

DAFTAR PUSTAKA

- A. Basnayaka, P., K. Ram, M., Stefanakos, L., & Kumar, A. (2013). Graphene/Polypyrrole Nanocomposite as Electrochemical Supercapacitor Electrode: Electrochemical Impedance Studies. *Graphene*, 02(02), 81–87. <https://doi.org/10.4236/graphene.2013.22012>
- Aakash, Nordblad, P., Rajendra Mohan, & Mukherjee, S. (2017). Structural, magnetic and hyperfine characterizations of nanocrystalline Zn-Cd doped nickel ferrites. *Journal of Magnetism and Magnetic Materials*, 441, 710–717. <https://doi.org/10.1016/j.jmmm.2017.06.040>
- Aboagye, D., Banadda, N., Kambugu, R., Seay, J., Kiggundu, N., Zziwa, A., & Kabenge, I. (2017). Glucose recovery from different corn stover fractions using dilute acid and alkaline pretreatment techniques. *Journal of Ecology and Environment*, 41(1). <https://doi.org/10.1186/s41610-017-0044-1>
- Afzia, M., Khan, R. A., Ismail, B., Zaki, M. E. A., Althagafi, T. M., Alanazi, A. A., & Khan, A. U. (2023). Correlation between Magnetic and Dielectric Response of $\text{CoFe}_2\text{O}_4:\text{Li}^{1+}/\text{Zn}^{2+}$ Nanopowders Having Improved Structural and Morphological Properties. *Molecules*, 28(6). <https://doi.org/10.3390/molecules28062824>
- Ahmad, S. I. (2022). Nano cobalt ferrites: Doping, Structural, Low-temperature, and room temperature magnetic and dielectric properties – A comprehensive review. In *Journal of Magnetism and Magnetic Materials* (Vol. 562). Elsevier B.V. <https://doi.org/10.1016/j.jmmm.2022.169840>
- Ahsan, M. Z., Khan, F. A., & Islam, M. A. (2019). Frequency and Temperature Dependent Dielectric and Magnetic Properties of Manganese Doped Cobalt Ferrite Nanoparticles. *Journal of Electronic Materials*, 48(12), 7721–7729. <https://doi.org/10.1007/s11664-019-07583-y>
- Akbar, L., Ahmed, M., Haq, I. U., Nawaz, A., & Bhutta, M. S. (2024). Enhancing optical and resistive characteristics of MnFe_2O_4 spinel ferrite through Ni^{2+} doping: An advancement in structural refinement. *Solid State Communications*, 378. <https://doi.org/10.1016/j.ssc.2023.115410>
- Alharbi, N. S., Alsubhi, N. S., & Felimban, A. I. (2022). Green synthesis of silver nanoparticles using medicinal plants: Characterization and application. *Journal of Radiation Research and Applied Sciences*, 15(3), 109–124. <https://doi.org/10.1016/j.jrras.2022.06.012>
- Ali, S. E., Marzouk, A. A., Abdel-Khalek, H., & El-Mahalawy, A. M. (2025). Controllability of optical, electrical, and magnetic properties of synthesized Cd-doped MgFe_2O_4 nanostructure. *Journal of Alloys and Compounds*, 1010. <https://doi.org/10.1016/j.jallcom.2024.177451>

- Almessiere, M. A., Slimani, Y., Auwal, I. A., Shirsath, S. E., Gondal, M. A., Sertkol, M., & Baykal, A. (2021). Biosynthesis effect of Moringa oleifera leaf extract on structural and magnetic properties of Zn doped Ca-Mg nano-spinel ferrites. *Arabian Journal of Chemistry*, 14(8), 103261. <https://doi.org/10.1016/j.arabjc.2021.103261>
- Altarawneh, A. M., Arrasheed, E. A., Ajlouni, A. W., Ghazy, R., Hemeda, O. M., Henaish, A. M. A., & Mostafa, M. (2023). Correlation between structural, cation distribution with dielectric spectra and magnetic properties for Co–Zn ferrite doped with La³⁺ ions. *Ceramics International*, 49(9), 14215–14224. <https://doi.org/10.1016/j.ceramint.2023.01.008>
- Anjum, S., & Masud, A. (2018). Structural and temperature dependent dielectric properties of tin substituted cobalt ferrites (Sn_xCo_{1-x}Fe₂O₄). In *Digest Journal of Nanomaterials and Biostructures* (Vol. 13, Issue 4).
- Aslam, A., Rehman, A. U., Amin, N., Ajaz un Nabi, M., Abdullah, Q. ul ain, Morley, N. A., Arshad, M. I., Ali, H. T., Yusuf, M., Latif, Z., & Mehmood, K. (2021). Lanthanum doped Zn_{0.5}Co_{0.5}LaxFe_{2-x}O₄ spinel ferrites synthesized via co-precipitation route to evaluate structural, vibrational, electrical, optical, dielectric, and thermoelectric properties. *Journal of Physics and Chemistry of Solids*, 154. <https://doi.org/10.1016/j.jpcs.2021.110080>
- Aslam, A., Rehman, A. U., Amin, N., Amman, M., Akhtar, M., Morley, N. A., Al-Sharif, M. S., Hessien, M. M., El-Nagdy, K. A., & Arshad, M. I. (2023). To study the structural, electrical, and magnetic properties of M (M = Mg²⁺, Mn²⁺, and Cd²⁺) doped Cu-Ni-Co-La spinel ferrites. *Materials Chemistry and Physics*, 294. <https://doi.org/10.1016/j.matchemphys.2022.127034>
- Bakhshi, H., Vahdati, N., Sedghi, A., & Mozharivskyj, Y. (2019). Comparison of the effect of nickel and cobalt cations addition on the structural and magnetic properties of manganese-zinc ferrite nanoparticles. *Journal of Magnetism and Magnetic Materials*, 474, 56–62. <https://doi.org/10.1016/j.jmmm.2018.10.146>
- Balasubramanian, M., & Murali, K. R. (2020). Biosynthesis of zinc ferrite (ZnFe₂O₄) nanoparticles using flower extract of nyctanthes arbor-tristis and their photocatalytic activity. *Ferroelectrics*, 555(1), 1–14. <https://doi.org/10.1080/00150193.2019.1691381>
- Bayahia, H. (2023). The highly efficient green synthesis of nanostructured ZnFe₂O₄ photocatalysts by using Ziziphus mauritiana and Salvadora persica extracts for the photocatalytic degradation of crystal violet in sunlight. *Journal of King Saud University - Science*, 35(4). <https://doi.org/10.1016/j.jksus.2023.102584>
- Chandekar, K. V., Yadav, S. P., Chinke, S., & Shkir, M. (2023). Impact of Co-doped Ni Fe₂O₄ (Co_xNi_{1-x} Fe₂O₄) nanostructures prepared by co-precipitation route on the structural, morphological, surface, and magnetic properties.

Journal of Alloys and Compounds, 966.
<https://doi.org/10.1016/j.jallcom.2023.171556>

- De, M., Mukherjee, A., & Tewari, H. S. (2015). Characterization of cadmium substituted nickel ferrites prepared using auto-combustion technique. *Processing and Application of Ceramics*, 9(4), 193–197. <https://doi.org/10.2298/PAC1504193D>
- Dong, D., Zhang, Y., Xiao, Y., Wang, T., Wang, J., Romero, C. E., & Pan, W. ping. (2020). High performance aqueous supercapacitor based on nitrogen-doped coal-based activated carbon electrode materials. *Journal of Colloid and Interface Science*, 580, 77–87. <https://doi.org/10.1016/j.jcis.2020.07.018>
- Fahimirad, S., Ajalloueian, F., & Ghorbanpour, M. (2019). Synthesis and therapeutic potential of silver nanomaterials derived from plant extracts. *Ecotoxicology and Environmental Safety*, 168 (October 2018), 260–278. <https://doi.org/10.1016/j.ecoenv.2018.10.017>
- Fröhlich, A. C., Foletto, E. L., & Dotto, G. L. (2019a). Preparation and characterization of NiFe₂O₄/activated carbon composite as potential magnetic adsorbent for removal of ibuprofen and ketoprofen pharmaceuticals from aqueous solutions. *Journal of Cleaner Production*, 229, 828–837. <https://doi.org/10.1016/j.jclepro.2019.05.037>
- Fröhlich, A. C., Foletto, E. L., & Dotto, G. L. (2019b). Preparation and characterization of NiFe₂O₄/activated carbon composite as potential magnetic adsorbent for removal of ibuprofen and ketoprofen pharmaceuticals from aqueous solutions. *Journal of Cleaner Production*, 229, 828–837. <https://doi.org/10.1016/j.jclepro.2019.05.037>
- Fu, M., Chen, W., Ding, J., Zhu, X., & Liu, Q. (2019). Biomass waste derived multi-hierarchical porous carbon combined with CoFe₂O₄ as advanced electrode materials for supercapacitors. *Journal of Alloys and Compounds*, 782, 952–960. <https://doi.org/10.1016/j.jallcom.2018.12.244>
- Golsefidi, M. A., Abrodi, M., Abbasi, Z., Dashtbozorg, A., Rostami, M. E., & Ebadi, M. (2016). Hydrothermal method for synthesizing ZnFe₂O₄ nanoparticles, photo-degradation of Rhodamine B by ZnFe₂O₄ and thermal stable PS-based nanocomposite. *Journal of Materials Science: Materials in Electronics*, 27(8), 8654–8660. <https://doi.org/10.1007/s10854-016-4886-6>
- Gul, S., Yousuf, M. A., Anwar, A., Warsi, M. F., Agboola, P. O., Shakir, I., & Shahid, M. (2020). Al-substituted zinc spinel ferrite nanoparticles: Preparation and evaluation of structural, electrical, magnetic and photocatalytic properties. *Ceramics International*, 46(9), 14195–14205. <https://doi.org/10.1016/j.ceramint.2020.02.228>

- Gunawan, I., Sudaryanto, & Wahyudianingsih. (2015). *Studi Electrochemical Impedance Spectroscopy dari Lembaran Polyvinyl Alcohol dengan Penambahan LiClO 4 Sebagai Bahan Elektrolit Baterai Li-Ion*.
- Hajlaoui, M. E., Dhahri, R., Hnainia, N., Benchaabane, A., Dhahri, E., & Khirouni, K. (2019). Conductivity and giant permittivity study of $\text{Zn}_{0.5}\text{Ni}_{0.5}\text{Fe}_2\text{O}_4$ spinel ferrite as a function of frequency and temperature. *RSC Advances*, 9(56), 32395–32402. <https://doi.org/10.1039/c9ra06589j>
- Hamdaoui, N., Azizian-Kalandaragh, Y., Khelifi, M., & Beji, L. (2019). Cd-doping effect on morphologic, structural, magnetic and electrical properties of $\text{Ni}_{0.6-x}\text{Cd}_x\text{Mg}_{0.4}\text{Fe}_2\text{O}_4$ spinel ferrite ($0 \leq x \leq 0.4$). *Journal of Alloys and Compounds*, 803, 964–970. <https://doi.org/10.1016/j.jallcom.2019.06.339>
- Handani, S., Emriadi, Dahlan, D., & Arief, S. (2020). Enhanced structural, optical and morphological properties of ZnO thin film using green chemical approach. *Vacuum*, 179. <https://doi.org/10.1016/j.vacuum.2020.109513>
- Hema, E., Manikandan, A., Karthika, P., Antony, S. A., & Venkatraman, B. R. (2015). A Novel Synthesis of Zn^{2+} -Doped CoFe_2O_4 Spinel Nanoparticles: Structural, Morphological, Opto-magnetic and Catalytic Properties. *Journal of Superconductivity and Novel Magnetism*, 28(8), 2539–2552. <https://doi.org/10.1007/s10948-015-3054-1>
- Ijaola, A. O., Farayibi, P. K., & Asmatulu, E. (2020). Superhydrophobic coatings for steel pipeline protection in oil and gas industries: A comprehensive review. In *Journal of Natural Gas Science and Engineering* (Vol. 83). Elsevier B.V. <https://doi.org/10.1016/j.jngse.2020.103544>
- Issa, B., Obaidat, I. M., Albiss, B. A., & Haik, Y. (2013). Magnetic nanoparticles: Surface effects and properties related to biomedicine applications. *International Journal of Molecular Sciences*, 14(11), 21266–21305. <https://doi.org/10.3390/ijms141121266>
- Jahromi, R., Hashem Samadi, S., & Rezaei, M. (2020). *Sugarcane Bagasse Gasification in a Downdraft Fixed-Bed Gasifier: Optimization of Operation Conditions*. <https://doi.org/10.26434/chemrxiv.12361031>
- Jyothish, B., Geethu, U. S., & Jacob, J. (2022). Influence of the Ag^{1+} and Co^{2+} doping on structural, optical and anti-cancer properties of ZnFe_2O_4 nanoparticles synthesized by co-precipitation method. *Materials Science and Engineering: B*, 276. <https://doi.org/10.1016/j.mseb.2021.115544>
- K Sathiyamurthy, & Sivagurunathan, P. (2017). Structural , magnetic and electrochemical properties of $\text{Co}_x\text{Zn}_{1-x}\text{Fe}_2\text{O}_4$ nanoparticles synthesized by co-precipitation method. *International Journal of Advanced Science and Research*, 6, 33–41.

- Kardile, H. J., Somvanshi, S. B., Chavan, A. R., Pandit, A. A., & Jadhav, K. M. (2020). Effect of Cd^{2+} doping on structural, morphological, optical, magnetic and wettability properties of nickel ferrite thin films. *Optik*, 207. <https://doi.org/10.1016/j.ijleo.2020.164462>
- Khalil, M., Yu, J., Liu, N., & Lee, R. L. (2014). Hydrothermal synthesis, characterization, and growth mechanism of hematite nanoparticles. *Journal of Nanoparticle Research*, 16(4). <https://doi.org/10.1007/s11051-014-2362-x>
- Kiki Rezki Lestari. (2022). Morphological of Zinc Ferrite Nanostructure Using the Hydrothermal Synthesis. *International Journal Publishing*, 4(no 2). <https://doi.org/https://doi.org/10.54783/influencejournal.v4i2.50>
- Kmita, A., Pribulova, A., Holtzer, M., Futas, P., & Rocznik, A. (2016). Use of Specific Properties of Zinc Ferrite in Innovative Technologies. *Archives of Metallurgy and Materials*, 61(4), 2141–2146. <https://doi.org/10.1515/amm-2016-0289>
- Kogulakrishnan, K., Nithiyanantham, S., Koteeshwari, R. S., Malarkodi, B., Giridharan, N. V., Silambarasan, M., Venkatesh, A., Mohan, R., Natarajan, B., Gunasekaran, B., & Palaniappan, L. (2024). Research on cadmium-injected manganese ferrite made through the sol-gel method, focusing on its structure, magnetic properties, electrical conductivity, and electrochemical behavior. *Materials Science and Engineering: B*, 310. <https://doi.org/10.1016/j.mseb.2024.117721>
- Kogularasu, S., Akilarasan, M., Chen, S. M., Elaiyappillai, E., Johnson, P. M., Chen, T. W., Al-Hemaid, F. M. A., Ali, M. A., & Elshikh, M. S. (2018). A comparative study on conventionally prepared MnFe_2O_4 nanospheres and template-synthesized novel MnFe_2O_4 nano-agglomerates as the electrodes for biosensing of mercury contaminations and supercapacitor applications. *Electrochimica Acta*, 290, 533–543. <https://doi.org/10.1016/j.electacta.2018.09.028>
- Kolekar, Y. D., Sanchez, L. J., & Ramana, C. V. (2014). Dielectric relaxations and alternating current conductivity in manganese substituted cobalt ferrite. *Journal of Applied Physics*, 115(14). <https://doi.org/10.1063/1.4870232>
- Kombaiah, K., Vijaya, J. J., Kennedy, L. J., Bououdina, M., Kaviyarasu, K., Ramalingam, R. J., Munusamy, M. A., & AlArfaj, A. (2017a). Effect of Cd^{2+} concentration on ZnFe_2O_4 nanoparticles on the structural, optical and magnetic properties. In *Optik* (Vol. 135, pp. 190–199). Elsevier GmbH. <https://doi.org/10.1016/j.ijleo.2017.01.066>
- Kombaiah, K., Vijaya, J. J., Kennedy, L. J., Bououdina, M., Kaviyarasu, K., Ramalingam, R. J., Munusamy, M. A., & AlArfaj, A. (2017b). Effect of Cd^{2+} concentration on ZnFe_2O_4 nanoparticles on the structural, optical and

- magnetic properties. In *Optik* (Vol. 135, pp. 190–199). Elsevier GmbH. <https://doi.org/10.1016/j.ijleo.2017.01.066>
- Kumar, S., Joshi, N. C., & Rawat, B. S. (2025). Synthesis And Electrochemical Performance Of ZnFe₂O₄/Go-Based Electrode Material. *Rasayan Journal of Chemistry*, 18(1), 124–131. <https://doi.org/10.31788/RJC.2025.1819065>
- Labanni, A., Zulhadjri, Handayani, D., Ohya, Y., & Arief, S. (2020). Size controlled synthesis of well-distributed nano-silver on hydroxyapatite using alkanolamine compounds. *Ceramics International*, 46(5), 5850–5855. <https://doi.org/10.1016/j.ceramint.2019.11.035>
- Lazarević, Z. Ž., Jovalekić, Č., Milutinović, A., Sekulić, D., Ivanovski, V. N., Rečnik, A., Cekić, B., & Ž. Romčević, N. (2013). Nanodimensional spinel NiFe₂O₄ and ZnFe₂O₄ ferrites prepared by soft mechanochemical synthesis. *Journal of Applied Physics*, 113(18), 0–11. <https://doi.org/10.1063/1.4801962>
- Li, J., Yousaf, M., Hayat, Q., Akbar, M., Noor, A., Shah, M. A. K. Y., Qi, F., & Lu, Y. (2023). Effect of rare earth Nd³⁺ doping contents on physical, structural, and magnetic properties of Co–Ni spinel ferrite nanoparticles. *Journal of Rare Earths*, 41(11), 1746–1753. <https://doi.org/10.1016/j.jre.2022.12.007>
- Liao, Z., Su, H. Y., Cheng, J., Sun, G. T., Zhu, L., & Zhu, M. Q. (2021). CoFe₂O₄-mesoporous carbons derived from Eucommia ulmoides wood for supercapacitors: Comparison of two activation method and composite carbons material synthesis method. *Industrial Crops and Products*, 171. <https://doi.org/10.1016/j.indcrop.2021.113861>
- Liu, H., Guo, Y., Zhang, Y., Wu, F., Liu, Y., & Zhang, D. (2013). Synthesis and properties of ZnFe₂O₄ replica with biological hierarchical structure. *Materials Science and Engineering: B*, 178(16), 1057–1061. <https://doi.org/10.1016/j.mseb.2013.06.012>
- Liu, R., Su, W., Shen, C., Iocozzia, J., Zhao, S., Yuan, K., Zhang, N., Wang, C. an, & Lin, Z. (2017). Hydrothermal synthesis of hollow SnO₂ spheres with excellent electrochemical performance for anodes in lithium ion batteries. *Materials Research Bulletin*, 96, 443–448. <https://doi.org/10.1016/j.materresbull.2017.03.004>
- Liu, X., Ma, C., Li, J., Zielinska, B., Kalenczuk, R. J., Chen, X., Chu, P. K., Tang, T., & Mijowska, E. (2019). Biomass-derived robust three-dimensional porous carbon for high volumetric performance supercapacitors. *Journal of Power Sources*, 412, 1–9. <https://doi.org/10.1016/j.jpowsour.2018.11.032>
- Liu, Y., Liu, X., Dong, W., Zhang, L., Kong, Q., & Wang, W. (2017). Efficient Adsorption of Sulfamethazine onto Modified Activated Carbon: A Plausible Adsorption Mechanism. *Scientific Reports*, 7(1). <https://doi.org/10.1038/s41598-017-12805-6>

- Mahendra, I., & Azhar, M. (2022). Ekstraksi dan Karakterisasi Katekin Dari Gambir. *11*(1), 5–7.
- Majid, S., Ali, A. S. G., Cao, W. Q., Reza, R., & Ge, Q. (2021). Biomass-derived porous carbons as supercapacitor electrodes-A review. In *Xinxing Tan Cailiao/New Carbon Materials* (Vol. 36, Issue 3, pp. 546–572). Institute of Metal Research Chinese Academy of Sciences. [https://doi.org/10.1016/S1872-5805\(21\)60038-0](https://doi.org/10.1016/S1872-5805(21)60038-0)
- Mandal, M., Nayak, A. K., Upadhyay, P., Patra, S., Subudhi, S., Mahapatra, A., & Mahanandia, P. (2023). Hydrothermal synthesis of ZnFe_2O_4 anchored graphene and activated carbon as a new hybrid electrode for high-performance symmetric supercapacitor applications. *Diamond and Related Materials*, 139. <https://doi.org/10.1016/j.diamond.2023.110300>
- Mandal, M., Subudhi, S., Alam, I., Subramanyam, B. V. R. S., Patra, S., Raiguru, J., Das, S., & Mahanandia, P. (2021). Facile synthesis of new hybrid electrode material based on activated carbon/multiwalled carbon nanotubes@ ZnFe_2O_4 for supercapacitor applications. *Inorganic Chemistry Communications*, 123. <https://doi.org/10.1016/j.inoche.2020.108332>
- Marouani, I., Basem, A., Abdulrahman, A., Samad, S., Khan, M. I., Jalilov, F., Karimov, M., Abduvokhidov, A., & Mahariq, I. (2025). Efficient photocatalytic environmental detoxification and sustainable H_2O_2 production using Cs_2TiBr_6 - ZnO supported on date palm seed derived activated carbon. *Journal of Water Process Engineering*, 76. <https://doi.org/10.1016/j.jwpe.2025.108148>
- Mishra, B., Munisha, B., Nanda, J., Sankaran, K. J., & Suman, S. (2022). Hydrothermally Synthesized Magnesium doped Zinc Ferrite Nanoparticles: An extensive study on structural, optical, magnetic, and dielectric properties. *Materials Chemistry and Physics*, 292. <https://doi.org/10.1016/j.matchemphys.2022.126791>
- Mohamad Nor, N., Lau, L. C., Lee, K. T., & Mohamed, A. R. (2013). Synthesis of activated carbon from lignocellulosic biomass and its applications in air pollution control - A review. In *Journal of Environmental Chemical Engineering* (Vol. 1, Issue 4, pp. 658–666). Elsevier Ltd. <https://doi.org/10.1016/j.jece.2013.09.017>
- Mohtashami, S. A., Asasian Kolur, N., Kaghazchi, T., Asadi-Kesheh, R., & Soleimani, M. (2018). Optimization of sugarcane bagasse activation to achieve adsorbent with high affinity towards phenol. *Turkish Journal of Chemistry*, 42(6), 1720–1735. <https://doi.org/10.3906/kim-1806-71>
- Mostafa, M., & Salem, B. I. (2022). Studying structural, molecular, morphological and electrical properties of $\text{Co}_{0.2}\text{Zn}_{0.8}\text{Fe}_2\text{O}_4$ doped with Cadmium.

Materials Science and Engineering: B, 286.
<https://doi.org/10.1016/j.mseb.2022.116043>

- Mumtaz, R., Shah, W. H., Iqbal, Y., Ullah, H., Asghar, G., Hussain, M., R. Abukhadra, M., & El-Sherbeeney, A. M. (2024). Electrical transport and dielectric relaxation mechanism in $\text{Zn}_{0.5}\text{Cd}_{0.5}\text{Fe}_2\text{O}_4$ spinel ferrite: A temperature- and frequency-dependent complex impedance study. *Heliyon*, 10(14). <https://doi.org/10.1016/j.heliyon.2024.e34155>
- Mustaqeem, M., Saleh, T. A., ur Rehman, A., Farooq Warsi, M., Mehmood, A., Sharif, A., & Akther, S. (2020). Synthesis of $\text{Zn}_{0.8}\text{Co}_{0.1}\text{Ni}_{0.1}\text{Fe}_2\text{O}_4$ polyvinyl alcohol nanocomposites via ultrasound-assisted emulsion liquid phase. *Arabian Journal of Chemistry*, 13(1), 3246–3254. <https://doi.org/10.1016/j.arabjc.2018.10.009>
- Nilufer Anwar Basha. (2023). Activated Carbon from Coconut Shell: Synthesis and Its Commercial Applications- A Recent Review. *Applied Science and Engineering Progress*, 16(2). <https://doi.org/DOI:10.14416/j.asep.2022.07.001>
- Nunes, L. J. R., Loureiro, L. M. E. F., Sá, L. C. R., & Silva, H. F. C. (2020). Sugarcane industry waste recovery: A case study using thermochemical conversion technologies to increase sustainability. *Applied Sciences (Switzerland)*, 10(18). <https://doi.org/10.3390/APP10186481>
- Okonkwo, C. A., Menkiti, M. C., Obiora-Okafo, I. A., & Ezenwa, O. N. (2021). Controlled pyrolysis of sugarcane bagasse enhanced mesoporous carbon for improving capacitance of supercapacitor electrode. *Biomass and Bioenergy*, 146. <https://doi.org/10.1016/j.biombioe.2021.105996>
- Palneedi, H., Peddigari, M., Hwang, G. T., Jeong, D. Y., & Ryu, J. (2018). High-Performance Dielectric Ceramic Films for Energy Storage Capacitors: Progress and Outlook. In *Advanced Functional Materials* (Vol. 28, Issue 42). Wiley-VCH Verlag. <https://doi.org/10.1002/adfm.201803665>
- Parajuli, D., & Murali, N. (2024). Tailoring Structural and Magnetic Properties: Cd^{2+} and Cu^{2+} Co-Doped Ni-Zn Ferrite Nanoparticles via Sol-Gel Auto-Combustion. *South African Journal of Chemical Engineering*. <https://doi.org/10.1016/j.sajce.2024.08.009>
- Permatasari, S., Halisa, N., & Frethernety, A. (2023). Bioactivity Examination of *Uncaria gambir* (W.Hunter) Roxb on In Vitro Human Sperm Motility. *Medical Laboratory Technology Journal*, 9(2). <https://doi.org/10.31964/mltj.v9i2.563>
- Pharma, D., Aziz, H., Norita Tetra, O., Alif, A., & Ramadhan, W. (2016). *Electrical Properties of Supercapacitor Electrode-Based on Activated Carbon from Waste Palm Kernel Shells* (Vol. 8, Issue 15). www.derpharmachemica.com

- Porrawatkul, P., Nuengmatcha, P., Tangwatanakul, W., & Chanthai, S. (2020). Effect of Zn, Ni, and Mn doping ions on magnetic properties of MFe_2O_4 ($\text{M} = \text{Mn, Zn, and Ni}$) nanoparticles synthesized via sol–gel autocombustion using PVA/sago starch blend as a chelating agent. *Journal of the Korean Ceramic Society*, 57(6), 676–683. <https://doi.org/10.1007/s43207-020-00069-2>
- Prabakaran, K., Kavinkumar, T., Shafi, M., Shobin, L. R., Mangalaraja, R. V., Bhaviripudi, V. R., Abarzúa, C. V., & Thirumurugan, A. (2025). Pyrolytic carbon decorated cobalt ferrite nanostructures as a negative electrode material for improved supercapacitor applications. *Diamond and Related Materials*, 151. <https://doi.org/10.1016/j.diamond.2024.111822>
- Putjuso, T., Putjuso, S., Karaphun, A., & Swatsitang, E. (2024). $\beta\text{-Ni}(\text{OH})_2$ nanoparticles@activated sugarcane bagasse carbon nanocomposites as an advanced hybrid electrode material for asymmetric supercapacitors. *Surfaces and Interfaces*, 51. <https://doi.org/10.1016/j.surfin.2024.104584>
- Qian, W., Sun, F., Xu, Y., Qiu, L., Liu, C., Wang, S., & Yan, F. (2014). Human hair-derived carbon flakes for electrochemical supercapacitors. *Energy and Environmental Science*, 7(1), 379–386. <https://doi.org/10.1039/c3ee43111h>
- Rahmadani, N., & Kurniawati, P. (2017). Sintesis dan Karakterisasi Karbon Teraktivasi Asam dan Basa Berbasis Mahkota Nanas. In *Jurusan Kimia FMIPA UM* (Vol. 5).
- Rahmayeni, Febrialita, R., Stiadi, Y., Putri, Y. E., Sofyan, N., & Zulhadjri. (2021a). Simbang Darah (*Iresine herbstii*) extract mediated hydrothermal method in the synthesis of zinc ferrite spinel nanoparticles used for photocatalysis and antibacterial applications. *Journal of Environmental Chemical Engineering*, 9(2). <https://doi.org/10.1016/j.jece.2021.105140>
- Rahmayeni, Febrialita, R., Stiadi, Y., Putri, Y. E., Sofyan, N., & Zulhadjri. (2021b). Simbang Darah (*Iresine herbstii*) extract mediated hydrothermal method in the synthesis of zinc ferrite spinel nanoparticles used for photocatalysis and antibacterial applications. *Journal of Environmental Chemical Engineering*, 9(2).
- Rahmayeni, Putri, J., Stiadi, Y., Zilfa, & Zulhadjri. (2019). Green synthesis of NiFe_2O_4 spinel ferrites magnetic in the presence of *Hibiscus rosa-sinensis* leaves extract: Morphology, structure and activity. *Rasayan Journal of Chemistry*, 12(4), 1942–1949. <https://doi.org/10.31788/RJC.2019.1245304>
- Rahmayeni, R., Oktavia, Y., Stiadi, Y., Arief, S., & Zulhadjri, Z. (2021). Spinel ferrite of MnFe_2O_4 synthesized in Piper betle Linn extract media and its application as photocatalysts and antibacterial. *Journal of Dispersion Science and Technology*, 42(3), 465–474. <https://doi.org/10.1080/01932691.2020.1721011>

- Rahmayeni, Ramadani, A., Stiadi, Y., Jamarun, N., Emriadi, & Arief, S. (2017). Photocatalytic performance of ZnO-ZnFe₂O₄ magnetic nanocomposites on degradation of Congo red dye under solar light irradiation. *Journal of Materials and Environmental Science*, 8(5), 1634–1643.
- Rahmayeni, Wendari, T. P., Atmoko, H. M., Stiadi, Y., Putri, Y. E., & Zulhadjri. (2023). CuFe₂O₄/activated carbon nanocomposite for efficient photocatalytic degradation of dye: Green synthesis approaches using the waste of oil palm empty bunches and bio-capping agent. *Case Studies in Chemical and Environmental Engineering*, 7. <https://doi.org/10.1016/j.cscee.2023.100305>
- Raudhatussyarifah, R., Sediawan, W. B., Azis, M. M., & Hartati, I. (2022). Microcrystalline cellulose production by acid hydrolysis of hydrotropic rice straw pulp. *IOP Conference Series: Earth and Environmental Science*, 963(1). <https://doi.org/10.1088/1755-1315/963/1/012055>
- Sagadevan, S., Chowdhury, Z. Z., & Rafique, R. F. (2018). Preparation and Characterization of Nickel ferrite Nanoparticles via Co-precipitation Method. *Materials Research*, 21(2), 21–25. <https://doi.org/10.1590/1980-5373-mr-2016-0533>
- Saikia, B. K., Benoy, S. M., Bora, M., Tamuly, J., Pandey, M., & Bhattacharya, D. (2020). A brief review on supercapacitor energy storage devices and utilization of natural carbon resources as their electrode materials. In *Fuel* (Vol. 282). Elsevier Ltd. <https://doi.org/10.1016/j.fuel.2020.118796>
- Salama, R. S., Gouda, M. S., Aboud, M. F. A., Alshorifi, F. T., El-Hallag, A. A., & Badawi, A. K. (2024). Synthesis and characterization of magnesium ferrite-activated carbon composites derived from orange peels for enhanced supercapacitor performance. *Scientific Reports*, 14(1). <https://doi.org/10.1038/s41598-024-54942-9>
- Salih, S. J., & Mahmood, W. M. (2023). Review on magnetic spinel ferrite (MFe₂O₄) nanoparticles: From synthesis to application. In *Heliyon* (Vol. 9, Issue 6). Elsevier Ltd. <https://doi.org/10.1016/j.heliyon.2023.e16601>
- Sarkar, S., Arya, A., Gaur, U. K., & Gaur, A. (2020). Investigations on porous carbon derived from sugarcane bagasse as an electrode material for supercapacitors. *Biomass and Bioenergy*, 142. <https://doi.org/10.1016/j.biombioe.2020.105730>
- Sharma, R., Thakur, P., Sharma, P., & Sharma, V. (2017). Ferrimagnetic Ni₂+doped Mg-Zn spinel ferrite nanoparticles for high density information storage. *Journal of Alloys and Compounds*, 704, 7–17. <https://doi.org/10.1016/j.jallcom.2017.02.021>
- Shukla, A., Sudhir, D., & Kumar, Y. (2017). A Comparative study of Sugarcane Bagasse gasification and Direct Combustion. In *International Journal of Applied Engineering Research* (Vol. 12). <http://www.ripublication.com>

- Song, M., Zhou, Y., Ren, X., Wan, J., Du, Y., Wu, G., & Ma, F. (2019). Biowaste-based porous carbon for supercapacitor: The influence of preparation processes on structure and performance. *Journal of Colloid and Interface Science*, 535, 276–286. <https://doi.org/10.1016/j.jcis.2018.09.055>
- Sun, L., Shao, R., Tang, L., & Chen, Z. (2013). Synthesis of ZnFe₂O₄/ZnO nanocomposites immobilized on graphene with enhanced photocatalytic activity under solar light irradiation. *Journal of Alloys and Compounds*, 564(February 2018), 55–62. <https://doi.org/10.1016/j.jallcom.2013.02.147>
- Surendra, B. S., Nagaswarupa, H. P., Hemashree, M. U., & Khanum, J. (2020). Jatrophia extract mediated synthesis of ZnFe₂O₄ nanopowder: Excellent performance as an electrochemical sensor, UV photocatalyst and an antibacterial activity. *Chemical Physics Letters*, 739. <https://doi.org/10.1016/j.cplett.2019.136980>
- Surya, K., & Michael, M. S. (2020). Novel interconnected hierarchical porous carbon electrodes derived from bio-waste of corn husk for supercapacitor applications. *Journal of Electroanalytical Chemistry*, 878. <https://doi.org/10.1016/j.jelechem.2020.114674>
- Suvaci, E., & Özel, E. (2021). Hydrothermal Synthesis. In *Encyclopedia of Materials: Technical Ceramics and Glasses: Volume 1-3* (Vol. 1, pp. V1-59-V1-68). Elsevier. <https://doi.org/10.1016/B978-0-12-803581-8.12096-X>
- Taer, E., Iwantono, Manik, S. T., Taslim, R., Dahlan, D., & Deraman, M. (2014). Preparation of activated carbon monolith electrodes from sugarcane bagasse by physical and physical-chemical activation process for supercapacitor application. *Advanced Materials Research*, 896, 179–182. <https://doi.org/10.4028/www.scientific.net/AMR.896.179>
- Tamilarasi, K., Aji Udhaya, P., & Meena, M. (2022). Enhancement on the electrical and optical behaviour of ZnFe₂O₄ nano particles via transition metal substitution. *Materials Today: Proceedings*, 64, 1671–1678. <https://doi.org/10.1016/j.matpr.2022.05.351>
- Vadiyar, M. M., Bhise, S. C., Kolekar, S. S., Chang, J. Y., Ghule, K. S., & Ghule, A. V. (2016). Low cost flexible 3-D aligned and cross-linked efficient ZnFe₂O₄ nano-flakes electrode on stainless steel mesh for asymmetric supercapacitors. *Journal of Materials Chemistry A*, 4(9), 3504–3512. <https://doi.org/10.1039/c5ta09022a>
- Wahyuni, S., & AriefiV, S. (2019). Green synthesis of Ag/TiO₂ Nanocomposite Assisted by Gambier Leaf (*Uncaria gambir* Roxb) Extract. *Jurnal Kimia Sains Dan Aplikasi*, 22(6), 250–255. <https://doi.org/10.14710/jksa.22.6>
- Wang, X., Cao, L., Lewis, R., Hreid, T., Zhang, Z., & Wang, H. (2020). Biorefining of sugarcane bagasse to fermentable sugars and surface oxygen group-rich

- hierarchical porous carbon for supercapacitors. *Renewable Energy*, 162, 2306–2317. <https://doi.org/10.1016/j.renene.2020.09.118>
- Wang, Y., Gan, T., Xiu, J., Liu, G., & Zou, H. (2022). Degradation of sulfadiazine in aqueous media by peroxymonosulfate activated with biochar-supported ZnFe₂O₄ in combination with visible light in an internal loop-lift reactor. *RSC Advances*, 12(37), 24088–24100. <https://doi.org/10.1039/d2ra04573g>
- Xie, B., Qin, J., Wang, S., Li, X., Sun, H., & Chen, W. (2020). Adsorption of Phenol on Commercial Activated Carbons: Modelling and Interpretation. *International Journal of Environmental Research and Public Health*, 17(3). <https://doi.org/10.3390/ijerph17030789>
- Yakout, S. M. (2020). Spintronics: Future Technology for New Data Storage and Communication Devices. In *Journal of Superconductivity and Novel Magnetism* (Vol. 33, Issue 9, pp. 2557–2580). Springer. <https://doi.org/10.1007/s10948-020-05545-8>
- Yang, H., Yang, X., Lin, J., Yang, F., He, Y., & Lin, Q. (2023). Effect of Cd²⁺ Substitution on Structural–Magnetic and Dielectric Properties of Ni–Cu–Zn Spinel Ferrite Nanomaterials by Sol–Gel. *Molecules*, 28(16). <https://doi.org/10.3390/molecules28166110>
- Yang, J., Zhang, Z., Wang, J., Zhao, X., Zhao, Y., Qian, J., & Wang, T. (2023). Pyrolysis and hydrothermal carbonization of biowaste: A comparative review on the conversion pathways and potential applications of char product. In *Sustainable Chemistry and Pharmacy* (Vol. 33). Elsevier B.V. <https://doi.org/10.1016/j.scp.2023.101106>
- Yang, S., Ai, J., Han, Z., Zhang, L., Zhao, D., Wang, J., Yang, C., & Cao, B. (2020). Electrospun ZnFe₂O₄/carbon nanofibers as high-rate supercapacitor electrodes. *Journal of Power Sources*, 469. <https://doi.org/10.1016/j.jpowsour.2020.228416>
- Yang, S., Han, Z., Zheng, F., Sun, J., Qiao, Z., Yang, X., Li, L., Li, C., Song, X., & Cao, B. (2018a). ZnFe₂O₄ nanoparticles-cotton derived hierarchical porous active carbon fibers for high rate-capability supercapacitor electrodes. *Carbon*, 134, 15–21. <https://doi.org/10.1016/j.carbon.2018.03.071>
- Yang, S., Han, Z., Zheng, F., Sun, J., Qiao, Z., Yang, X., Li, L., Li, C., Song, X., & Cao, B. (2018b). ZnFe₂O₄ nanoparticles-cotton derived hierarchical porous active carbon fibers for high rate-capability supercapacitor electrodes. *Carbon*, 134, 15–21. <https://doi.org/10.1016/j.carbon.2018.03.071>
- Yerdauletov, M. S., Nazarov, K., Mukhametuly, B., Yeleuov, M. A., Daulbayev, C., Abdulkarimova, R., Yskakov, A., Napolskiy, F., & Krivchenko, V. (2023). Characterization of Activated Carbon from Rice Husk for Enhanced Energy Storage Devices. *Molecules*, 28(15). <https://doi.org/10.3390/molecules28155818>

- Yibowei, M. E., Adekoya, J. G., Adediran, A. A., & Adekomaya, O. (2021). Carbon-based nano-filler in polymeric composites for supercapacitor electrode materials: a review. In *Environmental Science and Pollution Research* (Vol. 28, Issue 21, pp. 26269–26279). Springer Science and Business Media Deutschland GmbH. <https://doi.org/10.1007/s11356-021-13589-z>
- Yu, P., Liang, Y., Dong, H., Hu, H., Liu, S., Peng, L., Zheng, M., Xiao, Y., & Liu, Y. (2018). Rational Synthesis of Highly Porous Carbon from Waste Bagasse for Advanced Supercapacitor Application. *ACS Sustainable Chemistry and Engineering*, 6(11), 15325–15332. <https://doi.org/10.1021/acssuschemeng.8b03763>
- Yuli, Y., Eka, S., Rakiman, & Yazmendra, R. (2021). Biomass Waste of Cocoa Skin for Basic Activated Carbon as Source of Eco-Friendly Energy Storage. *Journal of Physics: Conference Series*, 1788(1). <https://doi.org/10.1088/1742-6596/1788/1/012020>
- Yunarto, N., Sulistyaningrum, N., Kurniatri, A. A., & Elya, B. (2021). Gambir (*Uncaria gambir* Roxb.) as A Potential Alternative Treatment for Hyperlipidemia. *Media Penelitian Dan Pengembangan Kesehatan*, 31(3), 183–192. <https://doi.org/10.22435/mpk.v31i3.4472>
- Yunita, Y., Nurlina, N., & Syahbanu, I. (2020). Sintesis Nanopartikel Zink Oksida (ZnO) dengan Penambahan Ekstrak Klorofil sebagai Capping Agent. *Positron*, 10(2), 44. <https://doi.org/10.26418/positron.v10i2.42136>
- Zain Ul Abidin, M., Ikram, M., Moeen, S., Nazir, G., Kanoun, M. B., & Goumri-Said, S. (2024). A comprehensive review on the synthesis of ferrite nanomaterials via bottom-up and top-down approaches advantages, disadvantages, characterizations and computational insights. *Coordination Chemistry Reviews*, 520, 216158. <https://doi.org/10.1016/j.ccr.2024.216158>
- Zapukhlyak, R., Hodlevsky, M., Boychuk, V., Mazurenko, J., Kotsyubynsky, V., Turovska, L., Rachiy, B., & Fedorchenko, S. (2023). Structure and magnetic properties of hydrothermally synthesized CuFe₂O₄ and CuFe₂O₄/rGO composites. *Journal of Magnetism and Magnetic Materials*, 587. <https://doi.org/10.1016/j.jmmm.2023.171208>
- Zawar, S., Atiq, S., Tabasum, M., Riaz, S., & Naseem, S. (2019). Highly stable dielectric frequency response of chemically synthesized Mn-substituted ZnFe₂O₄. *Journal of Saudi Chemical Society*, 23(4), 417–426. <https://doi.org/10.1016/j.jscs.2018.06.010>
- Zhang, X., Zhang, Z., Sun, S., Wu, Y., Sun, Q., & Liu, X. (2018). A facile one-step hydrothermal approach to synthesize hierarchical core-shell NiFe₂O₄@NiFe₂O₄ nanosheet arrays on Ni foam with large specific

capacitance for supercapacitors. *RSC Advances*, 8(27), 15222–15228. <https://doi.org/10.1039/c8ra02559b>

Zhi, M., Xiang, C., Li, J., Li, M., & Wu, N. (2013). Nanostructured carbon-metal oxide composite electrodes for supercapacitors: A review. *Nanoscale*, 5(1), 72–88. <https://doi.org/10.1039/c2nr32040a>

