, I. U. (2020). Characterization and Analysis of Oil Palm Empty Fruit Bunch (OPEFB) Waste of PT Kharisma Alam Persada South Borneo. *Majalah Obat Tradisional*, 25(3), 154-160.
- 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, 379-384.
- Hnoosong, W., Rungcharoenthong, P., & Sangjan, S. (2021). Preparation and properties of urea slow-release fertilizer hydrogel by sodium alginate-gelatin biopolymer. *Key Engineering Materials*, 889, 98-103.
- Hochmuth, G. (2011). Iron (Fe) nutrition of plants. *University of Florida If as Extension. Sl*, 353, 1-8.
- Hustiany, R., & Rahmi, A. (2019). *Kemasan Aktif Berbasiskan Arang Aktif Tandan Kosong dan Cangkang Kelapa Sawit*. Purwakarta:CV IRDH
- Ioannidou, O., & Zabaniotou, A. (2007). Agricultural residues as precursors for activated carbon production—a review. *Renewable and sustainable energy reviews*, 11(9), 1966-2005.
- Jamnongkan, T., & Kaewpirom, S. J. S. J. U. (2010). Controlled-release fertilizer based on chitosan hydrogel: phosphorus release kinetics. *Sci J Ubu*, 1(1), 43-50.
- Jasmidi.,Sari, S. A., Selly, R., Rahmah, S., Nasution, H. I., Zubir, M., Banjarnahor, L. R., & Efendi, Y. D. (2021, March). Synthesis and Characterization of Activated Carbon from Oil Palm Empty Bunches. In *Journal of Physics: Conference Series* (Vol. 1819, No. 1, p. 012021). IOP Publishing.

- Julianto, H., Farid, M., & Rasyida, A. (2017). Ekstraksi nanoselulosa dengan metode hidrolisis asam sebagai penguat komposit absorpsi suara. *Jurnal Teknik ITS*, 6(2), F243-F246.
- Kjesbu, J. S., Zaytseva-Zotova, D., Sämfors, S., Gatenholm, P., Troedsson, C., Thompson, E. M., & Strand, B. L. (2022). Alginate and tunicate nanocellulose composite microbeads—Preparation, characterization and cell encapsulation. *Carbohydrate Polymers*, 286, 119284.
- Koehlert, K. (2017). Activated carbon: Fundamentals and new applications. *Chem. Eng.*, 124, 32-40.
- Kristianingrum, S. (2016). Handout Spektroskopi Infra Merah (Infrared Spectroscopy, IR).
- Kunusa, W. R., Iyabu, H., & Abdullah, R. (2021, July). FTIR, SEM and XRD analysis of activated carbon from sago wastes using acid modification. In *Journal of Physics: Conference Series* (Vol. 1968, No. 1, p. 012014). IOP Publishing.
- Lani, N. S., Ngadi, N., Johari, A., & Jusoh, M. (2014). Isolation, characterization, and application of nanocellulose from oil palm empty fruit bunch fiber as nanocomposites. *Journal of Nanomaterials*, 2014.
- Lim, Y. H., Chew, I. M. L., Choong, T. S. Y., Tan, M. C., & Tan, K. W. (2016). Nanocrystalline cellulose isolated from oil palm empty fruit bunch and its potential in cadmium metal removal. In *MATEC web of conferences* (Vol. 59, p. 04002). EDP Sciences.
- Lubkowski, K., Smorowska, A., Grzmil, B., & Kozłowska, A. (2015). Controlled-release fertilizer prepared using a biodegradable aliphatic copolyester of poly (butylene succinate) and dimerized fatty acid. *Journal of agricultural and food chemistry*, 63(10), 2597-2605.
- Mahajan, G. V., & Aher, V. S. (2012). Composite material: A review over current development and automotive application. *International journal of scientific and research publications*, 2(11), 1-5.

- Mangallo, B., Mallongi, A., Mussad, I., & Taberima, S. (2020). Slow released fertilizer of Fe²⁺ and Mn²⁺ from composite micronutrient chitosan-silica.
- Moon, R. J., Martini, A., Nairn, J., Simonsen, J., & Youngblood, J. (2011). Cellulose nanomaterials review: structure, properties and nanocomposites. *Chemical Society Reviews*, 40(7), 3941-3994.
- Mulyadi, I. (2019). Isolasi dan karakterisasi selulosa. *Jurnal Saintika Unpam: Jurnal Sains Dan Matematika Unpam*, 1(2), 177-182.
- Nadeem, F., Hanif, M. A., Majeed, M. I., & Mushtaq, Z. (2018). Role of macronutrients and micronutrients in the growth and development of plants and prevention of deleterious plant diseases—A comprehensive review. *International Journal of Chemical and Biochemical Sciences*, 12, 31-52.
- Nascimento, D. M., Nunes, Y. L., Figueirêdo, M. C., de Azeredo, H. M., Aouada, F. A., Feitosa, J. P., ... & Dufresne, A. (2018). Nanocellulose nanocomposite hydrogels: technological and environmental issues. *Green Chemistry*, 20(11), 2428-2448.
- Neme, I., Gonfa, G., & Masi, C. (2022). Preparation and characterization of activated carbon from castor seed hull by chemical activation with H₃PO₄. *Results in Materials*, 15, 100304.
- Niemiec, M., & Komorowska, M. (2018). The use of slow-release fertilizers as a part of optimization of celeriac production technology. *Agricultural Engineering*, 22.
- Nugroho,A. (2019). *Teknologi Agroindustri Kelapa Sawit*. Banjarbaru. Lambung Mangkurat University Press
- Osman, N. B., Shamsuddin, N., & Uemura, Y. (2016). Activated carbon of oil palm empty fruit bunch (EFB); core and shaggy. *Procedia engineering*, 148, 758-764.
- Park, C. W., Han, S. Y., Choi, S. K., & Lee, S. H. (2017). Preparation and properties of holocellulose nanofibrils with different hemicellulose content. *BioResources*, 12(3), 6298-6308.

- Pereira, L., & Cotas, J. (2020). Introductory chapter: Alginates-A general overview. *Alginates-recent uses of this natural polymer*.
- Permatasari, A. R., Khasanah, L. U., & Widowati, E. (2014). Karakterisasi karbon aktif kulit singkong (*Manihot utilissima*) dengan variasi jenis aktivator. *Jurnal Teknologi Hasil Pertanian*, 7(2), 70-75.
- Pestovsky, Y. S., & Martínez-Antonio, A. (2019). The Synthesis of Alginic Microparticles and Nanoparticles. *Drug Des. Intellect. Prop. Int. J.*, 3(1), 293-327.
- Phanthong, P., Reubroycharoen, P., Hao, X., Xu, G., Abudula, A., & Guan, G. (2018). Nanocellulose: Extraction and application. *Carbon Resources Conversion*, 1(1), 32-43.
- Prahas, D., Kartika, Y., Indraswati, N., & Ismadji, S. J. C. E. J. (2008). Activated carbon from jackfruit peel waste by H₃PO₄ chemical activation: Pore structure and surface chemistry characterization. *Chemical Engineering Journal*, 140(1-3), 32-42.
- Prastiwi, D. A., Sumawinata, B., & Pari, G. (2019, October). The utilization of activated carbon as micronutrients carrier in slow release fertilizer formulation. In *IOP Conference Series: Earth and Environmental Science*, 359(1), IOP Publishing.
- Priatni, A., Murti, R. S., & Rahmawati, D. (2020). Adsorpsi limbah krom tanning dengan adsorben karbon aktif dari palm kernel cake (PKC). *Majalah Kulit, Karet, dan Plastik*, 36(1), 25-34.
- Priyadi, P., & Mangiring, W. (2019). Characteristics of Corn Cobs Waste Activated Carbon for Slow Release Micro Fertilizer Carrier. *SAINS TANAH-Journal of Soil Science and Agroclimatology*, 16(2), 147-158.
- Purwita, C. A., Sulaeman, A., & Setiyanto, H. (2020). Analisis Holoselulosa: Tinjauan Metode Analisis Kimia Konvensional. *Jurnal Selulosa*, 10(02), 101-110.
- Roquero, D. M., Othman, A., Melman, A., & Katz, E. (2022). Iron (III)-cross-linked alginate hydrogels: A critical review. *Materials Advances*, 3(4), 1849-1873.

- Rozo, G., Bohorques, L., & Santamaría, J. (2019). Controlled release fertilizer encapsulated by a κ -carrageenan hydrogel. *Polímeros*, 29.
- Sari, S. A., Selly, R., Rahmah, S., Nasution, H. I., Zubir, M., Banjarnahor, L. R., & Efendi, Y. D. (2021, March). Synthesis and Characterization of Activated Carbon from Oil Palm Empty Bunches. In *Journal of Physics: Conference Series*, 1819(1),(012021). IOP Publishing.
- Sathisaran, I., & Balasubramanian, M. (2020). Physical characterization of chitosan/gelatin-alginate composite beads for controlled release of urea. *Heliyon*, 6(11).
- Savana, R. T., & Maharani, D. K. Analisis Komposisi Unsur Pupuk Lepas Lambat Kitosan-Silika-Glutaraldehid Element Composition Analysis Chitosan-Silica-Glutaraldehyde Slow Release Fertilizer.
- Septevani, A. A., Rifathin, A., Sari, A. A., Sampora, Y., Ariani, G. N., & Sondari, D. (2020). Oil palm empty fruit bunch-based nanocellulose as a super-adsorbent for water remediation. *Carbohydrate polymers*, 229, 115433.
- Setiawati, M. R., Suryatmana, P., Hindersah, R., Kamaluddin, N., & Efendi, S. (2019). The effectiveness of various compositions lignolytic and cellulolytic microbes in composting empty fruit bunch palm oil and sugar cane biomass. In *IOP Conference Series: Earth and Environmental Science*, 393(1),(012032). IOP Publishing.
- Shaikh, H. M., Anis, A., Poulose, A. M., Al-Zahrani, S. M., Madhar, N. A., Alhamidi, A., & Alam, M. A. (2021). Isolation and characterization of alpha and nanocrystalline cellulose from date palm (*Phoenix dactylifera* L.) trunk mesh. *Polymers*, 13(11), 1893.
- Skjak-Brae,G.m Grasdalen, K.H., Draget, K.I., & Smidsrod, O. (1989). Inhomogeneous Polysaccharide Ionic Gels. Carbohydrat Polymer; 10:31-54
- Sujatno, A., Salam, R., Bandriyana, B., & Dimyati, A. (2015). Studi scanning electron microscopy (SEM) untuk karakterisasi proses oxidasi paduan zirkonium. *In urnal Forum Nuklir (JFN)*.9(1),44-50.

- Sukma, N. S., Arryanto, Y., & Sutarno, S. (2016). Characterization And Study Of Iron (III)-Released From Alginate/Zeolite/Fe Composite. *EKSAKTA: Journal of Sciences and Data Analysis*, 80-93.
- Sunardi, S., Faramitha, G. N., & Santoso, U. T. (2021). Characterization of Alginate-Cellulose-Kaolin Composites for Slow-Release Urea Fertilizer. *Indonesian Journal of Chemical Research*, 8(3), 219-227.
- Sundarajan, P., Eswaran, P., Marimuthu, A., Subhadra, L. B., & Kannaiyan, P. (2012). One pot synthesis and characterization of alginate stabilized semiconductor nanoparticles. *Bulletin of the Korean Chemical Society*, 33(10), 3218-3224.
- Sutirman, Z. A., Sanagi, M. M., & Aini, W. I. W. (2021). Alginate-based adsorbents for removal of metal ions and radionuclides from aqueous solutions: A review. *International journal of biological macromolecules*, 174, 216-228.
- Tadda, M. A., Ahsan, A., Shitu, A., ElSergany, M., Arunkumar, T., Jose, B., ... & Daud, N. N. (2016). A review on activated carbon: process, application and prospects. *Journal of Advanced Civil Engineering Practice and Research*, 2(1), 7-13.
- Taib, M. N. A. M., Yehye, W. A., Julkapli, N. M., & Hamid, S. B. O. (2018). Influence of hydrophobicity of acetylated nanocellulose on the mechanical performance of nitrile butadiene rubber (NBR) composites. *Fibers and Polymers*, 19(2), 383-392.
- Theivasanthi, T., Christma, F. A., Toyin, A. J., Gopinath, S. C., & Ravichandran, R. (2018). Synthesis and characterization of cotton fiber-based nanocellulose. *International journal of biological macromolecules*, 109, 832-836.
- Thoe, J. M. L., Surugau, N., & Chong, H. L. H. (2019). Application of oil palm empty fruit bunch as adsorbent: A review. *Transactions on Science and Technology*, 6(1), 9-26.

- Trirahayu, D. A., Putra, R. P., Hidayat, A. S., Perdana, M. I., & Safitri, E. (2022). Synthesis and Performance Evaluation of Cellulose-based Slow-release Fertilizer: A Review. *Kovalen: Jurnal Riset Kimia*, 8(1), 1-16.
- Ullah, M. W., Manan, S., Ul-Islam, M., Revin, V. V., Thomas, S., & Yang, G. (2021). Introduction to nanocellulose. In *Nanocellulose: synthesis, structure, properties and applications* (pp. 1-50).
- Venkatesulu,M.(2021). A Review Of Composite Materials: History, Types, Advantages, And Applications Over Traditional Materials. *International Journal Of Research In Aeronautical And Mechanical Engineering*.9(04),32-38
- Wang, H. (2021). Remediation of pear iron chlorosis by nanocellulose-iron chelation and mechanisms.
- Wesolowska, M., Rymarczyk, J., Góra, R., Baranowski, P., Slawinski, C., Klimczyk, M., ... & Schimmelpfennig, L. (2021). New slow-release fertilizers-economic, legal and practical aspects: a Review. *International Agrophysics*, 35(1).
- Wulandari, W. T., Rochliadi, A., & Arcana, I. M. (2016). Nanocellulose prepared by acid hydrolysis of isolated cellulose from sugarcane bagasse. In *IOP conference series: materials science and engineering* (Vol. 107, No. 1, p. 012045). IOP Publishing.
- Yahya, M. A., Mansor, M. H., Zolkarnaini, W. A. A. W., Rusli, N. S., Aminuddin, A., Mohamad, K., ... & Ozair, L. N. (2018, June). A brief review on activated carbon derived from agriculture by-product. In *AIP conference proceedings* (Vol. 1972, No. 1, p. 030023). AIP Publishing LLC.
- Yakout, S. M., & El-Deen, G. S. (2016). Characterization of activated carbon prepared by phosphoric acid activation of olive stones. *Arabian journal of chemistry*, 9, S1155-S1162.
- Yildirim, N., & Shaler, S. (2017). A study on thermal and nanomechanical performance of cellulose nanomaterials (CNs). *Materials*, 10(7), 718.

- Youssef, B., Soumia, A., Mounir, E. A., Omar, C., Abdelaziz, L., Mehdi, E. B., & Mohamed, Z. (2015). Preparation and properties of bionanocomposite films reinforced with nanocellulose isolated from Moroccan alfa fibres. *Autex Research Journal*, 15(3), 164-172.
- Zheng, D., Zhang, Y., Guo, Y., & Yue, J. (2019). Isolation and characterization of nanocellulose with a novel shape from walnut (*Juglans regia* L.) shell agricultural waste. *Polymers*, 11(7), 1130.
- Zhou, Y. M., Fu, S. Y., Zheng, L. M., & Zhan, H. Y. (2012). Effect of nanocellulose isolation techniques on the formation of reinforced poly (vinyl alcohol) nanocomposite films. *Express Polymer Letters*, 6(10).
- Zubir, M., Muchtar, Z., Syahputra, R. A., Sudarma, T. F., Nasution, H. I., Lubis, R. A. F., ... & Sandi, K. (2021, March). Characterization of Modified Fe-Cu Nanoparticle Activated Carbon Derived of Oil Palm Empty Bunches. In *Journal of Physics: Conference Series*, 1819(1), (012020). IOP Publishing.