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DAFTAR PUSTAKA

Azega, R. K., Smith, A. D., Chowdhury, N. R., Vyas, A., Li, Q., Haque, M., Xun, Q., Zhang, X., Thurakkal, S., Thiringer, T., Enoksson, P., & Lundgren, P. (2024). Supercapacitors and rechargeable batteries, a tale of two technologies: Past, present and beyond. *Sustainable Materials and Technologies*, 41, e01111.

Bazzi, K., Mandal, B. P., Nazri, M., Naik, V. M., Garg, V. K., Oliveira, A. C., Vaishnava, P. P., Nazri, G. A., & Naik, R. (2014). Effect of surfactants on the electrochemical behavior of $LiFePO_4$ cathode material for lithium ion batteries. *Journal of Power Sources*, 265, 67–74.

Benedek, P., Wenzler, N., Yarema, M., & Wood, V.C. (2017). Low-Temperature Hydrotermal Synthesis of Battery Grade Lithium Iron Phosphate. *RSC Adv.* 7, 17763-17767.

Bhaskar, A., Bramnik, N. N., Trots, D. M., Fuess, H., & Ehrenberg, H. (2012). In situ synchrotron diffraction study of charge–discharge mechanism of sol–gel synthesized LiM0.5Mn1.5O4 (M = Fe, Co). *Journal of Power Sources*, 217, 464–469.

Bobyl, A., & Kasatkin, I. (2021). Anisotropic crystallite size distributions in $LiFePO_4$ powders. *RSC advances*, 11(23), 13799–13805.

Bulakhe, R. N., Ryu, C., Gunjakar, J. L., & In, J. B. (2022). Chemical route to the synthesis of novel ternary $CuCr_2S_4$ cathodes for asymmetric supercapacitors. *Journal of Energy Storage*, 56(Part C), 106175.

Cabán-Huertas, Z., Ayyad, O., Dubal, D. P., & Gómez-Romero, P. (2016). Aqueous synthesis of $LiFePO_4$ with fractal granularity. *Scientific Reports*, 6, 27024.

Casimir, A., Zhang, H., Ogoke, O., Amine, J. C., Lu, J., & Wu, G. (2016). Silicon-based anodes for lithium-ion batteries: Effectiveness of materials synthesis and electrode preparation. *Nano Energy*, 27, 359–376.

Castro, M. T., Del Rosario, J. A. D., Chong, M. N., Chuang, P.-Y. A., Lee, J., & Ocon, J. D. (2021). Multiphysics modeling of lithium-ion, lead-acid, and vanadium redox flow batteries. *Journal of Energy Storage*, 42, 102982.

Chacko, B., & Madhuri, W. (2024). A comprehensive investigation on the electrochemical performance, synthesis, modification, and recycling methods of $LiFePO_4$ for sustainable future. *Journal of Energy Storage*, 98(Part A), 112851.

Chakraborty, R., Asthana, A., Singh, A. K., Adhikari, R., & Susan, M. A. B. H. (2023). Collagen - a highly developed and abundant fibrous protein: Synthesis and characterization. In M. S. Sreekala, L. Ravindran, K. Goda, & S. Thomas (Eds.), *Handbook of natural polymers* (pp. 489–508). Elsevier.

Chen, H., & Wang, S. Z. (2009). Preparation and electrochemical performance of $LiFePO_4$/C composite with carbon core structure. *Materials Letters, 63*(20), 1668–1670.

UNIVERSITAS
GADJAH MADA
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A'bid Inda Nurahman, Prof. Dr. Harsojo, SU., M.Sc
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Chen, T., Jin, Y., Lv, H., Yang, A., Liu, M., Chen, B., Xie, Y., & Chen, Q. (2020). Applications of lithium-ion batteries in grid-scale energy storage systems. *Transactions of Tianjin University*, 26(3), 208–217.

Chen, Y., Yang, S., Zheng, J., Hu, M., Wei, M., & Xiong, P. (2025). Synthesis of $LiFePO_4$ cathode materials from amorphous $FePO_4$ precursor: Effects of Li/P molar ratio on crystal defect formation and electrochemical performance. *Solid State Ionics*, 432, 117050.

Chong, J., Xun, S., Song, X., Ridgway, P., Liu, G., & Battaglia, V. S. (2012). Towards the understanding of coatings on rate performance of LiFePO4. *Journal of Power Sources*, 200, 67–76.

Coşkun, E., Kurşun, E., Yıldız, B., Aşkar, Y., Bahtiyar, D., Aydınol, M. K., Mavis, B., & Çınar-Aygün, S. (2024). Size and morphology controlled polyol synthesis of $LiFePO_4$ nanoparticles with addition of organic acid combinations. *Ceramics International*, 50(9, Part B), 15915–15930.

Duan, H., Meng, D., Wu, S., & Yuan, S. (2023). Effect of heat treatment and impurities from fuels on the electrochemical performance of nano-$LiFePO_4$ prepared by solution combustion synthesis. *Materials Letters*, 347, 134595.

Energy Institute, KPMG, & Kearney. (2024). Statistical Review of World Energy 2024. *Energy Institute*.

Foran, G., Mankovsky, D., Verdier, N., Lepage, D., Prébé, A., Aymé-Perrot, D., & Dollé, M. (2020). The impact of absorbed solvent on the performance of solid polymer electrolytes for use in solid-state lithium batteries. *iScience*, 23, 101597.

Gao, Y., Chen, K., Chen, H., Hu, X., Deng, Z., & Wei, Z. (2017). Surfactant assisted solvothermal synthesis of $LiFePO_4$ nanorods for lithium-ion batteries. *Journal of Energy Chemistry*, 26(3), 564–568.

Ghaeminezhad, N., Wang, Z., & Ouyang, Q. (2023). A review on lithium-ion battery thermal management system techniques: A control-oriented analysis. *Applied Thermal Engineering*, 219, 119497.

Gómez, H., Ram, M. K., Alvi, F., Villalba, P., Stefanakos, E. (L.), & Kumar, A. (2011). Graphene-conducting polymer nanocomposite as novel electrode for supercapacitors. *Journal of Power Sources*, 196(8), 4102–4108.

Guzzo, P. L., Marinho de Barros, F. B., & de Arruda Tino, A. A. (2019). Effect of prolonged dry grinding on size distribution, crystal structure and thermal decomposition of ultrafine particles of dolostone. *Powder Technology*, 342, 141–148.

Hamida, H.N., & Munasir. 2023. A Review: Modifikasi Doping LiFePO4 sebagai Katoda Baterai Li-Ion. *Inovasi Fisika Indonesia*, 12(2), 56–65.

Hansford, G. M., Turner, S. M. R., Degryse, P., & Shortland, A. J. (2017). High-resolution X-ray diffraction with no sample preparation. *Acta crystallographica. Section A, Foundations and advances*, 73(Pt 4), 293–311.

Herrero, Y. R., Camas, K. L., & Ullah, A. (2023). Characterization of biobased materials. In S. Ahmed & Annu (Eds.), *Advanced applications of biobased materials* (pp. 111–143). Elsevier.

UNIVERSITAS
GADJAH MADA
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A'bid Inda Nurahman, Prof. Dr. Harsojo, SU., M.Sc
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Hong, S. A., Kim, S. J., Kim, J., Lee, B. G., Chung, K. Y., & Lee, Y. W. (2012). Carbon coating on lithium iron phosphate ($LiFePO_4$): Comparison between continuous supercritical hydrothermal method and solid-state method. *Chemical Engineering Journal,* 198–199, 318–326.

Hovington, P., Timoshevskii, V., Burgess, S., Demers, H., Statham, P., Gauvin, R., & Zaghib, K. (2016). Can we detect Li K X-ray in lithium compounds using energy dispersive spectroscopy?. *Scanning*, *38*(6), 571–578.

Itagaki, M., Kobari, N., Yotsuda, S., Watanabe, K., Kinoshita, S., & Ue, M. (2004). In situ electrochemical impedance spectroscopy to investigate negative electrode of lithium-ion rechargeable batteries. *Journal of Power Sources*, 135(1–2), 255–261.

Jaizah Sabrina, G., & Arifin Imam Supardi, Z. (2019). Sintesis dan Karakterisasi Material Katoda LiFePO4 pada Baterai Lithium Ion. *Inovasi Fisika Indonesia*, 8(3).

Jeong, J. I., & Choi, M. (2005). A bimodal particle dynamics model considering coagulation, coalescence and surface growth, and its application to the growth of titania aggregates. *Journal of Colloid and Interface Science,* 281(2), 351–359.

Jin, X., Zhang, P., Teng, L., Rohani, S., He, M., Meng, F., Liu, Q., & Liu, W. (2023). Acid-free extraction of valuable metal elements from spent lithium-ion batteries using waste copperas. *Waste Management*, 165, 189–198.

Ju, S., Peng, H., Li, G., & Chen, K. (2012). Synthesis and electrochemical properties of $LiFePO_4$ single-crystalline nanoplates dominated with bc-planes. *Materials Letters, 74*, 22–25.

Kamrani, P., Hedrick, J., Marks, J. G., & Zaenglein, A. L. (2024). Petroleum jelly: A comprehensive review of its history, uses, and safety. *Journal of the American Academy of Dermatology,* 90(4), 807–813.

Kang, H.-C., Jun, D.-K., Jin, B., Jin, E. M., Park, K.-H., Gu, H.-B., & Kim, K.-W. (2008). Optimized solid-state synthesis of $LiFePO_4$ cathode materials using ball-milling. *Journal of Power Sources*, 179(1), 340–346.

Khan, M. M. (2025). X-ray diffraction. In Photocatalysts: *Synthesis and characterization methods* (pp. 213–223). Elsevier.

Kim, J. K., & Jeong, S. M. (2020). Physico-electrochemical properties of carbon coated LiFePO4 nanoparticles prepared by different preparation method. *Applied Surface Science, 505*, 144630.

Koech, A. K., Mwandila, G., Mulolani, F., & Mwaanga, P. (2024). Lithium-ion battery fundamentals and exploration of cathode materials: A review. *South African Journal of Chemical Engineering*, 50, 321–339.

Koech, A. K., Mwandila, G., Mulolani, F., & Mwaanga, P. (2025). Exploring the anode materials for lithium-ion batteries: A review. *Next Research*, 2(3), 100442.

Kurzweil, P., & Brandt, K. (2009). Secondary batteries – Lithium rechargeable systems: Overview. In J. Garche (Ed.), *Encyclopedia of Electrochemical Power Sources* (pp. 1–26). Elsevier.

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GADJAH MADA
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A'bid Inda Nurahman, Prof. Dr. Harsojo, SU., M.Sc
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Kwon, O., Oh, G., Hirose, T., Hori, S., Suzuki, K., Kanno, R., & Hirayama, M. (2026). High-temperature-compatible surface engineering with Li_2WO_4 for interfacial activation in sulfide-based all-solid-state batteries. *Journal of Power Sources*, 672, 239521.

Lara, C., Maril, M., Tobosque, P., Núñez, J., Pizarro, L., & Carrasco, C. (2025). Comprehensive analysis of improved $LiFePO_4$ kinetics: Understanding barriers to fast charging. *Journal of Power Sources*, 640, 236747.

Latif, C., Negara, V. S. I., Wongtepa, W., Thamatkeng, P., Zainuri, M., & Pratapa, S. (2018). Fe K-Edge X-ray absorption near-edge spectroscopy (XANES) and X-ray diffraction (XRD) analyses of $LiFePO_4$ and its base materials. *Journal of Physics: Conference Series,* 985(1), 012021.

Lee, N., Lee, H., Jeong, Y., dan Lee, J.H. 2026. Effects of Milling-Medium Physicochemical Properties on Particle-Size Reduction and Surface Properties of Illite During Wet Ball Milling. *Minerals*, 16(1): 116.

Li, T., Sui, F., Li, F., Cai, Y., & Jin, Z. (2014). Effects of dry grinding on the structure and granularity of calcite and its polymorphic transformation into aragonite. *Powder Technology*, 254, 338–343.

Li, X., Lepour, D., Heymann, F., & Maréchal, F. (2023). Electrification and digitalization effects on sectoral energy demand and consumption: A prospective study towards 2050. *Energy*, 279, 127992.

Liu, X., Sun, L., Vu, N. H., Linh, D. T. H., Dien, P. T., Hoa, L. T., Lien, D. T., Nang, H. X., & Dao, V.-D. (2023). Synthesis of $LiFePO_4$/carbon/graphene for high-performance Li-ion battery. *Journal of Electroanalytical Chemistry*, 932, 117205.

Lu, L., Han, X., Li, J., Hua, J., & Ouyang, M. (2013). A review on the key issues for lithium-ion battery management in electric vehicles. *Journal of Power Sources*, 226, 272–288.

Lv, Y. J., Su, J., Long, Y. F., Cui, X. R., Lv, X. Y., & Wen, Y. X. (2014). Effects of ball-to-powder weight ratio on the performance of $LiFePO_4$/C prepared by wet-milling assisted carbothermal reduction. *Powder Technology*, 253, 467–473.

Lv, L., Zhou, S., Liu, C., Sun, Y., Zhang, J., Bu, C., Meng, J., & Huang, Y. (2024). Recycling and reuse of spent LIBs: Technological advances and future directions. *Molecules,* 29(13), 3161.

Mahlia, T. M. I., Saktisahdan, T. J., Jannifar, A., Hasan, M. H., & Matseelar, H. S. C. (2014). A review of available methods and development on energy storage: Technology update. *Renewable and Sustainable Energy Reviews*, 33, 532–545.

Mishra, A., Mehta, A., Basu, S., Malode, S. J., Shetti, N. P., Shukla, S. S., Nadagouda, M. N., & Aminabhavi, T. M. (2018). Electrode materials for lithium-ion batteries. *Materials Science for Energy Technologies*, 1(2), 182–187.

Moram, M. A., & Vickers, M. E. (2009). X-ray diffraction of III-nitrides. Reports on Progress in Physics, 72(3), 036502.

UNIVERSITAS
GADJAH MADA
Karakterisasi Struktur dan Morfologi Material Aktif LiFePO4 dengan Metode Solid State Reaction
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Nasajpour-Esfahani, N., Garmestani, H., Bagheritabar, M., Jasim, D. J., Toghraie, D., Dadkhah, S., & Firoozeh, H. (2024). Comprehensive review of lithium-ion battery materials and development challenges. *Renewable and Sustainable Energy Reviews*, 203, 114783.

Ngoy, K. R., Lukong, V. T., Yoro, K. O., Makambo, J. B., Chukwuati, N. C., Ibegbulam, C., Eterigho-Ikelegbe, O., Ukoba, K., & Jen, T.-C. (2025). Lithium-ion batteries and the future of sustainable energy: A comprehensive review. *Renewable and Sustainable Energy Reviews*, 223, 115971.

Olabi, A. G. (2017). Renewable energy and energy storage systems. *Energy*, 136, 1–6.

Olabi, A. G., Abbas, Q., Shinde, P. A., & Abdelkareem, M. A. (2023). Rechargeable batteries: Technological advancement, challenges, current and emerging applications. *Energy*, 266, 126408.

Osman, A. I., Chen, L., Yang, M., Msigwa, G., Farghali, M., Fawzy, S., Rooney, D. W., & Yap, P.-S. (2023). Cost, environmental impact, and resilience of renewable energy under a changing climate: A review. *Environmental Chemistry Letters, 21*(2), 741–764.

Pandurangappa, M., & Ramakrishnappa, T. (2008). Derivatization and characterization of functionalized carbon powder via diazonium salt reduction. *Journal of Solid State Electrochemistry*, 12, 1411–1419.

Pei, B., Yao, H., Zhang, W., & Yang, Z. (2012). Hydrothermal synthesis of morphology-controlled LiFePO4 cathode material for lithium-ion batteries. *Journal of Power Sources*, 220,317–323.

Putra, O., Fadila, R., Andrijanto, E., & Suminar, D. R. (2021). Sintesis dan Karakterisasi Lithium Iron Phosphate (LiFePO4) Menggunakan Metoda Solid State Reaction Sebagai Katoda Pada baterai Lithium-Ion. *Fluida*, *14*(2), 42–49.

Rachmanto, M., Wibowo, L., & Paramitha, T. (2020). Review: Metode Sintesis Katoda LiFePO4 Baterai Lithium-Ion. *Equilibrium Journal of Chemical Engineering, 3*(2), 75-83.

Rispiandi, R., & Andrijanto, E. (2022). Optimasi Suhu Reaksi Sintesis Senyawa LiFePO4 Menggunakan Prekursor Lithium Sulfat Sebagai Sumber Ion Lithium. *Fluida*, *15*(1), 38–42.

Saha, B. P., Kumar, V., Joshi, S. V., Balakrishnan, A., & Martin, C. L. (2012). Investigation of compaction behavior of alumina nano powder. Powder Technology, 224, 90–95.

Sarmadi, A., Masoudpanah, S. M., & Ong, C. K. (2023). Combustion synthesis of $LiFePO_4$ cathode material: Effects of l-Lysine fuel and solvent type. *Journal of Electroanalytical Chemistry*, 938, 117450.

Satya, T. P., Rifai, A., Santoso, I., & Harsojo. (2024). The effect of non-polar solvent on the structural properties and electrochemical performance of $LiFePO_4$ cathode materials synthesized by solid-state reaction. *Carbon Letters*.

Senthilkumar, M., Imla Mary, C., & Moorthy Babu, S. (2017). Morphological controlled synthesis of hierarchical copper selenide nanocrystals by oleic

UNIVERSITAS
GADJAH MADA
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acid, 1-dodecanethiol and 1-octadecene as surfactants. *Journal of Crystal Growth*, 468, 169–174.

Singh, M., Singh, B., & Willert-Porada, M. (2017). Reaction mechanism and morphology of the $LiFePO_4$ materials synthesized by chemical solution deposition and solid-state reaction. *Journal of Electroanalytical Chemistry*, 790, 11–19.

Sundarayya, Y., Vijeth, H., Nagaraju, D., Kumara Swamy, K. C., & Sunandana, C. S. (2023). Isovalent substitution of vanadium in $LiFePO_4$: Evolution of monoclinic α-$Li_3Fe_2(PO_4)_3$ phase. *Inorganic Chemistry Communications*, 150, 110530.

Velev, B., 2018, Comparative Analysis of Lithium-Ion Batteries for EV/HEV Applications. *Int. Sci. J. Ind*. 4.0. 3, 73-76.

Weber, S., Schrag, K., Mildau, G., Kuballa, T., Walch, S. G., & Lachenmeier, D. W. (2018). Analytical methods for the determination of mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH)—A short review. *Analytical Chemistry Insights*, 13, 1–16.

Xu, X., Guo, Z., Zhu, D., Pan, J., Yang, C., & Li, S. (2025). Green pathways to $LiFePO_4$ cathodes: Exploring sustainable iron sources and recycling strategies. *Chemical Engineering Journal*, 521, 166798.

Yue, X., Hou, J., Zhao, H., Wu, P., Guo, Y., Shi, Q., Chen, L., Peng, S., Liu, Z., & Cao, G. (2020). Au–Ag alloy nanoparticles with tunable cavity for plasmon-enhanced photocatalytic H_2 evolution. J*ournal of Energy Chemistry*, 49, 1–7.

Zhang, D., Li, H., Lu, M., Han, W., Li, H., & Zhang, B. (2026). Challenges and opportunities of solid-state aluminum ion batteries: From basic scientific research to application. *Journal of Energy Chemistry*.

Zhang, Y., Huo, Q.-Y., Du, P.-P., Wang, L.-Z., Zhang, A.-Q., Song, Y.-H., Lv, Y., & Li, G.-Y. (2012). Advances in new cathode material $LiFePO_4$ for lithium-ion batteries. *Synthetic Metals*, 162(13–14), 1315–1326.