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DAFTAR PUSTAKA

Abdullah, M. M. S., Atta, A. M., Allohedan, H. A., Alkhathlan, H. Z., Khan, M., dan Ezzat, A. O. (2018). Green synthesis of hydrophobic magnetite nanoparticles coated with plant extract and their application as petroleum oil spill collectors. *Nanomaterials*, *8*(10), 1–13.

Abedini, A., Daud, A. R., Hamid, M. A. A., dan Othman, N. K. (2014). Radiolytic formation of Fe_3O_4 nanoparticles: Influence of radiation dose on structure and magnetic properties. *PLoS ONE*, *9*(3), 1–8.

Adimoolam, M. G., Amreddy, N., Nalam, M. R., dan Sunkara, M. V. (2018). A simple approach to design chitosan functionalized Fe_3O_4 nanoparticles for pH responsive delivery of doxorubicin for cancer therapy. *Journal of Magnetism and Magnetic Materials*, *448*, 199–207.

Adrianto, N., Panre, A. M., Istiqomah, N. I., Riswan, M., Apriliani, F., dan Suharyadi, E. (2022). Localized surface plasmon resonance properties of green synthesized silver nanoparticles. *Nano-Structures dan Nano-Objects*, *31*, 100895.

Ahn, T., Kim, J. H., Yang, H. M., Lee, J. W., dan Kim, J. D. (2012). Formation pathways of magnetite nanoparticles by coprecipitation method. *Journal of Physical Chemistry C*, *116*(10), 6069–6076.

Al-Hakkani, M. F. (2020). Biogenic copper nanoparticles and their applications: A review. *SN Applied Sciences*, *2*(3), 1–20.

Alfansuri, T., Aji, N., dan Imani, N. (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*, 169645.

Alfredo Reyes Villegas, V., Isaías De León Ramírez, J., Hernandez Guevara, E., Perez Sicairos, S., Angelica Hurtado Ayala, L., dan Landeros Sanchez, B. (2020). Synthesis and characterization of magnetite nanoparticles for photocatalysis of nitrobenzene. *Journal of Saudi Chemical Society*, *24*(2), 223–235.

Ali, A., Zafar, H., Zia, M., ul Haq, I., Phull, A. R., Ali, J. S., dan Hussain, A. (2016). Synthesis, characterization, applications, and challenges of iron oxide nanoparticles. *Nanotechnology, Science and Applications*, *9*, 49–67.

Altaf, S., Zafar, R., Zaman, W. Q., Ahmad, S., Yaqoob, K., Syed, A., Khan, A. J., Bilal, M., dan Arshad, M. (2021). Removal of levofloxacin from aqueous solution by green synthesized magnetite (Fe_3O_4) nanoparticles using Moringa olifera: Kinetics and reaction mechanism analysis. *Ecotoxicology and Environmental Safety*, *226*, 112826.

Amendola, V., Pilot, R., Frasconi, M., Maragò, O. M., dan Iatì, M. A. (2017). Surface plasmon resonance in gold nanoparticles: A review. *Journal of*

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Physics Condensed Matter, *29*(20), 203002.

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., dan El-Metwaly, N. M. (2022). Natural tannic acid (green tea) mediated synthesis of ethanol sensor based Fe_3O_4 nanoparticles: Investigation of structural, morphological, optical properties and colloidal stability for gas sensor application. *Sensors and Actuators B: Chemical*, *352*(P2), 131071.

Andrade, A. B., Ferreira, N. S., dan Valerio, M. E. G. (2017). Particle size effects on structural and optical properties of BaF_2 nanoparticles. *RSC Advances*, *7*(43), 26839–26848.

Ansari, F., Sobhani, A., dan Salavati-Niasari, M. (2016). Green synthesis of magnetic chitosan nanocomposites by a new sol-gel auto-combustion method. *Journal of Magnetism and Magnetic Materials*, *410*, 27–33.

Ansari, M. S., Othman, M. H. D., Ansari, M. O., Ansari, S., dan Abdullah, H. (2021). Progress in Fe_3O_4-centered spintronic systems: Development, architecture, and features. *Applied Materials Today*, *25*, 101181.

Antarnusa, G., dan Suharyadi, E. (2020). A synthesis of polyethylene glycol (PEG)-coated magnetite Fe_3O_4 nanoparticles and their characteristics for enhancement of biosenso. *Material Research Express*, *7*, 056103.

Arafa, A. A., Nada, A. A., Ibrahim, A. Y., Sajkiewicz, P., Zahran, M. K., dan Hakeim, O. A. (2021). Preparation and characterization of smart therapeutic pH-sensitive wound dressing from red cabbage extract and chitosan hydrogel. *International Journal of Biological Macromolecules*, *182*, 1820–1831.

Aranaz, I., Alcántara, A. R., Civera, M. C., Arias, C., Elorza, B., Caballero, A. H., dan Acosta, N. (2021). Chitosan: An overview of its properties and applications. *Polymers*, *13*(19), 53–79.

Arias, J. L., Reddy, L. H., dan Couvreur, P. (2012). Fe_3O_4/chitosan nanocomposite for magnetic drug targeting to cancer. *Journal of Materials Chemistry*, *22*(15), 7622–7632.

Arifin, M. (2011). Kajian fenomena surface plasmon resonance (SPR) pada sistem logam/polimer konduktif sebagai sensor gas. *Tesis*, Program Studi S2 Ilmu Fisika, Universitas Gadjah Mada, Yogyakarta.

Arista, D., Rachmawati, A., Ramadhani, N., Saputro, R. E., Taufiq, A., dan Sunaryono. (2019). Antibacterial performance of Fe_3O_4/PEG-4000 prepared by co-precipitation route. *IOP Conference Series: Materials Science and Engineering*, *515*(1).

Asgari, E., Sheikhmohammadi, A., dan Yeganeh, J. (2020). Application of the Fe3O4-chitosan nano-adsorbent for the adsorption of metronidazole from wastewater: Optimization, kinetic, thermodynamic and equilibrium studies. *International Journal of Biological Macromolecules*, *164*, 694–706.

Ashik, U. P. M., Kudo, S., dan Hayashi, J. (2018). An overview of metal oxide

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

nanostructures. In *Synthesis of Inorganic Nanomaterials*. Elsevier Ltd.

Ashraf, H., Meer, B., Iqbal, J., Ali, J. S., Andleeb, A., Butt, H., Zia, M., Mehmood, A., Nadeem, M., Drouet, S., Blondeau, J. P., Giglioli-Guivarc'h, N., Liu, C., Hano, C., dan Abbasi, B. H. (2022). Comparative evaluation of chemically and green synthesized zinc oxide nanoparticles: their in vitro antioxidant, antimicrobial, cytotoxic and anticancer potential towards HepG2 cell line. *Journal of Nanostructure in Chemistry*, 1–19.

Ates, B., Ulu, A., Köytepe, S., Ali Noma, S. A., Kolat, V. S., dan Izgi, T. (2018). Magnetic-propelled Fe_3O_4-chitosan carriers enhance l-asparaginase catalytic activity: A promising strategy for enzyme immobilization. *RSC Advances*, *8*(63), 36063–36075.

Ayesh, A. I., dan Salah, B. (2022). Fabrication of selective gas sensors using Fe_3O_4 nanoparticles decorated with CuO. *Materials Chemistry and Physics*, *282*, 125934.

Bagbi, Y., Sarswat, A., Mohan, D., Pandey, A., dan Solanki, P. R. (2017). Lead and chromium adsorption from water using L-Cysteine functionalized magnetite (Fe_3O_4) nanoparticles. *Scientific Reports*, *7*(1), 1–15.

Baghayeri, M., Veisi, H., Farhadi, S., Beitollahi, H., dan Maleki, B. (2018). Ag nanoparticles decorated Fe_3O_4/chitosan nanocomposite: synthesis, characterization and application toward electrochemical sensing of hydrogen peroxide. *Journal of the Iranian Chemical Society*, *15*(5), 1015–1022.

Bahadur, A., Saeed, A., Shoaib, M., Iqbal, S., Bashir, M. I., Waqas, M., Hussain, M. N., dan Abbas, N. (2017). Eco-friendly synthesis of magnetite (Fe_3O_4) nanoparticles with tunable size: Dielectric, magnetic, thermal and optical studies. *Materials Chemistry and Physics*, *198*, 229–235.

Ballarin, B., Boanini, E., Montalto, L., Mengucci, P., Nanni, D., Parise, C., Ragazzini, I., Rinaldi, D., Sangiorgi, N., Sanson, A., dan Cassani, M. C. (2019). PANI/Au/ Fe_3O_4 nanocomposite materials for high performance energy storage. *Electrochimica Acta*, *322*, 134707.

Begum, H., Ahmed, M. S., dan Jeon, S. (2017). New approach for porous chitosan-graphene matrix preparation through enhanced amidation for synergic detection of dopamine and uric acid. *ACS Omega*, *2*(6), 3043–3054.

Bélteky, P., Rónavári, A., Zakupszky, D., Boka, E., Igaz, N., Szerencsés, B., Pfeiffer, I., Vágvölgyi, C., Kiricsi, M., dan Kónya, Z. (2021). Are smaller nanoparticles always better? Understanding the biological effect of size-dependent silver nanoparticle aggregation under biorelevant conditions. *International Journal of Nanomedicine*, *16*, 3021–3040.

Bogireddy, N. K. R., Pal, U., Gomez, L. M., dan Agarwal, V. (2018). Size controlled green synthesis of gold nanoparticles using Coffea arabica seed extract and their catalytic performance in 4-nitrophenol reduction. *RSC Advances*, *8*(44), 24819–24826.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Boozer, C., Kim, G., Cong, S., Guan, H. W., dan Londergan, T. (2006). Looking towards label-free biomolecular interaction analysis in a high-throughput format: a review of new surface plasmon resonance technologies. *Current Opinion in Biotechnology*, *17*(4), 400–405.

Bunaciu, A. A., Udriştioiu, E. gabriela, dan Aboul-Enein, H. Y. (2015). X-ray diffraction: Instrumentation and applications. *Critical Reviews in Analytical Chemistry*, *45*(4), 289–299.

Chattopadhyay, D. P., dan Inamdar, M. S. (2010). Aqueous behaviour of chitosan. *International Journal of Polymer Science*, *2010*(1), 939536.

Chauhan, A., Midha, S., Kumar, R., Meena, R., Singh, P., Jha, S. K., dan Kuanr, B. K. (2021). Rapid tumor inhibition via magnetic hyperthermia regulated by caspase 3 with time-dependent clearance of iron oxide nanoparticles. *Biomaterials Science*, *9*(8), 2972–2990.

Cheng, L., Zhu, G., Liu, G., dan Zhu, L. (2020). FDTD simulation of the optical properties for gold nanoparticles. *Materials Research Express*, *7*(12), 1–6.

Chircov, C., Grumezescu, A. M., dan Holban, A. M. (2019). Magnetic particles for advanced molecular diagnosis. *Materials*, *12*(13), 10–12.

Chokkareddy, R., dan Redhi, G. G. (2018). Green synthesis of metal nanoparticles and its reaction mechanisms. *Scrivener Publishing*, 113–139.

Colombo, M., Carregal-Romero, S., Casula, M. F., Gutiérrez, L., Morales, M. P., Böhm, I. B., Heverhagen, J. T., Prosperi, D., dan Parak, W. J. (2012). Biological applications of magnetic nanoparticles. *Chemical Society Reviews*, *41*(11), 4306–4334.

Couture, M., Zhao, S. S., dan Masson, J. F. (2013). Modern surface plasmon resonance for bioanalytics and biophysics. *Physical Chemistry Chemical Physics*, *15*(27), 11190–11216.

Das, P. E., Abu-Yousef, I. A., Majdalawieh, A. F., Narasimhan, S., dan Poltronieri, P. (2020). Green synthesis of encapsulated copper nanoparticles using a hydroalcoholic extract of Moringa oleifera leaves and assessment of their antioxidant and antimicrobial activities. *Molecules*, *25*(3), 555–572.

Dash, A., Ahmed, M. T., dan Selvaraj, R. (2019). Mesoporous magnetite nanoparticles synthesis using the Peltophorum pterocarpum pod extract, their antibacterial efficacy against pathogens and ability to remove a pollutant dye. *Journal of Molecular Structure*, *1178*, 268–273.

De Oliveira Guidolin, T., Possolli, N. M., Polla, M. B., Wermuth, T. B., Franco de Oliveira, T., Eller, S., Klegues Montedo, O. R., Arcaro, S., dan Cechinel, M. A. P. (2021). Photocatalytic pathway on the degradation of methylene blue from aqueous solutions using magnetite nanoparticles. *Journal of Cleaner Production*, *318*, 128556.

Del Valle, T. A., Paiva, P. G. d., Ferreira de Jesus, E., Almeida, G. F. d., Zanferari, F., Costa, A. G. B. V. B., Bueno, I. C. S., dan Rennó, F. P. (2017). Dietary

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

chitosan improves nitrogen use and feed conversion in diets for mid-lactation dairy cows. *Livestock Science*, *201*(July 2016), 22–29.

Demirezen, D. A., dan Yilmaz, D. D. (2018). Green synthesis and characterization of iron green synthesis and nanoparticles using Ficus. *Internal*, *April*, 25–29.

Dhyani, H., Ali, M. A., Pal, S. P., Srivastava, S., Solanki, P. R., Malhotra, B. D., dan Sen, P. (2015). Mediator-free biosensor using chitosan capped CdS quantum dots for detection of total cholesterol. *RSC Advances*, *5*(57), 45928–45934.

Dinnebier, R. E. (2008). *Powder Diffraction: Theory and Practice*. Chapter 1.

Długosz, O., Szostak, K., Krupiński, M., dan Banach, M. (2021). Synthesis of Fe_3O_4/ZnO nanoparticles and their application for the photodegradation of anionic and cationic dyes. In *International Journal of Environmental Science and Technology* (Vol. 18, Issue 3, pp. 561–574).

Doble, M., dan Kruthiventi, A. K. (2007). Catalysis and green chemistry. *Green Chemistry and Engineering*, 53–67.

Dong, Y., Yang, Z., Sheng, Q., dan Zheng, J. (2018). Solvothermal synthesis of Ag@ Fe_3O_4 nanosphere and its application as hydrazine sensor. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, *538*(August 2017), 371–377.

Dutta, B., Checker, S., Barick, K. C., Salunke, H. G., Gota, V., dan Hassan, P. A. (2021). Malic acid grafted Fe_3O_4 nanoparticles for controlled drug delivery and efficient heating source for hyperthermia therapy. *Journal of Alloys and Compounds*, *883*, 160950.

Engels, S., dan O'Born, R. J. (2022). Realizing the potential of humic acid recovery in Norway through chitosan treatment of drinking water. *Procedia CIRP*, *105*, 177–182.

Farmanbar, N., Mohseni, S., dan Darroudi, M. (2022). Green synthesis of chitosan-coated magnetic nanoparticles for drug delivery of oxaliplatin and irinotecan against colorectal cancer cells. *Polymer Bulletin*.

Fu, C. C., Tran, H. N., Chen, X. H., dan Juang, R. S. (2020). Preparation of polyaminated Fe_3O_4@chitosan core-shell magnetic nanoparticles for efficient adsorption of phosphate in aqueous solutions. *Journal of Industrial and Engineering Chemistry*, *83*, 235–246.

Fujiwara, H. (2007). *Spectroscopic ellipsometry principles and applications*, John Wiley & Sonc, Ltd, England.

Guo, J., Zheng, Z., Chen, C., Lu, X., Zhang, Y., dan Zheng, B. (2017). Enhanced production of κ-carrageenase and κ-carrageenan oligosaccharides through immobilization of Thalassospira sp. Fjfst-332 with magnetic Fe_3O_4-chitosan microspheres. *Journal of Agricultural and Food Chemistry*, *65*(36), 7934–7943.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Guo, X. (2014). Fe_3O_4@Au nanoparticles enhanced surface plasmon resonance for ultrasensitive immunoassay. *Sensors and Actuators, B: Chemical*, *205*, 276–280.

Hermosa, G. C., Liao, C. S., Wu, H. S., Wang, S. F., Liu, T. Y., Jeng, K. S., Lind, S. S., Chang, C. F., dan Sun, A. C. A. (2022). Green synthesis of magnetic ferrites (Fe_3O_4, $CoFe_2O_4$, and $NiFe_2O_4$) stabilized by Aloe vera extract for cancer hyperthermia activities. *IEEE Transactions on Magnetics*, *9464*(c), 1–11.

Homola, J. (2008). Surface plasmon resonance sensors for detection of chemical and biological species. *Chemical Reviews*, *108*(2), 462–493.

Hossain, B., Paul, A. K., Islam, M. A., Rahman, M. M., Sarkar, A. K., dan Abdulrazak, L. F. (2022). A highly sensitive surface plasmon resonance biosensor using SnSe allotrope and heterostructure of BlueP/MoS2 for cancerous cell detection. *Optik*, *252*, 168506.

Hubenthal, F. (2007). Ultrafast dephasing time of localized surface plasmon polariton resonance and the involved damping mechanisms in colloidal gold nanoparticles. *Progress in Surface Science*, *82*(4–6), 378–387.

I. Saleh, H. (2020). Green synthesis of magnetite nanoparticles using Myrtuscommunis L. Grown in Egypt. *International Research Journal of Innovations in Engineering and Technology*, *4*(9), 06–13.

Ikono, R., Li, N., Pratama, N. H., Vibriani, A., Yuniarni, D. R., Luthfansyah, M., Bachtiar, B. M., Bachtiar, E. W., Mulia, K., Nasikin, M., Kagami, H., Li, X., Mardliyati, E., Rochman, N. T., Nagamura-Inoue, T., dan Tojo, A. (2019). Enhanced bone regeneration capability of chitosan sponge coated with TiO2 nanoparticles. *Biotechnology Reports*, *24*, e00350.

Imran, M., Sajwan, M., Alsuwayt, B., dan Asif, M. (2020). Synthesis, characterization and anticoagulant activity of chitosan derivatives. *Saudi Pharmaceutical Journal*, *28*(1), 25–32.

Indrayana, I. P. T., Tuny, M. T., Putra, R. A., Istiqomah, N. I., Juharni, dan Suharyadi, E. (2021). Optical properties of Fe_3O_4/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.

Jabbar, K. Q., Barzinjy, A. A., dan Hamad, S. M. (2022). Iron oxide nanoparticles: Preparation methods, functions, adsorption and coagulation/flocculation in wastewater treatment. *Environmental Nanotechnology, Monitoring and Management*, *17*, 100661.

Jain, S., dan 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), 1–13.

Jamir, M., Borgohain, C., dan Borah, J. P. (2022). Chitosan modified Fe_3O_4

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

nanoparticles for hyperthermia application. *Materials Today: Proceedings*, *xxxx*.

Jesus, A. C. B., Jesus, J. R., Lima, R. J. S., Moura, K. O., Almeida, J. M. A., Duque, J. G. S., dan Meneses, C. T. (2020). Synthesis and magnetic interaction on concentrated Fe_3O_4 nanoparticles obtained by the co-precipitation and hydrothermal chemical methods. *Ceramics International*, *46*(8), 11149–11153.

Juharni, J., Yahya, I. M., Suharyadi, E., Kato, T., dan Iwata, S. (2021). Microstructures, absorption spectra, and magnetic properties of core-shell Fe_3O_4@Ag nanoparticles for enhancing sensitivity of surface plasmon resonance (SPR) sensor. *International Journal of Nanoelectronics and Materials*, *14*(3), 209–217.

Kabashin, A. V., Evans, P., Pastkovsky, S., Hendren, W., Wurtz, G. A., Atkinson, R., Pollard, R., Podolskiy, V. A., dan Zayats, A. V. (2009). Plasmonic nanorod metamaterials for biosensing. *Nature Materials*, *8*(11), 867–871.

Kamalzare, M., Ahghari, M. R., Bayat, M., dan Maleki, A. (2021). Fe_3O_4@chitosan-tannic acid bionanocomposite as a novel nanocatalyst for the synthesis of pyranopyrazoles. *Scientific Reports*, *11*(1), 1–10.

Karaca, E., Şatir, M., Kazan, S., Açikgöz, M., Öztürk, E., Gürdaı, G., dan Ulutaş, D. (2015). Synthesis, characterization and magnetic properties of Fe_3O_4 doped chitosan polymer. *Journal of Magnetism and Magnetic Materials*, *373*, 53–59.

Karrat, A., Amine, A., Karrant, A., dan Amine, A. (2020). Recent advances in chitosan-based electrochemical sensors and biosensors. *Arabian Journal of Chemical and Environmental Research*, *07*(2), 66–93.

Keabadile, O. P., Aremu, A. O., Elugoke, S. E., dan Fayemi, O. E. (2020). Green and traditional synthesis of copper oxide nanoparticles—comparative study. *Nanomaterials*, *10*(12), 1–19.

Kgatitsoe, M. M., Ncube, S., Tutu, H., Nyambe, I. A., dan Chimuka, L. (2019). Synthesis and characterization of a magnetic nanosorbent modified with Moringa oleifera leaf extracts for removal of nitroaromatic explosive compounds in water samples. *Journal of Environmental Chemical Engineering*, *7*(3), 103128.

Khalil, M. I. (2015). Co-precipitation in aqueous solution synthesis of magnetite nanoparticles using iron(III) salts as precursors. *Arabian Journal of Chemistry*, *8*(2), 279–284.

Kolhatkar, A. G., Jamison, A. C., Litvinov, D., Willson, R. C., dan Lee, T. R. (2013). Tuning the magnetic properties of nanoparticles. *International Journal of Molecular Sciences*, *14*(8), 15977–16009.

Kooyman, R. P. H. (2010). Chapter 2. Physics of surface plasmon resonance. *Handbook of Surface Plasmon Resonance*, 15–34.

Kouotou, P. M., Kasmi, A. El, Wu, L. N., Waqas, M., dan Tian, Z. Y. (2018).

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Particle size-band gap energy-catalytic properties relationship of PSE-CVD-derived Fe_3O_4 thin films. *Journal of the Taiwan Institute of Chemical Engineers*, *93*, 427–435.

Kulkarni, N., Jain, P., Shindikar, A., Suryawanshi, P., dan Thorat, N. (2022). Advances in the colon-targeted chitosan based multiunit drug delivery systems for the treatment of inflammatory bowel disease. *Carbohydrate Polymers*, *288*, 119351.

Kumar, B., Smita, K., Cumbal, L., Debut, A., Galeas, S., dan Guerrero, V. H. (2016). Phytosynthesis and photocatalytic activity of magnetite (Fe_3O_4) nanoparticles using the Andean blackberry leaf. *Materials Chemistry and Physics*, *179*, 310–315.

Kumari, P., Gautam, R., Yadav, H., Kushwaha, V., Mishra, A., Gupta, S., dan Arora, V. (2016). Efficient reduction of C–N multiple bonds catalyzed by magnetically retrievable magnetite nanoparticles with sodium borohydride. *Catalysis Letters*, *146*(10), 2149–2156.

Kumirska, J., Czerwicka, M., Kaczyński, Z., Bychowska, A., Brzozowski, K., Thöming, J., dan Stepnowski, P. (2010). Application of spectroscopic methods for structural analysis of chitin and chitosan. *Marine Drugs*, *8*(5), 1567–1636.

Kwon, Y. T., Lim, G. D., Kim, S., Ryu, S. H., Lim, H. R., dan Choa, Y. H. (2019). Effect of localized surface plasmon resonance on dispersion stability of copper sulfide nanoparticles. *Applied Surface Science*, *477*, 204–210.

Law, W. C., Yong, K. T., Baev, A., dan Prasad, P. N. (2011). Sensitivity improved surface plasmon resonance biosensor for cancer biomarker detection based on plasmonic enhancement. *ACS Nano*, *5*(6), 4858–4864.

Li, G. yin, Jiang, Y. ren, Huang, K. long, Ding, P., dan Chen, J. (2008). Preparation and properties of magnetic Fe_3O_4-chitosan nanoparticles. *Journal of Alloys and Compounds*, *466*(1–2), 451–456.

Li, J., Li, Y., Chen, X., Kierzek, K., Shi, X., Chu, P. K., Tang, T., dan Mijowska, E. (2019). Selective synthesis of magnetite nanospheres with controllable morphologies on CNTs and application to lithium-ion batteries. *Physica Status Solidi (A) Applications and Materials Science*, *216*(11), 1–6.

Li, R., Fu, G., Liu, C., McClements, D. J., Wan, Y., Wang, S., dan Liu, T. (2018). Tannase immobilisation by amino-functionalised magnetic Fe_3O_4-chitosan nanoparticles and its application in tea infusion. *International Journal of Biological Macromolecules*, *114*, 1134–1143.

Lin, Y., Liu, X., Xing, Z., Geng, Y., Wilson, J., Wu, D., dan Kong, H. (2017). Preparation and characterization of magnetic Fe_3O_4–chitosan nanoparticles for cellulase immobilization. *Cellulose*, *24*(12), 5541–5550.

Lin, Z., Chen, S., dan Lin, C. (2020). Sensitivity improvement of a surface plasmon resonance sensor based on two-dimensional materials hybrid structure in visible region: A theoretical study. *Sensors*, *20*(9), 2445–2456.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Liu, A., Zhang, H., Ding, J., Kou, W., Yan, F., Huang, K., dan Chen, H. (2020). Enrichment of phospholipids using magnetic Fe_3O_4/TiO2 nanoparticles for quantitative detection at single cell levels by electrospray ionization mass spectrometry. *Talanta*, *212*, 120769.

Liu, X., Hu, Y., Zheng, S., Liu, Y., He, Z., dan Luo, F. (2016). Surface plasmon resonance immunosensor for fast, highly sensitive, and in situ detection of the magnetic nanoparticles-enriched Salmonella enteritidis. *Sensors and Actuators, B: Chemical*, *230*, 191–198.

Liu, X., Li, L., Liu, Y. Q., Shi, X. B., Li, W. J., Yang, Y., dan Mao, L. G. (2014). Ultrasensitive detection of deltamethrin by immune magnetic nanoparticles separation coupled with surface plasmon resonance sensor. *Biosensors and Bioelectronics*, *59*, 328–334.

Luo, Y., Zhou, Z., dan Yue, T. (2017). Synthesis and characterization of nontoxic chitosan-coated Fe_3O_4 particles for patulin adsorption in a juice-pH simulation aqueous. *Food Chemistry*, *221*, 317–323.

Maheshwaran, G., Malai Selvi, M., Selva Muneeswari, R., Nivedhitha Bharathi, A., Krishna Kumar, M., dan Sudhahar, S. (2021). Green synthesis of lanthanum oxide nanoparticles using Moringa oleifera leaves extract and its biological activities. *Advanced Powder Technology*, *32*(6), 1963–1971.

Mahmoudpour, M., Ezzati Nazhad Dolatabadi, J., Torbati, M., dan Homayouni-Rad, A. (2019). Nanomaterials based surface plasmon resonance signal enhancement for detection of environmental pollutions. *Biosensors and Bioelectronics*, *127*(November 2018), 72–84.

Makarov, V. ., Love, A. J., Sinitsyna, O. V., Makarova, S. ., Yaminsky, I. ., M.E., T., dan Kalinina, N. . (2014). "Green" nanotechnologies: Synthesis of metal nanopartikel using plant. *Acta Naturae*, *6*(20), 40–61.

Maruthupandy, M., Muneeswaran, T., Vennila, T., Anand, M., Cho, W. S., dan Quero, F. (2022). Development of chitosan decorated Fe_3O_4 nanospheres for potential enhancement of photocatalytic degradation of Congo red dye molecules. *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, *267*, 120511

Mateus, G. A. P., Paludo, M. P., Dos Santos, T. R. T., Silva, M. F., Nishi, L., Fagundes-Klen, M. R., Gomes, R. G., dan Bergamasco, R. (2018). Obtaining drinking water using a magnetic coagulant composed of magnetite nanoparticles functionalized with Moringa oleifera seed extract. *Journal of Environmental Chemical Engineering*, *6*(4), 4084–4092.

Matshediso, P. G., Cukrowska, E., dan Chimuka, L. (2015). Development of pressurised hot water extraction (PHWE) for essential compounds from Moringa oleifera leaf extracts. *Food Chemistry*, *172*, 423–427.

Mehata, M. S. (2021). Green route synthesis of silver nanoparticles using plants/ginger extracts with enhanced surface plasmon resonance and degradation of textile dye. *Materials Science and Engineering B: Solid-State*

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Materials for Advanced Technology, *273*(August), 115418.

Menges, B. (2015). Surface plasmon and optical waveguide fluorescence spectroscopy in limit of surface plasmon fluorescence spectroscopy and optical waveguide fluorescence spectroscopy in limit of detection studies. *Master Thesis Akihiro Sato Department of Information Proces*.

Mihai, A. D., Chircov, C., Grumezescu, A. M., dan Holban, A. M. (2020). Magnetite nanoparticles and essential oils systems for advanced antibacterial therapies. *International Journal of Molecular Sciences*, *21*(19), 1–24.

Mitra, S., dan Basak, M. (2022). Diverse bio-sensing and therapeutic applications of plasmon enhanced nanostructures. *Materials Today*, *xxx*(xx).

Miyazaki, C. M., Shimizu, F. M., dan Ferreira, M. (2017). Surface plasmon resonance (SPR) for sensors and biosensors. *Nanocharacterization Techniques*. Elsevier Inc.

Moacă, E.-A., Coricovac, E. D., Soica, C. M., Pinzaru, I. A., Păcurariu, C. S., dan Dehelean, C. A. (2018). Preclinical aspects on magnetic iron oxide nanoparticles and their interventions as anticancer agents: Enucleation, apoptosis and other mechanism. *Iron Ores and Iron Oxide Materials*.

Mohammadi, F. M., dan Ghasemi, N. (2018). Influence of temperature and concentration on biosynthesis and characterization of zinc oxide nanoparticles using cherry extract. *Journal of Nanostructure in Chemistry*, *8*(1), 93–102.

Mondes, V., Antonsson, E., Plenge, J., Raschpichler, C., Halfpap, I., Menski, A., Graf, C., Kling, M. F., dan Rühl, E. (2016). Plasmonic electric near-field enhancement in self-organized gold nanoparticles in macroscopic arrays. *Applied Physics B: Lasers and Optics*, *122*(6), 1–9.

Moon, S., Kim, D. J., Kim, K., Kim, D., Lee, H., Lee, K., dan Haam, S. (2010). Surface-enhanced plasmon resonance detection of nanoparticle-conjugated DNA hybridization. *Applied Optics*, *49*(3), 484–491.

Mustafa, D. E., Yang, T., Xuan, Z., Chen, S., Tu, H., dan Zhang, A. (2010). Surface plasmon coupling effect of gold nanoparticles with different shape and size on conventional surface plasmon resonance signal. *Plasmonics*, *5*(3), 221–231.

Nangare, S. N., dan Patil, P. O. (2021). Affinity-based nanoarchitectured biotransducer for sensitivity enhancement of surface plasmon resonance sensors for in vitro diagnosis: A review. *ACS Biomaterials Science and Engineering*, *7*(1), 2–30.

Negm, N. A., Abubshait, H. A., Abubshait, S. A., Abou Kana, M. T. H., Mohamed, E. A., dan Betiha, M. M. (2020). Performance of chitosan polymer as platform during sensors fabrication and sensing applications. *International Journal of Biological Macromolecules*, *165*, 402–435.

Nguyen, H. H., Park, J., Kang, S., dan Kim, M. (2015). Surface plasmon resonance: A versatile technique for biosensor applications. *Sensors*, *15*(5), 10481–10510.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Nguyen, M. D., Tran, H. V., Xu, S., dan Lee, T. R. (2021). Fe_3O_4 nanoparticles: Structures, synthesis, magnetic properties, surface functionalization, and emerging applications. *Applied Sciences*, *11*(23), 11301.

Niculescu, A. G., Chircov, C., dan Grumezescu, A. M. (2021). Magnetite nanoparticles: Synthesis methods – A comparative review. *Methods*, *199*, 16–27.

Niu, J. M., dan Zheng, Z. G. (2014). Effect of temperature on Fe_3O_4 magnetic nanoparticles prepared by coprecipitation method. *Advanced Materials Research*, *900*, 172–176.

Nnadozie, E. C., dan Ajibade, P. A. (2020). Green synthesis and characterization of magnetite (Fe_3O_4) nanoparticles using Chromolaena odorata root extract for smart nanocomposite. *Materials Letters*, *263*, 127145.

Noah, N. M., dan Ndangili, P. M. (2022). Green synthesis of nanomaterials from sustainable materials for biosensors and drug delivery. *Sensors International*, *3*, 100166.

Novoselova, L. Y. (2021). Nanoscale magnetite: New synthesis approach, structure and properties. *Applied Surface Science*, *539*(May 2020), 148275.

Oktivina, M., Nurrohman, D. T., Rinto, A. N. Q. Z., Suharyadi, E., dan Abraha, K. (2017). Effect of Fe_3O_4 magnetic nanoparticle concentration on the signal of surface plasmon resonance (SPR) spectroscopy. *IOP Conference Series: Materials Science and Engineering*, *202*(1), 012032.

Olajire, A. A., dan Bamigbade, L. A. (2021). Green synthesis of chitosan-based iron@silver nanocomposite as adsorbent for wastewater treatment. *Water Resources and Industry*, *26*(June), 100158.

Otto, A. (1968). Excitation of nonradiative surface plasma waves in silver by the method of frustrated total reflection. *Zeitschrift Für Physik*, *216*(4), 398–410.

Pal, S., Verma, A., Raikwar, S., Prajapati, Y. K., dan Saini, J. P. (2018). Detection of DNA hybridization using graphene-coated black phosphorus surface plasmon resonance sensor. *Applied Physics A: Materials Science and Processing*, *124*(5), 1–11.

Panda, S. K., Aggarwal, I., Kumar, H., Prasad, L., Kumar, A., Sharma, A., Vo, D. V. N., Van Thuan, D., dan Mishra, V. (2021). Magnetite nanoparticles as sorbents for dye removal: a review. *Environmental Chemistry Letters* , *19*(3), 2487–2525.

Panre, A. M., Yahya, I. M., Juharni, J., dan Suharyadi, E. (2021). Magneto-optic surface plasmon resonance properties of core-shell Fe_3O_4 @Ag nanoparticles . *Advances in Natural Sciences: Nanoscience and Nanotechnology*, *12*(4), 045011.

Park, H. S., Park, J., Kwak, J. Y., Hwang, G. W., Jeong, D. S., dan Lee, K. S. (2021). Novel nano-plasmonic sensing platform based on vertical conductive bridge. *Scientific Reports*, *11*(1), 1–8.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Patra, J. K., dan Baek, K. H. (2014). Green nanobiotechnology: Factors affecting synthesis and characterization techniques. *Journal of Nanomaterials*, *2014*, 1–12.

Petryayeva, E., dan Krull, U. J. (2011). Localized surface plasmon resonance: Nanostructures, bioassays and biosensing-A review. *Analytica Chimica Acta*, *706*(1), 8–24.

Philip, A., dan Kumar, A. R. (2022). The performance enhancement of surface plasmon resonance optical sensors using nanomaterials: A review. *Coordination Chemistry Reviews*, *458*, 214424.

Piliarik, M., dan Homola, J. (2009). Surface plasmon resonance (SPR) sensors: approaching their limits? *Optics Express*, *17*(19), 16505.

Piro, N. S., Hamad, S. M., Mohammed, A. S., dan Barzinjy, A. A. (2022). Green synthesis magnetite (Fe_3O_4) nanoparticles from Rhus coriaria extract: A characteristic comparison with a conventional chemical method. *IEEE Transactions on Nanobioscience*, 1–26.

Polte, J. (2015). Fundamental growth principles of colloidal metal nanoparticles - a new perspective. *CrystEngComm*, *17*(36), 6809–6830.

Pop, N. C. (2019). A model for magnetic hysteresis. *European Physical Journal Plus*, *134*(11). 567–579.

Pourmortazavi, S. M., Sahebi, H., Zandavar, H., dan Mirsadeghi, S. (2019). Fabrication of Fe_3O_4 nanoparticles coated by extracted shrimp peels chitosan as sustainable adsorbents for removal of chromium contaminates from wastewater: The design of experiment. *Composites Part B: Engineering*, *175*(July), 107130.

Prabakaran, M., Kim, S. H., Sasireka, A., Chandrasekaran, M., dan Chung, I. M. (2018). Polyphenol composition and antimicrobial activity of various solvent extracts from different plant parts of Moringa oleifera. *Food Bioscience*, *26*(September), 23–29.

Priya, B., Gupta, V. K., Pathania, D., dan Singha, A. S. (2014). Synthesis, characterization and antibacterial activity of biodegradable starch/PVA composite films reinforced with cellulosic fibre. *Carbohydrate Polymers*, *109*, 171–179.

Qin, H., Wang, C. M., Dong, Q. Q., Zhang, L., Zhang, X., Ma, Z. Y., dan Han, Q. R. (2015). Preparation and characterization of magnetic Fe_3O_4-chitosan nanoparticles loaded with isoniazid. *Journal of Magnetism and Magnetic Materials*, *381*, 120–126.

Qu, J., Liu, G., Wang, Y., dan Hong, R. (2010). Preparation of Fe_3O_4-chitosan nanoparticles used for hyperthermia. *Advanced Powder Technology*, *21*(4), 461–467.

Raafat, D., dan Sahl, H. G. (2009). Chitosan and its antimicrobial potential - A critical literature survey. *Microbial Biotechnology*, *2*(2 SPEC. ISS.), 186–201.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Radoń, A., Drygała, A., Hawełek, Ł., dan Łukowiec, D. (2017). Structure and optical properties of Fe_3O_4 nanoparticles synthesized by co-precipitation method with different organic modifiers. *Materials Characterization*, *131*(June), 148–156.

Rahman, M. S., Anower, M. S., Hasan, M. R., Hossain, M. B., dan Haque, M. I. (2017). Design and numerical analysis of highly sensitive Au-MoS2-graphene based hybrid surface plasmon resonance biosensor. *Optics Communications*, *396*(February), 36–43.

Rajabi, N., Masrournia, M., dan Abedi, M. (2020). Measuring and pre-concentration of lanthanum using Fe_3O_4@chitosan nanocomposite with solid-phase microextraction for ICP-OES determination. *Arabian Journal for Science and Engineering*, *45*(1), 121–129.

Ramesh, A. V., Rama Devi, D., Mohan Botsa, S., dan Basavaiah, K. (2018). Facile green synthesis of Fe_3O_4 nanoparticles using aqueous leaf extract of Zanthoxylum armatum DC. for efficient adsorption of methylene blue. *Journal of Asian Ceramic Societies*, *6*(2), 145–155.

Rechberger, W., Hohenau, A., Leitner, A., Krenn, J. R., Lamprecht, B., dan Aussenegg, F. R. (2003). Optical properties of two interacting gold nanoparticles. *Optics Communications*, *220*(1–3), 137–141.

Reddy, L. H., Arias, J. L., Nicolas, J., dan Couvreur, P. (2012). Magnetic nanoparticles: Design and characterization, toxicity and biocompatibility, pharmaceutical and biomedical applications. *Chemical Reviews*, *112*(11), 5818–5878.

Rinaudo, M. (2006). Chitin and chitosan: Properties and applications. *Progress in Polymer Science (Oxford)*, *31*(7), 603–632.

Rochelle M. Cornell, U. S. (2006). The iron oxides: Structure, properties, reactions, occurrences and uses. *Completely Revised and Extended Edition*. John Wiley & Sons.

Ruíz-Baltazar, Á. de J., Reyes-López, S. Y., Mondragón-Sánchez, M. de L., Robles-Cortés, A. I., dan Pérez, R. (2019). Eco-friendly synthesis of Fe_3O_4 nanoparticles: Evaluation of their catalytic activity in methylene blue degradation by kinetic adsorption models. *Results in Physics*, *12*(October 2018), 989–995.

Safari, J., dan Javadian, L. (2014). Chitosan decorated Fe_3O_4 nanoparticles as a magnetic catalyst in the synthesis of phenytoin derivatives. *RSC Advances*, *4*(90), 48973–48979.

Sajadi, S. M., Nasrollahzadeh, M., dan Maham, M. (2016). Aqueous extract from seeds of Silybum marianum L. as a green material for preparation of the Cu/Fe_3O_4 nanoparticles: A magnetically recoverable and reusable catalyst for the reduction of nitroarenes. *Journal of Colloid and Interface Science*, *469*, 93–98.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Samrot, A. V., Sahithya, C. S., Selvarani A, J., Purayil, S. K., dan Ponnaiah, P. (2021). A review on synthesis, characterization and potential biological applications of superparamagnetic iron oxide nanoparticles. *Current Research in Green and Sustainable Chemistry*, *4*(September 2020), 100042.

Sanchayanukun, P., dan Muncharoen, S. (2020). Chitosan coated magnetite nanoparticle as a working electrode for determination of Cr(VI) using square wave adsorptive cathodic stripping voltammetry. *Talanta*, *217*(December 2019), 121027.

Sathyavathi, R., Bala Murali Krishna, M., dan Narayana Rao, D. (2011). Biosynthesis of silver nanoparticles using Moringa oleifera leaf extract and its application to optical limiting. *Journal of Nanoscience and Nanotechnology*, *11*(3), 2031–2035.

Scarano, S., Mascini, M., Turner, A. P. F., dan Minunni, M. (2010). Surface plasmon resonance imaging for affinity-based biosensors. *Biosensors and Bioelectronics*, *25*(5), 957–966.

Seenuvasan, M., Kumar, K. S., Malar, C. G., Preethi, S., Kumar, M. A., dan Balaji, N. (2014). Characterization, analysis, and application of fabricated Fe_3O_4-chitosan-pectinase nanobiocatalyst. *Applied Biochemistry and Biotechnology*, *172*(5), 2706–2719.

Shukla, S. K., Mishra, A. K., Arotiba, O. A., dan Mamba, B. B. (2013). Chitosan-based nanomaterials: A state-of-the-art review. *International Journal of Biological Macromolecules*, *59*, 46–58.

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*, *16*(1), 1–24.

Sirivat, A., dan Paradee, N. (2019). Facile synthesis of gelatin-coated Fe_3O_4 nanoparticle: Effect of pH in single-step co-precipitation for cancer drug loading. *Materials and Design*, *181*, 107942.

Smith, J. O., Schreiber, S. J., Kopp, P. E., Getz, W. M., Anderson, R. M., dan May, R. M. (2005). Gold loses its lustre. *Nature*, *438*(November), 295–296.

Sogias, I. A., Khutoryanskiy, V. V., dan Williams, A. C. (2010). Exploring the factors affecting the solubility of chitosan in water. *Macromolecular Chemistry and Physics*, *211*(4), 426–433.

Soleymani, M., Khalighfard, S., Khodayari, S., Khodayari, H., Kalhori, M. R., Hadjighassem, M. R., Shaterabadi, Z., dan Alizadeh, A. M. (2020). Effects of multiple injections on the efficacy and cytotoxicity of folate-targeted magnetite nanoparticles as theranostic agents for MRI detection and magnetic hyperthermia therapy of tumor cells. *Scientific Reports*, *10*(1), 1–14.

Suárez-Ruiz, I., dan Ward, C. R. (2008). Basic factors controlling coal quality and technological behavior of coal. *Applied Coal Petrology: The Role of Petrology in Coal Utilization*, *1*, 19–59.

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

Subedi, N., Lähde, A., Abu-Danso, E., Iqbal, J., dan Bhatnagar, A. (2019). A comparative study of magnetic chitosan (Chi@ Fe_3O_4) and graphene oxide modified magnetic chitosan (Chi@ Fe_3O_4GO) nanocomposites for efficient removal of Cr(VI) from water. *International Journal of Biological Macromolecules*, *137*, 948–959.

Suharyadi, E., Muzakki, A., Istiqomah, N. I., Puspitarum, D. L., Purnama, B., dan Djuhana, D. (2022). Reusability of photocatalytic $CoFe_2O_4$@ZnO core–shell nanoparticles for dye degradation. *ECS Journal of Solid State Science and Technology*, *11*(2), 023004.

Sulaiman, G. M., Tawfeeq, A. T., dan Naji, A. S. (2018). Biosynthesis, characterization of magnetic iron oxide nanoparticles and evaluations of the cytotoxicity and DNA damage of human breast carcinoma cell lines. *Artificial Cells, Nanomedicine and Biotechnology*, *46*(6), 1215–1229.

Swathi, S., Ameen, F., Ravi, G., Yuvakkumar, R., Hong, S. I., Velauthapillai, D., AlKahtani, M. D. F., Thambidurai, M., dan Dang, C. (2020). Cancer targeting potential of bioinspired chain like magnetite (Fe_3O_4) nanostructures. *Current Applied Physics*, *20*(8), 982–987.

Szunerits, S., Spadavecchia, J., dan Boukherroub, R. (2014). Surface plasmon resonance: Signal amplification using colloidal gold nanoparticles for enhanced sensitivity. *Reviews in Analytical Chemistry*, *33*(3), 153–164.

Ta, Q., Ting, J., Harwood, S., Browning, N., Simm, A., Ross, K., Olier, I., dan Al-Kassas, R. (2021). Chitosan nanoparticles for enhancing drugs and cosmetic components penetration through the skin. *European Journal of Pharmaceutical Sciences*, *160*(November 2020), 105765.

Tanpichai, S., Srimarut, Y., Woraprayote, W., dan Malila, Y. (2022). Chitosan coating for the preparation of multilayer coated paper for food-contact packaging: Wettability, mechanical properties, and overall migration. *International Journal of Biological Macromolecules*, *213*(April), 534–545.

Teepoo, S., Dawan, P., dan Barnthip, N. (2017). Electrospun chitosan-gelatin biopolymer composite nanofibers for horseradish peroxidase immobilization in a hydrogen peroxide biosensor. *Biosensors*, *7*(4), 47–58.

Teja, A. S., dan Koh, P. Y. (2009). Synthesis, properties, and applications of magnetic iron oxide nanoparticles. *Progress in Crystal Growth and Characterization of Materials*, *55*(1–2), 22–45.

Tiama, T. M., dan Elhaes, H. (2021). Application of chitosan/Fe_3O_4 nanocomposite as biosensor. *Letters in Applied NanoBioScience*, *10*(3), 2438–2445.

Trouillas, P., Marsal, P., Siri, D., Lazzaroni, R., dan Duroux, J. L. (2006). A DFT study of the reactivity of OH groups in quercetin and taxifolin antioxidants: The specificity of the 3-OH site. *Food Chemistry*, *97*(4), 679–688.

Usman, U. L., Singh, N. B., Allam, B. K., dan Banerjee, S. (2022). Plant extract mediated synthesis of Fe_3O_4-chitosan composite for the removal of lead ions

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
RONA CUANA, Dr.Eng. Edi Suharyadi, S.Si., M.Eng.
Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

from aqueous solution. *Materials Today: Proceedings*, *xxxx*, 3–12.

Veisi, H., Zohrabi, A., Kamangar, S. A., Karmakar, B., Saremi, S. G., Varmira, K., dan Hamelian, M. (2021). Green synthesis of Pd/ Fe_3O_4 nanoparticles using Chamomile extract as highly active and recyclable catalyst for Suzuki coupling reaction. *Journal of Organometallic Chemistry*, *951*, 122005.

Vigneshwaran, S., Sirajudheen, P., dan Meenakshi, S. (2022). Surface activated mesoporous Ag-Fe_3O_4 tethered chitosan nanomatrix heterojunction photocatalyst for organic dyes degradation: Performance, recycling, and mechanism. *Environmental Nanotechnology, Monitoring and Management*, *17*(January), 100654.

Vongsak, B., Sithisarn, P., Mangmool, S., Thongpraditchote, S., Wongkrajang, Y., dan 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.

Vunain, E., Mishra, A. K., dan Mamba, B. B. (2017). Fundamentals of chitosan for biomedical applications. *Chitosan Based Biomaterials* (Vol. 1). Elsevier.

Wang, J., Munir, A., Zhu, Z., dan Zhou, H. S. (2010). Magnetic nanoparticle enhanced surface plasmon resonance sensing and its application for the ultrasensitive detection of magnetic nanoparticle-enriched small molecules. *Analytical Chemistry*, *82*(16), 6782–6789.

Wang, J., Wang, F., Chen, H., Liu, X., dan Dong, S. (2008). Electrochemical surface plasmon resonance detection of enzymatic reaction in bilayer lipid membranes. *Talanta*, *75*(3), 666–670.

Wang, L., Liu, F., Pal, A., Ning, Y., Wang, Z., Zhao, B., Bradley, R., dan Wu, W. (2021). Ultra-small Fe_3O_4 nanoparticles encapsulated in hollow porous carbon nanocapsules for high performance supercapacitors. *Carbon*, *179*, 327–336.

Wang, X., Gogol, P., Cambril, E., dan Palpant, B. (2012). Near-and far-field effects on the plasmon coupling in gold nanoparticle arrays. *Journal of Physical Chemistry C*, *116*(46), 24741–24747.

Wang, X. Y., Jiang, X. P., Li, Y., Zeng, S., dan Zhang, Y. W. (2015). Preparation Fe_3O_4@chitosan magnetic particles for covalent immobilization of lipase from thermomyces lanuginosus. *International Journal of Biological Macromolecules*, *75*, 44–50.

Wang, Y., Dostalek, J., dan Knoll, W. (2011). Magnetic nanoparticle-enhanced biosensor based on grating-coupled surface plasmon resonance. *Analytical Chemistry*, *83*(16), 6202–6207.

Wen, W., Wu, L., Chen, Y., Qi, X., Cao, J., Zhang, X., Ma, W., Ge, Y., dan Shen, S. (2020). Ultra-small Fe_3O_4 nanoparticles for nuclei targeting drug delivery and photothermal therapy. *Journal of Drug Delivery Science and Technology*, *58*(March), 101782.

Wibowo, N. A., Juharni, J., Sabarman, H., dan Suharyadi, E. (2021). A spin-valve

UNIVERSITAS
GADJAH MADA
Green Synthesis Nanopartikel Fe3O4/kitosan dan Karakterisasi Mikrostruktural, Sifat Optik, Sifat Kemagnetan, dan Surface Plasmon Resonance
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Universitas Gadjah Mada, 2022 | Diunduh dari http://etd.repository.ugm.ac.id/

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.

Wijaya, E., Lenaerts, C., Maricot, S., Hastanin, J., Habraken, S., Vilcot, J. P., Boukherroub, R., dan Szunerits, S. (2011). Surface plasmon resonance-based biosensors: From the development of different SPR structures to novel surface functionalization strategies. *Current Opinion in Solid State and Materials Science*, *15*(5), 208–224.

Wu, X., Lu, C., Zhou, Z., Yuan, G., Xiong, R., dan Zhang, X. (2014). Green synthesis and formation mechanism of cellulose nanocrystal-supported gold nanoparticles with enhanced catalytic performance. *Environmental Science: Nano*, *1*(1), 71–79.

Wulandari, I. O., Santjojo, D. J. D. H., Shobirin, R. A., dan Sabarudin, A. (2017). Characteristics and magnetic properties of chitosan-coated Fe_3O_4 nanoparticles prepared by ex-situ co-precipitation method. *Rasayan Journal of Chemistry*, *10*(4), 1348–1358.

Yahya, I. M., Wardani, D. P., dan Suharyadi, E. (2019). Optical constant determination of crosslinked chitosan-polyethylene glycol (PEG) using attenuated total reflection method by surface plasmon resonance phenomenon. *IOP Conference Series: Materials Science and Engineering*, *546*(4), 042051.

Yang, H., Wang, S., Bian, H., Xing, X., Yu, J., Wu, X., Zhang, L., Liang, X., Lu, A., dan Huang, C. (2022). Extracellular matrix-mimicking nanofibrous chitosan microspheres as cell micro-ark for tissue engineering. *Carbohydrate Polymers*, *292*, 119693.

Yeamsuksawat, T., Zhao, H., dan Liang, J. (2021). Characterization and antimicrobial performance of magnetic Fe_3O_4@chitosan@Ag nanoparticles synthesized via suspension technique. *Materials Today Communications*, *28*(December 2020), 102481.

Yew, Y. P., Shameli, K., Miyake, M., Ahmad Khairudin, N. B. B., Mohamad, S. E. B., Naiki, T., dan Lee, K. X. (2020). Green biosynthesis of superparamagnetic magnetite Fe_3O_4 nanoparticles and biomedical applications in targeted anticancer drug delivery system: A review. *Arabian Journal of Chemistry*, *13*(1), 2287–2308.

Yew, Y. P., Shameli, K., Miyake, M., Kuwano, N., Bt Ahmad Khairudin, N. B., Bt Mohamad, S. E., dan Lee, K. X. (2016). Green synthesis of magnetite (Fe_3O_4) nanoparticles using seaweed (Kappaphycus alvarezii) extract. *Nanoscale Research Letters*, *11*(1), 276–283.

Yuan, C., Lou, Z., Wang, W., Yang, L., dan Li, Y. (2019). Synthesis of Fe_3C@C from pyrolysis of Fe_3O_4-lignin clusters and its application for quick and sensitive detection of PrP Sc through a sandwich SPR detection assay. *International Journal of Molecular Sciences*, *20*(3),741–752.

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H., Webster, T. J., dan Kuča, K. (2021). Green synthesis of Fe_3O_4 nanoparticles stabilized by a garcinia mangostana fruit peel extract for hyperthermia and anticancer activities. *International Journal of Nanomedicine*, *16*, 2515–2532.

Zadvarzi, S. B., Khavarpour, M., Vahdat, S. M., Baghbanian, S. M., dan Rad, A. S. (2021). Synthesis of Fe_3O_4@chitosan@ZIF-8 towards removal of malachite green from aqueous solution: Theoretical and experimental studies. *International Journal of Biological Macromolecules*, *168*, 428–441.

Zarnegar, Z., dan Safari, J. (2014). Fe_3O_4@chitosan nanoparticles: A valuable heterogeneous nanocatalyst for the synthesis of 2,4,5-trisubstituted imidazoles. *RSC Advances*, *4*(40), 20932–20939.

Zeng, S., Baillargeat, D., Ho, H. P., dan Yong, K. T. (2014). Nanomaterials enhanced surface plasmon resonance for biological and chemical sensing applications. *Chemical Society Reviews*, *43*(10), 3426–3452.

Zeng, S., Yu, X., Law, W. C., Zhang, Y., dan Yong, K. T. (2013). Size dependence of Au NP-enhanced surface plasmon resonance based on differential phase measurement. *Sensors and Actuators, B: Chemical*, *176*, 1128–1133.

Zhang, D., Zuo, X., Wang, P., Gao, W., dan Pan, L. (2020). Influence of chitosan modification on self - assembly behavior of - Fe_3O_4 nanoparticles. *Applied Nanoscience*.

Zhang, J., Xia, W., Liu, P., Cheng, Q., Tahirou, T., Gu, W., dan Li, B. (2010). Chitosan modification and pharmaceutical/biomedical applications. *Marine Drugs*, *8*(7), 1962–1987.

Zhang, M., Li, M., Zhao, Y., Xu, N., Peng, L., Wang, Y., dan Wei, X. (2021). Novel monoclonal antibody-sandwich immunochromatographic assay based on Fe_3O_4/Au nanoparticles for rapid detection of fish allergen parvalbumin. *Food Research International*, *142*(January), 110102.

Zhang, Q., Zou, X. N., dan Chu, L. Q. (2018). Surface plasmon resonance studies of the hybridization behavior of DNA-modified gold nanoparticles with surface-attached DNA probes. *Plasmonics*, *13*(3), 903–913.

Zhu, J., Xu, Z., Xu, W., Fu, D., dan Song, S. (2018). Light humidity sensor of surface plasmon resonance by symmetric metal film. *Plasmonics*, *13*(2), 681–686.

Zulfikar, M. A., Afrita, S., Wahyuningrum, D., dan Ledyastuti, M. (2016). Preparation of Fe_3O_4-chitosan hybrid nano-particles used for humic acid adsorption. *Environmental Nanotechnology, Monitoring and Management*, *6*, 64–75.

Zulfiqar, Afzal, S., Khan, R., Zeb, T., Rahman, M., Burhanullah, Ali, S., Khan, G., Rahman, Z. ur, dan Hussain, A. (2018). Structural, optical, dielectric and magnetic properties of PVP coated magnetite (Fe_3O_4) nanoparticles. *Journal of Materials Science: Materials in Electronics*, *29*(23), 20040–20050.