

DAFTAR PUSTAKA

- Abdel, S. Z. T., El-Akad, R. H., Elshamy, A. I., El Gendy, A. E. N. G., Wessjohann, L. A., dan Farag, M. A. 2022. Dissection of Moringa Oleifera Leaf Metabolome in Context of Its Different Extracts, Origin and in Relationship to Its Biological Effects as Analysed Using Molecular Networking and Chemometrics. *Food Chemistry*, 399, 1-15.
- Abdullah, M., dan Associate Professor. 2008. Sintesis dan Fungsionalisasi Nanomaterial. *Pengantar Nanosains*. 1-25.
- Agarwal, H., Kumar, S. V., dan Rajeshkumar, S. 2017. Review Article A Review on Green Synthesis of Zinc Oxide Nanoparticles An Eco-Friendly Approach. *Resource-Efficient Technologies*, 3(4), 406–413.
- Agrawal, P., S, R. G., Jain, A. A., dan Kumar Gupta, P. 2018. Green Synthesis and Characterization of Multifunctional Zinc Oxide Nanomaterials using Extract of Moringa Oleifera Seed. *Materials Today: Proceedings*. 5, 20996-21002.
- Akhtar, M. J., Nadeem, M., Javaid, S., dan Atif, M. 2009. *Cation Distribution in Nanocrystalline ZnFe₂O₄ Investigated Using X-Ray Absorption Fine Structure Spectroscopy*. 21(40), 1-9.
- Anggraita, P. 2006. Penelitian Bahan Nano (Nanomaterial) Di Badan Tenaga Nuklir Nasional. *Jurnal Sains Materi Indonesia Indonesian Journal of Materials Science Edisi Khusus Oktober*. 20(2), 6–8.
- Ajmal, M. 2008. Fabrication and Physical Characterization of Ni_{1-x}Zn_xFe₂O₄ and Cu_{1-x}Zn_xFe₂O₄ Ferrites. *Disertasi*. Departemen Fisika. Universitas Quaid-i-Azam. Islamabad, Pakistan.
- Callister, W. D. 2007. *Materials science and engineering: an introduction*. John Wiley & Sons.
- Carta, D., Loche, D., Mountjoy, G., Navarra, G., dan Corrias, A. 2008. *NiFe₂O₄ Nanoparticles Dispersed in an Aerogel Silica Matrix: An X-ray Absorption Study*. 112(40), 15623–15630.

- Cheng, F., Su, C., Yang, Y., dan Yeh, C. 2005. *Characterization of aqueous dispersions of Fe₃O₄ nanoparticles and their biomedical applications*. 26, 729–738.
- Coey, J. M. 2010. *Magnetism and magnetic materials*. Cambridge University Press.
- Cullity, B. D., dan Graham, C. D. 2009. *Introduction to Magnetic Materials Second Edition*. John Wiley & Sons. New Jersey.
- Cullity, B. D, dan Graham, C. D. 2011. *Introduction to Magnetic Materials*. John Wiley & Sons.
- Cullity, B. D., & Stock, S. R. 2014. *Elements of X-ray Diffraction*. Pearson Education.
- da Silva, F. G., Depeyrot, J., Campos, A. F. C., Aquino, R., Fiorani, D., dan Peddis, D. 2019. *Structural and Magnetic Properties of Spinel*. Journal of Nanoscience and Nanotechnology. 19, 4888–4902.
- Deepak, P., Amutha, V., Kamaraj, C., Balasubramani, G., Aiswarya, D., dan Perumal, P. 2019. Chemical and Green Synthesis of Nanoparticles and Their Efficacy on Cancer Cells. *Green Synthesis, Characterization and Application of Nanoparticles*. Elsevier Inc. 15, 369-387.
- Deng, Y., Wang, C., Hu, J., Yang, W., dan Fu, S. 2005. *Investigation of Formation of Silica-Coated Magnetite Nanoparticles Via Sol – Gel Approach*. 262, 87– 93.
- Ealias, A. M., dan Saravanakumar, M. P. 2017. A Review on The Classification, Characterisation, Synthesis of Nanoparticles and Their Application. *IOP Conference Series: Materials Science and Engineering*. 263(3), 1-15.
- Elmaria, F. A. 2019. Modifikasi dan Karakteristik Magnetik Silika Nanopartikel (MSNP/ SiO₄²⁻) Berbasis Silika Alam sebagai Katalis Pembentuk Metil Ester. *Skripsi*. Fakultas Sains dan Teknologi. Universitas Islam Negeri Syarif Hidayatullah. Jakarta.s
- Eltabey, M. M., Agami, W. R., dan Mohsen, H. T. 2014. Improvement Of The Magnetic Properties for Mn-Ni-Zn Ferrites by Rare Earth Nd³⁺ Ion Substitution. *Journal of Advanced Research*, 5(5). 601–605.

- El-Okr, M. M., Salem, M. A., Salim, M. S., El-Okr, R. M., Ashoush, M., dan Talaat, H. M. 2011. Synthesis of Cobalt Ferrite Nano-Particles and Their Magnetic Characterization. *Journal of Magnetism and Magnetic Materials*. 323(7), 920–926.
- Epp, J. 2016. X-Ray Diffraction (XRD) Techniques for Materials Characterization. *Materials Characterization Using Nondestructive Evaluation (NDE) Methods*. Elsevier Ltd.
- Gawande, M. B., Monga, Y., Zboril, R., dan Sharma, R. K. 2015. Silica-Decorated Magnetic Nanocomposites for Catalytic Applications. *Coordination Chemistry Reviews*. 288, 118–143.
- Girginova, P. I., Daniel-da-silva, A. L., Lopes, C. B., Figueira, P., Otero, M., Amaral, V. S., Pereira, E., dan Trindade, T. 2010. Silica Coated Magnetite Particles for Magnetic Removal of Hg²⁺ from Water. *Journal of Colloid AndInterface Science*. 345(2), 234–240.
- Gore, S.K., dan Jadhav, S. S. 2020. Basics of Ferrites. *In Micro and Nano Technologies*. 1-11.
- Goutam, S. P., Saxena, G., Singh, V., Yadav, A. K., Bharagava, R. N., dan Thapa, K. B. 2017. Green Synthesis Of TiO₂ Nanoparticles Using Leaf Extracts of Jatropha Curcas L. for Photocatalytic Degradation of Tannery Wastewater. *Chemical Engineering Journal*. 1-35.
- Halliday, D., dan Resnick, R. 1989. *Fundamentals of Physics*. 9th ed. John Wiley & Sons, Inc. United States of America.
- Hong, R., Li, J., Zhang, S., Li, H., dan Zheng, Y. 2009. *Applied Surface Science Preparation and Characterization of Silica-Coated Fe₃O₄ Nanoparticles Used as Precursor of Ferrofluids*. 255, 3485–3492.
- Hwang, J. A., Choi, M., Shin, H. S., Ju, B. K., dan Chun, M. P. 2020. Structural and Magnetic Properties of NiZn Ferrite Nanoparticles Synthesized by A Thermal Decomposition Method. *Applied Sciences (Switzerland)*. 10(18), 1- 11.
- Ionescu, A., Llandro, J., dan Ziebeck, K. R. A. 2019. *Magnetism, Magnetic Materials, and Nanoparticles*. Cambridge University Press. 1-51.

- Iravani. 2011. *Green Chemistry Green Synthesis of Metal Nanoparticles Using Plants*. 13, 2638–2650.
- Istiqomah, N. I. 2020. Fotodegradasi Methylene Blue Menggunakan Fotokatalis Nanopartikel Magnetik ZnNi-Ferrite/Silika. *Tesis*. Fakultas Matematika dan Ilmu Pengetahuan Alam. Universitas Gadjah Mada. Yogyakarta.
- Jadoun, S., Arif, R., Jangid, N. K., dan Meena, R. K. 2021. Green Synthesis of Nanoparticles Using Plant Extracts: A Review. *Environmental Chemistry Letters* 19(1), 355–374.
- Job, A. E., Siqueira, A. F. De, Danna, C. S., Bellucci, F. S., Ernst, L., dan Silva, K. 2014. Utilization of Composites and Nanocomposites Based on Natural Rubber and Ceramic Nanoparticles as Control Agents for *Leishmania braziliensis*, in D. M. Claborn (ed.), *Leishmaniasis - Trends in Epidemiology, Diagnosis and Treatment*. IntechOpen. London.
- Jong. 2009. *Inorganic Chemistry and Catalysis*. University Sorbonnelaan, Netherlands. 3-401.
- Kalam, A., Al-sehemi, A. G., Assiri, M., Du, G., Ahmad, T., Ahmad, I., & Pannipara, M. 2018. Results in Physics Modified Solvothermal Synthesis of Cobalt Ferrite (CoFe₂O₄) Magnetic Nanoparticles Photocatalysts for Degradation of Methylene Blue with H₂O₂ / Visible Light. *Results in Physics*. 8, 1046–1053.
- Kasolo, J. N., Bimenya, G. S., Ojok, L., dan Ochieng, J. 2010. *Phytochemicals and uses of Moringa oleifera leaves in Ugandan rural communities*. 4(9), 753-757.
- Khanna, L. dan Verma, N. K. 2013. Silica/Potassium Ferrite Nanocomposite: Structural, Morphological, Magnetic, Thermal and in Vitro Cytotoxicity Analysis. *Materials Science and Engineering B: Solid-State Materials for Advanced Technology*. 178(18), 1230–1239.
- Khatami, M., Alijani, H. Q., Nejad, M. S., & Varma, R. S. 2018. Core@Shell Nanoparticles: Greener Synthesis Using Natural Plant Products. *Applied Sciences (Switzerland)*, 8(3), 1–17.

- Kong, L.B., Liu, L., Yang, Z., Li, S., Zhang, T., dan Wang, C., 2018. Theory of ferrimagnetism and ferrimagnetic metal oxides. *Magnetic, Ferroelectric, and Multiferroic Metal Oxides*. 287-311.
- Kumar, S., dan Pandey, A. K. 2013. Chemistry and Biological Activities of Flavonoids: An Overview. *The Scientific World Journal Group*. 2013, 353–374.
- Laia, S. 2021. Prosiding Seminar Nasional Fisika Universitas Riau- VI (Snfur-6). Suseptibilitas Magnetik Dan Morfologi Nanopartikel Oksida Besi Dipreparasi Menggunakan Ball Milling Melalui Variasi Bola Milling. *Prosiding SNFUR-6*. 15-19.
- Lee, S., Lee, D., Kim, K., dan Park, M. 2016. Cation Distribution in Ni-Mn-O Spinel System for The Application of IR Sensors. *Procedia Engineering*. 168,1279–1282.
- Lendzion-Bieluń, Z., Wojciechowska, A., Grzechulska-Damszel, J., Narkiewicz, U., Śniadecki, Z., & Idzikowski, B. 2020. Effective Processes of Phenol Degradation on Fe₃O₄–TiO₂ Nanostructured Magnetic Photocatalyst. *Journal of Physics and Chemistry of Solids*, 136, 22–27.
- Li, Y., Church, J. S., Woodhead, A. L., dan Moussa, F. 2010. Spectrochimica ActaPart A: Molecular and Biomolecular Spectroscopy Preparation and Characterization of Silica Coated Iron Oxide Magnetic. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 76(5), 484–489.
- Lin, H., Zhu, H., Tan, J., Wang, H., Wang, Z., Li, P., Zhao, C., dan Liu, J. 2019. Comparative Analysis of Chemical Constituents of Ultra-Performance LiquidChromatography Coupled with Quadrupole-Time-Of-Flight Mass Spectrometry. *Molecules Journal*. 24(942), 1-25.
- Masruroh, Manggara, A., Papilaka, T., dan Triandi, R. T. 2013. Penentuan Ukuran Kristal (*Crystallite Size*) Lapisan Tipis PZT dengan Metode XRD Melalui Pendekatan Persama Debye Scherrer. *Erudio Journal of Educational Innovation*. 1(2), 24–29.
- Mathew, D. S., dan Juang, R. S. 2007. An Overview of The Structure and Magnetism of Spinel Ferrite Nanoparticles and Their Synthesis in

- Microemulsions. *Chemical Engineering Journal*. 129(1–3), 51–65.
- Mody, V. V., Singh, A., dan Wesley, B. 2013. Basics of Magnetic Nanoparticles For Their Application in The Field of Magnetic Fluid Hyperthermia. *European Journal of Nanomedicine*, 5(1), 11–21.
- Mohallem, N. D. S., Silva, J. B., Tacchi Nascimento, G. L., dan Guimarães, V. L. 2012. Study of Multifunctional Nanocomposites Formed by Cobalt Ferrite Dispersed in a Silica Matrix Prepared by Sol-Gel Process. *Nanocomposites - New Trends and Developments*. 18, 457–481.
- Munasir, M., dan Ningseh, N. W. 2017. Sintesis dan Karakterisasi Nanokomposit Fe₃O₄@SiO₂ Core Shell Berbasis Bahan Alam Fabrication of Anti-Corrosion Materials for High-Temperature Media View project The SiO₂ Nano Particles for Energy Material View project. *Jurnal Inovasi Fisika Indonesia*, 06(03), 10–13.
- Nadeem, K., Krenn, H., Sarwar, W., dan Mumtaz, M. 2014. Comparison of Surface Effects In SiO₂ Coated and Uncoated Nickel Ferrite Nanoparticles. *Applied Surface Science*, 288, 677–681.
- Nakashima, S., Fujita, K., Tanaka, K., Hirao, K., Yamamoto, T., dan Tanaka, I. 2007. First-principles XANES Simulations of Spinel Zinc Ferrite With A Disordered Cation Distribution. *Physical Review B*. 75(17), 2–9.
- Nakhjavan, B. 2011. Designer Synthesis of Monodisperse Heterodimer and Ferrite Nanoparticles. *Disertasi*. Departemen Kimia, Farmasi dan Geosains. Universitas Johannes Gutenberg. Main, Jerman.
- Narayanan, K. B., dan Sakthivel, N. 2011. Green Synthesis of Biogenic Metal Nanoparticles by Terrestrial and Aquatic Phototrophic and Heterotrophic Eukaryotes and Biocompatible Agents. *Advances in Colloid and Interface Science*, 169(2), 59–79.
- Ningsih, S. K. W. 2016. *Sintesis Anorganik*. Edisi Satu. UNP Press. Padang.
- Nishio, K., Ikeda, M., Gokon, N., Tsubouchi, S., Narimatsu, H., dan Mochizuki, Y. 2007. Preparation of Size-Controlled (30 – 100 nm) magnetite Nanoparticles for Biomedical Applications. 310, 2408–2410.
- Ovais, M., Khalil, A. T., Ayaz, M., Ahmad, I., Nethi, S. K., dan Mukherjee, S.

2018. Biosynthesis of Metal Nanoparticles via Microbial Enzymes : A Mechanistic Approach. *International Journal of Molecular Sciences*. 19, 1–20.
- Pankhurst, Q. A., Connolly, J., Jones, S. K., dan Dobson, J. 2003. Applications of Magnetic Nanoparticles in Biomedicine. *Journal of Physics D: Applied Physics*, 36(13), 167-181.
- Patidar, V., dan Jain, P. 2017. Green Synthesis of TiO₂ Nanoparticle Using Moringa Oleifera Leaf Extract. *International Research Journal of Engineering and Technology (IRJET)*. 4(3), 470-473.
- Plouffe, B. D. 2014. Fundamentals And Application of Magnetic Particles in Cell Isolation and Enrichment: A review. *IOP Publishing: Reports and Progress in Physics*. 78(1), 1-38.
- Preethi, D. R. A., dan Philominal, A. 2022. Green Synthesis of Pure and Silver Doped Copper Oxide Nanoparticles using Moringa Oleifera Leaf Extract. *Materials Letters: X*. 13, 1-4.
- Puri, R. K., dan Babbar, V. K. 1997. *Solid State Physics*. 3th ed. S, Chand & Company LTD. Ram Nagar, New Delhi, India.
- Raghavan, V. 2011. *Materials Science and Engineering*. 5th ed. Prentice-Hall of India (PHI) Learning Private Limited, New Delhi.
- Redha, A. 2010. Flavonoid: Struktur, Sifat Antioksidatif dan Peranannya Dalam Sistem Biologis. *Jurnal Berlin*. 9(2), 196–202.
- Roy, S. D., Das, K. C., Dhar, S. S. 2021. Conventional to Green Synthesis of Magnetic Iron Oxide Nanoparticles; Its Application as Catalyst, Photocatalyst and Toxicity: A Short Review. *Current Research in Green and Sustainable Chemistry*. 4, 1-12.
- Scepka, T. 2016. Noninvasive Control of Magnetic State in Ferromagnetic Nanodots by Hall Probe Magnetometry. *Dissertation Thesis*. Faculty of Electrical Engineering and Information Technology. Slovak University of Technology, Bratislava.

- Setyawan dan Balgis. 2011. Mesoporous Silicas Prepared from Sodium Silicate Using Gelatin Templating. *Asia-Pacific Journal of Chemical Engineering*. 7(3), 448- 454.
- Setyawan, H., Fajaroh, F., Widiyastuti, W., Winardi, S., Lenggono, I. W., dan Mufti, N. 2012. One-Step Synthesis of Silica-Coated Magnetite Nanoparticles by Electrooxidation of Iron in Sodium Silicate Solution. *Journal of Nanoparticle Research*, 14(4), 1-9.
- Shahid, M., Dumat, C., Khalid, S., Schreck, E., Xiong, T., dan Niazi, N. K. 2016. Foliar Heavy Metal Uptake, Toxicity and Detoxification in Plants: A Comparison of Foliar and Root Metal Uptake. *Journal of Hazardous Materials*. 325, 36-58.
- Shahraki, R. R., Ebrahimi, M., Ebrahimi, S. A. S., dan Masoudpanah, S. M. 2012. Structural Characterization and Magnetic Properties of Superparamagnetic Zinc Ferrite Nanoparticles Synthesized by The Coprecipitation Method. *Journal of Magnetism and Magnetic Materials*, 324(22), 3762–3765.
- Shahri, M. M. 2019. Magnetic Materials and Magnetic Nanocomposites for Biomedical Application. *Contemporary Synthesis, Application and Theory Micro and Nano Technologies*. 77-95.
- Shima, M., Oguri, K., Ohya, Y., Gomi, M., Ikuhara, Y. H., Sasaki, Y., Hishikawa, Y., dan Kawabe, K. 2013. Synthesis and Magnetic Behavior of Nickel Zinc Ferrite Nanoparticles Coated onto Carbon Microcoils. *IEEE Transactions on Magnetics*, 49(8), 4824–4826.
- Shi, L., Wang, X., Hu, Y., & He, Y. 2020. Investigation Of Photocatalytic Activity Through Photo-Thermal Heating Enabled by Fe₃O₄/TiO₂ Composite Under Magnetic Field. *Solar Energy*, 196, 505–512.
- Singh, J., Dutta, T., Kim, K. H., Rawat, M., Samddar, P., dan Kumar, P. 2018. Green Synthesis of Metals and Their Oxide Nanoparticles : Applications for Environmental Remediation. *Journal of Nanobiotechnology*, 1–24.
- Spaldin, N. A. 2010. *Magnetic Materials Fundamentals and Applications* (2nd ed.). Cambridge University Press.

- Sulanjari, Santi, W. N., Artanti, A. A., Suharyadi, E., Kato, T., dan Iwata, S. 2014. Kajian Sifat Kemagnetan Pada Nanopartikel Cobalt Ferrite (CoFe₂O₄) yang Dicoating dengan Polyethylene Glykol (PEG-4000) dan Silika. *Jurnal Fisika Indonesia*. 18(54), 103–107.
- Sulfikar, Masakke, Y., & Rasyid, M. 2015. Biosintesis Partikel-nano Perak Menggunakan Ekstrak Metanol Daun Manggis (*Garcinia mangostana L.*). *Jurnal Sainsmat*, IV(1), 28–41.
- Susanti, Ramadhani, F., Soraya, M., dan Afriani, F. 2021. Potensi Green-Synthesis Nanopartikel Perak Berbasis Bahan Floral di Indonesia: Sebuah Review. *Seminar Nasional Penelitian dan Pengabdian pada Masyarakat*. 174-176.
- Tatarchuk, T., Bououdina, M., Judith Vijaya, J., dan John Kennedy, L. 2017. Spinel Ferrite Nanoparticles: Synthesis, Crystal Structure, Properties, And Perspective Applications. *Springer Proceedings in Physics*, 195, 305–325.
- Tawainella, R. D., Riana, Y., Fatayati, R., Ammeliya, Kato, T., Iwata, S. dan Suharyadi, E. 2014. Sintesis dan Karakterisasi Sifat Kemagnetan Nanopartikel Manganese Ferrite (MnFe₂O₄) dengan Metode Kopresipitasi. *Jurnal Fisika Indonesia*. 18(52), 1-7.
- Tebriani. 2019. Analisis Vibrating Sample Magnetometer (VSM) Pada Hasil Elektrodeposisi Lapisan Tipis Magnetite Menggunakan Arus continue Direct Current. *Natural Science Journal*. 5(1), 722–730.
- Telford, W. M., Geldart, L. P., dan Sheriff, R. E. 1990. *Applied Geophysics*. 2nd ed. Cambridge University Press. New York.
- Umut, E. 2013. Surface Modification of Nanoparticles Used in Biomedical Applications In (Ed.). *Modern Surface Engineering Treatments*. IntechOpen. 185-207.
- Valenzuela, R. 2012. Novel Applications of Ferrites. *Physics Research International*. 2012, 1-9.
- Vestal, C. R., dan Zhang, Z. J. 2004. Magnetic Spinel Ferrite Nanoparticles from Microemulsions. 1(1999), 240–263.

- Wahajuddin dan Arora. 2012. Superparamagnetic Iron Oxide Nanoparticles: Magnetic Nanoplatforms as Drug Carriers. *International Journal of Nanomedicine*. 7, 3445–3471.
- Wangness, R. K. 1986. Electromagnetic Fields. 2nd ed. Wiley-VCH, Weinheim.
- Willard, M. A., Kurihara, L. K., Carpenter, E. E., Calvin, S., dan Harris, V. G. 2004. Chemically Prepared Magnetic Nanoparticles. *International Materials Reviews*, 49(3–4), 125–170.
- Wu, A., Ou, P., dan Zeng, L. 2010. Biomedical Applications of Magnetic Nanoparticles. *NANO: Brief Reports and Reviews*. 5(5), 245–270.
- Yang, B. H., Zhuang, Y., Hu, H., Du, X., Zhang, C., Shi, X., Wu, H., dan Yang, S. 2010. Silica-Coated Manganese Oxide Nanoparticles as a Platform for Targeted Magnetic Resonance and Fluorescence Imaging of Cancer Cells. *Advanced Functional Materials Journal*. 20(11), 1733–1741.
- Yusof, K. N., Alias, S. S., Harun, Z., Basri, H., & Azhar, F. H. 2018. Parkia speciosa as Reduction Agent in Green Synthesis Silver Nanoparticles. *ChemistrySelect*. 3(31), 8881–8885.
- Zhu, Y. dan Inada, H. 2012. *Encyclopedia of Nanotechnology*. 2273-2652.
- Zulaicha, A. S., Saputra, I. S., Sari, I. P., Ghifari, M. A., Yulizar, Y., Permana, Y. N. dan Sudirman. 2021. Green Synthesis Nanopartikel Perak (AgNPs) Menggunakan Bioreduktor Alami Ekstrak Daun Ilalang (*Imperata cylindrica* L.). *Rafflesia Journal of Natural and Applied Sciences*. 1(1), 11-19.