DAFTAR PUSTAKA

Akay, S., Kayan, B., Peña, M.Á., Jouyban, A., Martínez, F., dan Acree, W.E., 2022, Expanding the Equilibrium Solubility and Dissolution Thermodynamics of Benzoic Acid in Aqueous Alcoholic Mixtures, *Reactions*, 3, 392–414.

Anghistra, P.D. dan Subagio, A., 2023, Modifikasi Zeolit Alam dengan Mn pada Pengaruh Asam dan High Energy Milling, *J. Environ. Chem.*, 3, 1–5.

Banik, B.K., Banerjee, B., Kaur, G., Saroch, S., dan Rajat, K., 2020, Tetrabutylammonium Bromide (TBAB) Catalyzed Synthesis of Bioactive Heterocycles, *Molecules*, 25, 1–6.

Butova, V. V., Budnyk, A.P., Guda, A.A., Lomachenko, K.A., Bugaev, A.L., Soldatov, A. V., Chavan, S.M., Øien-ØDegaard, S., Olsbye, U., Lillerud, K.P., Atzori, C., Bordiga, S., dan Lamberti, C., 2017, Modulator effect in UiO-66-NDC (1, 4-naphthalenedicarboxylic acid) synthesis and comparison with UiO-67-NDC isoreticular metal-organic frameworks, *Cryst. Growth Des.*, 17, 5422–5431.

Chai, L., Pan, J., Hu, Y., Qian, J., dan Hong, M., 2021, Rational Design and Growth of MOF-on-MOF Heterostructures, *Small*, 17, 1–31.

Chia, R.J.J., Lau, W.J., Yusof, N., dan Ismail, A.F., 2023, Synthesis of Novel Benzoic Acid Modified Metal Organic Framework For Adsorptive Removal of Arsenate, *J. Environ. Chem. Eng.*, 11, 1–11.

Dalpozzo, R., Ca, N. Della, Gabriele, B., dan Mancuso, R., 2019, Recent Advances In The Chemical Fixation Of Carbon Dioxide: A Green Route To Carbonylated Heterocycle Synthesis, *Catalysts*, 9, 1–59.

Diring, S., Furukawa, S., Takashima, Y., Tsuruoka, T., dan Kitagawa, S., 2010, Controlled Multiscale Synthesis Of Porous Coordination Polymer In Nano/Micro Regimes, *Chem. Mater.*, 22, 4531–4538.

Duan, C., Yu, Y., dan Hu, H., 2022, Recent Progress On Synthesis Of ZIF-67-Based Materials And Their Application To Heterogeneous Catalysis, *Green Energy Environ.*, 7, 3–15.

Ediati, R., Putra Hidayat, A.R., Syukrie, T.D., Zulfa, L.L., Jannah, M., Harmami, H., Fansuri, H., dan Ibnu Ali, B.T., 2025, Investigation The Adsorption Kinetic And Isotherm Studies Of Remazol Red 5B Dye On Benzoic Acid Modified Al2O3/Uio-66 Composite, *Arab. J. Chem.*, 18, 1–21.

Ethiraj, J., Palla, S., dan Reinsch, H., 2020, Insights Into High Pressure Gas Adsorption Properties Of ZIF-67: Experimental And Theoretical Studies, *Microporous Mesoporous Mater.*, 294, 1–9.

Fan, Z., Wang, J., Wang, W., Burger, S., Wang, Z., Wang, Y., Wöll, C., Cokoja, M., dan Fischer, R.A., 2020, Defect Engineering of Copper Paddlewheel-Based Metal-Organic Frameworks of Type NOTT-100: Implementing

Truncated Linkers and Its Effect on Catalytic Properties, *ACS Appl. Mater. Interfaces*, 12, 37993–38002.

Farahbod, H., Johnson, B.A., Minami, S.S., dan Leon, M., 2006, Chemotopic Representations of Aromatic Odorants in the Rat Olfactory Bulb, *J. Comp. Neurol.*, 497, 350–366.

Ganiyu, S.A., Suleiman, M.A., Al-Amrani, W.A., Usman, A.K., dan Onaizi, S.A., 2023, Adsorptive Removal Of Organic Pollutants From Contaminated Waters Using Zeolitic Imidazolate Framework Composites: A Comprehensive And Up-To-Date Review, *Sep. Purif. Technol.*, 318, 1–57.

Gao, Y., Wu, J., Zhang, W., Tan, Y., Gao, J., Zhao, J., dan Tang, B., 2015, Synthesis Of Nickel Oxalate/Zeolitic Imidazolate Framework-67 (Nic2o4/ZIF-67) As A Supercapacitor Electrode, *New J. Chem.*, 39, 94–97.

Ghanbari, T., Abnisa, F., dan Wan Daud, W.M.A., 2020, A Review On Production Of Metal Organic Frameworks (MOF) For CO_2 Adsorption, *Sci. Total Environ.*, 707, 1–28.

Guan, H., Sun, H., dan Zhao, X., 2025, Application of Density Functional Theory to Molecular Engineering of Pharmaceutical Formulations, *Int. J. Mol. Sci.*, 26, 1–24.

Hu, L., Xu, W., Jiang, Q., Ji, R., Yan, Z., dan Wu, G., 2024, Recent Progress On CO_2 Cycloaddition With Epoxide Catalyzed By Zifs And Zifs-Based Materials, *J. CO_2 Util.*, 81, 1–15.

Hu, T.D., Jiang, Y., dan Ding, Y.H., 2019, Computational Screening of Metal-Substituted HKUST-1 Catalysts For Chemical Fixation of Carbon Dioxide Into Epoxides, *J. Mater. Chem. A*, 7, 14825–14834.

Isaeva, V.I., Nefedov, O.M., dan Kustov, L.M., 2018, Metal–Organic Frameworks-Based Catalysts For Biomass Processing, *Catalysts*, 8, 1–39.

Ivansyah, A.L., 2020, Kajian Teoretis Interaksi Antarmolekul pada Kompleks Inklusi Hidroksipropil-β-Siklodekstrin dan Hidroksiklorokuin, *al-Kimiya*, 7, 95–102.

Ji, D., Xue, C., Wen, Y., Zhao, Y., Gong, W., dan Li, Y., 2024, Preparation And CO_2 Adsorption Behavior Of ZIF-67-Based Porous Liquids: A Molecular Dynamics Study, *Sep. Purif. Technol.*, 347, 1–11.

Kalauni, K., Vedrtnam, A., Wdowin, M., dan Chaturvedi, S., 2022, ZIF for CO2 Capture: Structure, Mechanism, Optimization, and Modeling, *Processes*, 10, 1–32.

Khaoua, O., Mouffouk, S., Benbellat, N., Zeroual, S., Golhen, S., Gouasmia, A., Chermette, H., dan Haba, H., 2024, Synthesis, Characterisation, Hirshfeld Surface Analysis, Magnetic Susceptibility, DFT Calculations, pkCSM Profile, and Biological Activities of Novel Mono-, Di-, and Multinuclear Cobalt (II)

Complexes, *Eur. J. Inorg. Chem.*, 27, 1–22.

Kong, F. dan Chen, W., 2024, Carbon Dioxide Capture and Conversion Using Metal–Organic Framework (MOF) Materials: A Comprehensive Review, *Nanomaterials*, 14, 1–50.

Kuruppathparambil, R.R., Jose, T., Babu, R., Hwang, G.Y., Kathalikkattil, A.C., Kim, D.W., dan Park, D.W., 2016, A Room Temperature Synthesizable And Environmental Friendly Heterogeneous ZIF-67 Catalyst For The Solvent Less And Co-Catalyst Free Synthesis Of Cyclic Carbonates, *Appl. Catal. B Environ.*, 182, 562–569.

Li, L.J., Chu, C.H., dan Yu, O.Y., 2023, Application of Zeolites and Zeolitic Imidazolate Frameworks in Dentistry—A Narrative Review, *Nanomaterials*, 13, 1–15.

Lu, B.B., Jiang, W., Yang, J., Liu, Y.Y., dan Ma, J.F., 2017, Resorcin[4]arene-Based Microporous Metal-Organic Framework as an Efficient Catalyst for CO_2 Cycloaddition with Epoxides and Highly Selective Luminescent Sensing of Cr2O72-, *ACS Appl. Mater. Interfaces*, 9, 39441–39449.

Lu, D., Klomkliang, N., Verpoort, F., dan Chaemchuen, S., 2024, Tuning Coordination in ZIF-67 Through the Solid-State Thermal Synthesis for Balancing Structural Stability and Catalytic Reactivity, *ACS Appl. Mater. Interfaces* , 16, 32322–32333.

Lu, W., Wei, Z., Gu, Z.Y., Liu, T.F., Park, Jinhee, Park, Jihye, Tian, J., Zhang, M., Zhang, Q., Gentle, T., Bosch, M., dan Zhou, H.C., 2014, Tuning The Structure And Function Of Metal-Organic Frameworks Via Linker Design, *Chem. Soc. Rev.*, 43, 5561–5593.

Mallya, A.N. dan Panda, S., 2021, DFT Study Of Iminodiacetic Acid Functionalised Polyaniline Copolymer Interaction With Heavy Metal Ions Through Binding Energy, Stability Constant And Charge Transfer Calculations, *Comput. Theor. Chem.*, 1202, 1–11.

Marshall, C.R., Staudhammer, S.A., dan Brozek, C.K., 2019, Size Control Over Metal-Organic Framework Porous Nanocrystals, *Chem. Sci.*, 10, 9396–9408.

Moazen, F., Eshghi, H., dan Torabi, H., 2024, Upcycling Sugar Beet Waste Into Sustainable Organo-nanocatalysis For Carbon Dioxide Fixation and Cyclic Carbonate Synthesis: a Research Design Study, *J. Mater. Sci. Mater. Eng.*, 19, 1–17.

Morris, W., Leung, B., Furukawa, H., Yaghi, O.K., He, N., Hayashi, H., Houndonougbo, Y., Asta, M., dan Laird, B.B., 2010, A Combined Experimental-Computational Investigation of Carbon Dioxide Capture In a Series of Isoreticular Zeolitic Imidazolate Frameworks, *J. Am. Chem. Soc.*, 132, 11006–11008.

Mousavi, B., Chaemchuen, S., Moosavi, B., Luo, Z., Gholampour, N., dan

Verpoort, F., 2016, Zeolitic Imidazole Framework-67 As An Efficient Heterogeneous Catalyst For The Conversion Of CO_2 To Cyclic Carbonates, *New J. Chem.*, 40, 5170–5176.

Nguyen, Q.T., Jeong, K., Lee, Y.R., dan Baek, K.Y., 2023, Structural Design of Core-Shell Zeolitic Imidazolate Frameworks as an Efficient catalyst for CO_2 cycloaddition to epoxides, *J. CO_2 Util.*, 70, 1–12.

Nunes, L.J.R., 2023, The Rising Threat of Atmospheric CO_2: A Review on the Causes, Impacts, and Mitigation Strategies, *Environ. - MDPI*, 10, 1–22.

Del Olmo, A., Calzada, J., dan Nuñez, M., 2017, Benzoic Acid And Its Derivatives As Naturally Occurring Compounds In Foods And As Additives: Uses, Exposure, And Controversy, *Crit. Rev. Food Sci. Nutr.*, 57, 3084–3103.

Patra, R. dan Sarma, D., 2023, A Thiol-Containing Zirconium MOF Functionalized With Silver Nanoparticles For Synergistic CO_2 Cycloaddition Reactions, *Dalt. Trans.*, 52, 10795–10804.

Pongajow, N.T., Juliandri, J., dan Hastiawan, I., 2017, Penentuan Geometri Dan Karakteristik Ikatan Senyawa Kompleks Ni(II)-Dibutilditiokarbamat Dengan Metode Density Functional Theory, *Indones. J. Appl. Sci.*, 7, 33–36.

Pratiwi, R.A. dan Nandiyanto, A.B.D., 2022, How to Read and Interpret UV-VIS Spectrophotometric Results in Determining the Structure of Chemical Compounds, *Indones. J. Educ. Res. Technol.*, 2, 1–20.

Qin, J., Wang, S., dan Wang, X., 2017, Visible-Light Reduction CO_2 With Dodecahedral Zeolitic Imidazolate Framework ZIF-67 As An Efficient Co-Catalyst, *Appl. Catal. B Environ.*, 209, 476–482.

Sadiq, S., Khan, I., Humayun, M., Wu, P., Khan, Abbas, Khan, Sohail, Khan, Aftab, Khan, Shoaib, Alanazi, A.F., dan Bououdina, M., 2023, Synthesis of Metal-Organic Framework-Based ZIF-8@ZIF-67 Nanocomposites for Antibiotic Decomposition and Antibacterial Activities, *ACS Omega*, 8, 49244–49258.

Saeed, T., Naeem, A., Ud Din, I., Alotaibi, M.A., Alharthi, A.I., Wali Khan, I., Huma Khan, N., dan Malik, T., 2020, Structure, Nomenclature And Viable Synthesis Of Micro/Nanoscale Metal Organic Frameworks And Their Remarkable Applications In Adsorption Of Organic Pollutants, *Microchem. J.*, 159, 1–13.

Sakakura, T., Choi, J.C., dan Yasuda, H., 2007, Transformation Of Carbon Dioxide, *Chem. Rev.*, 107, 2365–2387.

Sakakura, T. dan Kohno, K., 2009, The Synthesis Of Organic Carbonates From Carbon Dioxide, *Chem. Commun.*, 1312–1330.

Schaate, A., Roy, P., Godt, A., Lippke, J., Waltz, F., Wiebcke, M., dan Behrens, P., 2011, Modulated Synthesis Of Zr-Based Metal-Organic Frameworks: From Nano To Single Crystals, *Chem. - A Eur. J.*, 17, 6643–6651.

Sihombing, J.L., Trisunaryanti, W., Purwono, S., Syoufyan, A., dan Triyono, D., 2008, Sintesis dan Karakterisasi Katalis NiO-CoO-MoO/Zeolit Alam dan NiO-MoO-CoO/Zeolit Alam dan Uji Katalisasi pada Proses Hidrorengkah Pelumas Bekas, *Bmipa*, 18, 90–101.

Sing, K.S.W., Everett, D.H., Haul, R.A.W., Moscou, L., Pierotti, R.A., Rouquerol, J., dan Siemieniewska, T., 1985, Reporting Physisorption Data For Gas/Solid Systems — With Special Reference To The Determination Of Surface Area And Porosity, *Pure Appl. Chem.*, 57, 603–619.

Sisican, K.M.D., Usman, K.A.S., Bacal, C.J.O., Edañol, Y.D.G., dan Conato, M.T., 2023, Benzoic Acid Modulation of MIL-88B(Fe) Nanocrystals Toward Tunable Synthesis Of MOF-Based Fenton-Like Degradation Catalysts, *Cryst. Growth Des.*, 23, 8509–8517.

Skorik, N.A., Filippova, M.M., Bukhol'Tseva, E.I., Mal'Kov, V.S., dan Kurzina, I.A., 2015, Cobalt(II) And Copper(II) Complexes With Carboxylic Acids, Imidazole, And 2-Methylimidazole, *Russ. J. Inorg. Chem.*, 60, 729–735.

Solomon, S., Plattner, G.K., Knutti, R., dan Friedlingstein, P., 2009, Irreversible Climate Change Due To Carbon Dioxide Emissions, *Proc. Natl. Acad. Sci. U. S. A.*, 106, 1704–1709.

Suharto, T.I., 2022, Katalis Dalam Industri Kimia, UAD Press, Yogyakarta.

Tsuruoka, T., Furukawa, S., Takashima, Y., Yoshida, K., Isoda, S., dan Kitagawa, S., 2009, Nanoporous Nanorods Fabricated By Coordination Modulation And Oriented Attachment Growth, *Angew. Chemie - Int. Ed.*, 48, 4739–4743.

Vermoortele, F., Bueken, B., Le Bars, G., Van De Voorde, B., Vandichel, M., Houthoofd, K., Vimont, A., Daturi, M., Waroquier, M., Van Speybroeck, V., Kirschhock, C., dan De Vos, D.E., 2013, Synthesis Modulation As A Tool To Increase The Catalytic Activity Of Metal-Organic Frameworks: The Unique Case Of Uio-66(Zr), *J. Am. Chem. Soc.*, 135, 11465–11468.

Wang, L., Zhao, N., Zhu, C., Chen, L., Jiang, Y., Zhou, R., Liu, Y., Qu, B., dan Hintzen, H.T., 2024, Tunable Visible Emission And Persistent Luminescence Of $Baga_2o_4:Cu^{2+}$, *Chem. Eng. J.*, 483, 149361.

Warono, D. dan Syamsudin, 2013, Unjuk Kerja Spektrofotometer Untuk Analisa Zat Aktif Ketoprofen, *Konversi*, 2, 57–65.

Widiarti, N. dan Kusumastuti, E., 2015, Modifikasi Katalis Cao Dengan Sro Pada Reaksi Transesterifikasi Minyak Jelantah Menjadi Biodiesel Menggunakan Katalis Asam, *Jurnal MIPA*, 38, 49–56.

Wulandari, R., Riyanto, C.A., dan Martono, Y., 2023, Kinerja Karbon Aktif Daun Eceng Gondok pada Penurunan Kadar Fosfat Artifisial dan Surfaktan dalam Limbah Detergen, *Alchemy J. Penelit. Kim.*, 19, 149.

Yan, S., Zhu, D., Zhang, Z., Li, H., Chen, G., dan Liu, B., 2019, A Pilot-Scale

Experimental Study On CO_2 Capture Using Zeolitic Imidazolate Framework-8 Slurry Under Normal Pressure, *Appl. Energy*, 248, 104–114.

Yusuf, V.F., Malek, N.I., dan 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.

Zanon, A., Chaemchuen, S., Mousavi, B., dan Verpoort, F., 2017, 1 Zn-doped ZIF-67 as catalyst for the CO_2 fixation into cyclic carbonates, *J. CO_2 Util.*, 20, 282–291.