

DAFTAR PUSTAKA

- Aguilar-Mendez, M.A., Martin-Martinez, E.S., Ortega-Arroyo, L., Cobian-Portillo, G., and Sanchez-Espindola, E., 2011, Synthesis and Characterization of Silver Nanoparticles: Effect on Phytopathogen *Colletotrichum gloesporioides*, *J. Nanopart. Res.*, 13, 2525-2532.
- Alam, A., Ravindran, A., Chandran, P., and Khan, S.S., 2015, Highly Selective Colorimetric Detection and Estimation of Hg^{2+} at Nano-molar Concentration by Silver Nanoparticles in the Presence of Glutathione, *Spectrochim. Acta, Part A*, 138, 503-508.
- Al-Thabaiti, S.A., Al-Nowaiser, F.M., Obaid, A.Y., Al-Youbi, A.O., and Khan, Z., 2008, Formation and Characterization of Surfactant Stabilized Silver Nanoparticles: a Kinetic Study, *Colloids Surf., A*, 67, 230-237.
- Al-Thabaiti, S.A., Malik, M.A., Al-Youbi, A.A.O., Khan, Z., and Hussain, J.I., 2013, Effects of Surfactant and Polymer on the Morphology of Advanced Nanomaterials in Aqueous Solution, *Int. J. Electrochem. Sci.*, 8, 204-218.
- Ashkarran, A.A., 2010, a Novel Method for Synthesis of Colloidal Silver Nanoparticles by Arc Discharge in Liquid, *Curr. Appl. Phys.*, 10, 1442-1447.
- Castro-Aceituno, V., Ahn, S., Simu, S.Y., Singh, P., Mathiyalagan, R., Lee, H.A., and Yang, D.C., 2016, Anticancer Activity of Silver Nanoparticles from *Panax ginseng* Fresh Leaves in Human Cancer Cells, *Biomed. Pharmacother.*, 84, 158-165.
- Chen, D.H., and Huang Y.W., 2002, Spontaneous Formation of Ag Nanoparticles in Dimethylacetamide Solution of Poly(ethylene glycol), *J. Colloid Interface Sci.*, 255, 299-302.
- Chen, J.P. and Lim, L.L., 2002, Key Factors in Chemical Reduction by Hydrazine for Recovery of Precious Metals, *Chemosphere*, 49, 363-370.
- Cheon, J.Y., Kang, Y.O., and Park, W.H., 2015, Formation of Ag Nanoparticles in PVA Solution and Catalytic Activity of Their Electrospun PVA Nanofibers, *Fiber Polym.* 4, 16, 840-849.
- Chou, K.S. and Ren, C.Y., 2000, Synthesis of Nanosized Silver Particles by Chemical Reduction Method, *Mater. Chem. Phys.*, 64, 241-246.
- Chowdhury, I.P., Ghosh, S., Roy, M. and Naskar, M.K., 2015, Green Synthesis of Water-Dispersible Silver Nanoparticles at Room Temperature Using Green *carambola* (Star Fruit) Extract, *J. Sol-Gel. Sci. Technol.*, 73, 199-207.
- Creighton, J.A., Blatchford, C.G., and Albrecht, M.G., 1979, Plasma Resonance Enhancement of Raman Scattering by Pyridine Adsorbed on Silver or Gold Sol Particles of Size Comparable to the Excitation Wavelength, *J. Chem. Soc. Faraday Trans II*, 75, 798-800.

- Dadosh, T., 2009, Synthesis of Uniform Silver Nanoparticles With a Controllable Size, *Mater. Lett.*, 63, 2236-2238.
- Davidovic, S., Miljkovic, M., Lazic, V., Jovic, D., Jokic, B., Dimitrijevic, S. and Radetic, M., 2015, Impregnation of Cotton Fabric with Silver Nanoparticles Synthesized by Dextran Isolated from Bacterial Spesies *Leuconostoc mesenteroides* T3, *Carbohydr. Polym.*, 131, 331-336.
- de Moura, M.R., Mattoso, L.H.C. and Zucolotto, V., 2012, Development of Cellulose-Based Bactericidal Nanocomposites Containing Silver Nanoparticles and Their Use as Active Food Packaging, *J. Food Eng.*, 109, 520-524.
- Dubas, S.T. and Pimpan, V., 2008, Green Synthesis of Silver Nanoparticles for Ammonia Sensing, *Talanta*, 76, 29-33.
- Fanning, J.C., Brooks, B.C., Hoeglund, A.B., Pelletier, D.A., and Wadford, J.A., 2000, The Reduction of Nitrate and Nitrite Ions in Basic Solution With Sodium Borohydride in the Presence of Copper(II) Ions, *Inorg. Chim. Acta*, 310, 115-119.
- Farias, C.B.B., Silva, A.F., Rufino, R.D., Luna, J.M., Souza, J.E.G. and Sarubbo, L.A., 2014, Synthesis of Silver Nanoparticles Using a Biosurfactant Produced in Low-Cost Medium as Stabilizing Agent, *Electron. J. Biotechnol.*, 17, 122-125.
- Filipponi, L. and Sutherland, D., 2013, *Nanotechnologies: Principles, Applications, Implications and Hands-on Activities*, European Commission, Brussels.
- Ghorbani, H.R., Safekordi, A.A., Attar, H. and Rezayat, S.S.M., 2011, Biological and Non-biological Methods for Sliver Nanoparticles Synthesis, *Chem. Biochem. Eng.* 25, 317-326.
- Guo, H., and Tao, S., 2007, Silver Nanoparticles Doped Silica Nanocomposites Coated on an Optical Fiber for Ammonia Sensing, *Sens. Actuators, B*, 123, 578-582.
- Gurunathan, S., Kalishwaralal, K., Vaidyanathan, R., Deepak, V., Pandian, S.R.K., Muniyandi, J., Hariharan, N., and Eom, S.H., 2009, Biosynthesis, Purification and Characterization of Silver Nanoparticles Using *Escherichia coli*, *Colloids Surf., B*, 74, 328-335.
- Harits, A.A., Wahyuni, S., dan Priatmoko, S., 2014, Preparasi Nanopartikel Perak dengan Metode Reduksi dan Aplikasi sebagai Antibakteri Penyebab Infeksi, *Indo. J. Chem. Sci.*, 3, 1.
- He, B., Tan, J.J., Liew, K.Y., and Liu, H., 2004, Synthesis of Size Controlled Ag Nanoparticles, *J. Mol. Catal. A: Chem.*, 221, 121-126.
- Hebeish, A., El-Shafei, A., Sharaf, S., and Zaghoul, S., 2011, Novel Precursors for Green Synthesis and Application of Silver Nanoparticles in the Realm of Cotton Finishing, *Carbohydr. Polym.*, 84, 605-613.

- Ilic, V., Saponjic, Z., Vodnik, V., Potkonjak, B., Jovancic, P., Nedeljkovic, J., and Radetic, M., 2009, the Influence of Silver content on Antimicrobial Activity and Color of Cotton Fabrics Functionalized with Ag Nanoparticles, *Carbohydr. Polym.*, 78, 565-569.
- Janardhanan, R., Karuppaiah, M., Hebalkar, N., and Rao, T.N., 2009, Synthesis and Surface Chemistry of Nano Silver Particles, *Polyhedron*, 28, 2522-2530.
- Jang, S.J., Yang, I.J., Tettey, C.O., Kim, K.M., and Shin, H.M., 2016, In-vitro Anticancer Activity of Green Synthesis Silver Nanoparticles on MCF-7 Human Breast Cancer Cells, *Mater. Sci. Eng., C*, 68, 430-435.
- Khan, M.S., and Chaudhari, V.R., 2014, Morphological Effect on Fluorescence Behavior of Silver Nanoparticles, *J. Fluoresc.*, 24, 751-757.
- Khan, Z., Al-Thabaiti, S.A., El-Mossalamy, E.H., and Obaid, A.Y., 2009, Studies on the Kinetics of Growth of Silver Nanoparticles in Different Surfactant Solutions, *Colloids Surf. B Biointerfaces*, 73, 284-288.
- Khan, Z., Al-Thabaiti, S.A., Obaid, A.Y., and Al-Youbi, A.O., 2011, Preparation and Characterization of Silver Nanoparticles by Chemical Reduction Method, *Colloids Surf. B Biointerfaces*, 82, 513-517.
- Khanna, P.K., Singh, N., Charan, S., Subbarao, V.V.V.S., Gokhale, R., and Mulik, U.P., 2005, Synthesis and Characterization of Ag/PVA Nanocomposite by Chemical Reduction Method, *Mater. Chem. Phys.*, 93, 117-121.
- Khodashenas, B., and Ghorbani, H.R., 2015, Review Synthesis of Silver Nanoparticles With Different Shapes, *ARAB J CHEM*, xxx, xxx-xxx.
- Kumar, V.V., and Anthony, S.P., 2014, Silver Nanoparticles Based Selective Colorimetric Sensor for Cd^{2+} , Hg^{2+} and Pb^{2+} ions: Tuning Sensitivity Using Co-stabilizing Agents, *Sens. Actuators B Chem.*, 191, 31-36.
- Kvitek, L., Panacek, A., Sukupova, J., Kolar, M., Vecerova, R., Pucek, R., Holecova, M., and Zboril, R., 2008, Effect of Surfactants and Polymers on Stability and Antibacterial Activity of Silver Nanoparticles (NPs), *J. Phys. Chem. C*, 112, 5825-5834.
- Lee, K.J., Lee, Y., Shim, I., Jun, B.H., Cho, H.J., and Joung, J., 2007, Large-scale Synthesis of Polymer-stabilized Silver Nanoparticles, *Solid State Phenom*, 124-126, 1189-1192.
- Li, X., Zhang, J., Xu, W., Jia, H., Wang, X., Yang, B., Zhao, B., Li, B., and Ozaki, Y., 2003, Mercaptoacetic Acid-Capped Silver Nanoparticles Colloid: Formation, Morphology, and SERS Activity, *Langmuir*, 19, 4285-4290.
- Li, T., Park, H.G., and Choi, S.H., 2007, γ -Irradiation-induced Preparation of Ag and Au Nanoparticles and Their Characterizations, *Mater. Chem. Phys.*, 105, 325-330.



- Lou, X., Pan, H., Zhu, S., Zhu, C., Liao, Y., Li, Y., Zhang, D., and Chen, Z., 2015, Synthesis of Silver Nanoprisms on Reduced Graphene Oxide for High-Performance Catalyst, *Catal. Commun.*, 69, 43-47.
- Lu, Y.C., and Chou, K.S., 2008, A Simple and Effective Route for the Synthesis of Nano-silver Colloidal Dispersions, *J. Chin. Inst. Chem. Eng.*, 39, 673-678.
- Maillard, M., Giorgio, S., and Pileni, M.P., 2003, Tuning the Size of Silver Nanodisks with Similar Aspect Ratios: Synthesis and Optical properties, *J. Phys. Chem. B*, 107, 2466-2470.
- Marcelina, 2014, Analisis Fe^{3+} Secara Kolorimetri dengan Menggunakan Nanopartikel Perak Sebagai Agen Sensor, *Tesis*, Progam Pasca Sarjana Kimia Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Gadjah Mada.
- Martinez-Castanon, G.A., Nino-Martinez, N., Martinez-Guiterrez, F., Martinez-Mendoza, J.R., and Ruiz, F., 2008, Synthesis and Antibacterial Activity of Silver Nanoparticles with Different Sizes, *J. Nanopart. Res.*, 10(8), 1343-1348.
- Mattea, F., Vedelago, J., Malano, F., Gomez, C., Strumia, M.C., and Valente, M., 2017, Silver Nanoparticles in X-ray Biomedical Applications, *Radiat. Phys. Chem.*, 130, 442-460.
- Mellisani, B., 2016, Analisis Pb Sebagai Kompleks Pb(II)-Ditizon Secara Kolorimetri Berdasarkan Pada Respon Plasmonik Koloid Nanopartikel Perak, *Tesis*, Progam Pasca Sarjana Kimia Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Gadjah Mada.
- Mikac, L., Ivanda, M., Gotic, M., Mihelj, T., and Horvat, L., 2014, Synthesis and Characterization of Silver Colloidal Nanoparticles with Different Coatings for SERS Application, *J. Nanopart. Res.*, 16, 2748.
- Mirzaei, A., Janghorban, K., Hashemi, B., Bonyani, M., Leonardi, S.G., and Neri, G., 2016, Characterization and Optical Studies of PVP-Capped Silver Nanoparticles, *J. Nanostruct. Chem.*
- Nersisyan, H.H., Lee, J.H., Son, H.T., Won, C.W., and Maeng, D.Y., 2003, A New and Effective Chemical Reduction Method for Preparation of Nanosized Silver Powder and Colloid Dispersion, *Mater. Res. Bull.*, 38, 949-956.
- Nickel, U., Castell, A.Z., Poppl, K., and Schneider, S., 2000, A Silver Colloid Produced by Reduction with Hydrazine as Support for Highly Sensitive Surface-Enhanced Raman Spectroscopy, *Langmuir*, 16, 9087-9091.
- Njagi, E.C., Huang, H., Stafford, L., Genuino, H., Galindo, H.M., Collins, J.B., Hoag, G.E., and Suib, S.T., 2010, Biosynthesis of Iron and Silver Nanoparticle at Room Temperature Using Aqueous Sorghum Bran Extracts, *Langmuir*, 27(1), 264-271.

- Pal, S., Tak, Y.K., and Song, J.M., 2007, Does the Antibacterial Activity of Silver Nanoparticles Depend On the Shape of the Nanoparticle? A Study of the Gram-negative Bacterium *Escherichia coli*, *Appl. Environ. Microb.*, 73, 1712-1720.
- Pandey, S., Goswami, G.K., and Nanda, K.K., 2012, Green Synthesis of Biopolymer-Silver Nanoparticle Nanocomposite: An Optical Sensor for Ammonia Detection, *Int. J. Biol. Macromol.*, 51, 583-589.
- Park, C., 2015, *Nanoparticle Characterization Techniques*, Malvern Instruments Limited, Chester Country.
- Patil, R.S., Kokate, M.R., Jambhale, C.L., Pawar, S.M., Han, S.H., and Sokelar, S.S., 2012, One-pot Synthesis of PVA-capped Silver Nanoparticles Their Characterization and Biomedical Application, *Adv. Nat. Sci: Nanosci. Nanotechnol.*, 3, 015013.
- Qin, Y., Ji, X., Jing, J., Liu, H., Wu, H., and Yang, W., 2010, Size Control Over Spherical Silver Nanoparticles by Ascorbic Acid Reduction, *Colloids Surf. A Physicochem Eng. Asp.*, 372, 172-176.
- Ratyakshi and Chauhan, R.P., 2009, Colloidal Synthesis of Silver Nano Particles, *Asian J. Chem.*, 21, no 10.
- Reddy, A.S., Chen, C.Y., Baker, S.C., Chen, C.C., Jean, J.S., Fan, C.W., Chen, H.R., and Wang, J.C., 2009, Synthesis of Silver Nanoparticles using Surfactin: A Biosurfactant as Stabilizing Agent, *Mater. Lett.*, 63, 1227-1230.
- Salehi-Khojin, A., Jhong, H.M., Rosen, B.A., Zhu, W., Ma, S., Kenis, P.J.A., and Masel, R.I., 2013, Nanoparticle Silver Catalysts that Show Enhanced Activity for Carbon Dioxide Electrolysis, *J. Phys. Chem.*, 117, 1627-1632.
- Saputra, A.H., Haryono, A., Laksmono, J.A., dan Anshari, M.H., 2011, Preparasi Koloid Nanosilver dengan Berbagai Jenis Reduktor sebagai Bahan Anti Bakteri, *JUSAMI*, 3(12), 202-208.
- Saxena, A., Tripathi, R.M., Zafar, F., and Singh, P., 2012, Green Synthesis of Silver Nanoparticles using Aqueous Solution of *Ficus benghalensis* Leaf Extract and Characterization of Their Antibacterial Activity, *Mater. Lett.*, 67, 91-94.
- Seo, W.S., Kim, T.H., Sung, J.S., and Song, K.C., 2004, Synthesis of Silver Nanoparticles by Chemical Reduction Method, *Korean Chem. Eng.*, 42, 78-83.
- Sharma, V.K., Yngard, R.A., and Lin, Y., 2009, Silver Nanoparticles: Green Synthesis and Their Antimicrobial Activities, *Adv. Colloid Interface Sci.*, 145, 83-96.
- Shervani, Z., Ikushima, Y., Sato, M., Kawanami, H., Hakuta, Y., Yokohama, T., Negase, T., Kuneida, H., and Aramaki, K., 2008, Morphology and Size-



- controlled Synthesis of Silver Nanoparticles in Aqueous Surfactant Polymer Solutions, *Colloid Polym. Sci.*, 286, 403-410.
- Shon, Y.S., and Cutler, E., 2004, Aqueous Synthesis of Alkanethiolate-Protected Ag Nanoparticles Using Bunte Salts, *Langmuir*, 20, 6626-6630.
- Sileikaite, A., Prosycevas, I., Puiso, J., Juraitis, A., and Guobiene, A., 2006, Analysis of Silver Produced by Chemical Reduction of Silver Salt Solution, *Mater. Sci-Medzg.*, 14(12), 287-291.
- Singh, S., Bharti, A., and Meena, V.K., 2015, Green Synthesis of Multi-Shaped Silver Nanoparticles: Optical, Morphological and Antibacterial Properties, *J. Mater. Sci: Mater Electron*, 26, 3638-3648.
- Sinha, T., Ahmaruzzaman, M., and Bhattacharjee, A., 2014, A Simple Approach for the Synthesis of Silver Nanoparticles and Their Application as a Catalyst for Photodegradation of Methyl Violet 6B Dye Under Solar Irradiation, *JECE*, 2, 2269-2279.
- Sondi, I., and Sondi, B.S., 2004, Silver Nanoparticles as Antimicrobial Agent: a Case Study on *E. coli* as a Model for Gram-negative Bacteria, *J. Colloid Interface Sci.*, 275, 177-182.
- Sondi, I., Goia, D.V., and Matijevic, E., 2003, Preparation of Highly Concentrated Stable Dispersions of Uniform Silver nanoparticles, *J. Colloid Interface Sci.*, 260, 75-81.
- Song, K.C., Lee, S.M., Park, T.S., and Lee, B.S., 2009, Preparation of Colloidal Silver Nanoparticles by Chemical Reduction Method, *Korean J. Chem. Eng.*, 26, 153-155.
- Stevanovic, M., Savanovic, I., Uskokovic, V., Skapin, S.D., Bracko, I., Javanovic, U., and Uskokovic, D., 2012, A New, Simple, Green, and One-pot Four-component Synthesis of bare and Poly(α,γ -L-glutamic acid)-capped Silver Nanoparticles, *Colloid Polym. Sci.*, 290, 221-231.
- Suber, L., Sondi, I., Matijevic, E., and Goia D.V., 2005, Preparation and the Mechanisms of Formation of Silver Particles of Different Morphologies in Homogeneous Solutions, *J. Colloid Interface Sci.*, 288, 489-495.
- Sun, L., Zhang, Z., and Dang, H., 2003, A Novel Method for Preparation of Silver Nanoparticles, *Mater. Lett.*, 57, 3874-3879.
- Tan, K.S., and Cheong, K.Y., 2013, Advances of Ag, Cu, and Ag-Cu Alloy Nanoparticles Synthesis Via Chemical Reduction Route, *J. Nanopart. Res.*, 15, 1537.
- Tan, Y., Li, Y., and Zhu, D., 2003, Preparation of Silver Nanocrystals In the Presence of Aniline, *J. Colloid Interface Sci.*, 258, 244-251.
- Tang, B., Wang, J., Xu, S., Afrin, T., Xu, W., Sun, L., and Wang, X., 2011, Application of Anisotropic Silver Nanoparticles: Multifunctionalization of Wool Fabric, *J. Colloid Interface Sci.*, 356, 513-518.



- Tankhiwale, R., and Bajpai, S.K., 2009, Graft Copolymerization Onto Cellulose-based Filter Paper and Its Furthe Development as Silver Nanoparticles Loaded Antibacterial Food-packaging Material, *Colloids Surf, B Biointerface*, 69, 164-168.
- Tolaymat, T.M., El Badawy, A.M., Genaidy, A., Scheckel, K.G., Luxton, T.P., Suidan, M., 2010, An Evidence-based Environmental Prespective of Manufactured Silver Nanoparticle on Syntheses and Applications: A Systematic Review and Critical Appraisal of Peer-reviewed Scientific Papers, *Sci. Total Environ.* 408, 999-1006.
- van Hyning, D.L., Klemperer, W.G., and Zukoski, C.F., 2001, Silver Nanoparticle Formation: Predictions and Verification of the Aggregative Growth Model, *Langmuir*, 17, 3128-3135.
- Vidhu, V.K., and Philip, D., 2014, Catalytic Degradation of Organic Dyes Using Biosynthesized Silver Nanoparticles, *Micron*, 56, 54-62.
- Wang, H., Qiao, X., Chen, J., and Ding, S., 2005, Preparation of Silver Nanoparticles by Chemical Reduction Method, *Colloids Surf. A Physicochem Eng. Asp.*, 256, 111-115.
- Wiley, B.J., Chen, Y., McLellan, J.M., Xiong, Y., Li, Z.Y., Ginger, D., and Xia, Y., 2007, Synthesis and Optical Properties of Silver Nanobars and Nanorice, *Nano. Lett.*, 7, 1032-1036.
- Xu, R., 2008, Proggess In Nanoparticles Characterization: Sizing and Zeta Potential Measurement, *Particuology*, 6, 112-115.
- Yu, L., and Zhang, Y., 2010, Preparation of Nano-silver Flake by Chemical Reduction Method, *Rare Metal Eng.*, 39, 401-404.
- Zielinska, A., Skwarek, E., Zaleska, A., Gazda, M., and Hupka, J., 2009, Preparation of Silver Nanoparticles With Controlled Particle Size, *Procedia Chem.*, 1, 1560-1566.