



## DAFTAR PUSTAKA

- An, Y., Lv, X., Jiang, W., Wang, L., Shi, Y., Hang, X., and Pang, H., 2024, The Stability of MOFs in Aqueous Solutions—Research Progress and Prospects, *Green Chem. Eng.*, 5, 187–204.
- Appel, A.M., Bercaw, J.E., Bocarsly, A.B., Dobbek, H., DuBois, D.L., Dupuis, M., Ferry, J.G., Fujita, E., Hille, R., Kenis, P.J.A., Kerfeld, C.A., Morris, R.H., Peden, C.H.F., Portis, A.R., Ragsdale, S.W., Rauchfuss, T.B., Reek, J.N.H., Seefeldt, L.C., Thauer, R.K., et al., 2013, Frontiers, Opportunities, and Challenges in Biochemical and Chemical Catalysis of CO<sub>2</sub> Fixation, *Chem. Rev.*, 113, 6621–6658.
- Bibi, S., Pervaiz, E., and Ali, M., 2021, Synthesis and Applications of Metal Oxide Derivatives of ZIF-67: A Mini-Review, *Chem. Pap.*, 75, 2253-2275.
- Butt, F.S., Safdar, M., Lewis, A., Mazlan, N.A., Radacsi, N., Fan, X., Arellano-García, H., and Huang, Y., 2023, Superhydrophobic ZIF-67 with Exceptional Hydrostability, *Mater. Today Adv.*, 20, 100448.
- Cahyo, H., Purnomo, S., Kemala Octisari, S., Surveyandini, M., Sundari, S., and Purwendah, E., 2023, Environment, Population, and Economy on CO<sub>2</sub> Emission in Indonesia, *Int. J. Energy Econ. Policy*, 13, 295–303.
- Chen, L., Wang, H.-F., Li, C., and Xu, Q., 2020, Bimetallic Metal–Organic Frameworks and Their Derivatives, *Chem. Sci.*, 11(21), 5369-5403.
- Davis, S., Athira, E., and Rajan, V.K., 2025, Density Functional Theory to Decrypt Metal–Organic Framework–A Review, *Comput. Mater. Sci.*, 247, 113537.
- Deshpande, N., Parulkar, A., Joshi, R., Diep, B., Kulkarni, A., and Brunelli, N.A., 2019, Epoxide Ring Opening with Alcohols Using Heterogeneous Lewis Acid Catalysts: Regioselectivity and Mechanism, *J. Catal.*, 370, 46–54.
- Duan, C., Yu, Y., and Hu, H., 2022, Recent Progress on Synthesis of ZIF-67-Based Materials and Their Application to Heterogeneous Catalysis, *GEE*, 7(1), 3–15.
- Dziejarski, B., Serafin, J., Andersson, K., and Krzyżyńska, R., 2023, CO<sub>2</sub> Capture Materials: A Review of Current Trends and Future Challenges, *Mater. Today Sustain.*, 24, 100483.
- Filonchik, M., Peterson, M.P., Zhang, L., Hurynovich, V., and He, Y., 2024, Greenhouse Gases Emissions and Global Climate Change: Examining the Influence of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, *Sci. Total Environ.*, 935, 173359.
- Furukawa, H., Cordova, K.E., O’Keeffe, M., and Yaghi, O.M., 2013, The Chemistry and Applications of Metal–Organic Frameworks, *Science (1979)*, 341, 1230444.
- Guo, X., Xing, T., Lou, Y., and Chen, J., 2016, Controlling ZIF-67 Crystals Formation Through Various Cobalt Sources in Aqueous Solution, *J. Solid State Chem.*, 235, 107–112.



- Jodaeeasl, N., Wang, S., Hu, A., and Peslherbe, G.H., 2025, Comprehensive DFT Investigation of Small-Molecule Adsorption on the Paradigm M-MOF-74 Family of Metal–Organic Frameworks, *Phys. Chem. Chem. Phys.*, 27(6), 3068–3082.
- Kalauni, K., Vedrtnam, A., Wdowin, M., and Chaturvedi, S., 2022, ZIF for CO<sub>2</sub> Capture: Structure, Mechanism, Optimization, and Modeling, *Processes*, 10(12).
- Khokarale, S. and Mikkola, J.-P., 2019, Metal Free Synthesis of Ethylene and Propylene Carbonate from Alkylene Halohydrin and CO<sub>2</sub> at Room Temperature, *RSC Adv.*, 9(58), 34023–34031.
- Kouser, S., Hezam, A., Khadri, M.J.N., and Khanum, S.A., 2022, A Review on Zeolite Imidazole Frameworks: Synthesis, Properties, and Applications, *J. Porous Mater.*, 29, 663–681.
- Li, D., Yadav, A., Zhou, H., Roy, K., Pounraj, T., and Lee, C., 2023, Advances and Applications of Metal-Organic Frameworks (MOFs) in Emerging Technologies: A Comprehensive Review, *Glob. Chall.*, 8(2).
- Li, M.-Y., Liu, J., Gao, R., Lin, D.-Y., Wang, F., and Zhang, J., 2021, Design and Synthesis of Zeolitic Tetrazolate-Imidazolate Frameworks, *Mater. Today Adv.*, 10, 100145.
- Lopes, E.J.C., Ribeiro, A.P.C., and Martins, L.M.D.R.S., 2020, New Trends in the Conversion of CO<sub>2</sub> to Cyclic Carbonates, *Catalysts*, 10(5).
- Ma, D., Cheng, Z., Yuan, Y., and Chaemchuen, S., 2024, Facile Functionalization Iron in Zeolitic Imidazole Framework-67 Under Solvent-Free Conditions for Enhancing CO<sub>2</sub> Fixation Reaction, *Microporous Mesoporous Mater.*, 375, 113161.
- Matusiak, J., Przekora, A., and Franus, W., 2023, Zeolites and Zeolite Imidazolate Frameworks on A Quest to Obtain the Ideal Biomaterial for Biomedical Applications: A Review, *Mater. Today*, 67, 495–517.
- NASA, 2025, Carbon Dioxide Concentration | NASA Global Climate Change, <https://climate.nasa.gov/vital-signs/carbon-dioxide/?intent=121>, Diakses pada 29 April 2025.
- Nunes, L.J.R., 2023, The Rising Threat of Atmospheric CO<sub>2</sub>: A Review on the Causes, Impacts, and Mitigation Strategies, *Environments*, 10(4).
- Pal, T.K., De, D., and Bharadwaj, P.K., 2020, Metal–Organic Frameworks for the Chemical Fixation of CO<sub>2</sub> into Cyclic Carbonates, *Coord. Chem. Rev.*, 408, 213173.
- Park, K., Ni, Z., Côté, A., Choi, J., Huang, R., Uribe-Romo, F., Chae, H., O’Keeffe, M., and Yaghi, O., 2006, Exceptional Chemical and Thermal Stability of Zeolitic Imidazolate Frameworks, *Proc. Natl. Acad. Sci. U S A*, 103, 10186–10191.



- Qin, J., Wang, S., and Wang, X., 2017, Visible-Light Reduction CO<sub>2</sub> with Dodecahedral Zeolitic Imidazolate Framework ZIF-67 as An Efficient Co-Catalyst, *Appl. Catal. B.*, 209, 476–482.
- Raptopoulou, C.P., 2021, Metal-Organic Frameworks: Synthetic Methods and Potential Applications, *Materials*, 14(2).
- Rehman, A., Gunam Resul, M.F.M., Eze, V., and Harvey, A., 2019, A Kinetic Study of Zn Halide/TBAB-Catalysed Fixation of CO<sub>2</sub> with Styrene Oxide in Propylene Carbonate, *Green Process Synth.*, 8(1), 719–729.
- Shams, M., Niazi, Z., Saeb, M.R., Mozaffari Moghadam, S., Mohammadi, A.A., and Fattahi, M., 2024, Tailoring the Topology of ZIF-67 Metal-Organic Frameworks (MOFs) Adsorbents to Capture Humic Acids, *Ecotoxicol Environ. Saf.*, 269, 115854.
- Simonsen, K.R., Hansen, D.S., and Pedersen, S., 2024, Challenges in CO<sub>2</sub> Transportation: Trends and Perspectives, *Renew. Sustain. Energy Rev.*, 191, 114149.
- Singh, C., Mukhopadhyay, S., and Hod, I., 2021, Metal–Organic Framework Derived Nanomaterials for Electrocatalysis: Recent Developments for CO<sub>2</sub> and N<sub>2</sub> Reduction, *Nano. Converg.*, 8(1).
- Thomas, A., Maiyelvaganan, K.R., Kamalakannan, S., and Prakash, M., 2019, Density Functional Theory Studies on Zeolitic Imidazolate Framework-8 and Ionic Liquid-Based Composite Materials, *ACS Omega*, 4, 22655–22666.
- Wang, H., Sakthinathan, S., Keyan, A.K., Yu, C.-L., Kameoka, S., Chiu, T.-W., and Nagaraj, K., 2024, Preparation of Zeolitic Imidazolate Framework and Carbon Nanofiber Composites for Nitrofurazone Detection, *Micro*, 4(1), 14–32.
- Weng, T. and Schmidt, J.R., 2019, Flexible and Transferable ab Initio Force Field for Zeolitic Imidazolate Frameworks: ZIF-FF, *J. Phys. Chem. A.*, 123(13), 3000-3012.
- Xia, W., Zhu, J., Guo, W., An, L., Xia, D., and Zou, R., 2014, Well-Defined Carbon Polyhedrons Prepared from Nano Metal–Organic Frameworks for Oxygen Reduction, *J. Mater. Chem. A.*, 2(30), 11606-11613.
- Yahia, M., Phan Le, Q.N., Ismail, N., Essalhi, M., Sundman, O., Rahimpour, A., Dal-Cin, M.M., and Tavajohi, N., 2021, Effect of Incorporating Different ZIF-8 Crystal Sizes in The Polymer of Intrinsic Microporosity, PIM-1, for CO<sub>2</sub>/CH<sub>4</sub> Separation, *Microporous Mesoporous Mater.*, 312, 110761.
- Yang, X., Tan, B., Wang, B., Yao, L., Li, X., Zhao, D., Li, W., Cao, L., Huang, Y., and Wang, X., 2022, 3D Electron-Rich ZIF-67 Coordination Compounds Based on 2-Methylimidazole: Synthesis, Characterization and Effect on Thermal Decomposition of RDX, HMX, CL-20, DAP-4 and AP, *Molecules*, 27(23).



- Yusuf, V.F., Malek, N.I., and Kailasa, S.K., 2022, Review on Metal–Organic Framework Classification, Synthetic Approaches, and Influencing Factors: Applications in Energy, Drug Delivery, and Wastewater Treatment, *ACS Omega*, 7, 44507–44531.
- Zhang, X., Guo, S.-X., Gandionco, K.A., Bond, A.M., and Zhang, J., 2020, Electrocatalytic Carbon Dioxide Reduction: from Fundamental Principles to Catalyst Design, *Mater Today Adv.*, 7, 100074.
- Zhou, H.C., Long, J.L., and Yaghi, O.M., 2012, Introduction to Metal–Organic Frameworks, *Chem. Rev.*, 112, 673–674.