DAFTAR PUSTAKA

[1] H. Mohammadi *dkk.*, "Lightweight Glass Fiber-Reinforced Polymer Composite for Automotive Bumper Applications: A Review," *Polymers (Basel)*, vol. 15, no. 1, hlm. 1–30, 2023, doi: 10.3390/polym15010193.

[2] R. Hanifi, G. B. Dewangga, E. Widianto, T. Mesin, F. Teknik, dan U. S. Karawang, "Analisis Material Komposit Berbasis Serat Pelepah Kelapa Sawit Dan Matriks Polypropylene Sebagai Bahan Pembuatan Bumper Mobil," *Journal of Infrastructure & Science Engineering*, vol. 2, no. 2, hlm. 15–23, 2019.

[3] F. Hasfi dan F. Ika, "Pengaruh Penambahan Serbuk Alumina (Al2O3) Terhadap Kuat Tarik dan Sifat Termal Komposit HDPE / Serbuk Kayu Mahoni," vol. 1, no. 1, hlm. 9–16, 2024, doi: 10.52330/jpcet.v1i1.236.

[4] Irmadona, "Analysis of Banana Leaves as Noise Reducing Media With Addition of Zalacca Plam Peel," *Indonesian Journal of Chemical Science and Technology*, vol. 53, no. 7, hlm. 401–405, 2019.

[5] K. Priyanto, A. H. Purwono, dan D. A. Cristanto, "Ketangguhan Impak Dan Kekuatan Tarik Komposit Fiberglass/Clay Filler Bermatriks Unsaturated Polyester BQTN-EX 157," *Teknika*, hlm. 45–53, 2019.

[6] Falma Irawati Sijabat, Jenmorisdo Saragih, dan Halimatuddahliana, "Pengaruh Ukuran Serbuk Tempurung Kelapa Sebagai Pengisi Komposit Poliester Tak Jenuh Terhadap Sifat Mekanik Dan Penyerapan Air," *Jurnal Teknik Kimia USU*, vol. 2, no. 4, hlm. 31–37, 2013, doi: 10.32734/jtk.v2i4.1488.

[7] J. Lehman, *Biochar for Environmental Management*. 2012. doi: 10.4324/9781849770552.

[8] Y. Yim dan B. Kim, "Preparation and Characterization of Activated Carbon / Polymer Composites," *journal polymer MDPI*, hlm. 1–14, 2023.

[9] S. Bahri dan S. Thalib, "Pengaruh Ukuran Partikel Pengisi Terhadap Sifat Mekanik Komposit Poliester/Abu Sekam Padi," *Jurnal Teknik Mesin*, vol. 11, no. 1, hlm. 7–12, 2023.

[10] M. Stambouli, W. Chaouch, S. Gargoubi, R. Zouari, dan S. Msahli, "Effect of calcium carbonate particle size and content on the thermal properties of PVC foamed layer used for coated textiles," *Turk J Chem*, vol. 47, no. 1, hlm. 40–46, 2023, doi: 10.55730/1300-0527.3514.

[11] R. H. Setyanto, "Review: Teknik Manufaktur Komposit Hijau dan Aplikasinya," *Performa*, vol. 11, no. 1, hlm. 9–18, 2012.

[12] M. Affandi, "Analisa Impact Pada Variasi Profil Bumper Reinforcement Beam Komposit Epoxy HGM Menggunakan Software Finite Element," hlm. 1–110, 2015.

[13] J. E. Ford, *Polyester*, vol. 20, no. 2. 2012. doi: 10.5040/9781501365287.2080.

[14] S. Nadilah, I. Winursito, dan S. Wahyuni, “Poliester Tak Jenuh Sebagai Bahan Baku Pembuatan Helm Pengaman,” 2003.

[15] H. Fahmi dan H. Hermansyah, “Pengaruh Orientasi Serat Pada Komposit Resin Polyester/ Serat Daun Nenas Terhadap Kekuatan Tarik,” *Jurnal Teknik Mesin*, vol. 1, no. 1, hlm. 46–52, 2011.

[16] N. Saba, M. Jawaid, O. Y. Alothman, M. T. Paridah, dan A. Hassan, “Recent advances in epoxy resin, natural fiber-reinforced epoxy composites and their applications,” *Journal of Reinforced Plastics and Composites*, vol. 35, no. 6, hlm. 447–470, 2016, doi: 10.1177/0731684415618459.

[17] H. Hestiawan, Jamasri, dan Kusmono, “Pengaruh Penambahan Katalis Terhadap Sifat Mekanis Resin Poliester Tak Jenuh,” *Teknosia*, vol. 3, no. 1, hlm. 1–7, 2017.

[18] D. Cahyandari, H. S. R, Soekrisno, dan Kusmono, “Pengaruh Fraksi Volume Serat Terhadap Kekuatan Tarik dan,” *Pengaruh Fraksi Volume Serat Terhadap Kekuatan Tarik dan Kekuatan Impak Biokomposites Selulose Bakteria-sirlak*, vol. 1, no. 2, hlm. 1–5, 2015.

[19] A. Prasetyaningrum, N. Rokhati, dan K. Rahayu, “Optimasi Proses Pembuatan Serat Eceng Gondok untuk Menghasilkan Komposit Serat dengan Kualitas Fisik dan Mekanik yang Tinggi,” *Riptek*, vol. 3, no. 1, hlm. 45–50, 2009.

[20] E. Calabrese *dkk.*, “Thermal and Electrical Characterization of Polyester Resins Suitable for Electric Motor Insulation,” *Polymers (Basel)*, vol. 15, no. 6, 2023, doi: 10.3390/polym15061374.

[21] P. Pączkowski, A. Puszka, dan B. Gawdzik, “Investigation of Degradation of Composites Based on Unsaturated Polyester Resin and Vinyl Ester Resin,” *Materials*, vol. 15, no. 4, 2022, doi: 10.3390/ma15041286.

[22] S. T. M. T. Dr. Nasmi Herlina Sari dan S. T. M. T. Suteja, *Polimer Termoset*. Deepublish, 2021.

[23] S. A. Rahmawaty, “Analisa Kekuatan Tarik dan Tekuk pada Komposit Fiberglas-Polyester Berpenguat Serat Gelas dengan Variasi Fraksi Volume Serat,” *JTM-ITI (Jurnal Teknik Mesin ITI)*, vol. 5, no. 3, hlm. 146, 2021, doi: 10.31543/jtm.v5i3.685.

[24] Caroline Oktaviana Hutagalung dan Maulida, “Karakteristik Fourier Transform Infra Red Dan Kekuatan Bentur Komposit Poliester Tak Jenuh Berpengisi Abu Sekam Padi Putih,” *Jurnal Teknik Kimia USU*, vol. 3, no. 1, hlm. 23–26, 2014, doi: 10.32734/jtk.v3i1.1497.

[25] N. Nurhayati dan S. C. Tyas, “Rasio Polimer Dengan Katalis Dan Bulu Ayam (Gallus domesticus) Untuk Pembuatan Keramik Dinding,” *Prosiding Seminar Nasional Pakar*, no. 1999, hlm. 59–67, 2018, doi: 10.25105/pakar.v0i0.2604.

[26] V. Malau, “Karakterisasi Sifat Mekanis Dan Fisis Komposit E-Glass Dan Resin Eternal 2504 Dengan Variasi Kandungan Serat, Temperatur Dan Lama Curing,” *Mekanika*, vol. 8, hlm. 144–149, 2010.

[27] R. Dewi, A. Azhari, dan I. Nofriadi, “Aktivasi Karbon Dari Kulit Pinang Dengan Menggunakan Aktivator Kimia Koh,” *Jurnal Teknologi Kimia Unimal*, vol. 9, no. 2, hlm. 12, 2021, doi: 10.29103/jtku.v9i2.3351.

[28] Pari dkk, “Pembuatan dan Pemanfaatan Arang Aktif sebagai Reduktor Emisi Formaldehida Kayu LApis (Manufacturing and Application of Activated Charcoal as Reductor of Plywood Formaldehyde Emission),” *Jurnal Penelitian Hasil Hutan*, vol. 24, hlm. 425–436, 2006.

[29] S. Jamilatun, M. Setyawan, S. Salamah, D. A. A. Purnama, dan R. U. M. Putri, “Pembuatan Arang Aktif dari Tempurung Kelapa dengan Aktivasi Sebelum dan Sesudah Pirolisis,” *Seminar Nasional Sains dan Teknologi*, no. 0258, hlm. 1–8, 2015.

[30] D. Tamado *dkk.*, “Sifat Termal Karbon Aktif Berbahan Arang Tempurung Kelapa,” *Seminar Nasional Fisika Universitas Negeri Jakarta*, hlm. 73–81, 2013.

[31] R. Masriatini dan M. Fatimura, “Penggunaan arang tempurung kelapa yang diaktifkan untuk menyerap zat warna limbah cair industri kain tradisional,” *Jurnal Redoks*, vol. 4, hlm. 37–40, 2019.

[32] S. Ojha, S. K. Acharya, dan G. Raghavendra, “Mechanical properties of natural carbon black reinforced polymer composites,” *J Appl Polym Sci*, vol. 132, no. 1, hlm. 1–7, 2015, doi: 10.1002/app.41211.

[33] G. S. Pambayun, R. Y. E. Yulianto, M. Rachimoellah, E. M. M. Putri, J. T. Kimia, dan F. T. Industri, “Pembuatan Karbon Aktif Dari Arang Tempurung Kelapa Dengan Aktivator ZnCl2 Dan Na2CO3 Sebagai Adsorben Untuk Mengurangi Kadar Fenol Dalam Air Limbah,” vol. 2, no. 1, 2013.

[34] Badan Pusat Statistik, “Badan Pusat Statistik.” Diakses: 4 Juli 2024. [Daring]. Tersedia pada: https://www.bps.go.id/id/statistics-table/2/MTMyIzI=/produksi-tanaman-perkebunan--ribu-ton-.html

[35] J. Lehman, *Biochar for Environmental Management*. 2012. doi: 10.4324/9781849770552.

[36] T. F. Rahayu, “Pengaruh Variasi Konsentrasi Karbon Tempurung Kelapa Terhadap Karakteristik Tinta Spidol Whiteboard Ramah Lingkungan,” *Jurnal Kartika Kimia*, vol. 4, no. 2, hlm. 77–82, 2021, doi: 10.26874/jkk.v4i2.86.

[37] G. Syahbirin, A. A. Darwis, A. Suryani, dan W. Syafi’i, “Pengaruh Nisbah Pereaksi (Lignin Eupcalyptus – Natrium Bisulfit) Dan pH Awal Reaksi Sulfonasi Terhadap Karakteristik Natrium Lignosulfonat,” *Jurnal Teknik Industri Pertanian*, vol. 19, no. 2, hlm. 101–106, 2010.

[38] G. Pari, K. Sofyan, W. Syafii, dan H. Yamamoto, “Kajian Struktur Arang Dari Lignin(Study on Charcoal Structure of Lignin), Jurnal Penelitian Hasil Hutan Vol.24 No. 1,” hlm. 9–20, 2006.

[39] M. Erfani Jazi *dkk.*, “Structure, chemistry and physicochemistry of lignin for material functionalization,” *SN Applied Sciences*, vol. 1, no. 9, hlm. 1–19, 2019, doi: 10.1007/s42452-019-1126-8.

[40] R. H. Setyanto, “Review: Teknik Manufaktur Komposit Hijau dan Aplikasinya,” *Performa*, vol. 11, no. 1, hlm. 9–18, 2012.

[41] B. Sial, “Composite Formation By Hand Lay Up Process,” no. May, 2022.

[42] Diaza Erlangga Briyan Nugraha, Ferry Setiawan, dan Sehono, “Eksperimen Pembuatan Komposit Berbahan Dasar Tanaman Mendong Menggunakan Metode Vacuum Bagging,” *Journal of Applied Mechanical Engineering and Renewable Energy*, vol. 2, no. 2, hlm. 36–41, 2022, doi: 10.52158/jamere.v2i2.376.

[43] Y. O. Bani, D. P. Mangesa, dan J. S. Bale, “Pembuatan Dan Pengujian Alat Fabrikasi Komposit Vacuum Bag Dengan Menggunakan Metode VDI 2221,” *Lontar Jurnal Teknik Mesin UNDANA*, vol. 04, no. 01, hlm. 16–25, 2017.

[44] K. Abdurohman *dkk.*, “A Comparison of Vacuum Infusion, Vacuum Bagging, and Hand Lay-Up Process on The Compressive and Shear Properties of GFRP Materials,” *Indonesian Journal of Aerospace*, vol. 21, no. 1, hlm. 39–50, 2023, doi: 10.59981/ijoa.2023.286.

[45] Kuswanto, “Proses Pembuatan Body Microcar Dari Bahan Fakultas Teknologi Industri Universitas Islam Indonesia Yogyakarta,” 2008.

[46] V. A. Suoth dan M. D. Bobanto, “Dengan Menggunakan P-Trak Smoke Particle Concentration Measuring Using P-Trak,” 2016.

[47] U. Ulusoy, “A Review of Particle Shape Effects on Material Properties for Various Engineering Applications: From Macro to Nanoscale,” *Minerals*, vol. 13, no. 1, 2023, doi: 10.3390/min13010091.

[48] Harso, “Nanopartikel dan Dampaknya Bagi Kesehatan Manusia,” *Universitas Flores*, vol. 01, hlm. 1–7, 2017.

[49] S. C. Tjong, “Structural and mechanical properties of polymer nanocomposites,” *Materials Science and Engineering R: Reports*, vol. 53, no. 3–4, hlm. 73–197, 2006, doi: 10.1016/j.mser.2006.06.001.

[50] H. Hezaveh dan M. K. Moraveji, “Modeling Effective Thermal Conductivity of Al2O3 Nanoparticles in Water and Ethylene Glycol Based on Shape Factor,” *International Journal of Chemical Engineering and Applications*, vol. 2, no. 1, hlm. 1–4, 2011, doi: 10.7763/ijcea.2011.v2.64.

[51] M. Lengyel, N. Kállai-Szabó, V. Antal, A. J. Laki, dan I. Antal, “Microparticles, microspheres, and microcapsules for advanced drug delivery,” *Scientia Pharmaceutica*, vol. 87, no. 3, 2019, doi: 10.3390/scipharm87030020.

[52] K. M. Z. Hossain, U. Patel, dan I. Ahmed, “Development of microspheres for biomedical applications: A review,” *Progress in Biomaterials*, vol. 4, no. 1, hlm. 1–19, 2015, doi: 10.1007/s40204-014-0033-8.

[53] Y. Higo, T. P. Halford, dan K. Takashima, “Mechanical properties measurement of microscale materials for MEMS application,” *11th International Conference on Fracture 2005, ICF11*, vol. 7, no. January 2005, hlm. 4758–4763, 2005.

[54] Z. Rajabimashhadi, R. Naghizadeh, A. Zolriasatein, S. Bagheri, C. Mele, dan C. Esposito Corcione, “Hydrophobic, Mechanical, and Physical Properties of Polyurethane Nanocomposite: Synergistic Impact of Mg(OH)2 and SiO2,” *Polymers*, vol. 15, no. 8, 2023, doi: 10.3390/polym15081916.

[55] J. A. King, D. R. Klimek, I. Miskioglu, dan G. M. Odegard, “Mechanical properties of graphene nanoplatelet/epoxy composites,” *Journal of Composite Materials*, vol. 49, no. 6, hlm. 659–668, 2015, doi: 10.1177/0021998314522674.

[56] R. M. Christensen, *Mechanics of Composite Materials.* 1984.

[57] F. Y. Utama dan H. Zakiyya, “Pengaruh variasi arah serat komposit berpenguat hibrida fiberhybrid terhadap kekuatan tarik dan densitas material dalam aplikasi body part mobil,” *Mekanika*, vol. 15, no. 2, hlm. 60–69, 2016.

[58] R. Desiasni, R. Chandra, dan F. Widyawati, “Pengaruh Volume Limbah Serbuk Kayu Jati (Tectona Grandis) Terhadap Daya Serap Air Pada Komposit Partikel Dengan Matriks Epoksi,” *Jurnal TAMBORA*, vol. 5, no. 2, hlm. 74–78, 2021, doi: 10.36761/jt.v5i2.1128.

[59] A. H. Karle, P. Jagdish, A. Gajbhiye, S. Sarnobat, dan R. Shahu, “Mechanical Properties of Particulate Reinforced Epoxy Composites-A Review,” 2022.

[60] A. Nayan dan T. Hafli, “Analisa Stuktur Mikro Material Komposit Polimer Berpenguat Serbuk Cangkang Kerang,” *Journal of Mechanical Science and Technology*, vol. 6, no. 1, hlm. 15–24, 2022.

[61] M. Bustamante-Torres, D. Romero-Fierro, B. Arcentales-Vera, S. Pardo, dan E. Bucio, “Interaction between filler and polymeric matrix in nanocomposites: Magnetic approach and applications,” *Polymers*, vol. 13, no. 17, 2021, doi: 10.3390/polym13172998.

[62] I. Pleşa, P. V. Noţingher, S. Schlögl, C. Sumereder, dan M. Muhr, “Properties of polymer composites used in high-voltage applications,” *Polymers*, vol. 8, no. 5, 2016, doi: 10.3390/polym8050173.

[63] K. Diharjo, I. Elharomy, dan A. Purwanto, “Pengaruh Fraksi Volume Filler terhadap Kekuatan Bending dan Ketangguhan Impak Komposit Nanosilika-Phenolic,” *Jurnal Rekayasa Mesin*, vol. 5, no. 1, hlm. 27–32, 2014.

[64] S. Sunardi, Moh. Fawaid, dan F. R. N. Muhamad, “Variasi Campuran Fly Ash Batubara Untuk Material Komposit,” *Flywheel: Jurnal Teknik Mesin Untirta*, vol. I, no. 1, hlm. 90–102, 2015.

[65] A. K. Sharma, R. Bhandari, A. Aherwar, dan R. Rimašauskiene, “Matrix materials used in composites: A comprehensive study,” *Mater Today Proc*, vol. 21, hlm. 1559–1562, 2020, doi: 10.1016/j.matpr.2019.11.086.

[66] Apri dan L. Anggaraini, “Aplikasi Polikarbonat sebagai Bodi Kendaraan dengan Peluang Pengembangannya,” hlm. 8–13, 2019.

[67] ASTM D638-14, “ASTM D638-14.pdf,” 2014.

[68] L. Diana, A. Ghani Safitra, dan M. Nabiel Ariansyah, “Analisis Kekuatan Tarik pada Material Komposit dengan Serat Penguat Polimer,” *Jurnal Engine : Energi, Manufaktur, dan Material*, vol. 4, no. 2, hlm. 59–67, 2020.

[69] Y. Nuhgraha, M. K. A. Rosa, dan I. Agustian, “Perancangan Alat Uji Impak Digital dengan Metode Charpy Untuk Mengukur Kekuatan Material Polimer,” *Jurnal Amplifier : Jurnal Ilmiah Bidang Teknik Elektro Dan Komputer*, vol. 10, no. 2, hlm. 15–19, 2020, doi: 10.33369/jamplifier.v10i2.15316.

[70] C. U. Wardani, Y. Samantha, dan H. Budiman, “Analisis Pengujian Impak Metoda Izod dan Charpy Menggunakan Benda Uji Alumunium dan Baja ST37,” *Universitas Majalengka*, no. 1, hlm. 244–247, 2017.

[71] ASTM D256-02, “ASTM D56-02,” vol. 08, no. Reapproved 1989, hlm. 3–4, 2000, doi: 10.1520/C1709-18.

[72] yopi Handoyo, “Perancangan Alat Uji Impak Metode Charpy Kapasitas 100 Joule,” vol. 1, no. 1, hlm. 17–25, 2013.

[73] ASTM D6110, “Standard Test Methods for Determining the Charpy Impact Resistance of Notched iTeh Standards iTeh Standards Document Preview,” vol. 08, no. April, hlm. 3–8, 1998, doi: 10.1520/D6110-10.1.

[74] I. Mawardi, S. Rizal, S. Aprilia, dan M. Faisal, “Kajian stabilitas termal bahan baku material insulasi panas berbasis serat alam : kayu kelapa sawit dan serat rami Study of the thermal stability of raw materials for thermal insulation materials based on natural fibers : palm wood and ramie fiber,” hlm. 16–21, 2021.

[75] M. Wagner, *Thermal Analysis in Practice*. 2017. doi: 10.3139/9781569906446.fm.

[76] A. Jamaludin, F. Al Afghani, H. Dwiyanti, dan A. Saputri, “Identifikasi Kerusakan Thermo Gravimetry Analysis Di Hotcell 108 Irm,” *PIN Pengelolaan Instalasi Nuklir*, hlm. 19–28, 2021.

[77] S. S. M. S. D. I. D. M. S. Dr. Zikri Noer, *Karakterisasi Material*. Medan: GUEPEDIA’, 2021.

[78] E. Apriyanti, U. Chasanah, dan E. Efitra, *Pengembangan Metode Filtrasi Menggunakan Membran Keramik Berbasis Fly Ash Batubara*. PT. Sonpedia Publishing Indonesia, 2024.

[79] V. L. Kett dan D. M. Price, “Thermogravimetry,” hlm. 18–46, 2016.

[80] M. Martijanti, S. Sutarno, dan A. L. Juwono, “Polymer composite fabrication reinforced with bamboo fiber for particle board product raw material application,” *Polymers (Basel)*, vol. 13, no. 24, 2021, doi: 10.3390/polym13244377.

[81] T. Hanemann dan D. V. Szabó, *Polymer-nanoparticle composites: From synthesis to modern applications*, vol. 3, no. 6. 2010. doi: 10.3390/ma3063468.

[82] S. Y. Fu, X. Q. Feng, B. Lauke, dan Y. W. Mai, “Effects of particle size, particle/matrix interface adhesion and particle loading on mechanical properties of particulate-polymer composites,” *Composites Part B: Engineering*, vol. 39, no. 6, hlm. 933–961, 2008, doi: 10.1016/j.compositesb.2008.01.002.

[83] S. Savetlana dan Y. Parulian, “Kekuatan Tarik Komposit Poliester Berpenguat Partikel Kayu Jati , Merawan dan Meranti Merah,” *Jurnal Mechanical*, vol. 4, no. 1, hlm. 58–62, 2013.

[84] K. Agarwal, S. K. Kuchipudi, B. Girard, dan M. Houser, “Mechanical properties of fiber reinforced polymer composites: A comparative study of conventional and additive manufacturing methods,” *J Compos Mater*, vol. 52, no. 23, hlm. 3173–3181, 2018, doi: 10.1177/0021998318762297.

[85] S. K. Bhudolia, P. Perrotey, dan S. C. Joshi, “Optimizing polymer infusion process for thin ply textile composites with novel matrix system,” *Materials*, vol. 10, no. 3, 2017, doi: 10.3390/ma10030293.

[86] I. I. Shuvo, “Aerospace Composite Structure: Routing a Thermoset Composite Fabrication Model by Prepeg Lay-up Medium to Manufacture Sandwich Panels for Aircraft,” *Research & Development in Material Science*, vol. 12, no. 1, hlm. 1249–1260, 2019, doi: 10.31031/rdms.2019.12.000780.

[87] P. Sormunen dan T. Kärki, “Compression molded thermoplastic composites entirely made of recycled materials,” *Sustainability (Switzerland)*, vol. 11, no. 3, 2019, doi: 10.3390/su11030631.

[88] Y. Chen *dkk.*, “In-depth analysis of the structure and properties of two varieties of natural luffa sponge fibers,” *Materials*, vol. 10, no. 5, 2017, doi: 10.3390/ma10050479.

[89] Rotua Adryani dan Maulida, “Pengaruh Ukuran Partikel Dan Komposisi Abu Sekam Padi Hitam Terhadap Sifat Kekuatan Tarik Komposit Poliester Tidak Jenuh,” *Jurnal Teknik Kimia USU*, vol. 3, no. 4, hlm. 31–36, 2015, doi: 10.32734/jtk.v3i4.1653.

[90] Syahrinal Anggi Daulay, Fachry Wirathama, dan Halimatuddahliana, “Pengaruh Ukuran Partikel Dan Komposisi Terhadap Sifat Kekuatan Bentur Komposit Epoksi Berpengisi Serat Daun Nanas,” *Jurnal Teknik Kimia USU*, vol. 3, no. 3, hlm. 13–17, 2014, doi: 10.32734/jtk.v3i3.1628.

[91] D. Irnawan dan B. Karomah, “Kajian Ukuran Serbuk Komposit Limbah Cangkang Telur,” *Journal of Architecture and Built Environment*, vol. 1, no. 2, hlm. 24–27, 2019.

[92] M. E. Mngomezulu, A. S. Luyt, S. A. Chapple, dan M. J. John, “Effect of expandable graphite on thermal and flammability properties of poly(lactic acid)-starch/poly(ε-caprolactone) blend systems,” *Polym Eng Sci*, vol. 58, no. 9, hlm. 1619–1629, 2018, doi: 10.1002/pen.24751.

[93] D. M. Panaitescu dan D. M. Vuluga, “Molecular Crystals and Liquid Crystals Properties of Polymer Composites with Cellulose Microfibrils,” no. January 2014, hlm. 37–41, 2010.

[94] A. V. Mentari, G. Handika, dan S. Maulina, “The Comparison of Function Group and Surface Morphology of Activated Carbon from Oil Palm Frond Using Phosporic Acid (H3PO4),” *Jurnal Teknik Kimia USU*, vol. 7, no. 1, hlm. 16–20, 2018.

[95] V. I. Irzhak, I. E. Uflyand, dan G. I. Dzhardimalieva, “Self-Healing of Polymers and Polymer Composites,” *Polymers*, vol. 14, no. 24, 2022, doi: 10.3390/polym14245404.

[96] C. Prastyadi, “Pengaruh Variasi Fraksi Volume, Temperatur, Waktu Curing dan Post-Curing Terhadap Karakteristik Tekan Komposit Polyester - Hollow Glass Microspheres,” *Jurnal Teknik Its*, vol. 6, no. 1, hlm. 196–200, 2017.