

## DAFTAR PUSTAKA

- Abu-Salah, K. M., Alrokyan, S. A., Khan, M. N., & Ansari, A. A. (2010). Nanomaterials as analytical tools for genosensors. *Sensors*, 10(1), 963–993. <https://doi.org/10.3390/s100100963>
- Adeyeye, A. O., & Shimon, G. (2015). Growth and Characterization of Magnetic Thin Film and Nanostructures. In *Handbook of Surface Science* (1st ed., Vol. 5). Elsevier B.V. <https://doi.org/10.1016/B978-0-444-62634-9.00001-1>
- Ahmad, A., Mukherjee, P., Senapati, S., Mandal, D., Khan, M. I., Kumar, R., & Sastry, M. (2003). Extracellular biosynthesis of silver nanoparticles using the fungus *Fusarium oxysporum*. *Colloids and Surfaces B: Biointerfaces*, 28(4), 313–318. [https://doi.org/10.1016/S0927-7765\(02\)00174-1](https://doi.org/10.1016/S0927-7765(02)00174-1)
- Akhtar, M. S., Panwar, J., & Yun, Y. S. (2013). Biogenic synthesis of metallic nanoparticles by plant extracts. *ACS Sustainable Chemistry and Engineering*, 1(6), 591–602. <https://doi.org/10.1021/sc300118u>
- Altaf, S., Zafar, R., Zaman, W. Q., Ahmad, S., Yaqoob, K., Syed, A., Khan, A. J., Bilal, M., & Arshad, M. (2021). Removal of levofloxacin from aqueous solution by green synthesized magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles using *Moringa olifera*: Kinetics and reaction mechanism analysis. *Ecotoxicology and Environmental Safety*, 226. <https://doi.org/10.1016/j.ecoenv.2021.112826>
- Amirjani, A., Firouzi, F., & Haghshenas, D. F. (2020). Predicting the Size of Silver Nanoparticles from Their Optical Properties. *Plasmonics*, 15(4), 1077–1082. <https://doi.org/10.1007/s11468-020-01121-x>
- Ananthi, S., Kavitha, M., Kumar, E. R., Balamurugan, A., Al-Douri, Y., Alzahrani, H. K., Keshk, A. A., Habeebullah, T. M., Abdel-Hafez, S. H., & El-Metwaly, N. M. (2022). Natural tannic acid (green tea) mediated synthesis of ethanol sensor based Fe<sub>3</sub>O<sub>4</sub> nanoparticles: Investigation of structural, morphological, optical

properties and colloidal stability for gas sensor application. *Sensors and Actuators B: Chemical*, 352(P2), 131071. <https://doi.org/10.1016/j.snb.2021.131071>

Antarnusa, G., Jayanti, P. D., Denny, Y. R., & Suherman, A. (2022). Utilization of co-precipitation method on synthesis of Fe<sub>3</sub>O<sub>4</sub>/PEG with different concentrations of PEG for biosensor applications. *Materialia*, 25(July), 101525. <https://doi.org/10.1016/j.mtla.2022.101525>

Ardiyanti, H., Aji, N., & Imani, N. (2023). Journal of Science : Advanced Materials and Devices New design of a commercial chip-based GMR sensor with magnetite nanoparticles for biosensing applications. *Journal of Science: Advanced Materials and Devices*, 8(2), 100556. <https://doi.org/10.1016/j.jsamd.2023.100556>

Bahadur, A., Saeed, A., Shoaib, M., Iqbal, S., Bashir, M. I., Waqas, M., Hussain, M. N., & Abbas, N. (2017). Eco-friendly synthesis of magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles with tunable size: Dielectric, magnetic, thermal and optical studies. *Materials Chemistry and Physics*, 198, 229–235. <https://doi.org/10.1016/j.matchemphys.2017.05.061>

Baibich, M. N., Broto, J. M., Fert, A., Van Dau, F. N., Petroff, F., Eitenne, P., Creuzet, G., Friederich, A., & Chazelas, J. (1988). Giant magnetoresistance of (001)Fe/(001)Cr magnetic superlattices. *Physical Review Letters*, 61(21), 2472–2475. <https://doi.org/10.1103/PhysRevLett.61.2472>

Barnaś, J., & Dugaev, V. K. (2015). Giant Magnetoresistance and Applications. In *Handbook of Surface Science* (Vol. 5). <https://doi.org/10.1016/B978-0-444-62634-9.00009-6>

Baselt, D. R., Lee, G. U., Natesan, M., Metzger, S. W., Sheehan, P. E., & Colton, R. J. (1998). A biosensor based on magnetoresistance technology. This paper was awarded the Biosensors & Bioelectronics Award for the most original

contribution to the Congress.1. *Biosensors and Bioelectronics*, 13(7–8), 731–739.  
<http://linkinghub.elsevier.com/retrieve/pii/S0956566398000372>

Bindhu, M. R., Umadevi, M., Esmail, G. A., Al-Dhabi, N. A., & Arasu, M. V. (2020). Green synthesis and characterization of silver nanoparticles from *Moringa oleifera* flower and assessment of antimicrobial and sensing properties. *Journal of Photochemistry and Photobiology B: Biology*, 205(January), 111836. <https://doi.org/10.1016/j.jphotobiol.2020.111836>

Bose, C. K. (2007). Possible role of *Moringa oleifera* Lam. Root in epithelial ovarian cancer. *MedGenMed Medscape General Medicine*, 9(1).

Callister Jr, W. D., & Rethwisch, D. G. (2018). Characteristics, Application, and Processing of Polymers. In *Materials Science and Engineering - An Introduction*.

Carneiro, P., Morais, S., & Pereira, M. do C. (2023). Biosensors for  $\alpha$ -synuclein detection: Towards an improved diagnosis of Parkinson's disease. *TrAC Trends in Analytical Chemistry*, 166, 117150. <https://doi.org/10.1016/j.trac.2023.117150>

Castro, H. F., Correia, V., Pereira, N., Costab, P., Oliveiraa, J., & Lanceros-Méndez, S. (2018). Printed Wheatstone bridge with embedded polymer based piezoresistive sensors for strain sensing applications. *Additive Manufacturing*, 20(December 2017), 119–125. <https://doi.org/10.1016/j.addma.2018.01.004>

Chady, T. (2002). Evaluation of stress loaded steel samples using GMR magnetic field sensor. *IEEE Sensors Journal*, 2(5), 488–493. <https://doi.org/10.1109/JSEN.2002.804574>

Chaki, S. H., Malek, T. J., Chaudhary, M. D., Tailor, J. P., & Deshpande, M. P. (2015). Magnetite Fe<sub>3</sub>O<sub>4</sub> nanoparticles synthesis by wet chemical reduction and their characterization. *Advances in Natural Sciences: Nanoscience and Nanotechnology*, 6(3). <https://doi.org/10.1088/2043-6262/6/3/035009>

- Chin, S. F., Iyer, K. S., & Raston, C. L. (2009). Facile and green approach to fabricate gold and silver coated superparamagnetic nanoparticles. *Crystal Growth and Design*, 9(6), 2685–2689. <https://doi.org/10.1021/cg8013199>
- Chokkareddy, R., & Redhi, G. G. (2018). Green synthesis of metal nanoparticles and its reaction mechanisms. *The Macabresque: Human Violation and Hate in Genocide, Mass Atrocity and Enemy-Making, October*, 113–139. <https://doi.org/10.1002/9781119418900.ch4>
- Cuana, R., Panre, A. M., Istiqomah, N. I., Tumbelaka, R. M., Sunaryono, Wicaksono, S. T., & Suharyadi, E. (2022). Green Synthesis of Fe<sub>3</sub>O<sub>4</sub> /Chitosan Nanoparticles Utilizing Moringa Oleifera Extracts and Their Surface Plasmon Resonance Properties . *ECS Journal of Solid State Science and Technology*, 11(8), 083015. <https://doi.org/10.1149/2162-8777/ac8b36>
- Culshaw, B., & López-Higuera, J. M. (2016). Fundamentals of photonics. In *Optochemical Nanosensors* (Vol. 5). <https://doi.org/10.1080/713823546>
- Darmawan, M. Y., Imani Istiqomah, N., Adrianto, N., Marsel Tumbelaka, R., Dwi Nugraheni, A., & Suharyadi, E. (2023). Green synthesis of Fe<sub>3</sub>O<sub>4</sub>/Ag composite nanoparticles using Moringa oleifera: Exploring microstructure, optical, and magnetic properties for magnetic hyperthermia applications. *Results in Chemistry*, 6(March), 100999. <https://doi.org/10.1016/j.rechem.2023.100999>
- Ennen, I., Kappe, D., Rempel, T., Glenske, C., & Hütten, A. (2016). Giant Magnetoresistance: Basic concepts, microstructure, magnetic interactions and applications. *Sensors (Switzerland)*, 16(6). <https://doi.org/10.3390/s16060904>
- Fan, Y., Smith, K. J., Lüpke, G., Hanbicki, A. T., Goswami, R., Li, C. H., Zhao, H. B., & Jonker, B. T. (2013). Exchange bias of the interface spin system at the Fe/MgO interface. *Nature Nanotechnology*, 8(6), 438–444. <https://doi.org/10.1038/nnano.2013.94>

- Gai, K., Qi, H., Zhu, X., & Wang, M. (2019). Preparation of Ag-Fe<sub>3</sub>O<sub>4</sub> nanoparticles sensor and application in detection of methomyl. *E3S Web of Conferences*, 118, 2–6. <https://doi.org/10.1051/e3sconf/201911801002>
- Garcia, S., Yoga, M., & Aji, N. (2023). Materialia Two spin-valve GMR thin films on half wheatstone bridge circuit for detecting green-synthesized Fe<sub>3</sub>O<sub>4</sub> @ Ag nanoparticles-labeled biomolecule. *Materialia*, 32(August), 101930. <https://doi.org/10.1016/j.mtla.2023.101930>
- Getzlaff, M. (2016). Fundamental Magnetism. In *Angewandte Chemie International Edition*, 6(11), 951–952. (Vol. 3, Issue 1). <https://medium.com/@arifwicaksanaa/pengertian-use-case-a7e576e1b6bf>
- Ghaseminezhad, S. M., & Shojaosadati, S. A. (2016). Evaluation of the antibacterial activity of Ag/Fe<sub>3</sub>O<sub>4</sub> nanocomposites synthesized using starch. *Carbohydrate Polymers*, 144, 454–463. <https://doi.org/10.1016/j.carbpol.2016.03.007>
- Gibiino, G. P., Marchesi, M., Cogliati, M., Syeda, S. F., Romani, A., Traverso, P. A., & Crescentini, M. (2023). Experimental evaluation of Hall-effect current sensors in BCD10 technology. *Measurement: Journal of the International Measurement Confederation*, 220(June), 113289. <https://doi.org/10.1016/j.measurement.2023.113289>
- Guan, M., Mu, X., Zhang, H., Zhang, Y., Xu, J., Li, Q., Wang, X., Cao, D., & Li, S. (2019). Spindle-like Fe<sub>3</sub>O<sub>4</sub> nanoparticles for improving sensitivity and repeatability of giant magnetoresistance biosensors. *Journal of Applied Physics*, 126(6). <https://doi.org/10.1063/1.5096345>
- Guo, S., Dong, S., & Wang, E. (2009). A general route to construct diverse multifunctional Fe<sub>3</sub>O<sub>4</sub>metal hybrid nanostructures. *Chemistry - A European Journal*, 15(10), 2416–2424. <https://doi.org/10.1002/chem.200801942>
- Hajalilou, A., Ferreira, L. P., Melo Jorge, M. E., Reis, C. P., & Cruz, M. M. (2021).

- Superparamagnetic Ag-Fe<sub>3</sub>O<sub>4</sub> composites nanoparticles for magnetic fluid hyperthermia. *Journal of Magnetism and Magnetic Materials*, 537(June), 168242. <https://doi.org/10.1016/j.jmmm.2021.168242>
- Hamouda, R. A., Hussein, M. H., Abo-elmagd, R. A., & Bawazir, S. S. (2019). Synthesis and biological characterization of silver nanoparticles derived from the cyanobacterium *Oscillatoria limnetica*. *Scientific Reports*, 9(1), 1–18. <https://doi.org/10.1038/s41598-019-49444-y>
- Hosni, N., Zehani, K., Brazuna, R. P., Moscovici, J., Bessais, L., & Maghraoui-Meherzi, H. (2018). Synthesis of (2D) MNPs nanosheets of nickel ferrite using a low-cost co-precipitation process. *Materials Science and Engineering: B*, 232–235(April), 48–54. <https://doi.org/10.1016/j.mseb.2018.10.012>
- Huang, T., AlSalem, H. S., Binkadem, M. S., Al-Goul, S. T., El-kott, A. F., Alsayegh, A. A., Majdou, G. J., El-Saber Batiha, G., & Karmakar, B. (2022). Green synthesis of Ag/Fe<sub>3</sub>O<sub>4</sub> nanoparticles using Mentha extract: Preparation, characterization and investigation of its anti-human lung cancer application. *Journal of Saudi Chemical Society*, 26(4), 101505. <https://doi.org/10.1016/j.jscs.2022.101505>
- Indrayana, I. P. T., Tuny, M. T., Putra, R. A., Istiqomah, N. I., Juharni, & Suharyadi, E. (2021). Optical Properties of Fe<sub>3</sub>O<sub>4</sub>/Chitosan and Its Applications for Signal Amplifier in Surface Plasmon Resonance Sensor . *Proceedings of the 2nd International Conference on Science, Technology, and Modern Society (ICSTMS 2020)*, 576(Icstms 2020), 424–429. <https://doi.org/10.2991/assehr.k.210909.093>
- Inoue, J. ichiro. (2009). GMR, TMR and BMR. In *Nanomagnetism and Spintronics*. <https://doi.org/10.1016/B978-0-444-53114-8.00002-9>
- Iskandar, D., Suprpto, Y. K., & Purnama, I. K. E. (2017). Determination of priority parameter for classification of poverty using chi-square method and crammer's V correlation. *Proceedings - 2016 International Seminar on Application of*

*Technology for Information and Communication, ISEMANTIC 2016*, 247–252.  
<https://doi.org/10.1109/ISEMANTIC.2016.7873846>

Jain, S., & Mehata, M. S. (2017). Medicinal Plant Leaf Extract and Pure Flavonoid Mediated Green Synthesis of Silver Nanoparticles and their Enhanced Antibacterial Property. *Scientific Reports*, 7(1), 1–14.  
<https://doi.org/10.1038/s41598-017-15724-8>

Jiang, C., Chan, P. H., Leung, C. W., & Pong, P. W. T. (2017). CoFe<sub>2</sub>O<sub>4</sub> Nanoparticle-Integrated Spin-Valve Thin Films Prepared by Interfacial Self-Assembly. *Journal of Physical Chemistry C*, 121(40), 22508–22516.  
<https://doi.org/10.1021/acs.jpcc.7b07242>

Jogschies, L., Klaas, D., Kruppe, R., Rittinger, J., Taptimthong, P., Wienecke, A., Rissing, L., & Wurz, M. C. (2015). Recent developments of magnetoresistive sensors for industrial applications. *Sensors (Switzerland)*, 15(11), 28665–28689.  
<https://doi.org/10.3390/s151128665>

Jordán, D., González-Chávez, D., Laura, D., León Hilario, L. M., Montebanco, E., Gutarra, A., & Avilés-Félix, L. (2018). Detection of magnetic moment in thin films with a home-made vibrating sample magnetometer. *Journal of Magnetism and Magnetic Materials*, 456, 56–61.  
<https://doi.org/10.1016/j.jmmm.2018.01.088>

Karapınar, H. S., & Bilgiç, A. (2022). A new magnetic Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>@TiO<sub>2</sub>-APTMS-CPA adsorbent for simple, fast and effective extraction of aflatoxins from some nuts. *Journal of Food Composition and Analysis*, 105(October 2021), 104261.  
<https://doi.org/10.1016/j.jfca.2021.104261>

Kareem, S. H., Ati, A. A., Shamsuddin, M., & Lee, S. L. (2015). Nanostructural, morphological and magnetic studies of PEG/Mn(1-x)Zn(x)Fe<sub>2</sub>O<sub>4</sub> nanoparticles synthesized by co-precipitation. *Ceramics International*, 41(9), 11702–11709.



<https://doi.org/10.1016/j.ceramint.2015.05.134>

- Katata-Seru, L., Moremedi, T., Aremu, O. S., & Bahadur, I. (2018). Green synthesis of iron nanoparticles using Moringa oleifera extracts and their applications: Removal of nitrate from water and antibacterial activity against Escherichia coli. *Journal of Molecular Liquids*, 256, 296–304. <https://doi.org/10.1016/j.molliq.2017.11.093>
- Kurtan, U., & Baykal, A. (2014). Fabrication and characterization of Fe<sub>3</sub>O<sub>4</sub>@APTES@PAMAM-Ag highly active and recyclable magnetic nanocatalyst: Catalytic reduction of 4-nitrophenol. *Materials Research Bulletin*, 60, 79–87. <https://doi.org/10.1016/j.materresbull.2014.08.016>
- Kwizera, E. A., Chaffin, E., Wang, Y., & Huang, X. (2017). Synthesis and properties of magnetic-optical core-shell nanoparticles. *RSC Advances*, 7(28), 17137–17153. <https://doi.org/10.1039/c7ra01224a>
- Li, G., Sun, S., Wilson, R. J., White, R. L., Pourmand, N., & Wang, S. X. (2006). Spin valve sensors for ultrasensitive detection of superparamagnetic nanoparticles for biological applications. *Sensors and Actuators, A: Physical*, 126(1), 98–106. <https://doi.org/10.1016/j.sna.2005.10.001>
- Liu, Z., Lei, M., Zeng, W., Li, Y., Li, B., Liu, D., & Liu, C. (2023). Synthesis of magnetic Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>-(-NH<sub>2</sub>/-COOH) nanoparticles and their application for the removal of heavy metals from wastewater. *Ceramics International*, 49(12), 20470–20479. <https://doi.org/10.1016/j.ceramint.2023.03.177>
- Luo, J., Zhang, Y., Ou-Yang, J., & Yang, X. (2020). Electric field-controlled anisotropic magnetoresistance effect with four-fold-symmetric magnetic anisotropy. *Ceramics International*, 46(9), 13732–13736. <https://doi.org/10.1016/j.ceramint.2020.02.161>
- Mabarroh, N., Alfansuri, T., Aji Wibowo, N., Imani Istiqomah, N., Marsel Tumbelaka, R., & Suharyadi, E. (2022). Detection of green-synthesized magnetite



- nanoparticles using spin-valve GMR-based sensor and their potential as magnetic labels. *Journal of Magnetism and Magnetic Materials*, 560(June), 169645. <https://doi.org/10.1016/j.jmmm.2022.169645>
- Madubuonu, N., Aisida, S. O., Ali, A., Ahmad, I., Zhao, T. kai, Botha, S., Maaza, M., & Ezema, F. I. (2019). Biosynthesis of iron oxide nanoparticles via a composite of Psidium guavaja-Moringa oleifera and their antibacterial and photocatalytic study. *Journal of Photochemistry and Photobiology B: Biology*, 199(June), 111601. <https://doi.org/10.1016/j.jphotobiol.2019.111601>
- Mahmoudi, M., & Serpooshan, V. (2012). Silver-coated engineered magnetic nanoparticles are promising for the success in the fight against antibacterial resistance threat. *ACS Nano*, 6(3), 2656–2664. <https://doi.org/10.1021/nn300042m>
- Malik, P., Shankar, R., Malik, V., Sharma, N., & Mukherjee, T. K. (2014). Green Chemistry Based Benign Routes for Nanoparticle Synthesis. *Journal of Nanoparticles*, 2014(March), 1–14. <https://doi.org/10.1155/2014/302429>
- Matinise, N., Fuku, X. G., Kaviyarasu, K., Mayedwa, N., & Maaza, M. (2017). ZnO nanoparticles via Moringa oleifera green synthesis: Physical properties & mechanism of formation. *Applied Surface Science*, 406, 339–347. <https://doi.org/10.1016/j.apsusc.2017.01.219>
- Matula, R. A. (1979). Electrical resistivity of copper, gold, palladium, and silver. *Journal of Physical and Chemical Reference Data*, 8(4), 1147–1298. <https://doi.org/10.1063/1.555614>
- Mittal, A. K., Chisti, Y., & Banerjee, U. C. (2013). Synthesis of metallic nanoparticles using plant extracts. *Biotechnology Advances*, 31(2), 346–356. <https://doi.org/10.1016/j.biotechadv.2013.01.003>
- Mohammadpour, A., Karami, N., Zabihi, R., Fazeliyan, E., Abbasi, A., Karimi, S.,

- Barbosa de Farias, M., Adeodato Vieira, M. G., Shahsavani, E., & Mousavi Khaneghah, A. (2023). Green synthesis, characterization, and application of Fe<sub>3</sub>O<sub>4</sub> nanoparticles for methylene blue removal: RSM optimization, kinetic, isothermal studies, and molecular simulation. *Environmental Research*, 225(February), 115507. <https://doi.org/10.1016/j.envres.2023.115507>
- Moodley, J. S., Krishna, S. B. N., Pillay, K., Serphen, & Govender, P. (2018). Green synthesis of silver nanoparticles from Moringa oleifera leaf extracts and its antimicrobial potential. *Advances in Natural Sciences: Nanoscience and Nanotechnology*, 9(1). <https://doi.org/10.1088/2043-6254/aaabb2>
- Morgunov, R. B., Koplak, O. V., Allayarov, R. S., Kunitsyna, E. I., & Mangin, S. (2020). Effect of the stray field of Fe/Fe<sub>3</sub>O<sub>4</sub> nanoparticles on the surface of the CoFeB thin films. *Applied Surface Science*, 527(May). <https://doi.org/10.1016/j.apsusc.2020.146836>
- Muşuroi, C., Oproiu, M., Volmer, M., & Firastrau, I. (2020). High sensitivity differential giant magnetoresistance (GMR) based sensor for non-contacting DC/AC current measurement. *Sensors (Switzerland)*, 20(1). <https://doi.org/10.3390/s20010323>
- Nguyen, H. H., Lee, S. H., Lee, U. J., Fermin, C. D., & Kim, M. (2019). Immobilized enzymes in biosensor applications. *Materials*, 12(1), 1–34. <https://doi.org/10.3390/ma12010121>
- Nnadozie, E. C., & Ajibade, P. A. (2020). Green synthesis and characterization of magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles using Chromolaena odorata root extract for smart nanocomposite. *Materials Letters*, 263, 127145. <https://doi.org/10.1016/j.matlet.2019.127145>
- NVE Corp, N. (2013). *Application Notes for GMR Sensors*. ?, 78–130.
- Omidfar, K., Ahmadi, A., Syedmoradi, L., Khoshfetrat, S. M., & Larijani, B. (2020).

Point-of-care biosensors in medicine: a brief overview of our achievements in this field based on the conducted research in EMRI (endocrinology and metabolism research Institute of Tehran University of medical sciences) over the past fourteen years. *Journal of Diabetes and Metabolic Disorders*.  
<https://doi.org/10.1007/s40200-020-00668-0>

Park, M. (2020). Surface display technology for biosensor applications: A review. *Sensors (Switzerland)*, 20(10). <https://doi.org/10.3390/s20102775>

Patrizi, B., De Cumis, M. S., Viciani, S., & D'Amato, F. (2019). Dioxin and related compound detection: Perspectives for optical monitoring. *International Journal of Molecular Sciences*, 20(11), 1–19. <https://doi.org/10.3390/ijms20112671>

Petit, S., & Madejova, J. (2013). Fourier Transform Infrared Spectroscopy. In *Developments in Clay Science* (2nd ed., Vol. 5, Issue C). Elsevier Ltd. <https://doi.org/10.1016/B978-0-08-098259-5.00009-3>

Radoń, A., Drygała, A., Hawełek, Ł., & Łukowiec, D. (2017). Structure and optical properties of Fe<sub>3</sub>O<sub>4</sub> nanoparticles synthesized by co-precipitation method with different organic modifiers. *Materials Characterization*, 131(June), 148–156. <https://doi.org/10.1016/j.matchar.2017.06.034>

Rahman, H., Arini, S. F., & Utomo, V. (2020). Tannins Extraction of Tea Leaves by Ultrasonic Method: Comparison with The Conventional Method. *Jurnal Teknologi*, 8(1), 84–95. <https://doi.org/10.31479/jtek.v1i8.62>

Rahmayanti, M. (2020). SINTESIS DAN KARAKTERISASI MAGNETIT (Fe<sub>3</sub>O<sub>4</sub>): STUDI KOMPARASI METODE KONVENSIONAL DAN METODE SONOKIMIA. *Al Ulum: Jurnal Sains Dan Teknologi*, 6(1), 26. <https://doi.org/10.31602/ajst.v6i1.3659>

Ramesh, R., Geerthana, M., Prabhu, S., & Sohila, S. (2017). Synthesis and Characterization of the Superparamagnetic Fe<sub>3</sub>O<sub>4</sub>/Ag Nanocomposites. *Journal*

*of Cluster Science*, 28(3), 963–969. <https://doi.org/10.1007/s10876-016-1093-9>

- Ramesh, A. V., Rama Devi, D., Mohan Botsa, S., & Basavaiah, K. (2018). Facile green synthesis of Fe<sub>3</sub>O<sub>4</sub> nanoparticles using aqueous leaf extract of *Zanthoxylum armatum* DC. for efficient adsorption of methylene blue. *Journal of Asian Ceramic Societies*, 6(2), 145–155. <https://doi.org/10.1080/21870764.2018.1459335>
- Rath, C., Anand, S., Das, R. P., Sahu, K. K., Kulkarni, S. D., Date, S. K., & Mishra, N. C. (2002). Dependence on cation distribution of particle size, lattice parameter, and magnetic properties in nanosize Mn-Zn ferrite. *Journal of Applied Physics*, 91(3), 2211–2215. <https://doi.org/10.1063/1.1432474>
- Reddy, N. V., Li, H., Hou, T., Bethu, M. S., Ren, Z., & Zhang, Z. (2021). Phytosynthesis of silver nanoparticles using *perilla frutescens* leaf extract: Characterization and evaluation of antibacterial, antioxidant, and anticancer activities. *International Journal of Nanomedicine*, 16, 15–29. <https://doi.org/10.2147/IJN.S265003>
- Reig, C., Cubells-Beltrán, M. D., & Muñoz, D. R. (2009). Magnetic field sensors based on Giant Magnetoresistance (GMR) technology: Applications in electrical current sensing. *Sensors*, 9(10), 7919–7942. <https://doi.org/10.3390/s91007919>
- Reig, C., Freitas, S. C. de, & Mukhopadhyay, S. C. (2013). *Giant Magnetoresistance (GMR) Sensors*.
- Romero-Arismendi, N. O., Pérez-Benítez, J. A., Ramírez-Pacheco, E., & Espina-Hernández, J. H. (2020). Design method for a GMR-based eddy current sensor with optimal sensitivity. *Sensors and Actuators, A: Physical*, 314. <https://doi.org/10.1016/j.sna.2020.112348>
- Ruíz-Baltazar, Á. de J. (2020). Green synthesis assisted by sonochemical activation of Fe<sub>3</sub>O<sub>4</sub>-Ag nano-alloys: Structural characterization and studies of sorption of

- cationic dyes. *Inorganic Chemistry Communications*, 120(July), 108148.  
<https://doi.org/10.1016/j.inoche.2020.108148>
- Samal, D., & Anil Kumar, P. S. (2008). Giant magnetoresistance. *Resonance*, 13(4), 343–354. <https://doi.org/10.1007/s12045-008-0015-z>
- Sari, E. K., Tumbelaka, R. M., Ardiyanti, H., Istiqomah, N. I., Chotimah, & Suharyadi, E. (2023). Green synthesis of magnetically separable and reusable Fe<sub>3</sub>O<sub>4</sub>/Cdots nanocomposites photocatalyst utilizing Moringa oleifera extract and watermelon peel for rapid dye degradation. *Carbon Resources Conversion*, 6(4), 274–286. <https://doi.org/10.1016/j.crcon.2023.04.003>
- Shirzadfar, H. (2014). *Design And Evaluation Of A GMR-Biosensor For Magnetic Characterization Of Biological Medium*. January, 149. <https://doi.org/10.13140/RG.2.1.2350.7361>
- Singh, J., Dutta, T., Kim, K. H., Rawat, M., Samddar, P., & Kumar, P. (2018). “Green” synthesis of metals and their oxide nanoparticles: Applications for environmental remediation. *Journal of Nanobiotechnology*, 16(1), 1–24. <https://doi.org/10.1186/s12951-018-0408-4>
- Some, S., Bulut, O., Biswas, K., Kumar, A., Roy, A., Sen, I. K., Mandal, A., Franco, O. L., İnce, İ. A., Neog, K., Das, S., Pradhan, S., Dutta, S., Bhattacharjya, D., Saha, S., Das Mohapatra, P. K., Bhuimali, A., Unni, B. G., Kati, A., ... Ocsoy, I. (2019). Effect of feed supplementation with biosynthesized silver nanoparticles using leaf extract of *Morus indica* L. V1 on *Bombyx mori* L. (Lepidoptera: Bombycidae). *Scientific Reports*, 9(1), 1–14. <https://doi.org/10.1038/s41598-019-50906-6>
- Song, Y., Chen, J., Yang, X., Zhang, D., Zou, Y., Ni, D., Ye, J., Yu, Z., Chen, Q., Jin, S., & Liang, P. (2022). Fabrication of Fe<sub>3</sub>O<sub>4</sub>@Ag magnetic nanoparticles for highly active SERS enhancement and paraquat detection. *Microchemical Journal*,

173(July 2021), 107019. <https://doi.org/10.1016/j.microc.2021.107019>

- Suharyadi, E., Alfansuri, T., Handriani, L. S., Wibowo, N. A., & Sabarman, H. (2021). Detection of Fe<sub>3</sub>O<sub>4</sub>/PEG nanoparticles using one and two spin-valve GMR sensing elements in wheatstone bridge circuit. *Journal of Materials Science: Materials in Electronics*, 32(19), 23958–23967. <https://doi.org/10.1007/s10854-021-06859-6>
- Sun, A. C. (2018). Synthesis of magnetic carbon nanodots for recyclable photocatalytic degradation of organic compounds in visible light. *Advanced Powder Technology*, 29(3), 719–725. <https://doi.org/10.1016/j.appt.2017.12.013>
- Taimoory, S. M., Trant, J. F., Rahdar, A., Aliahmad, M., Sadeghfar, F., & Hashemzaei, M. (2017). Importance of the inter-electrode distance for the electrochemical synthesis of magnetite nanoparticles: Synthesis, characterization, computational modelling, and cytotoxicity. *E-Journal of Surface Science and Nanotechnology*, 15(March), 31–39. <https://doi.org/10.1380/ejssnt.2017.31>
- Talabani, R. F., Hamad, S. M., Barzinjy, A. A., & Demir, U. (2021). Biosynthesis of silver nanoparticles and their applications in harvesting sunlight for solar thermal generation. *Nanomaterials*, 11(9). <https://doi.org/10.3390/nano11092421>
- Tan, X., Huang, D., Zhao, M., Cheng, Q., Ren, Y., Chen, Y., Yi, M., Ding, Q., Zuo, X., Wang, Y., Song, Y., Lu, Q., Han, G., & Li, H. (2023). Research about passivation layer of SiO<sub>2</sub> in GMR sensors for magnetic bead detection. *Journal of Magnetism and Magnetic Materials*, 585(June), 170912. <https://doi.org/10.1016/j.jmmm.2023.170912>
- Thompson, M. (2004). amc technical brief: The amazing Horwitz function. *Royal Society of Chemistry*, 17.
- Tung, L. M., Cong, N. X., Huy, L. T., Lan, N. T., Phan, V. N., Hoa, N. Q., Vinh, L. K., Thinh, N. V., Tai, L. T., Ngo, D. T., Mølhave, K., Huy, T. Q., & Le, A. T. (2016).

- Synthesis, characterizations of superparamagnetic Fe<sub>3</sub>O<sub>4</sub>-Ag hybrid nanoparticles and their application for highly effective bacteria inactivation. *Journal of Nanoscience and Nanotechnology*, 16(6), 5902–5912. <https://doi.org/10.1166/jnn.2016.11029>
- Vettolierea, A., Granata, C., & Russo, M. (2012). An ultra high sensitive current sensor based on superconducting quantum interference device. *Physics Procedia*, 36, 25–28. <https://doi.org/10.1016/j.phpro.2012.06.034>
- Vongsak, B., Sithisarn, P., Mangmool, S., Thongpraditchote, S., Wongkrajang, Y., & Gritsanapan, W. (2013). Maximizing total phenolics, total flavonoids contents and antioxidant activity of Moringa oleifera leaf extract by the appropriate extraction method. *Industrial Crops and Products*, 44, 566–571. <https://doi.org/10.1016/j.indcrop.2012.09.021>
- Wahyuni, S., & Riswan, M. (2023). table 6Localized Surface Plasmon Resonance Properties Dependence of Green-Synthesized Fe<sub>3</sub>O<sub>4</sub>/Ag Composite Nanoparticles on Ag Concentration and an Electric Field for Biosensor Application. *Photonics and Nanostructures - Fundamentals and Applications*, 101191. <https://doi.org/10.1016/j.photonics.2023.101191>
- Walker, J., Halliday, D., & Resnick, R. (2014). Fundamentals of Physics Halliday & Resnick 10th Edition. In *Wiley*.
- Wang, G. A., Nakashima, S., Arai, S., Kato, T., & Iwata, S. (2010). High sensitivity giant magnetoresistance magnetic sensor using oscillatory domain wall displacement. *Journal of Applied Physics*, 107(9), 4–7. <https://doi.org/10.1063/1.3360585>
- Wang, J., Yang, X., Li, A., & Cai, X. (2018). Preparation and characterization of multifunctional Fe<sub>3</sub>O<sub>4</sub>-coated Ag nanocomposites for catalytic reduction of 4-nitrophenol. *Materials Letters*, 220, 24–27.



<https://doi.org/10.1016/j.matlet.2018.02.100>

Wang, W., Wang, Y., Tu, L., Feng, Y., Klein, T., & Wang, J. P. (2014). Magnetoresistive performance and comparison of supermagnetic nanoparticles on giant magnetoresistive sensor-based detection system. *Scientific Reports*, 4, 1–5. <https://doi.org/10.1038/srep05716>

Wibowo, N. A., Juharni, J., Sabarman, H., & Suharyadi, E. (2021). A Spin-Valve GMR Based Sensor with Magnetite@silver Core-Shell Nanoparticles as a Tag for Bovine Serum Albumin Detection. *ECS Journal of Solid State Science and Technology*, 10(10), 107002. <https://doi.org/10.1149/2162-8777/ac2d4e>

William D. Callister, & David G. Rethwisch. (2015). Fundamentals of Materials Science and Engineering: An Integrated Approach (Fifth Edition). Wiley, 964.

Wu, K., Klein, T., Krishna, V. D., Su, D., Perez, A. M., & Wang, J. P. (2017). Portable GMR Handheld Platform for the Detection of Influenza A Virus. *ACS Sensors*, 2(11), 1594–1601. <https://doi.org/10.1021/acssensors.7b00432>

Wu, W., He, Q., & Jiang, C. (2008). Magnetic iron oxide nanoparticles: Synthesis and surface functionalization strategies. *Nanoscale Research Letters*, 3(11), 397–415. <https://doi.org/10.1007/s11671-008-9174-9>

Xiao, L., Mertens, M., Wortmann, L., Kremer, S., Valldor, M., Lammers, T., Kiessling, F., & Mathur, S. (2015). Enhanced in vitro and in vivo cellular imaging with green tea coated water-soluble iron oxide nanocrystals. *ACS Applied Materials and Interfaces*, 7(12), 6530–6540. <https://doi.org/10.1021/am508404t>

Xu, J., Li, Q., Gao, X. Y., Leng, F. F., Lu, M., Guo, P. Z., Zhao, G. X., & Li, S. D. (2016). Detection of the Concentration of MnFe<sub>2</sub>O<sub>4</sub> Magnetic Microparticles Using Giant Magnetoresistance Sensors. *IEEE Transactions on Magnetics*, 52(4), 48–51. <https://doi.org/10.1109/TMAG.2015.2497249>

- Xu, J., Li, Q., Zong, W., Zhang, Y., & Li, S. (2016). Ultra-wide detectable concentration range of GMR biosensors using Fe<sub>3</sub>O<sub>4</sub> microspheres. *Journal of Magnetism and Magnetic Materials*, 417, 25–29. <https://doi.org/10.1016/j.jmmm.2016.05.059>
- Yamaura, M., Camilo, R. L., Sampaio, L. C., Macêdo, M. A., Nakamura, M., & Toma, H. E. (2004). Preparation and characterization of (3-aminopropyl)triethoxysilane-coated magnetite nanoparticles. *Journal of Magnetism and Magnetic Materials*, 279(2–3), 210–217. <https://doi.org/10.1016/j.jmmm.2004.01.094>
- Yew, Y. P., Shameli, K., Miyake, M., Ahmad Khairudin, N. B. B., Mohamad, S. E. B., Naiki, T., & Lee, K. X. (2020). Green biosynthesis of superparamagnetic magnetite Fe<sub>3</sub>O<sub>4</sub> nanoparticles and biomedical applications in targeted anticancer drug delivery system: A review. *Arabian Journal of Chemistry*, 13(1), 2287–2308. <https://doi.org/10.1016/j.arabjc.2018.04.013>
- Yew, Y. P., Shameli, K., Miyake, M., Kuwano, N., Bt Ahmad Khairudin, N. B., Bt Mohamad, S. E., & Lee, K. X. (2016). Green Synthesis of Magnetite (Fe<sub>3</sub>O<sub>4</sub>) Nanoparticles Using Seaweed (*Kappaphycus alvarezii*) Extract. *Nanoscale Research Letters*, 11(1). <https://doi.org/10.1186/s11671-016-1498-2>
- Zafar, S., & Zafar, A. (2019). Biosynthesis and Characterization of Silver Nanoparticles Using Phoenix dactylifera Fruits Extract and their In Vitro Antimicrobial and Cytotoxic Effects. *The Open Biotechnology Journal*, 13(1), 37–46. <https://doi.org/10.2174/1874070701913010037>
- Zhang, X., Guo, Q., & Cui, D. (2009). Recent advances in nanotechnology applied to biosensors. *Sensors*, 9(2), 1033–1053. <https://doi.org/10.3390/s90201033>
- Zhang, Y., Xu, J., Cao, D., Li, Q., Zhao, G., Sun, N. X., & Li, S. (2018). The influence of bias magnetization of nanoparticles on GMR sensor signal and sensitivity for the ultra-low concentration detection. *Journal of Magnetism and Magnetic*

*Materials*, 453, 132–136. <https://doi.org/10.1016/j.jmmm.2018.01.010>

Zhou, X., Mai, E., Sveiven, M., Pochet, C., Jiang, H., Huang, C. C., & Hall, D. A. (2021). A 9.7-nT, 704-ms Magnetic Biosensor Front-End for Detecting Magneto-Relaxation. *IEEE Journal of Solid-State Circuits*, 56(7), 2171–2181. <https://doi.org/10.1109/JSSC.2020.3043669>

Zhou, X., Sveiven, M., & Hall, D. A. (2019). A CMOS Magnetoresistive Sensor Front-End With Mismatch-Tolerance and Sub-ppm Sensitivity for Magnetic Immunoassays. *IEEE Transactions on Biomedical Circuits and Systems*, 13(6), 1254–1263. <https://doi.org/10.1109/TBCAS.2019.2949725>

Zhu, X., Pathakoti, K., & Hwang, H. M. (2018). Green synthesis of titanium dioxide and zinc oxide nanoparticles and their usage for antimicrobial applications and environmental remediation. In *Green Synthesis, Characterization and Applications of Nanoparticles* (Issue August). <https://doi.org/10.1016/B978-0-08-102579-6.00010-1>

Zikalala, N., Matshetshe, K., Parani, S., & Oluwafemi, O. S. (2018). Biosynthesis protocols for colloidal metal oxide nanoparticles. *Nano-Structures and Nano-Objects*, 16, 288–299. <https://doi.org/10.1016/j.nanoso.2018.07.010>