

DAFTAR PUSTAKA

- [1] C. Defonseka, *Practical Guide to Flexible Polyurethane Foams Practical Guide to Flexible Polyurethane Foams*. 2013.
- [2] X. M. Tan and D. Rodrigue, “Density Graded Polymer Composite Foams,” *Cellular Polymers*, vol. 42, no. 1, pp. 25–51, 2023, doi: 10.1177/02624893221143507.
- [3] Q. Guo, *Thermosets: Structure, Properties and Applications*. 2017.
- [4] S. K. M. Haque *et al.*, “Application And Suitability Of Polymeric Materials As Insulators In Electrical Equipment,” *Energies*, vol. 14, no. 10, pp. 1–29, 2021, doi: 10.3390/en14102758.
- [5] N. H. Sari and Suteja, *Polimer Termoset*. Deepublish, 2021.
- [6] A. S. Dutta, “Polyurethane Foam Chemistry,” *Recycling of Polyurethane Foams*, pp. 17–27, 2018, doi: 10.1016/b978-0-323-51133-9.00002-4.
- [7] D. J. Mohamed, N. J. Hadi, and Z. K. Alobad, “Investigation of the Polyol Types and Isocyanate Concentrations on the Rheological, Morphological and Mechanical Properties of Polyurethane Foams,” *IOP Conference Series: Materials Science and Engineering*, vol. 1094, no. 1, pp. 1–17, 2021, doi: 10.1088/1757-899x/1094/1/012157.
- [8] S. Czonka, A. Strakowska, K. Strzelec, A. Kairyte, and A. Kremensas, “Bio-based Polyurethane Composite Foams with Improved Mechanical, Thermal, and Antibacterial Properties,” *Materials*, vol. 13, no. 1108, pp. 1–20, 2020, doi: 10.3390/ma13051108.
- [9] G. Grün, H. Kröber, and T. Pretsch, “Shape Memory Polymer Foam with Programmable Apertures,” *Polymers*, vol. 1914, no. 12, pp. 1–23, 2020.
- [10] G. Czél, L. Vanyorek, A. Sycheva, F. Kerekes, E. Szőri-Dorogházi, and D. Janovszky, “Antimicrobial Effect of Silver Nanoparticles Plated Natural Zeolite In Polyurethane Foam,” *Express Polymer Letters*, vol. 15, no. 9, pp. 853–864, 2021, doi: 10.3144/expresspolymlett.2021.68.
- [11] J. Ko’sny and D. W. Yarbrough, “Thermal Insulation and Radiation Control Technologies for Buildings,” *Syria Studies*, vol. 7, no. 1, pp. 217–240, 2022.
- [12] N. Sienkiewicz and S. Czonka, “Natural Additives Improving Polyurethane Antimicrobial Activity,” *Polymers*, vol. 14, no. 2533, pp. 1–22, 2022, doi: 10.3390/polym14132533.
- [13] A. B. Santoso, “Upaya Mempertahankan Eksistensi Cengkeh di Provinsi Maluku Melalui Rehabilitasi dan Peningkatan Produktivitas,” *Litbang Pertanian*, vol. 37, no. 1, pp. 26–32, 2018.

- [14] U. Suhendar and S. Sogandi, "Identifikasi Senyawa Aktif Ekstrak Daun Cengkeh (*Syzygium Aromaticum*) Sebagai Inhibitor *Streptococcus Mutans*," *Al-Kauniyah: Jurnal Biologi*, vol. 12, no. 2, pp. 229–239, 2019, doi: 10.15408/kauniyah.v12i2.12251.
- [15] D. Dukarska, J. Walkiewicz, A. Derkowski, and R. Mirski, "Properties of Rigid Polyurethane Foam Filled with Sawdust from Primary Wood Processing," *Materials*, vol. 15, no. 15, 2022, doi: 10.3390/ma15155361.
- [16] E. Akdogan, M. Erdem, M. E. Ureyen, and M. Kaya, "Rigid Polyurethane Foams With Halogen-Free Flame Retardants: Thermal Insulation, Mechanical, And Flame Retardant Properties," *Journal of Applied Polymer Science*, vol. 137, no. 1, 2019, doi: 10.1002/app.47611.
- [17] A. Demharter, "Polyurethane Rigid Foam, A Proven Thermal Insulating Material For Applications Between +130°C And -196°C," *Cryogenics*, vol. 38, no. 1, pp. 113–117, 1998, doi: 10.1016/S0011-2275(97)00120-3.
- [18] J. P. Greene, *Automotive Plastics and Composites: Materials and Processing*. in *Plastics Design Library*. Elsevier Science, 2021.
- [19] S. Thomas, K. Joseph, S. K. Malhotra, K. Goda, and M. S. Sreekala, *Polymer Composites, Macro- and Microcomposites*. in *Polymer Composites*. Wiley, 2012.
- [20] A. Das and P. Mahanwar, "A Brief Discussion On Advances In Polyurethane Applications," *Advanced Industrial and Engineering Polymer Research*, vol. 3, no. 3, pp. 93–101, 2020, doi: 10.1016/j.aiepr.2020.07.002.
- [21] E. Oktariani and L. R. Sari, "Potensi Zeolit Alam dalam Meningkatkan Sifat Termal Busa Poliuretan," *Jurnal Teknologi dan Manajemen*, vol. 19, no. 2, pp. 107–112, 2021, doi: 10.52330/jtm.v19i2.40.
- [22] M. S. Kathalewar, P. B. Joshi, A. S. Sabnis, and V. C. Malshe, "Non-Isocyanate Polyurethanes: From Chemistry To Applications," *RSC Advances*, vol. 3, no. 13, pp. 4110–4129, 2013, doi: 10.1039/c2ra21938g.
- [23] J. O. Akindoyo, M. D. H. Beg, S. Ghazali, M. R. Islam, N. Jeyaratnam, and A. R. Yuvaraj, "Polyurethane Types, Synthesis And Applications-A Review," *RSC Advances*, vol. 6, no. 115, pp. 114453–114482, 2016, doi: 10.1039/c6ra14525f.
- [24] N. V. Gama, A. Ferreira, and A. Barros-Timmons, "Polyurethane Foams: Past, Present, and Future," *Materials*, vol. 11, no. 10, pp. 1–35, 2018, doi: 10.3390/ma11101841.
- [25] G. Wypych, *Handbook of Polymers*. Elsevier Science, 2016.
- [26] G. Kasi, S. Gnanasekar, K. Zhang, E. T. Kang, and L. Q. Xu, "Polyurethane-Based Composites With Promising Antibacterial Properties," *Journal of Applied Polymer Science*, vol. 139, no. 20, 2022, doi: 10.1002/app.52181.
- [27] H. Janik, M. Sienkiewicz, and J. Kucinska-Lipka, *Polyurethanes*. 2014. doi: 10.1016/B978-1-4557-3107-7.00009-9.

- [28] T. Khan, V. Acar, M. R. Aydin, B. Hülagü, H. Akbulut, and M. Ö. Seydibeyoğlu, "A Review On Recent Advances In Sandwich Structures Based On Polyurethane Foam Cores," *Polymer Composites*, vol. 41, no. 6, pp. 2355–2400, 2020, doi: 10.1002/pc.25543.
- [29] I. Singh, S. K. Samal, S. Mohanty, and S. K. Nayak, "Recent Advancement Inplant-Oil Derived Polyol Based Polyurethane Foamfor Future Perspective: A Review," *Prepositional Phrases and Prepositional Verbs*, pp. 1–43, 2019, doi: 10.1515/9783110802368-003.
- [30] J. O. Akindoyo, M. D. H. Beg, S. Ghazali, M. R. Islam, N. Jeyaratnam, and A. R. Yuvaraj, "Polyurethane Types, Synthesis and Applications - A Review," *RSC Advances*, vol. 6, no. 115, pp. 1–100, 2016, doi: 10.1039/c6ra14525f.
- [31] S. T. McKenna and T. R. Hull, "The Fire Toxicity of Polyurethane Foams," *Fire Science Reviews*, vol. 5, no. 3, pp. 1–27, 2016, doi: 10.1186/s40038-016-0012-3.
- [32] R. Mangesa and Irsan, "Jurnal Biology Science & Education 2020 MUHAMMAD A'TOURROHMAN," *Jurnal Biology Science & Education 2020*, vol. 9, no. 2, pp. 184–190, 2020.
- [33] V. A. Parthasarathy, B. Chempakam, and T. J. Zachariah, *Chemistry Of Spices*. 2008. doi: 10.4327/jsnfs1949.32.267.
- [34] N. Nurdjannah and N. Bermawie, "Cloves," *Handbook of Herbs and Spices: Second Edition*, vol. 1, pp. 197–215, 2012, doi: 10.1533/9780857095671.197.
- [35] D. H. A. Sudarni *et al.*, "Malachite Green Removal by Activated Potassium Hydroxide Clove Leaf Agrowaste Biosorbent: Characterization, Kinetic, Isotherm, and Thermodynamic Studies," *Adsorption Science and Technology*, vol. 2021, 2021, doi: 10.1155/2021/1145312.
- [36] D. Bhowmik, K. P. S. Kumar, A. Yadav, S. Srivastava, S. Paswan, and A. S. Dutta, "Recent Trends in Indian Traditional Herbs Syzygium Aromaticum and its Health Benefits," *Journal of Pharmacognosy and Phytochemistry*, vol. 1, no. 1, pp. 6–17, 2012.
- [37] M. Basavaraju and B. S. Gunashree, " Escherichia coli : An Overview of Main Characteristics , " *Escherichia coli - Old and New Insights*, no. November, 2023, doi: 10.5772/intechopen.105508.
- [38] D. P. Hutasoit, "Pengaruh Sanitasi Makanan dan Kontaminasi Bakteri Escherichia coli Terhadap Penyakit Diare," *Jurnal Ilmiah Kesehatan Sandi Husada*, vol. 12, no. 2, pp. 779–786, 2020, doi: 10.35816/jiskh.v12i2.399.
- [39] A. Aliviameita and Puspitasari, *Bakteriologi Dasar*, vol. 1, no. 1. 2020.
- [40] P. R. Murray, K. Rosenthal, and M. A. Pfaller, *Medical Microbiology*. Elsevier Health Sciences, 2020.
- [41] N. Sienkiewicz, S. Czlonka, A. Kairyte, and S. Vaitkus, "Curcumin As A Natural Compound in The Synthesis of Rigid Polyurethane Foams With Enhanced

- Mechanical, Antibacterial and Anti-Ageing Properties," *Polymer Testing*, vol. 79, pp. 1–31, 2019, doi: 10.1016/j.polymertesting.2019.106046.
- [42] C. Li *et al.*, "Fabrication and Properties of Antimicrobial Flexible Nanocomposite Polyurethane Foams With In Situ Generated Copper Nanoparticles," *Journal of Materials Research and Technology*, vol. 19, pp. 3603–3615, 2022, doi: 10.1016/j.jmrt.2022.06.115.
- [43] A. Grzabka-Zasadzinska, B. Przemysław, and S. Borysiak, "Highly Insulative PEG-Grafted Cellulose Polyurethane," *Materials*, vol. 14, no. 6363, pp. 1–18, 2021.
- [44] M. Si. Galuh Yuliani, *Gambaran Umum tentang Polimer*, vol. 53, no. 1. 2013.
- [45] Y. Kong and J. N. Hay, "The Measurement of The Crystallinity of Polymers by DSC," *Polymer*, vol. 43, no. 14, pp. 3873–3878, 2002, doi: 10.1016/S0032-3861(02)00235-5.
- [46] H. Khan, A. S. Yerramilli, A. D’Oliveira, T. L. Alford, D. C. Boffito, and G. S. Patience, "Experimental Methods In Chemical Engineering: X-Ray Diffraction Spectroscopy—XRD," *Canadian Journal of Chemical Engineering*, vol. 98, no. 6, pp. 1255–1266, 2020, doi: 10.1002/cjce.23747.
- [47] S. Kavesh and J. M. Schultz, "Meaning and Measurement of crystallinity in polymers: A Review," *Polymer Engineering & Science*, vol. 9, no. 6, pp. 452–460, 1969, doi: 10.1002/pen.760090612.
- [48] M. Abd-Elghany and T. M. Klapötke, "A Review on Differential Scanning Calorimetry Technique and its Importance in the Field of Energetic Materials," *Physical Sciences Reviews*, vol. 3, no. 4, pp. 1–14, 2018, doi: 10.1515/psr-2017-0103.
- [49] J. Drzeżdżon, D. Jacewicz, A. Sielicka, and L. Chmurzyński, "Characterization of Polymers Based on Differential Scanning Calorimetry Based Techniques," *TrAC - Trends in Analytical Chemistry*, vol. 110, pp. 51–56, 2019, doi: 10.1016/j.trac.2018.10.037.
- [50] N. M. Nurazzi *et al.*, "Thermogravimetric Analysis (TGA) and Differential Scanning Calorimetry (DSC) of PLA/Cellulose Composites," *Polylactic Acid-Based Nanocellulose and Cellulose Composites*, no. June, pp. 145–164, 2022, doi: 10.1201/9781003160458-7.
- [51] A. Muñoz-Bonilla and M. Fernández-García, "Polymeric Materials with Antimicrobial Activity," *Progress in Polymer Science (Oxford)*, vol. 37, no. 2, pp. 281–339, 2012, doi: 10.1016/j.progpolymsci.2011.08.005.
- [52] N. Afriani, Yusmarini, and U. Pato, "Aktivitas Antimikroba Lactobacillus Plantarum 1 yang Diisolasi dari Industri Pengolahan Pati Sagu Terhadap Bakteri Patogen Escherichia Coli Fncc-19 Dan Staphylococcus Aureus Fncc-15," *Jom Faperta*, vol. 4, no. 2, pp. 1–12, 2017.

- [53] A. Br. Ginting and M. H. Al Hasa, "Reaksi Termokimia Paduan AlFeNi Dengan Bahan Bakar U₃Si₂," *Jurnal Teknik Bahan Nuklir*, vol. 5, no. 1, pp. 1–52, 2009.
- [54] F. J. Lanyi, N. Wenzke, J. Kaschta, and D. W. Schubert, "On the Determination of the Enthalpy of Fusion of α -Crystalline Isotactic Polypropylene Using Differential Scanning Calorimetry , X-Ray Diffraction , and Fourier- Transform Infrared Spectroscopy : An Old Story Revisited," 2020, doi: 10.1002/adem.201900796.
- [55] T. Kajiyama and W. J. MacKnight, "Thermal Properties of Polyurethanes. Enthalpies and Entropies of Fusion," vol. I, no. 5, pp. 1–7, 1970.
- [56] F. J. Lanyi, N. Wenzke, J. Kaschta, and D. W. Schubert, "On the Determination of the Enthalpy of Fusion of α -Crystalline Isotactic Polypropylene Using Differential Scanning Calorimetry, X-Ray Diffraction, and Fourier-Transform Infrared Spectroscopy: An Old Story Revisited," *Advanced Engineering Materials*, vol. 22, no. 9, Sep. 2020, doi: 10.1002/ADEM.201900796/FORMAT/PDF.
- [57] C. Brondi, M. Santiago-Calvo, E. Di Maio, and M. Á. Rodríguez-Perez, "Role of Air Bubble Inclusion on Polyurethane Reaction Kinetics," *Materials*, vol. 15, no. 9, pp. 1–18, 2022, doi: 10.3390/ma15093135.
- [58] M. L. Pinto, "Formulation, preparation, and characterization of polyurethane foams," *Journal of Chemical Education*, vol. 87, no. 2, pp. 212–215, 2010, doi: 10.1021/ed8000599.
- [59] G. Węgrzyk, D. Grzeda, and J. Ryszkowska, "The Effect of Mixing Pressure in a High-Pressure Machine on Morphological and Physical Properties of Free-Rising Rigid Polyurethane Foams—A Case Study," *Materials*, vol. 16, no. 2, 2023, doi: 10.3390/ma16020857.
- [60] E. Riande, R. Diaz-Calleja, M. G. Prolongo, R. M. Masegosa, and C. Salom, *Polymer Viscoelasticity*. 2000.
- [61] B. Kurniawan and W. F. Aryana, "Binahong (Cassia Alata L) as Inhibitor of Escherichiacoli Growth," *J Majority*, vol. 4, no. 4, pp. 100–104, 2015.
- [62] G. Kasi, S. Gnanasekar, K. Zhang, E. T. Kang, and L. Q. Xu, "Polyurethane-Based Composites With Promising Antibacterial Properties," *Journal of Applied Polymer Science*, vol. 139, no. 20, 2022, doi: 10.1002/app.52181.
- [63] A. Ramadhani, S. Saadah, and S. Sogandi, "EFEK ANTIBAKTERI EKSTRAK DAUN CENGKEH (*Syzygium aromaticum*) TERHADAP *Escherichia coli* DAN *Staphylococcus aureus*," *Jurnal Biotehnologi & Biosains Indonesia (JBBI)*, vol. 7, no. 2, pp. 203–214, 2020, doi: 10.29122/jbbi.v7i2.4146.
- [64] T. M. De Almeida Alves *et al.*, "Biological Screening of Brazilian Medicinal Plants," *Memorias do Instituto Oswaldo Cruz*, vol. 95, no. 3, pp. 367–373, 1999, doi: 10.1590/s0074-02762000000300012.

- [65] W. W. Davis and T. R. Stout, "Disc plate method of microbiological antibiotic assay. I. Factors influencing variability and error.," *Applied microbiology*, vol. 22, no. 4, pp. 659–665, 1971, doi: 10.1128/aem.22.4.659-665.1971.
- [66] N. J. Omorodion and E. C. Ujoh, "Antimicrobial Activities of Aqueous and Ethanolic Extracts of Some Natural Spices (Garlic, Turmeric, Thyme and Onions) On Some Clinical Isolates," *GSC Biological and Pharmaceutical Sciences*, vol. 19, no. 1, pp. 335–345, 2022, doi: 10.30574/gscbps.2022.19.1.0094.