

DAFTAR PUSTAKA

- [1] Q. Guo *et al.*, “Flexible Ti₃C₂T_x-Polyurethane Electrodes for Versatile Wearable Applications,” *Polymers*, vol. 16, no. 18, pp. 2623–2623, Sep. 2024, doi: <https://doi.org/10.3390/polym16182623>.
- [2] D.-C. Wang *et al.*, “Flexible, anti-damage, and non-contact sensing electronic skin implanted with MWCNT to block public pathogens contact infection,” *Nano research*, vol. 15, no. 3, pp. 2616–2625, 2022, doi: <https://doi.org/10.1007/s12274-021-3831-z>.
- [3] L. Bi, Z. Yang, L. Chen, Z. Wu, and C. Ye, “Compressible AgNWs/Ti₃C₂T_x MXene aerogel-based highly sensitive piezoresistive pressure sensor as versatile electronic skins,” *Journal of Materials Chemistry A*, vol. 8, no. 38, pp. 20030–20036, 2020, doi: <https://doi.org/10.1039/d0ta07044k>.
- [4] L. Iryani and S. Satrio Wibowo, “Proses Manufaktur Material Komposit Struktur Sayap Pesawat Udara Tanpa Awak Dengan Menggunakan Metode Hand Lay-Up dan Vacuum Bagging,” *Prosiding SNTTM XVIII*, vol. 1, pp. 1–4, 2019.
- [5] Utari Yolla Sundari, Ardi Sandriya, Erni, Odi Andanu, and Fauziah Fiardilla, “Karakterisasi Fisik Film Berbasis Polivinil Alkohol (PVA) Dengan Penambahan Nanoclay Sebagai Filler,” *Jurnal Penelitian UPR*, vol. 4, no. 1, pp. 8–15, Jun. 2024, doi: <https://doi.org/10.52850/jptupr.v4i1.13709>.
- [6] X. Xia and Q. Xiao, “Electromagnetic Interference Shielding of 2D Transition Metal Carbide (MXene)/Metal Ion Composites,” *Nanomaterials*, vol. 11, no. 11, 2021, doi: [10.3390/nano11112929](https://doi.org/10.3390/nano11112929).
- [7] V. Harahap, S. Sidabutar, and F. Kesehatan, “Sintesis dan Sifat Magnetik Komposit BaFe₁₂O₁₉/ZnO Terhadap Aplikasi Elektronik Media Perekam dan Absorben ,” *2-TRIK: Tunas-Tunas Riset Kesehatan*, vol. 10, no. 2, pp. 86–92, May 2020, doi: <https://doi.org/10.33846/2trik10203>.
- [8] A. Ramadhan, Abrar, and I. W. Fathonah , “Pengaruh Suhu Annealing Terhadap Sifat Listrik dan Struktur Kristal Lapisan Tipis Nanokomposit PVA/ZnO,” *eProceedings of Engineering*, vol. 10, no. 5, p. 4440, 2023.
- [9] R. Rahmatunisa, E. S. Iriani, N. E. Suyatma, and R. Syarief, “Pengaruh Nanopartikel Zinc Oxide dan Etilen Glikol Terhadap Sifat Fisik dan Antimikroba Biodegradable Foam” *Jurnal Penelitian Pascapanen Pertanian*, vol. 12, no. 2, p. 51, Jan. 2017, doi: <https://doi.org/10.21082/jpasca.v12n2.2015.51-59>.
- [10] D. Ponnamma *et al.*, “Synthesis, Optimization and Applications of ZnO/polymer Nanocomposites,” *Materials Science and Engineering: C*, vol. 98, pp. 1210–1240, May 2019, doi: <https://doi.org/10.1016/j.msec.2019.01.081>.

- [11] Jamileh Shojaeiarani, et al. "Cellulose Nanocrystal Based Composites: A Review." *Composites Part C: Open Access*, vol. 5, 2021, p. 100164, www.sciencedirect.com/science/article/pii/S2666682021000591, <https://doi.org/10.1016/j.jcomc.2021.100164>.
- [12] S. Salimi, R. Sotudeh-Gharebagh, R. Zarghami, S. Y. Chan, and K. H. Yuen, "Production of Nanocellulose and Its Applications in Drug Delivery: A Critical Review," *ACS Sustainable Chemistry & Engineering*, vol. 7, no. 19, pp.15800-15827, Sep.2019, doi:<https://doi.org/10.1021/acssuschemeng.9b02744>.
- [13] Patrik Sobolčiak et al., "2D Ti₃C₂T_x (MXene)-reinforced Polyvinyl Alcohol (PVA) Nanofibers with Enhanced Mechanical and Electrical Properties," *Plos One Journal*, vol. 12, no. 8, pp. e0183705–e0183705, Aug. 2017, doi: <https://doi.org/10.1371/journal.pone.0183705>.
- [14] D. Candani, M. Ulfah, W. Noviana dan R. Zainul, "Pemanfaatan Teknologi Sonikasi" doi: <https://doi.org/10.31227/osf.io/uxknv>
- [15] S. A. Rahmawaty, "Analisa Kekuatan Tarik dan Tekuk pada Komposit Fiberglass-Polyester Berpenguat Serat Gelas dengan Variasi Fraksi Volume Serat," *JTM-ITI (Jurnal Teknik Mesin ITI)*, vol. 5, no. 3, p. 146, Dec. 2021, doi: <https://doi.org/10.31543/jtm.v5i3.685>.
- [16] D. K. Rajak, D. D. Pagar, R. Kumar, and C. I. Pruncu, "Recent progress of reinforcement materials: A comprehensive overview of composite materials," *J. Mater. Res. Technol.*, vol. 8, no. 6, pp. 6354–6374, 2019, doi: 10.1016/j.jmrt.2019.09.068.
- [17] N. H. Haryanti and Suryajaya, *Serat Purun Tikus (Eleocharis dulcis) Sebagai Material Komposit*. Banjarmasin: Lambung Mangkurat University Press, 2020.
- [18] T. Surdia, *Pengetahuan Bahan Teknik*, Jakarta: PT. Pradnya Paramitha, 1992.
- [19] K. J. De France, T. Hoare, and E. D. Cranston, "Review of Hydrogels and Aerogels Containing Nanocellulose," *Chem. Mater.*, vol. 32, no. 17, pp. 7454–7476, 2020.
- [20] M. Fachrul Rozi and A. Mahyudin, "Analisis Variasi Fraksi Volume Nanoserat Pinang Terhadap Sifat Mekanik dan Uji Biodegradasi Material Komposit Epoksi dengan Pati Talas," *J. Fis. Unand*, vol. 9, no. 2, pp. 274-284, 2020, doi: 10.25077/jfu.9.2.274-284.2020.
- [21] Z. Zulkifli, H. Hermansyah, and S. Mulyanto, "Analisa Kekuatan Tarik dan Bentuk Patahan Komposit Serat Sabuk Kelapa Bermatriks Epoxyterhadap Variasi Fraksi Volume Serat," *JTT (Jurnal Teknol. Terpadu)*, vol. 6, no. 2, p. 90, 2018, doi: 10.32487/jtt.v6i2.459.
- [22] M. Pogorelov, K. Smyrnova, S. Kyrylenko, O. Gogotsi, V. Zahorodna, and A. Pogrebnjak, "MXenes—A New Class of Two-Dimensional Materials: Structure, Properties and Potential Applications," *Nanomaterials*, vol. 11, no. 12, 2021, doi: 10.3390/nano11123412.

- [23] G. Deysher et al., “Synthesis of Mo₄VAlC₄ MAX Phase and Two-Dimensional Mo₄VC₄ MXene with Five Atomic Layers of Transition Metals,” *ACS Nano*, vol. 14, no. 1, pp. 204–217, Jan. 2020, doi: 10.1021/acsnano.9b07708.
- [24] S. Abdolhosseinzadeh, X. Jiang, H. Zhang, J. Qiu, and C. (John) Zhang, “Perspectives on solution processing of two-dimensional MXenes,” *Materials Today*, vol. 48, pp. 214–240, 2021, doi: <https://doi.org/10.1016/j.mattod.2021.02.010>.
- [25] K. R. G. Lim, M. Shekhirev, B. C. Wyatt, B. Anasori, Y. Gogotsi, and Z. W. Seh, “Fundamentals of MXene synthesis,” *Nature Synthesis*, vol. 1, no. 8, pp. 601–614, 2022, doi: 10.1038/s44160-022-00104-6.
- [26] X. Xu et al., “MXenes with applications in supercapacitors and secondary batteries: A comprehensive review,” *Materials Reports: Energy*, vol. 2, no. 1, p. 100080, 2022, doi: <https://doi.org/10.1016/j.matre.2022.100080>.
- [27] E. Mostafavi and S. Iravani, “MXene-Graphene Composites: A Perspective on Biomedical Potentials,” *Nanomicro Lett*, vol. 14, no. 1, p. 130, 2022, doi: 10.1007/s40820-022-00880-y.
- [28] U. U. Rahman *et al.*, “MXenes as Emerging Materials: Synthesis, Properties, and Applications,” *Molecules*, vol. 27, no. 15, 2022, doi: 10.3390/molecules27154909.
- [29] K. Rajavel, Y. Hu, P. Zhu, R. Sun, and C. Wong, “MXene/metal oxides-Ag ternary nanostructures for electromagnetic interference shielding,” *Chemical Engineering Journal*, vol. 399, p. 125791, 2020, doi: <https://doi.org/10.1016/j.cej.2020.125791>.
- [30] I. Ihsanullah and H. Ali, “Technological challenges in the environmental applications of MXenes and future outlook,” *Case Studies in Chemical and Environmental Engineering*, vol. 2, p. 100034, 2020, doi: <https://doi.org/10.1016/j.cscee.2020.100034>.
- [31] K. Gong, K. Zhou, X. Qian, C. Shi, and B. Yu, “MXene as emerging nanofillers for high-performance polymer composites: A review,” *Compos B Eng*, vol. 217, p. 108867, 2021, doi: <https://doi.org/10.1016/j.compositesb.2021.108867>.
- [32] S. Biswas and P. S. Alegaonkar, “MXene: Evolutions in Chemical Synthesis and Recent Advances in Applications,” *Surfaces*, vol. 5, no. 1, pp. 1–34, 2022, doi: 10.3390/surfaces5010001.
- [33] T. Rasheed, “3D MXenes as promising alternatives for potential electrocatalysis applications: opportunities and challenges,” *Journal of Materials Chemistry C*, vol. 10, no. 26, pp. 9669–9690, 2022, doi: <https://doi.org/10.1039/d2tc01542k>.
- [34] L. Gao *et al.*, “Emerging applications of MXenes for photodetection: Recent advances and future challenges,” *Materials Today*, vol. 61, pp. 169–190, 2022, doi: <https://doi.org/10.1016/j.mattod.2022.10.022>.

- [35] X. Hui, X. Ge, R. Zhao, L. Zhaoqiang, and L. Yin, "Interface Chemistry on MXene-Based Materials for Enhanced Energy Storage and Conversion Performance," *Advanced Functional Materials*, vol. 30, Sep. 2020, doi: <https://doi.org/10.1002/adfm.202005190>.
- [36] A. F. Waluyo and H. Sabarman, "FABRIKASI FIBER POLYVINYL ALCOHOL (PVA) DENGAN ELEKTROSPINING," *Gravity : Jurnal Ilmiah Penelitian dan Pembelajaran Fisika*, vol. 5, no. 1, Feb. 2019, doi: <https://doi.org/10.30870/gravity.v5i1.5215>.
- [37] T. Mutia et al., "Preparasi Dan Karakterisasi Membran Serat Nano Polivinil Alkohol / Gelatin Dengan Antibiotika Topikal Menggunakan Metode Electrospinning Preparation and Characterization of Polyvinyl Alcohol / Gelatin.
- [38] X. Hong, L. Zou, J. Zhao, C. Li, and L. Cong, "Drywet spinning of PVA fiber with high strength and high Young's modulus," *IOP Conference Series: Materials Science and Engineering*, vol. 439, no. 4, p. 042011, 2018, doi: <https://doi.org/10.1088/1757899X/439/4/042011>.
- [39] Zhang, et al., "Highly conductive and sensitive acrylamide-modified carboxymethyl cellulose/polyvinyl alcohol composite hydrogels for flexible sensors," *IEEE Transactions on Nanotechnology*, vol. 20, pp. 123-130, 2022.
- [40] S. T. Hameed, T. F. Qahtan, A. M. Abdelghany, and A. H. Oraby, "Effect of Zinc Oxide nanoparticles on physical properties of carboxymethyl cellulose/ poly (ethylene oxide) matrix," *Physica B Condens Matter*, vol. 633, p. 413771, 2022, doi: <https://doi.org/10.1016/j.physb.2022.413771>.
- [41] M. Hidayati and H. Harmadi, "Rancang Bangun Sensor Serat Optik dengan Cladding Zinc Oxide untuk Mendeteksi Kelembaban Udara," *J. Fis. Unand*, vol. 10, no. 2, pp. 255–261, 2021, doi: [10.25077/jfu.10.2.255-261.2021](https://doi.org/10.25077/jfu.10.2.255-261.2021).
- [42] E. Lizundia, D. Puglia, T.-D. Nguyen, and I. Armentano, "Cellulose nanocrystal based multifunctional nanohybrids," *Prog Mater Sci*, vol. 112, p. 100668, 2020, doi: <https://doi.org/10.1016/j.pmatsci.2020.100668>.
- [43] M. A. Kosnan, M. A. Azam, N. E. Safie, R. F. Munawar, and A. Takasaki, "Recent Progress of Electrode Architecture for MXene/MoS₂ Supercapacitor: Preparation Methods and Characterizations," *Micromachines*, vol. 13, no. 11, p. 1837, Nov. 2022, doi: <https://doi.org/10.3390/mi13111837>.
- [44] J. Lorimer, *Applied Sonochemistry: The Uses of Power Ultrasound in Chemistry and Processing*. 2002. doi: [10.1002/352760054X](https://doi.org/10.1002/352760054X).
- [45] K. Parthiban and L. Poovazhagan, "Ultrasonication Assisted Fabrication of Aluminum and Magnesium Matrix Nanocomposites - A Review," vol. 979, pp. 63–67, 2020, doi: [10.4028/www.scientific.net/MSF.979.63](https://doi.org/10.4028/www.scientific.net/MSF.979.63).
- [46] H. Abrial, V. Lawrensus, D. Handayani, and E. Sugiarti, "Preparation of nano-sized particles from bacterial cellulose using ultrasonication and their characterization,"

- Carbohydr. Polym., vol. 191, pp. 161–167, 2018, doi: 10.1016/j.carbpol.2018.03.026.
- [47] I. Majid, G. A. Nayik, and V. Nanda, “Ultrasonication and food technology: A review,” *Cogent Food & Agriculture*, vol. 1, no. 1, Aug. 2015, doi: <https://doi.org/10.1080/23311932.2015.1071022>.
- [48] Chikita Hulungo, Donny Royke Wenas, and Anneke Rondonuwu, “Identifikasi Komposisi Mineral Batuan Teralterasi Menggunakan Spektroskopi SEM-EDX dan FTIR Pada Daerah Manifestasi Panas Bumi di Desa Mototompiaan Kecamatan Modayg Kabupaten Bolaang Mongondow Timur,” *Jurnal FisTa Fisika dan Terapannya*, vol. 3, no. 1, pp. 8–12, May 2022, doi: <https://doi.org/10.53682/fista.v3i1.163>.
- [49] N. Masta, *Buku Materi Pembelajaran Scanning Electron Microscopy*. Jakarta, 2020.
- [50] A. Samnur, A. Samnur, and A. Badaruddin, *Pengujian Bahan Teknik*, 1st ed. Yogyakarta: Deepublish, 2022, pp. 1-144. ISBN 978-623-02-5174-0.
- [51] S. Yunus, A. Yusman, M. Mahardika, H. Abral, and R. Nazir, “Increasing Electrical Conductivity of Bacterial Cellulose/Polypyrrole Bio Composite Films Prepared Using the Pulling Technique,” *TEM Journal*, pp. 370–376, Feb. 2023, doi: <https://doi.org/10.18421/tem121-46>.
- [52] A. I. Wulandari and C. L. Agusty, “Analisis Tegangan Regangan Pada Pelat Deck Dan Bottom Kapal Ferry Ro-Ro Menggunakan Finite Element Method Stress Stain Analysis on Deck and Bottom Plate of Ferry Ro-Ro Ship with Finite Element Method,” *J. Ilm. Teknol. Marit.*, vol. 15, no. 1, pp. 45–52, 2021
- [53] Irzaman, A Maddu, H Syafutra dan A Ismangil, “Uji konduktivitas listrik dan dielektrik film tipis lithium tantalate yang didadah niobium pentaoksida menggunakan metode chemical solution deposition,” 2010.
- [54] Irzaman, R Erviansyah, H. Syafutra, A Maddu dan Siswadi, “Studi konduktivitas listrik film tipis Ba 0,25, Sr 0,25, TiO₃ yang didadah ferium oksida (BFST) menggunakan metoda chemical solution,” *Berkala Fisika*, vol. 12, no. 1, pp. 33 38, 2010.
- [55] S. R. A. Rani, “Studi Konduktivitas Listrik CaCO₃ dan Karbon Arang Dengan Metode Four Point Probe”, *SAINFIS*, vol. 2, no. 1, pp. 40-54, Feb. 2022.
- [56] D. Jang and S. Lee, “Correlating thermal conductivity of carbon fibers with mechanical and structural properties,” *J. Ind. Eng. Chem.*, vol. 89, pp. 115-118, 2020, doi: 10.1016/j.jiec.2020.06.026.
- [57] W. Zhao, H. Chi, S. Zhang, X. Zhang, and T. Li, “One-Pot Synthesis of Cellulose/MXene/PVA Foam for Efficient Methylene Blue Removal,” *Molecules*, vol. 27, no. 13, p. 4243, Jun. 2022, doi: <https://doi.org/10.3390/molecules27134243>.

- [58] K. H. Tan, L. Samylingam, N. Aslfattahi, R. Saidur, and K. Kadirgama, "Optical and Conductivity Studies of Polyvinyl alcohol-Mxene (PVA-Mxene) Nanocomposite Thin Films for Electronic Applications," *Optics & Laser Technology*, vol. 136, p. 106772, Apr. 2021, doi: <https://doi.org/10.1016/j.optlastec.2020.106772>.
- [59] A. E. Pramono, "Karakteristik Komposit Karbon-Karbon Berbasis Limbah Organik Hasil Proses Tekan Panas," Fakultas Teknik, Universitas Indonesia, Depok, 2012.
- [60] A. Al Faruqi, "Studi Pengaruh Variasi Komposisi Binder Sampah Plastik Polypropylene (Pp) Dan High-Density Polyethylene (Hdpe) Terhadap Sifat Fisis Dan Sifat Mekanik Komposit Berpenguat Serbuk Ampas Tebu Untuk Aplikasi Papan Partikel," Institut Teknologi Sepuluh November, 2019.
- [61] T. Parker *et al.*, "Fourier-Transform Infrared Spectral Library of Mxenes," *Chemistry of Materials*, vol. 36, no. 17, pp. 8437–8446, Aug. 2024, doi: <https://doi.org/10.1021/acs.chemmater.4c01536>.
- [62] A. N. Shahab, "Sintesis Lapis Tipis TiO₂ Dopping Zn 10% w/w sebagai Fotokatalis Metilen Biru Menggunakan Metode Dip-Coating," Universitas Islam Indonesia Yogyakarta, 2023.
- [63] M. Tang *et al.*, "Surface Terminations of Mxene: Synthesis, Characterization, and Properties," *Symmetry*, vol. 14, no. 11, p. 2232, Oct. 2022, doi: <https://doi.org/10.3390/sym14112232>.
- [64] A. Nayan and Teuku Hafli, "Analisa Stuktur Mikro Material Komposit Polimer Berpenguat Serbuk Cangkang Kerang," *Malikussaleh Journal of Mechanical Science Technology/Malikussaleh Journal of Mechanical Science and Technology*, vol. 6, no. 1, pp. 15–15, Aug. 2022, doi: <https://doi.org/10.29103/mjmst.v6i1.8184>
- [65] S. Tamayo-Vegas, A. Muhsan, C. Liu, M. Tarfaoui, and K. Lafdi, "The Effect of Agglomeration on the Electrical and Mechanical Properties of Polymer Matrix Nanocomposites Reinforced with Carbon Nanotubes," *Polymers*, vol. 14, no. 9, p. 1842, Apr. 2022, doi: <https://doi.org/10.3390/polym14091842>.
- [66] D. Coetzee, M. Venkataraman, J. Militky, and M. Petru, "Influence of Nanoparticles on Thermal and Electrical Conductivity of Composites," *Polymers*, vol. 12, no. 4, p. 742, Mar. 2020, doi: <https://doi.org/10.3390/polym12040742>.
- [67] T. Ji *et al.*, "Effects of ultrasonication time on the properties of polyvinyl Alcohol/Sodium carboxymethyl Cellulose/Nano-ZnO/Multilayer graphene nanoplatelet composite films," *Nanomaterials*, vol. 10, Art. no. 9, 2020, doi: <https://doi.org/10.3390/nano10091797>.
- [68] L. Li, L. Han, H. Hu, and R. Zhang, "A review on polymers and their composites for flexible electronics," vol. 4, no. 3, pp. 726–746, Jan. 2023, doi: <https://doi.org/10.1039/d2ma00940d>.