

## DAFTAR PUSTAKA

- Adiatama, Aufa Rai, Ratna Frida Susanti, Widi Astuti, Himawan Tri Bayu Murti Petrus, and Kevin Cleary Wanta. 2022. "Synthesis and Characteristic of Nanosilica From Geothermal Sludge: Effect of Surfactant." *Metalurgi* 37 (2): 73. <https://doi.org/10.14203/metalurgi.v37i2.637>.
- Adibnia, Vahid, Seyed Mohammad Taghavi, and Reghan J. Hill. 2017. "Roles of Chemical and Physical Crosslinking on the Rheological Properties of Silica-Doped Polyacrylamide Hydrogels." *Rheologica Acta* 56 (2): 123–34. <https://doi.org/10.1007/s00397-016-0989-5>.
- Ahmed, Enas M. 2015. "Hydrogel: Preparation, Characterization, and Applications: A Review," 105–21.
- Akhtar, Muhammad Faheem, Muhammad Hanif, and Nazar Muhammad Ranjha. 2016. "Methods of Synthesis of Hydrogels ... A Review." *Saudi Pharmaceutical Journal* 24 (5): 554–59. <https://doi.org/10.1016/j.jsps.2015.03.022>.
- Arthus, Leticia, Allan Pétris Angeli, Maria Regina Wolf Maciel, and Leonardo Vasconcelos Fregolente. 2026. "Optimized Continuous Flow Water Removal from Biodiesel and Diesel (B15) Using Raschig Ring-Shaped Polyacrylamide/Cellulose Microfibrils Hydrogels in Fixed-Bed Columns." *Fuel* 404 (December 2024). <https://doi.org/10.1016/j.fuel.2025.136332>.
- Arthus, Leticia, Bianca Ramos Estevam, Zaida Jova Aguila, Maria Regina Wolf Maciel, and Leonardo Vasconcelos Fregolente. 2023. "Facile Tuning of Hydrogel Properties for Efficient Water Removal from Biodiesel: An Assessment of Alkaline Hydrolysis and Drying Techniques." *Chemical Engineering Science* 282 (May): 119224. <https://doi.org/10.1016/j.ces.2023.119224>.
- Bashir, Shadid, Maryam Hina, Javed Iqbal, A. H. Rajpar, M. A. Mujtaba, N. A. Alghamdi, S. Wageh, K. Ramesh, and S. Ramesh. 2020. "Fundamental Concepts of Hydrogels: Synthesis, ." *Polymers* 12 (2702): 1–60.
- BPS. 2023. "Statistik Kelapa Sawit Indonesia" 16.
- Cazarolli, Juciana Clarice, Thais Livramento Silva, Mariane Rodrigues Lobato, Jhonata Rodrigues de Brito, Pabulo Henrique Rampelotto, João Victor de Souza Rocha, Aline Oliboni de Azambuja, et al. 2021. "Impact of Water Content on Microbial Growth in Brazilian Biodiesel during Simulated Storage." *Fuel* 297 (January). <https://doi.org/10.1016/j.fuel.2021.120761>.
- Czarnecka, Elzbieta, and Jacek Nowaczyk. 2020. "Semi-Natural Superabsorbents Based on Starch-g-Poly(Acrylic Acid): Modification, Synthesis and Application." *Polymers* 12 (8). <https://doi.org/10.3390/polym12081794>.
- Dourado, Marcelo D.L., Patricia B.L. Fregolente, Maria R.W. Maciel, and Leonardo V. Fregolente. 2021. "Screening of Hydrogels for Water Adsorption in Biodiesel Using Crosslinked Homopolymers." *Chemical Engineering Transactions* 86 (September 2020): 1129–34. <https://doi.org/10.3303/CET2186189>.
- Duceac, Ioana A., Liliana Verestiuc, Cristina D. Dimitriu, Vasilica Maier, and Sergiu Coseri. 2020. "Design and Preparation of New Multifunctional Hydrogels Based on Chitosan/Acrylic Polymers for Drug Delivery and Wound Dressing Applications." *Polymers* 12 (7): 1–20.

<https://doi.org/10.3390/polym12071473>.

- Erceg, Tamara, Tamara Dapčević-Hadnađev, Miroslav Hadnađev, and Ivan Ristić. 2021. "Swelling Kinetics and Rheological Behaviour of Microwave Synthesized Poly(Acrylamide-Co-Acrylic Acid) Hydrogels." *Colloid and Polymer Science* 299 (1): 11–23. <https://doi.org/10.1007/s00396-020-04763-9>.
- Foudazi, Reza, Ryan Zowada, Ica Manas-Zloczower, and Donald L. Feke. 2023. "Porous Hydrogels: Present Challenges and Future Opportunities." *Langmuir* 39 (6): 2092–2111. <https://doi.org/10.1021/acs.langmuir.2c02253>.
- Fregolente, P. B.L., and M. R. Wolf Maciel. 2012. "Water Absorbing Material to Removal Water from Biodiesel and Diesel." *Procedia Engineering* 42: 1983–88. <https://doi.org/10.1016/j.proeng.2012.07.594>.
- Fregolente, P. B.L., M. R. Wolf Maciel, and L. S. Oliveira. 2015. "Removal of Water Content from Biodiesel and Diesel Fuel Using Hydrogel Adsorbents." *Brazilian Journal of Chemical Engineering* 32 (4): 895–901. <https://doi.org/10.1590/0104-6632.20150324s20140142>.
- Fregolente, Patricia B.L., Henrique L. Gonçalves, Maria Regina W. Maciel, and Leonardo V. Fregolente. 2018. "Swelling Degree and Diffusion Parameters of Poly(Sodium Acrylate-Co-Acrylamide) Hydrogel for Removal of Water Content from Biodiesel." *Chemical Engineering Transactions* 65: 445–50. <https://doi.org/10.3303/CET1865075>.
- Fregolente, Patricia, Leonardo Fregolente, and Maria Maciel. 2012. "Water Content in Biodiesel, Diesel, and Biodiesel–Diesel Blends." *Journal of Chemical & Engineering Data* 57 (May): 1817–1821. <https://doi.org/10.1021/je300279c>.
- Gonçalves, Henrique Luiz, Patrícia Bogalhos Lucente Fregolente, Maria Regina Wolf Maciel, and Leonardo Vasconcelos Fregolente. 2021. "Formulation of Hydrogels for Water Removal from Diesel and Biodiesel." *Separation Science and Technology (Philadelphia)* 56 (2): 374–88. <https://doi.org/10.1080/01496395.2019.1709506>.
- Gun'ko, Vladimir M., Irina N. Savina, and Sergey V. Mikhalovsky. 2017. "Properties of Water Bound in Hydrogels." *Gels* 3 (4). <https://doi.org/10.3390/gels3040037>.
- Guo, Xuan, and Jianlong Wang. 2019. "A General Kinetic Model for Adsorption: Theoretical Analysis and Modeling." *Journal of Molecular Liquids* 288: 111100. <https://doi.org/10.1016/j.molliq.2019.111100>.
- Jain, Siddharth, and M P Sharma. 2011. "Thermal Stability of Biodiesel and Its Blends: A Review." *Renewable and Sustainable Energy Reviews* 15 (1): 438–48. <https://doi.org/https://doi.org/10.1016/j.rser.2010.08.022>.
- Jakeria, M. R., M. A. Fazal, and A. S.M.A. Haseeb. 2014. "Influence of Different Factors on the Stability of Biodiesel: A Review." *Renewable and Sustainable Energy Reviews*. Elsevier Ltd. <https://doi.org/10.1016/j.rser.2013.09.024>.
- Jenie, S. N.Aisyiyah, Almira Ghaisani, Yudia P. Ningrum, Anis Kristiani, Fauzan Aulia, and Himawan T.M.B. Petrus. 2018. "Preparation of Silica Nanoparticles from Geothermal Sludge via Sol-Gel Method." *AIP Conference Proceedings* 2026: 1–6. <https://doi.org/10.1063/1.5064968>.
- KESDM. 2021. "Team Handbook Energy & Economic Statistics Indonesia." *Ministry of Energy and Mineral Resources Republic of Indonesia*, 23–26. <https://www.esdm.go.id/en/publication/handbook-of-energy-economic->

statistics-of-indonesia-heesi.

KESDM. 2023. “Kementerian Energi Dan Sumber Daya Mineral. Retrieved from Direktorat Jenderal Energi Baru, Terbarukan Dan Konservasi Energi.” *Https://Ebtke.Esdm.Go.Id.*

Khan, Yusuf, Shahid Bashir, Maryam Hina, S. Ramesh, K. Ramesh, and Indranil Lahiri. 2020. “Effect of Salt Concentration on Poly (Acrylic Acid) Hydrogel Electrolytes and Their Applications in Supercapacitor.” *Journal of The Electrochemical Society* 167 (10): 100524. <https://doi.org/10.1149/1945-7111/ab992a>.

KLHK. 2022. “Enhanced Nationally Determined Contribution Republic of Indonesia 2022.” Jakarta. <https://www.ptonline.com/articles/how-to-get-better-mfi-results>.

Knothe, Gerhard. 2016. *Biodiesel and Its Properties. Industrial Oil Crops*. AOCS Press. Published by Elsevier Inc. All rights reserved. <https://doi.org/10.1016/B978-1-893997-98-1.00002-6>.

Kusumastuti, Yuni, Himawan Tri Bayu Murti Petrus, Fiska Yohana, Agung Tri Buwono, and Radinda Bian Zaqina. 2017. “Synthesis and Characterization of Biocomposites Based on Chitosan and Geothermal Silica.” *AIP Conference Proceedings* 1823. <https://doi.org/10.1063/1.4978200>.

Lin, Wei Chun, Alba Marcellan, Dominique Hourdet, and Costantino Creton. 2011. “Effect of Polymer-Particle Interaction on the Fracture Toughness of Silica Filled Hydrogels.” *Soft Matter*. <https://doi.org/10.1039/c1sm05420a>.

Madduma-Bandarage, Ujith S.K., and Sundararajan V. Madihally. 2021. “Synthetic Hydrogels: Synthesis, Novel Trends, and Applications.” *Journal of Applied Polymer Science* 138 (19): 1–23. <https://doi.org/10.1002/app.50376>.

Matheofani, A Pamungkas, K Amri, F T Pratiwi, A G Arisant, Romelan, and M D Solikhah. 2021. “Pengaruh Waktu Penyimpanan Terhadap Kadar Air Dan Angka Asam Pada Sampel Biodiesel Dan Campuran Biodiesel ( BXX ).” *Seminar Nasional Sains Dan Teknologi 2021*, no. November: 1–6.

Matheofani, Fatimah Tresna Pratiwi, Khairil Amri, Romelan, Mutiara Maharani, Aminuddin, and Maharani Dewi Solikhah. 2024. “Adsorption of Water Content in Biodiesel Blends Using Potassium Polyacrylate: Impact on Acid Number.” *IOP Conference Series: Earth and Environmental Science* 1354 (1). <https://doi.org/10.1088/1755-1315/1354/1/012006>.

Mohamad Said, Khairul Anwar, and Mohamed Afizal Mohamed Amin. 2016. “Overview on the Response Surface Methodology (RSM) in Extraction Processes.” *Journal of Applied Science & Process Engineering* 2 (1). <https://doi.org/10.33736/jaspe.161.2015>.

Mohammadzadeh Bina, Saeid, Saeid Jalilinasrabady, Hikari Fujii, and Nugroho Agung Pambudi. 2018. “Classification of Geothermal Resources in Indonesia by Applying Exergy Concept.” *Renewable and Sustainable Energy Reviews* 93 (May): 499–506. <https://doi.org/10.1016/j.rser.2018.05.018>.

More, Aarti P. 2024. *Superabsorbent Composites: A Review. Polymer Bulletin*. Vol. 81. Springer Berlin Heidelberg. <https://doi.org/10.1007/s00289-023-04809-2>.

Muljani, Srie, Heru Setyawan, Gede Wibawa, and Ali Altway. 2014. “A Facile Method for the Production of High-Surface-Area Mesoporous Silica Gels from Geothermal Sludge.” *Advanced Powder Technology* 25 (5): 1593–99. <https://doi.org/10.1016/j.appt.2014.05.012>.

- Narasimmanaidu, Satishwara Rao, Nurul Hilwa Mohd Zini, Mohd Noor Asril Saadun, Fadhilah Shikh Anuar, Mohd Yuhazri Yaakob, and Mohd Khairi Mohamed Nor. 2023. "Effect of Storage Tank Material on Biodiesel Stability under Different Environmental Conditions." *Jurnal Tribologi* 36 (August 2022): 32–42.
- Nuryono, and Narsito. 2005. "Pengaruh Konsentrasi Asam Terhadap Karakter Silika Gel Hasil Sintesis Dari Natrium Silikat." *Indonesian Journal of Chemistry* 5 (1): 23–30.
- Pambudi, Nugroho Agung, Ryuichi Itoi, Rie Yamashiro, Boy Yoseph CSS Syah Alam, Loren Tusara, Saeid Jalilinasrabady, and Jaelani Khasani. 2015. "The Behavior of Silica in Geothermal Brine from Dieng Geothermal Power Plant, Indonesia." *Geothermics* 54: 109–14. <https://doi.org/10.1016/j.geothermics.2014.12.003>.
- Pamungkas, A, M D Solikhah, F T Pratiwi, Romelan, Matheofani, and S S Wirawan. 2023. "Investigation of Biodiesel Stability under Vacuum Heating Process Investigation of Biodiesel Stability under Vacuum Heating Process." *Earth and Environmental Science PAPER*. <https://doi.org/10.1088/1755-1315/1187/1/012017>.
- Paula, Clarissa D., Gabriela F. Ferreira, Luisa F.R. Pinto, Patrícia B.L. Fregolente, Rubens Maciel Filho, and Leonardo V. Fregolente. 2019. "Evaluation of Different Types of Hydrogels for Water Removal from Fuels." *Chemical Engineering Transactions* 74 (January): 889–94. <https://doi.org/10.3303/CET1974149>.
- Pereira, Lucas Matheus Soares, Thaís Moré Milan, and Delia Rita Tapia-Blácido. 2021. "Using Response Surface Methodology (RSM) to Optimize 2G Bioethanol Production: A Review." *Biomass and Bioenergy* 151 (February). <https://doi.org/10.1016/j.biombioe.2021.106166>.
- Petrus, Himawan Tri Bayu Murti, Muhammad Olvianas, Widi Astuti, and Muhammad Istiawan Nurpratama. 2021. "Valorization of Geothermal Silica and Natural Bentonite through Geopolymerization: A Characterization Study and Response Surface Design." *International Journal of Technology* 12 (1): 195–206. <https://doi.org/10.14716/ijtech.v12i1.3537>.
- Petrus, Himawan Tri Bayu Murti, Muhammad Olvianas, Muhammad Faiz Shafiyurrahman, I Gusti Agung, Arvin Nanda, Siti Nurul, Aisyiyah Jenie, et al. 2022. "Circular Economy of Coal Fly Ash and Silica Geothermal for Green Geopolymer : Characteristic and Kinetic Study." *Gels* 8 (233): 1–14.
- Pratiwi, F T, M D Solikhah, A G Arisanti, and Matheofani. 2023. "Acrylamide and Acrylate Based Hydrogel for Water Adsorption in Biodiesel Acrylamide and Acrylate Based Hydrogel for Water Adsorption in Biodiesel." *Earth and Environmental Science PAPER*. <https://doi.org/10.1088/1755-1315/1187/1/012044>.
- Pratiwi, Fatimah Tresna, Maharani Dewi Solikhah, Anisa Galuh Arisanti, and Matheofani. 2023. "Acrylamide and Acrylate Based Hydrogel for Water Adsorption in Biodiesel." In *IOP Conference Series: Earth and Environmental Science*. Vol. 1187. Institute of Physics. <https://doi.org/10.1088/1755-1315/1187/1/012044>.
- Reji, Meega, and Rupak Kumar. 2022. "Response Surface Methodology (RSM): An Overview to Analyze Multivariate Data." *Indian Journal of Microbiology*

- Research* 9 (4): 241–48. <https://doi.org/10.18231/j.ijmr.2022.042>.
- Revellame, Emmanuel D., Dhan Lord Fortela, Wayne Sharp, Rafael Hernandez, and Mark E. Zappi. 2020. “Adsorption Kinetic Modeling Using Pseudo-First Order and Pseudo-Second Order Rate Laws: A Review.” *Cleaner Engineering and Technology* 1 (October): 100032. <https://doi.org/10.1016/j.clet.2020.100032>.
- Saeed, Ahmed M. 2014. “Temperature Effect on Swelling Properties of Commercial Polyacrylic Acid Hydrogel Beads.” *International Journal of Advanced Biological and Biomedical Research* 1 (12): 1614–27.
- Saluja, Rajesh Kumar, Vineet Kumar, and Radhey Sham. 2016. “Stability of Biodiesel – A Review.” *Renewable and Sustainable Energy Reviews* 62: 866–81. <https://doi.org/10.1016/j.rser.2016.05.001>.
- Santos, Fernanda B., Isadora D. Perez, Leonardo V. Fregolente, and Maria Regina Wolf Maciel. 2022. “Application of Poly(Acrylamide-Co-Acrylonitrile) Hydrogel to Remove Soluble Water from Biodiesel and Evaluation in the Control Mechanism of the Mass Transfer Process in an Adsorption Process.” *Chemical Engineering Transactions* 92 (May): 487–92. <https://doi.org/10.3303/CET2292082>.
- Santos, Fernanda B., Isadora D. Perez, Gerlison T. Gomes, Melissa G.A. Vieira, Leonardo V. Fregolente, and Maria Regina Wolf Maciel. 2020. “Study of the Kinetics Swelling of Poly(Acrylamide-Co-Acrylonitrile) Hydrogel for Removal of Water Content from Biodiesel.” *Chemical Engineering Transactions* 80 (February): 265–70. <https://doi.org/10.3303/CET2080045>.
- Sennakesavan, Gangadevi, Mohammad Mostakhdemin, L. K. Dkhar, Ali Seyfoddin, and S. J. Fatihhi. 2020. “Acrylic Acid/Acrylamide Based Hydrogels and Its Properties - A Review.” *Polymer Degradation and Stability* 180: 109308. <https://doi.org/10.1016/j.polymdegradstab.2020.109308>.
- Shi, Xiaomei, Shimei Xu, Jiantao Lin, Shun Feng, and Jide Wang. 2009. “Synthesis of SiO<sub>2</sub>-Polyacrylic Acid Hybrid Hydrogel with High Mechanical Properties and Salt Tolerance Using Sodium Silicate Precursor through Sol-Gel Process.” *Materials Letters* 63 (5): 527–29. <https://doi.org/10.1016/j.matlet.2008.11.029>.
- Siqueira Cavalcanti, Eduardo Homem de, Adriane Ramos Zimmer, Fátima Menezes Bento, and Marco Flôres Ferrão. 2019. “Chemical and Microbial Storage Stability Studies and Shelf Life Determinations of Commercial Brazilian Biodiesels Stored in Carbon Steel Containers in Subtropical Conditions.” *Fuel* 236 (July 2018): 993–1007. <https://doi.org/10.1016/j.fuel.2018.09.043>.
- Sorkhabi, Tannaz Soltanzakerin, Mehrab Fallahi Samberan, Krzysztof Adam Ostrowski, Tomasz M Majka, Marcin Piechaczek, and Paulina Zajdel. 2022. “Containing Nano-SiO<sub>2</sub> and Copolymeric Hydrogel Based on Structural and Swelling Studies.”
- Sutresno, Vincent, Hadi Sujoto, I Wayan Christ, Widhi Herman, Widi Astuti, Slamet Sumardi, Nurul Aisyiyah Jenie, et al. 2023. “Penentuan Kondisi Optimum Pembuatan Silica Gel Menggunakan Silika Geothermal Dengan Metode Sol-Gel” 17: 1–7. <https://doi.org/10.22146/jrekpros.77696>.
- Tiwari, Ingita, and P. A. Mahanwar. 2019. “Polyacrylate/Silica Hybrid Materials: A Step towards Multifunctional Properties.” *Journal of Dispersion Science*

- and Technology* 40 (7): 925–57.  
<https://doi.org/10.1080/01932691.2018.1489276>.
- Wang, Jianlong, and Xuan Guo. 2020. “Adsorption Kinetic Models: Physical Meanings, Applications, and Solving Methods.” *Journal of Hazardous Materials* 390 (January): 122156.  
<https://doi.org/10.1016/j.jhazmat.2020.122156>.
- Wang, Jianlong, and Wei Wan. 2009. “Experimental Design Methods for Fermentative Hydrogen Production: A Review.” *International Journal of Hydrogen Energy* 34 (1): 235–44.  
<https://doi.org/10.1016/j.ijhydene.2008.10.008>.
- Wirawan, Soni S., Maharani D. Solikhah, Hari Setiapraja, and Agus Sugiyono. 2024. “Biodiesel Implementation in Indonesia: Experiences and Future Perspectives.” *Renewable and Sustainable Energy Reviews*. Elsevier Ltd.  
<https://doi.org/10.1016/j.rser.2023.113911>.
- Wu, Lili, Lingzi Zeng, Haibo Chen, and Chaocan Zhang. 2012. “Effects of Silica Sol Content on the Properties of Poly(Acrylamide)/Silica Composite Hydrogel.” *Polymer Bulletin* 68 (2): 309–16. <https://doi.org/10.1007/s00289-011-0536-6>.
- Yang, Jun, Xi Ping Wang, and Xu Ming Xie. 2012. “In Situ Synthesis of Poly(Acrylic Acid) Physical Hydrogels from Silica Nanoparticles.” *Soft Matter* 8 (4): 1058–63. <https://doi.org/10.1039/c1sm06647a>.
- Yang, Jun, and Jingjing Zhao. 2014. “Preparation and Mechanical Properties of Silica Nanoparticles Reinforced Composite Hydrogels.” *Materials Letters* 120: 36–38. <https://doi.org/10.1016/j.matlet.2014.01.078>.
- Yang, Yaoyao, Zhiyuan Liang, Rui Zhang, Shengwei Zhou, Haobo Yang, Yanyu Chen, Jiahui Zhang, Hongyi Yin, and Dengguang Yu. 2024. “Research Advances in Superabsorbent Polymers.” *Polymers* 16 (4). <https://doi.org/10.3390/polym16040501>.
- Yu, Kun, Jiangrong Liu, Huiting Li, Bing Li, and Jianzhong Guo. 2024. “Preparation and Properties of Super Water-Retaining Agent with Sulfonic Acid and Carboxylic Acid Groups Assisted by Ultrasounds.” *Polymer Bulletin* 81 (15): 13607–27. <https://doi.org/10.1007/s00289-024-05347-1>.

<https://www.statista.com/statistics/271472/biodiesel-production-in-selected-countries/>