

DAFTAR PUSTAKA

- Abdelrasoul, A., Doan, H., Lohi, A., & Cheng, C. (2015). Morphology Control of Polysulfone Membranes in Filtration Processes: A Critical Review. *ChemBioEng Reviews*, 2(1), 22–43. <https://doi.org/10.1002/cben.201400030>
- Ali, I., Zenab Hasan, S., Garcia, H., Danquah, M. K., & Imanova, G. (2024). Recent advances in graphene-based nano-membranes for desalination. *Chemical Engineering Journal*, 483, 149108. <https://doi.org/10.1016/j.cej.2024.149108>
- Arahman, N., Mulyati, S., Fahrina, A., Muchtar, S., Yusuf, M., Takagi, R., Matsuyama, H., Nordin, N. A. H., & Bilad, M. R. (2019). Improving Water Permeability of Hydrophilic PVDF Membrane Prepared via Blending with Organic and Inorganic Additives for *Humic acid* Separation. *Molecules*, 24(22), 4099. <https://doi.org/10.3390/molecules24224099>
- Aziz, S., Mazhar, A. R., Ubaid, A., Shah, S. M. H., Riaz, Y., Talha, T., & Jung, D.-W. (2024). A comprehensive review of membrane-based water filtration techniques. *Applied Water Science*, 14(8), 169. <https://doi.org/10.1007/s13201-024-02226-y>
- Baig, M. I., Durmaz, E. N., Willott, J. D., & De Vos, W. M. (2020). Sustainable Membrane Production through Polyelectrolyte Complexation Induced Aqueous Phase Separation. *Advanced Functional Materials*, 30(5), 1907344. <https://doi.org/10.1002/adfm.201907344>
- Bărdacă Urducea, C., Nechifor, A. C., Dimulescu, I. A., Oprea, O., Nechifor, G., Totu, E. E., Isildak, I., Albu, P. C., & Bungău, S. G. (2020). Control of Nanostructured Polysulfone Membrane Preparation by Phase Inversion Method. *Nanomaterials*, 10(12), 2349. <https://doi.org/10.3390/nano10122349>
- Basko, A., Lebedeva, T., Yurov, M., Ilyasova, A., Elyashevich, G., Lavrentyev, V., Kalmykov, D., Volkov, A., & Pochivalov, K. (2023). Mechanism of PVDF Membrane Formation by NIPS Revisited: Effect of Precipitation Bath Nature and Polymer–Solvent Affinity. *Polymers*, 15(21), 4307. <https://doi.org/10.3390/polym15214307>
- Bubela, H., Konovalova, V., Kujawa, J., Kolesnyk, I., Burban, A., & Kujawski, W. (2023). Enhancing of transport parameters and antifouling properties of PVDF membranes modified with Fe₃O₄ nanoparticles in the process of proteins fractionation. *Separation and Purification Technology*, 325, 124573. <https://doi.org/10.1016/j.seppur.2023.124573>
- Callister, W. D., & Rethwisch, D. G. (2018). *Materials Science and Engineering: An Introduction* (10th ed.). John Wiley & Sons, Inc.

- Concha, V. O. C., Timóteo, L., Duarte, L. A. N., Bahú, J. O., Munoz, F. L., Silva, A. P., Lodi, L., Severino, P., León-Pulido, J., & Souto, E. B. (2024). Properties, characterization and biomedical applications of *Polyvinylidene fluoride* (PVDF): A review. *Journal of Materials Science*, 59(31), 14185–14204. <https://doi.org/10.1007/s10853-024-10046-3>
- Enemu, N., Richards, H., & Daramola, M. O. (2025). Preparation of hydrophilic PVDF membrane via blending with Fe₃O₄ nanoparticles and PVA for improved membrane performance in BTEX removal from wastewater. *Journal of Environmental Chemical Engineering*, 13(3), 116135. <https://doi.org/10.1016/j.jece.2025.116135>
- Farahani, M. H. D. A., & Vatanpour, V. (2018). A comprehensive study on the performance and antifouling enhancement of the PVDF mixed matrix membranes by embedding different nanoparticulates: Clay, functionalized carbon nanotube, SiO₂ and TiO₂. *Separation and Purification Technology*, 197, 372–381. <https://doi.org/10.1016/j.seppur.2018.01.031>
- Gayatri, R., Fizal, A. N. S., Yuliwati, E., Zailani, M. Z., Jaafar, J., Hossain, M. S., Zulkifli, M., Tawcepreda, W., & Ahmad Yahaya, A. N. (2024). Effect of *Polyvinylidene fluoride* concentration in PVDF-TiO₂-PVP composite membranes properties and its performance in bovine serum albumin rejection. *Case Studies in Chemical and Environmental Engineering*, 9, 100620. <https://doi.org/10.1016/j.cscee.2024.100620>
- Geleta, T. A., Maggay, I. V., Chang, Y., & Venault, A. (2023). Recent Advances on the Fabrication of Antifouling Phase-Inversion Membranes by Physical Blending Modification Method. *Membranes*, 13(1), 58. <https://doi.org/10.3390/membranes13010058>
- Hopp-Hirschler, M., & Nieken, U. (2020). Modeling of pore formation in phase inversion processes: Analysis of pore formation mechanism. *Journal of Thermal Analysis and Calorimetry*, 139(4), 2831–2846. <https://doi.org/10.1007/s10973-019-09110-x>
- Hudaib, B., Abu-Zurayk, R., Eskhan, A., & Esaifan, M. (2025). PVDF/Polypyrrole Composite Ultrafiltration Membrane with Enhanced Hydrophilicity, Permeability, and Antifouling Properties for Efficient Crude Oil Wastewater Separation. *Polymers*, 17(19), 2566. <https://doi.org/10.3390/polym17192566>
- Kartohardjono, S., Salsabila, G. M. K., Ramadhani, A., Purnawan, I., & Lau, W. J. (2023). Preparation of PVDF-PVP Composite Membranes for Oily Wastewater Treatment. *Membranes*, 13(6), 611. <https://doi.org/10.3390/membranes13060611>
- Khan, N. A., Singh, S., López-Maldonado, E. A., N., P., Méndez-Herrera, P. F., López-López, J. R., Baig, U., Ramamurthy, P. C., Mubarak, N. M., Karri, R. R., & Aljundi, I. H. (2023). Emerging membrane technology and hybrid

- treatment systems for the removal of micropollutants from wastewater. *Desalination*, 565, 116873. <https://doi.org/10.1016/j.desal.2023.116873>
- Klučáková, M. (2018). Size and Charge Evaluation of Standard Humic and Fulvic Acids as Crucial Factors to Determine Their Environmental Behavior and Impact. *Frontiers in Chemistry*, 6, 235. <https://doi.org/10.3389/fchem.2018.00235>
- Kolya, H., & Kang, C.-W. (2023). Next-Generation Water Treatment: Exploring the Potential of Biopolymer-Based Nanocomposites in Adsorption and Membrane Filtration. *Polymers*, 15(16), 3421. <https://doi.org/10.3390/polym15163421>
- Koyuncu, I., Yavuzturk Gul, B., Esmaeili, M. S., Pekgenc, E., Orhun Teber, O., Tuncay, G., Karimi, H., Parvaz, S., Maleki, A., & Vatanpour, V. (2022). Modification of PVDF membranes by incorporation Fe₃O₄@Xanthan gum to improve *antifouling*, anti-bacterial, and separation performance. *Journal of Environmental Chemical Engineering*, 10(3), 107784. <https://doi.org/10.1016/j.jece.2022.107784>
- Krzeminski, P., Schwermer, C., Wennberg, A., Langford, K., & Vogelsang, C. (2017). Occurrence of UV filters, fragrances and organophosphate flame retardants in municipal WWTP effluents and their removal during membrane post-treatment. *Journal of Hazardous Materials*, 323, 166–176. <https://doi.org/10.1016/j.jhazmat.2016.08.001>
- Kurakula, M., & Rao, G. S. N. K. (2020). Pharmaceutical assessment of *Polyvinylpyrrolidone* (PVP): As excipient from conventional to controlled delivery systems with a spotlight on COVID-19 inhibition. *Journal of Drug Delivery Science and Technology*, 60, 102046. <https://doi.org/10.1016/j.jddst.2020.102046>
- Li, W., Chen, Y., Yao, L., Ren, X., Li, Y., & Deng, L. (2020). Fe₃O₄/PVDF-HFP photothermal membrane with in-situ heating for sustainable, stable and efficient pilot-scale solar-driven membrane distillation. *Desalination*, 478, 114288. <https://doi.org/10.1016/j.desal.2019.114288>
- Liu, R., Yang, J., Zhang, R., Li, H., & Mu, R. (2025). Performance comparison of nano-Al₂O₃-modified PVDF membranes fabricated *via* two methods for enhanced dye removal. *RSC Advances*, 15(6), 4163–4172. <https://doi.org/10.1039/D4RA08615E>
- Mannaf, M. M., Rahman, Md. M., Sabuj, S. T., Talukder, N., & Lee, E. S. (2025). Current Progress in Advanced Functional Membranes for Water-Pollutant Removal: A Critical Review. *Membranes*, 15(10), 300. <https://doi.org/10.3390/membranes15100300>
- Martini, S. (2022). Membrane Technology for Water Pollution Control: A Review of Recent Hybrid Mechanism. *Jurnal Rekayasa Kimia & Lingkungan*, 17(1), 83–96. <https://doi.org/10.23955/rkl.v17i1.23610>

- Nascimben Santos, E., Fazekas, Á., Hodúr, C., László, Z., Beszédes, S., Scheres Firak, D., Gyulavári, T., Hernádi, K., Arthanareeswaran, G., & Veréb, G. (2021). Statistical Analysis of Synthesis Parameters to Fabricate PVDF/PVP/TiO₂ Membranes via Phase-Inversion with Enhanced Filtration Performance and Photocatalytic Properties. *Polymers*, 14(1), 113. <https://doi.org/10.3390/polym14010113>
- Ponomar, M., Krasnyuk, E., Butylskii, D., Nikonenko, V., Wang, Y., Jiang, C., Xu, T., & Pismenskaya, N. (2022). *Sessile drop* Method: Critical Analysis and Optimization for Measuring the *Contact angle* of an Ion-Exchange Membrane Surface. *Membranes*, 12(8), 765. <https://doi.org/10.3390/membranes12080765>
- Rosman, N., Salleh, W. N. W., Mohamed, M. A., Jaafar, J., Ismail, A. F., & Harun, Z. (2018). Hybrid membrane filtration-advanced oxidation processes for removal of pharmaceutical residue. *Journal of Colloid and Interface Science*, 532, 236–260. <https://doi.org/10.1016/j.jcis.2018.07.118>
- Rusdin, A., Mohd Gazzali, A., Ain Thomas, N., Megantara, S., Aulifa, D. L., Budiman, A., & Muchtaridi, M. (2024). Advancing Drug Delivery Paradigms: Polyvinyl Pyrrolidone (PVP)-Based Amorphous Solid Dispersion for Enhanced Physicochemical Properties and Therapeutic Efficacy. *Polymers*, 16(2), 286. <https://doi.org/10.3390/polym16020286>
- Saravanan, A., Senthil Kumar, P., Jeevanantham, S., Karishma, S., Tajsabreen, B., Yaashikaa, P. R., & Reshma, B. (2021). Effective water/wastewater treatment methodologies for toxic pollutants removal: Processes and applications towards sustainable development. *Chemosphere*, 280, 130595. <https://doi.org/10.1016/j.chemosphere.2021.130595>
- Saxena, P., & Shukla, P. (2021). A comprehensive review on fundamental properties and applications of poly(vinylidene fluoride) (PVDF). *Advanced Composites and Hybrid Materials*, 4(1), 8–26. <https://doi.org/10.1007/s42114-021-00217-0>
- Shehata, N., Egirani, D., Olabi, A. G., Inayat, A., Abdelkareem, M. A., Chae, K.-J., & Sayed, E. T. (2023). Membrane-based water and wastewater treatment technologies: Issues, current trends, challenges, and role in achieving sustainable development goals, and circular economy. *Chemosphere*, 320, 137993. <https://doi.org/10.1016/j.chemosphere.2023.137993>
- Tan, X., & Rodrigue, D. (2019). A Review on Porous Polymeric Membrane Preparation. Part I: Production Techniques with Polysulfone and Poly (Vinylidene Fluoride). *Polymers*, 11(7), 1160. <https://doi.org/10.3390/polym11071160>
- Tang, Y., Lin, Y., Ford, D. M., Qian, X., Cervellere, M. R., Millett, P. C., & Wang, X. (2021). A review on models and simulations of membrane formation via

- phase inversion processes. *Journal of Membrane Science*, 640, 119810. <https://doi.org/10.1016/j.memsci.2021.119810>
- Tanudjaja, H. J., Hejase, C. A., Tarabara, V. V., Fane, A. G., & Chew, J. W. (2019). Membrane-based separation for oily wastewater: A practical perspective. *Water Research*, 156, 347–365. <https://doi.org/10.1016/j.watres.2019.03.021>
- Tran, T. T. V., Kumar, S. R., Nguyen, C. H., Lee, J. W., Tsai, H.-A., Hsieh, C.-H., & Lue, S. J. (2021). High-permeability graphene oxide and poly(vinyl pyrrolidone) blended poly(vinylidene fluoride) membranes: Roles of additives and their cumulative effects. *Journal of Membrane Science*, 619, 118773. <https://doi.org/10.1016/j.memsci.2020.118773>
- Wang, D., Yang, G., Xing, B., Liu, X., Jiang, C., Luo, Y., Hou, M., Wang, Y., Shi, X., & Zhu, Y. (2025). The antifouling and mechanism of Fe₃O₄@PVDF catalytic membrane in-situ coupling Fenton oxidation for organic pollutants removal. *Separation and Purification Technology*, 354, 128905. <https://doi.org/10.1016/j.seppur.2024.128905>
- Xiong, Z., Liu, J., Yang, Y., Lai, Q., Wu, X., Yang, J., Zeng, Q., Zhang, G., & Zhao, S. (2022). Reinforcing hydration layer on membrane surface via nano-capturing and hydrothermal crosslinking for fouling reduction. *Journal of Membrane Science*, 644, 120076. <https://doi.org/10.1016/j.memsci.2021.120076>
- Yang, X., Yan, C., Sun, Y., Liu, Y., Yang, S., Deng, Q., & Wen, X. (2021). Micro-spectrophotometric determination of nickel in *Gentiana rigescens* after switchable hydrophilicity solvent-based ultrasound-assisted liquid phase microextraction. *Microchemical Journal*, 168, 106402. <https://doi.org/10.1016/j.microc.2021.106402>
- Yao, M., Tijing, L. D., Naidu, G., Kim, S.-H., Matsuyama, H., Fane, A. G., & Shon, H. K. (2020). A review of membrane wettability for the treatment of saline water deploying membrane distillation. *Desalination*, 479, 114312. <https://doi.org/10.1016/j.desal.2020.114312>
- Yoo, H.-B., Yang, I., Kim, J. H., Jung, I.-I., Kang, H., Jung, H., Park, I.-Y., Kim, Y. H., & Park, S.-R. (2021). High-sensitivity Microvolume UV Absorption Spectrometry for Routine Analysis of Small-volume Biological Samples. *BioTechniques*, 70(5), 251–262. <https://doi.org/10.2144/btn-2021-0005>