

References

References

- Ahluwalia, S., Prakash, N.T., Prakash, R., Pal, B., 2016. Improved degradation of methyl orange dye using bio-co-catalyst Se nanoparticles impregnated ZnS photocatalyst under UV irradiation. *Chemical Engineering Journal* 306, 1041–1048.
- Ahmad, J., Majid, K., Dar, M.A., 2018. Controlled synthesis of p-type NiO/n-type GO nanocomposite with enhanced photocatalytic activity and study of temperature effect on the photocatalytic activity of the nanocomposite. *Applied Surface Science* 457, 417–426.
- Ahmad, R., Ahmad, Z., Khan, A.U., Mastoi, N.R., Aslam, M., Kim, J., 2016. Photocatalytic systems as an advanced environmental remediation: Recent developments, limitations and new avenues for applications. *Journal of Environmental Chemical Engineering* 4, 4143–4164.
- Ahmad, Z., Afzal, A.M., Khan, M.F., Manzoor, A., Khalil, H.M.W., Aftab, S., 2019. Copper-Doped Nickel-Oxide Nanoparticles for Photocatalytic Degradation of Eriochrome Black-T and Methylene Blue and Its Solar Cell Applications. *Journal of Nanoelectronics and Optoelectronics* 14, 1304–1312.
- Ai, L., Zeng, Y., 2013. Hierarchical porous NiO architectures as highly recyclable adsorbents for effective removal of organic dye from aqueous solution. *Chemical Engineering Journal* 215–216, 269–278.
- Al Abri, R., Al Marzouqi, F., Kuvarega, A.T., Meetani, M.A., Al Kindy, S.M.Z., Karthikeyan, S., Kim, Y., Selvaraj, R., 2019. Nanostructured cerium-doped ZnO for photocatalytic degradation of pharmaceuticals in aqueous solution. *Journal of Photochemistry and Photobiology A: Chemistry* 384, 112065.
- Alagiri, M., Ponnusamy, S., Muthamizhchelvan, C., 2012. Synthesis and characterization of

- NiO nanoparticles by sol–gel method. *J Mater Sci: Mater Electron* 23, 728–732.
- Alderman, D.J., Clifton-Hadley, R.S., 1993. Malachite green: a pharmacokinetic study in rainbow trout, *Oncorhynchus mykiss* (Walbaum). *Journal of Fish Diseases* 16, 297–311.
- Alrebdi, T.A., Ahmed, H.A., Alrefae, S.H., Pashameah, R.A., Toghan, A., Mostafa, A.M., Alkallas, F.H., A. Rezk, R., 2022. Enhanced adsorption removal of phosphate from water by Ag-doped PVA-NiO nanocomposite prepared by pulsed laser ablation method. *Journal of Materials Research and Technology* 20, 4356–4364.
- Altın, İ., Sökmen, M., 2014. Preparation of TiO₂-polystyrene photocatalyst from waste material and its usability for removal of various pollutants. *Applied Catalysis B: Environmental* 144, 694–701.
- Andreozzi, R., Caprio, V., Insola, A., Marotta, R., 1999. Advanced oxidation processes (AOP) for water purification and recovery. *Catalysis Today* 53, 51–59.
- Ansari, F., Sobhani, A., Salavati-Niasari, M., 2016. PbTiO₃/PbFe₁₂O₁₉ nanocomposites: Green synthesis through an eco-friendly approach. *Composites Part B: Engineering* 85, 170–175.
- Appusamy, A., John, I., Ponnusamy, K., Ramalingam, A., 2014. Removal of crystal violet dye from aqueous solution using triton X-114 surfactant via cloud point extraction. *Engineering Science and Technology, an International Journal* 17, 137–144.
- Arsalani, N., Bazazi, S., Abuali, M., Jodeyri, S., 2020. A new method for preparing ZnO/CNT nanocomposites with enhanced photocatalytic degradation of malachite green under visible light. *Journal of Photochemistry and Photobiology A: Chemistry* 389, 112207.

References

- Ashok Kumar Reddy, Y., Sivasankar Reddy, A., Sreedhara Reddy, P., 2014. Effect of oxygen partial pressure on the properties of NiO–Ag composite films grown by DC reactive magnetron sputtering. *Journal of Alloys and Compounds* 583, 396–403.
- Aydoghmish, S.M., Hassanzadeh-Tabrizi, S.A., Saffar-Teluri, A., 2019. Facile synthesis and investigation of NiO–ZnO–Ag nanocomposites as efficient photocatalysts for degradation of methylene blue dye. *Ceramics International* 45, 14934–14942.
- Bagtache, R., Sebai, I., Abdmeziem, K., Trari, M., 2019. Visible light induced H₂ evolution on the hetero-junction Ag/NiO prepared by nitrate route. *Solar Energy* 177, 652–656.
- Bai, X., Zong, R., Li, C., Liu, D., Liu, Y., Zhu, Y., 2014. Enhancement of visible photocatalytic activity via Ag@C₃N₄ core–shell plasmonic composite. *Applied Catalysis B: Environmental* 147, 82–91.
- Baig, U., Khan, A., Gondal, M.A., Dastageer, M.A., Falath, W.S., 2020a. Laser Induced Anchoring of Nickel Oxide Nanoparticles on Polymeric Graphitic Carbon Nitride Sheets Using Pulsed Laser Ablation for Efficient Water Splitting under Visible Light. *Nanomaterials* 10, 1098.
- Baig, U., Uddin, M.K., Gondal, M.A., 2020b. Removal of hazardous azo dye from water using synthetic nano adsorbent: Facile synthesis, characterization, adsorption, regeneration and design of experiments. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 584, 124031.
- Bansal, P., Bhullar, N., Sud, D., 2009. Studies on photodegradation of malachite green using TiO₂/ZnO photocatalyst. *Desalination and Water Treatment* 12, 108–113.
- Barilari, A., Quiroz Londoño, M., Paris, M. del C., Lima, M.L., Massone, H.E., 2020. Groundwater contamination from point sources. A hazard index to protect water

References

- supply wells in intermediate cities. *Groundwater for Sustainable Development* 10, 100363.
- Barreca, D., Ferrucci, A.P., Gasparotto, A., Maccato, C., Maragno, C., Tondello, E., 2007. Temperature-Controlled Synthesis and Photocatalytic Performance of ZnO Nanoplatelets. *Chemical Vapor Deposition* 13, 618–625.
- Benitez, F.J., Real, F.J., Acero, J.L., Garcia, C., Llanos, E.M., 2007. Kinetics of phenylurea herbicides oxidation by Fenton and photo-Fenton processes. *Journal of Chemical Technology & Biotechnology* 82, 65–73.
- Bolton, J.R., Bircher, K.G., Tumas, W., Tolman, C.A., 1996. Figures-of-Merit for the Technical Development and Application of Advanced Oxidation Processes. *Journal of Advanced Oxidation Technologies* 1, 13–17.
- Buazar, F., Bavi, M., Kroushawi, F., Halvani, M., Khaledi-Nasab, A., Hossieni, S.A., 2016. Potato extract as reducing agent and stabiliser in a facile green one-step synthesis of ZnO nanoparticles. *Journal of Experimental Nanoscience* 11, 175–184.
- Bussi, J., Ohanian, M., Vázquez, M., Dalchiele, E.A., 2002. Photocatalytic Removal of Hg from Solid Wastes of Chlor-Alkali Plant. *J. Environ. Eng.* 128, 733–739.
- Castañeda, C., Alvarado, I., Martínez, J.J., Brijaldo, M.H., Passos, F.B., Rojas, H., 2019. Enhanced photocatalytic reduction of 4-nitrophenol over Ir/CeO₂ photocatalysts under UV irradiation. *Journal of Chemical Technology & Biotechnology* 94, 2630–2639.
- Chen, Abraham.S.C., Snoeyink, V.L., Mallevialle, J., Fiessinger, F., 1989. Activated Alumina for Removing Dissolved Organic Compounds. *Journal - American Water Works Association* 81, 53–60.

References

- Chen, C., Zheng, Y., Zhan, Y., Lin, X., Zheng, Q., Wei, K., 2011. Enhanced Raman scattering and photocatalytic activity of Ag/ZnO heterojunction nanocrystals. *Dalton Transactions* 40, 9566–9570.
- Chen, C.C., Lu, C.S., Chung, Y.C., Jan, J.L., 2007. UV light induced photodegradation of malachite green on TiO₂ nanoparticles. *Journal of Hazardous Materials* 141, 520–528.
- Chen, D., Sivakumar, M., Ray, A.K., 2008. Heterogeneous Photocatalysis in Environmental Remediation. *Dev. Chem. Eng. Mineral Process.* 8, 505–550.
- Cheng, W., Wang, S.-G., Lu, L., Gong, W.-X., Liu, X.-W., Gao, B.-Y., Zhang, H.-Y., 2008. Removal of malachite green (MG) from aqueous solutions by native and heat-treated anaerobic granular sludge. *Biochemical Engineering Journal* 39, 538–546.
- Chong, M.N., Jin, B., Chow, C.W.K., Saint, C., 2010. Recent developments in photocatalytic water treatment technology: A review. *Water Research* 44, 2997–3027.
- Clark, M., 2011. *Handbook of Textile and Industrial Dyeing: Principles, Processes and Types of Dyes*. Elsevier.
- Crini, G., Peindy, H.N., Gimbert, F., Robert, C., 2007. Removal of C.I. Basic Green 4 (Malachite Green) from aqueous solutions by adsorption using cyclodextrin-based adsorbent: Kinetic and equilibrium studies. *Separation and Purification Technology* 53, 97–110.
- Cui, W., An, W., Liu, L., Hu, J., Liang, Y., 2014. Synthesis of CdS/BiOBr composite and its enhanced photocatalytic degradation for Rhodamine B. *Applied Surface Science, Photocatalytic materials for energy and environmental applications* 319, 298–305.
- Dai, W., Pan, X., Chen, S., Chen, C., Wen, Z., Zhang, H., Ye, Z., 2014. Honeycomb-like NiO/ZnO heterostructured nanorods: photochemical synthesis, characterization, and

References

- enhanced UV detection performance. *Journal of Materials Chemistry C* 2, 4606–4614.
- Darwish, A.A.A., Rashad, M., AL-Aoh, H.A., 2019. Methyl orange adsorption comparison on nanoparticles: Isotherm, kinetics, and thermodynamic studies. *Dyes and Pigments* 160, 563–571.
- Das, A., Dey, A., 2020. P-Nitrophenol -Bioremediation using potent *Pseudomonas* strain from the textile dye industry effluent. *Journal of Environmental Chemical Engineering* 8, 103830.
- Dermenci, K.B., Genc, B., Ebin, B., Olmez-Hanci, T., Gürmen, S., 2014. Photocatalytic studies of Ag/ZnO nanocomposite particles produced via ultrasonic spray pyrolysis method. *Journal of Alloys and Compounds* 586, 267–273.
- Ding, Y., Wang, Y., Su, L., Zhang, H., Lei, Y., 2010. Preparation and characterization of NiO – Ag nanofibers, NiO nanofibers, and porous Ag : towards the development of a highly sensitive and selective non-enzymatic glucose sensor. *Journal of Materials Chemistry* 20, 9918–9926.
- Divband, B., Khatamian, M., Eslamian, G.R.K., Darbandi, M., 2013. Synthesis of Ag/ZnO nanostructures by different methods and investigation of their photocatalytic efficiency for 4-nitrophenol degradation. *Applied Surface Science* 284, 80–86.
- Dong, Q., Yin, S., Guo, C., Wu, X., Kumada, N., Takei, T., Miura, A., Yonesaki, Y., Sato, T., 2014. Single-crystalline porous NiO nanosheets prepared from β -Ni(OH)₂ nanosheets: Magnetic property and photocatalytic activity. *Applied Catalysis B: Environmental* 147, 741–747.
- Duda, A.M., 1993. Addressing Nonpoint Sources of Water Pollution Must Become an

References

- International Priority. Water Science and Technology 28, 1–11.
- Dupin, J.-C., Gonbeau, D., Vinatier, P., Levasseur, A., 2000. Systematic XPS studies of metal oxides, hydroxides and peroxides. *Phys. Chem. Chem. Phys.* 2, 1319–1324.
- Elango, G., Roopan, S.M., 2016. Efficacy of SnO₂ nanoparticles toward photocatalytic degradation of methylene blue dye. *Journal of Photochemistry and Photobiology B: Biology* 155, 34–38.
- El-Kemary, M., Nagy, N., El-Mehasseb, I., 2013. Nickel oxide nanoparticles: Synthesis and spectral studies of interactions with glucose. *Materials Science in Semiconductor Processing* 16, 1747–1752.
- Faisal, M., Harraz, F.A., Ismail, A.A., El-Toni, A.M., Al-Sayari, S.A., Al-Hajry, A., Al-Assiri, M.S., 2018. Novel mesoporous NiO/TiO₂ nanocomposites with enhanced photocatalytic activity under visible light illumination. *Ceramics International* 44, 7047–7056.
- Fenton, H.J.H., 1894. LXXIII.—Oxidation of tartaric acid in presence of iron. *J. Chem. Soc., Trans.* 65, 899–910.
- Ferrari-Lima, A.M., de Souza, R.P., Mendes, S.S., Marques, R.G., Gimenes, M.L., Fernandes-Machado, N.R.C., 2015. Photodegradation of benzene, toluene and xylenes under visible light applying N-doped mixed TiO₂ and ZnO catalysts. *Catalysis Today*, Symposium “Catalysis for pollution treatment” of the 11th edition of the Europacat Congress in Catalysis (EUROPACAT XI), Lyon, France 241, 40–46.
- Fox, M.Anne., Dulay, M.T., 1993. Heterogeneous photocatalysis. *Chem. Rev.* 93, 341–357.
- Fragua, D., Noguera-Gomez, J., J. Rodríguez-Canto, P., M. Valencia, L., Mata, M. de la,

References

- Herrera, M., I. Molina, S., Abargues, R., 2020. Au–NiOx nanocomposite for hot electron-assisted plasmonic photocatalysis. *Journal of Materials Chemistry C* 8, 9885–9897.
- Fu, F., Lin, L., Xu, E., 2017. Functional pretreatments of natural raw materials, in: *Advanced High Strength Natural Fibre Composites in Construction*. Elsevier, pp. 87–114.
- Fu, J., Xu, Q., Low, J., Jiang, C., Yu, J., 2019. Ultrathin 2D/2D WO₃/g-C₃N₄ step-scheme H₂-production photocatalyst. *Applied Catalysis B: Environmental* 243, 556–565.
- Fu, Y., Huang, T., Zhang, L., Zhu, J., Wang, X., 2015. Ag/g-C₃N₄ catalyst with superior catalytic performance for the degradation of dyes: a borohydride-generated superoxide radical approach. *Nanoscale* 7, 13723–13733.
- Fu, Y., Liu, C., Zhu, C., Wang, H., Dou, Y., Shi, W., Shao, M., Huang, H., Liu, Y., Kang, Z., 2018. High-performance NiO/g-C₃N₄ composites for visible-light-driven photocatalytic overall water splitting. *Inorganic Chemistry Frontiers* 5, 1646–1652.
- Fujihara, K., Izumi, S., Ohno, T., Matsumura, M., 2000. Time-resolved photoluminescence of particulate TiO₂ photocatalysts suspended in aqueous solutions. *Journal of Photochemistry and Photobiology A: Chemistry* 132, 99–104.
- Fujishima, A., Honda, K., 1972. Electrochemical Photolysis of Water at a Semiconductor Electrode. *Nature* 238, 37–38.
- Fujishima, A., Rao, T.N., Tryk, D.A., 2000. Titanium dioxide photocatalysis. *Journal of Photochemistry and Photobiology C: Photochemistry Reviews* 1, 1–21.
- Gan, Y.X., Jayatissa, A.H., Yu, Z., Chen, X., Li, M., 2020. Hydrothermal Synthesis of Nanomaterials. *Journal of Nanomaterials* 2020, e8917013.
- Ghazal, S., Akbari, A., Hosseini, H.A., Sabouri, Z., Forouzanfar, F., Khatami, M., Darroudi,

References

- M., 2020a. Sol-gel biosynthesis of nickel oxide nanoparticles using *Cydonia oblonga* extract and evaluation of their cytotoxicity and photocatalytic activities. *Journal of Molecular Structure* 1217, 128378.
- Ghazal, S., Akbari, A., Hosseini, H.A., Sabouri, Z., Forouzanfar, F., Khatami, M., Darroudi, M., 2020b. Biosynthesis of silver-doped nickel oxide nanoparticles and evaluation of their photocatalytic and cytotoxicity properties. *Appl. Phys. A* 126, 480.
- Giannakis, S., Rtimi, S., Pulgarin, C., 2017. Light-Assisted Advanced Oxidation Processes for the Elimination of Chemical and Microbiological Pollution of Wastewaters in Developed and Developing Countries. *Molecules* 22, 1070.
- Gomathi Devi, L., Girish Kumar, S., Mohan Reddy, K., Munikrishnappa, C., 2009. Photo degradation of Methyl Orange an azo dye by Advanced Fenton Process using zero valent metallic iron: Influence of various reaction parameters and its degradation mechanism. *Journal of Hazardous Materials* 164, 459–467.
- Gómez-Solís, C., Oliva, J., Diaz-Torres, L.A., Bernal-Alvarado, J., Reyes-Zamudio, V., Abidov, A., Torres-Martinez, L.M., 2019. Efficient photocatalytic activity of MSnO_3 (M: Ca, Ba, Sr) stannates for photoreduction of 4-nitrophenol and hydrogen production under UV light irradiation. *Journal of Photochemistry and Photobiology A: Chemistry* 371, 365–373.
- Gondal, M.A., Sayeed, M.N., 2007. Laser-enhanced photocatalytic degradation of organic pollutants from water using ZnO semiconductor catalyst. *Journal of Environmental Science and Health, Part A* 43, 70–77.
- Guo, J., Fu, W., Yang, H., Yu, Q., Zhao, W., Zhou, X., Sui, Y., Ding, J., Li, Y., Cheng, S., Li, M., 2010. A NiO/TiO_2 junction electrode constructed using self-organized TiO_2

References

- nanotube arrays for highly efficient photoelectrocatalytic visible light activations. *J. Phys. D: Appl. Phys.* 43, 245202.
- Gupta, S., Tripathi, M., 2012. A review on the synthesis of TiO₂ nanoparticles by solution route. *Open Chemistry* 10, 279–294.
- Gupta, V.K., Mittal, A., Jain, R., Mathur, M., Sikarwar, S., 2006. Adsorption of Safranin-T from wastewater using waste materials— activated carbon and activated rice husks. *Journal of Colloid and Interface Science* 303, 80–86.
- Gupta, V.K., Saravanan, R., Agarwal, S., Gracia, F., Khan, M.M., Qin, J., Mangalaraja, R.V., 2017. Degradation of azo dyes under different wavelengths of UV light with chitosan-SnO₂ nanocomposites. *Journal of Molecular Liquids* 232, 423–430.
- Hameed, A., Gombac, V., Montini, T., Graziani, M., Fornasiero, P., 2009a. Synthesis, characterization and photocatalytic activity of NiO–Bi₂O₃ nanocomposites. *Chemical Physics Letters* 472, 212–216.
- Hameed, A., Montini, T., Gombac, V., Fornasiero, P., 2009b. Photocatalytic decolourization of dyes on NiO–ZnO nano-composites. *Photochem Photobiol Sci* 8, 677–682.
- Han, F., Kambala, V.S.R., Srinivasan, M., Rajarathnam, D., Naidu, R., 2009. Tailored titanium dioxide photocatalysts for the degradation of organic dyes in wastewater treatment: A review. *Applied Catalysis A: General* 359, 25–40.
- Hassanpour, M., Safardoust-Hojaghan, H., Salavati-Niasari, M., Yeganeh-Faal, A., 2017. Nano-sized CuO/ZnO hollow spheres: synthesis, characterization and photocatalytic performance. *J Mater Sci: Mater Electron* 28, 14678–14684.
- Hayat, K., Gondal, M.A., Khaled, M.M., Ahmed, S., 2011. Effect of operational key parameters on photocatalytic degradation of phenol using nano nickel oxide

References

- synthesized by sol–gel method. *Journal of Molecular Catalysis A: Chemical* 336, 64–71.
- He, K., Guo, L., 2017. NiS modified CdS pyramids with stacking fault structures: Highly efficient and stable photocatalysts for hydrogen production from water. *International Journal of Hydrogen Energy* 42, 23995–24005.
- Henni, A., Harfouche, N., Karar, A., Zerrouki, D., Perrin, F.X., Rosei, F., 2019. Synthesis of graphene–ZnO nanocomposites by a one-step electrochemical deposition for efficient photocatalytic degradation of organic pollutant. *Solid State Sciences* 98, 106039.
- Hernández-Gordillo, A., Obregón, S., Paraguay-Delgado, F., Rodríguez-González, V., 2015. Effective photoreduction of a nitroaromatic environmental endocrine disruptor by AgNPs functionalized on nanocrystalline TiO₂. *RSC Advances* 5, 15194–15197.
- Herrmann, J.-M., 1999. Heterogeneous photocatalysis: fundamentals and applications to the removal of various types of aqueous pollutants. *Catalysis Today* 53, 115–129.
- Hoffmann, M.R., Martin, S.T., Choi, W., Bahnemann, D.W., 1995. Environmental Applications of Semiconductor Photocatalysis. *Chem. Rev.* 95, 69–96.
- Hogan, C.M., 2010. Water pollution. *Encyclopedia of earth*. Red. CJ Cleveland. Environmental Information Coalition, National Council for Science and the Environment, Washington DC.
- Hu, X., Wang, X., Ban, Y., Ren, B., 2011. A comparative study of UV–Fenton, UV–H₂O₂ and Fenton reaction treatment of landfill leachate. *Environmental Technology* 32, 945–951.
- Huang, Z., Sun, Q., Lv, K., Zhang, Z., Li, M., Li, B., 2015. Effect of contact interface between TiO₂ and g-C₃N₄ on the photoreactivity of g-C₃N₄/TiO₂ photocatalyst: (001)

References

- vs (101) facets of TiO₂. Applied Catalysis B: Environmental 164, 420–427.
- Hussein, A.M., Mahoney, L., Peng, R., Kibombo, H., Wu, C.-M., Koodali, R.T., Shende, R., 2013. Mesoporous coupled ZnO/TiO₂ photocatalyst nanocomposites for hydrogen generation. Journal of Renewable and Sustainable Energy 5, 033118.
- Iorhemen, O.T., Hamza, R.A., Tay, J.H., 2016. Membrane Bioreactor (MBR) Technology for Wastewater Treatment and Reclamation: Membrane Fouling. Membranes 6, 33.
- Jahurul Islam, M., Amaranatha Reddy, D., Choi, J., Kyu Kim, T., 2016. Surface oxygen vacancy assisted electron transfer and shuttling for enhanced photocatalytic activity of a Z-scheme CeO₂–AgI nanocomposite. RSC Advances 6, 19341–19350.
- Jain, R., Gupta, V.K., Sikarwar, S., 2010. Adsorption and desorption studies on hazardous dye Naphthol Yellow S. Journal of Hazardous Materials 182, 749–756.
- Jansi Rani, B., Aiswarya Kanjana, P., Ravi, G., Yuvakkumar, R., Saravanakumar, B., 2019. Superior electrochemical water oxidation of novel NiS@FeS₂ nanocomposites. Materials Science in Semiconductor Processing 101, 174–182.
- Jo, W.-K., Clament Sagaya Selvam, N., 2015. Enhanced visible light-driven photocatalytic performance of ZnO–g-C₃N₄ coupled with graphene oxide as a novel ternary nanocomposite. Journal of Hazardous Materials 299, 462–470.
- Kale, D., Thakur, P., 2015. Highly efficient photocatalytic degradation and mineralization of 4-nitrophenol by graphene decorated ZnO. J Porous Mater 22, 797–806.
- Kale, M.J., Avanesian, T., Christopher, P., 2014. Direct Photocatalysis by Plasmonic Nanostructures. ACS Catal. 4, 116–128.
- Kim, K.S., Davis, R.E., 1972. Electron spectroscopy of the nickel-oxygen system. Journal of Electron Spectroscopy and Related Phenomena 1, 251–258.

References

- Kim, S.-I., Lee, J.-S., Ahn, H.-J., Song, H.-K., Jang, J.-H., 2013. Facile Route to an Efficient NiO Supercapacitor with a Three-Dimensional Nanonetwork Morphology. *ACS Appl. Mater. Interfaces* 5, 1596–1603.
- Kitsiou, V., Filippidis, N., Mantzavinos, D., Poullos, I., 2009. Heterogeneous and homogeneous photocatalytic degradation of the insecticide imidacloprid in aqueous solutions. *Applied Catalysis B: Environmental* 86, 27–35.
- Kiurski, J., Marić, B., Adamović, D., Mihailović, A., Grujić, S., Oros, I., Krstić, J., 2012. Register of hazardous materials in printing industry as a tool for sustainable development management. *Renewable and Sustainable Energy Reviews* 16, 660–667.
- Klug, H.P., Alexander, L.E., 1974. X-Ray Diffraction Procedures: For Polycrystalline and Amorphous Materials, 2nd Edition, X-Ray Diffraction Procedures: For Polycrystalline and Amorphous Materials.
- Kookana, R.S., Rogers, S.L., 1995. Effects of Pulp Mill Effluent Disposal on Soil. *Reviews of Environmental Contamination and Toxicology* 13–64.
- Kudo, A., Miseki, Y., 2009. Heterogeneous photocatalyst materials for water splitting. *Chem. Soc. Rev.* 38, 253–278.
- Kumar, A., Rout, L., Achary, L.S.K., Mohanty, A., Marpally, J., Chand, P.K., Dash, P., 2016. Design of binary SnO₂-CuO nanocomposite for efficient photocatalytic degradation of malachite green dye. Presented at the 5th NATIONAL CONFERENCE ON THERMOPHYSICAL PROPERTIES: (NCTP-09), Baroda (India), p. 020027.
- Kumar, V., Prakash, J., Singh, J.P., Chae, K.H., Swart, C., Ntwaeaborwa, O.M., Swart, H.C., Dutta, V., 2017. Role of silver doping on the defects related photoluminescence and antibacterial behaviour of zinc oxide nanoparticles. *Colloids and Surfaces B:*

References

- Biointerfaces 159, 191–199.
- Kuşçu, Ö.S., Sponza, D.T., 2009. Kinetics of para-nitrophenol and chemical oxygen demand removal from synthetic wastewater in an anaerobic migrating blanket reactor. *Journal of Hazardous Materials* 161, 787–799.
- L, N.M., A, E.B.K., M, S.N., H, S., 2015. Synthesis And Characterization Of SnO_2 Nanostructures Prepared By A Facile Precipitation Method 5, 47–53.
- Labani, M.M., Rezaee, R., Saeedi, A., Hinai, A.A., 2013. Evaluation of pore size spectrum of gas shale reservoirs using low pressure nitrogen adsorption, gas expansion and mercury porosimetry: A case study from the Perth and Canning Basins, Western Australia. *Journal of Petroleum Science and Engineering* 112, 7–16.
- Langergraber, G., Muellegger, E., 2005. Ecological Sanitation—a way to solve global sanitation problems? *Environment International* 31, 433–444.
- Langford, J.I., Wilson, A.J.C., 1978. Scherrer after sixty years: A survey and some new results in the determination of crystallite size. *J Appl Cryst* 11, 102–113.
- Lee, H.J., Kim, J.H., Park, S.S., Hong, S.S., Lee, G.D., 2015. Degradation kinetics for photocatalytic reaction of methyl orange over Al-doped ZnO nanoparticles. *Journal of Industrial and Engineering Chemistry* 25, 199–206.
- Lee, W.-W., Chung, W.-H., Lu, C.-S., Lin, W.-Y., Chen, C.-C., 2012. A study on the degradation efficiency and mechanisms of ethyl violet by HPLC–PDA–ESI–MS and GC–MS. *Separation and Purification Technology* 98, 488–496.
- Li, T., Zhao, L., He, Y., Cai, J., Luo, M., Lin, J., 2013. Synthesis of $\text{g-C}_3\text{N}_4/\text{SmVO}_4$ composite photocatalyst with improved visible light photocatalytic activities in RhB degradation. *Applied Catalysis B: Environmental* 129, 255–263.

References

- Li, X., Garlisi, C., Guan, Q., Anwer, S., Al-Ali, K., Palmisano, G., Zheng, L., 2021. A review of material aspects in developing direct Z-scheme photocatalysts. *Materials Today* 47, 75–107.
- Li, X., Wang, Y., 2011. Structure and photoluminescence properties of Ag-coated ZnO nano-needles. *Journal of Alloys and Compounds* 509, 5765–5768.
- Li, X., Zhang, J., Shen, L., Ma, Y., Lei, W., Cui, Q., Zou, G., 2009. Preparation and characterization of graphitic carbon nitride through pyrolysis of melamine. *Appl. Phys. A* 94, 387–392.
- Lin, X., Wei, B., Zhang, X., Song, M., Yu, S., Gao, Z., Zhai, H., Zhao, L., Che, G., 2016. Construction of heterostructured g-C₃N₄/Ag/Bi_{3.64}Mo_{0.36}O_{6.55} nanospheres with enhanced visible-light photocatalytic activity. *Separation and Purification Technology* 169, 9–16.
- Linda, T., Muthupoongodi, S., Shajan, X.S., Balakumar, S., 2016. Fabrication and characterization of chitosan templated CdO/NiO nano composite for dye degradation. *Optik* 127, 8287–8293.
- Liu, X., Li, J., 2021. A method for effectively regulating the green emissions of ZnO through NiS@NiO/rGO. *Applied Surface Science* 556, 149805.
- Liu, Y., Ohko, Y., Zhang, R., Yang, Y., Zhang, Z., 2010. Degradation of malachite green on Pd/WO₃ photocatalysts under simulated solar light. *Journal of Hazardous Materials* 184, 386–391.
- Liu, Y., Zhang, Q., Xu, M., Yuan, H., Chen, Y., Zhang, Jiaxi, Luo, K., Zhang, Jingquan, You, B., 2019. Novel and efficient synthesis of Ag-ZnO nanoparticles for the sunlight-induced photocatalytic degradation. *Applied Surface Science* 476, 632–640.

References

- Loidl, M., Hinteregger, C., Ditzelmüller, G., Ferschl, A., Streichsbier, F., 1990. Degradation of aniline and monochlorinated anilines by soil-born *Pseudomonas acidovorans* strains. *Arch. Microbiol.* 155, 56–61.
- Low, E.W., Chase, H.A., Milner, M.G., Curtis, T.P., 2000. Uncoupling of metabolism to reduce biomass production in the activated sludge process. *Water Research* 34, 3204–3212.
- Lu, M., Pei, Z., Weng, S., Feng, W., Fang, Z., Zheng, Z., Huang, M., Liu, P., 2014. Constructing atomic layer g-C₃N₄–CdS nanoheterojunctions with efficiently enhanced visible light photocatalytic activity. *Physical Chemistry Chemical Physics* 16, 21280–21288.
- Luo, Y.-N., Li, Y., Qian, L., Wang, X.-T., Wang, J., Wang, C.-W., 2020. Excellent photocatalytic performance from NiS decorated TiO₂ nanoflowers with exposed {001} facets. *Materials Research Bulletin* 130, 110945.
- Ma, S., Li, R., Lv, C., Xu, W., Gou, X., 2011. Facile synthesis of ZnO nanorod arrays and hierarchical nanostructures for photocatalysis and gas sensor applications. *Journal of Hazardous Materials* 192, 730–740.
- Majhi, D., Samal, P.K., Das, K., Gouda, S.K., Bhoi, Y.P., Mishra, B.G., 2019. α -NiS/Bi₂O₃ Nanocomposites for Enhanced Photocatalytic Degradation of Tramadol. *ACS Appl. Nano Mater.* 2, 395–407.
- Malwal, D., Gopinath, P., 2015. Fabrication and characterization of poly(ethylene oxide) templated nickel oxide nanofibers for dye degradation. *Environmental Science: Nano* 2, 78–85.
- Manders, J.R., Tsang, S.-W., Hartel, M.J., Lai, T.-H., Chen, S., Amb, C.M., Reynolds, J.R.,

References

- So, F., 2013. Solution-Processed Nickel Oxide Hole Transport Layers in High Efficiency Polymer Photovoltaic Cells. *Advanced Functional Materials* 23, 2993–3001.
- Marschall, R., 2014. Semiconductor Composites: Strategies for Enhancing Charge Carrier Separation to Improve Photocatalytic Activity. *Advanced Functional Materials* 24, 2421–2440.
- Mehan, G.T., Grubbs, G.H., Frace, S.E., Anderson, D.F., Anderson, W., Jett, G., Guilaran, Y.T., Freeman, J.L., 2002. Development Document for Final Effluent Limitations Guidelines and Standards for the Iron and Steel Manufacturing Point Source Category.
- Milenova, K.I., Zaharieva, K.L., Vassilev, S.V., Dimova, S.S., Stambolova, I.D., Blaskov, V.N., n.d. Synthesis and investigation of composite photocatalysts on the base of nickel and zinc oxides 5.
- Mirzaei, A., Yerushalmi, L., Chen, Z., Haghighat, F., 2018. Photocatalytic degradation of sulfamethoxazole by hierarchical magnetic ZnO@g-C₃N₄: RSM optimization, kinetic study, reaction pathway and toxicity evaluation. *Journal of Hazardous Materials* 359, 516–526.
- Mittal, A., 2006. Adsorption kinetics of removal of a toxic dye, Malachite Green, from wastewater by using hen feathers. *Journal of Hazardous Materials* 133, 196–202.
- Mohamed Reda, G., Fan, H., Tian, H., 2017. Room-temperature solid state synthesis of Co₃O₄/ZnO p–n heterostructure and its photocatalytic activity. *Advanced Powder Technology* 28, 953–963.
- Mohamed, R.M., McKinney, D., Kadi, M.W., Mkhaliid, Ibraheem.A., Sigmund, W., 2016.

References

- Platinum/zinc oxide nanoparticles: Enhanced photocatalysts degrade malachite green dye under visible light conditions. *Ceramics International* 42, 9375–9381.
- Mohammad, R.K., Aboud, L.H., Jassim, A.H., 2019. Study of molecular electronic energy levels of malachite green dye. *AIP Conference Proceedings* 2144, 030022.
- Mokhtar, P.K., Mehdi, M.K., Masoud, S.N., 2014. Facile Hydrothermal Synthesis Of Tellurium Nanostructures For Solar Cells 4, 459–465.
- Moss, B., 2008. Water pollution by agriculture. *Phil. Trans. R. Soc. B* 363, 659–666.
- Mushtaq, N., Singh, D.V., Bhat, R.A., Dervash, M.A., Hameed, O. bin, 2020. Freshwater Contamination: Sources and Hazards to Aquatic Biota, in: Qadri, H., Bhat, R.A., Mehmood, M.A., Dar, G.H. (Eds.), *Fresh Water Pollution Dynamics and Remediation*. Springer, Singapore, pp. 27–50.
- Nagamuthu, S., Ryu, K.-S., 2019. Synthesis of Ag/NiO Honeycomb Structured Nanoarrays as the Electrode Material for High Performance Asymmetric Supercapacitor Devices. *Sci Rep* 9, 4864.
- Nagarajan, S., Arumugam Kuppasamy, K., 2013. Extracellular synthesis of zinc oxide nanoparticle using seaweeds of gulf of Mannar, India. *Journal of Nanobiotechnology* 11, 39.
- Nagaraju, G., Udayabhanu, Shivaraj, Prashanth, S.A., Shastri, M., Yathish, K.V., Anupama, C., Rangappa, D., 2017. Electrochemical heavy metal detection, photocatalytic, photoluminescence, biodiesel production and antibacterial activities of Ag–ZnO nanomaterial. *Materials Research Bulletin* 94, 54–63.
- Nandi, P., Das, D., 2019. Photocatalytic degradation of Rhodamine-B dye by stable ZnO nanostructures with different calcination temperature induced defects. *Applied*

References

- Surface Science 465, 546–556.
- Nandiyanto, A.B.D., Zaen, R., Oktiani, R., 2020. Correlation between crystallite size and photocatalytic performance of micrometer-sized monoclinic WO₃ particles. *Arabian Journal of Chemistry* 13, 1283–1296.
- Ngo, Y.-L.T., Hoa, L.T., Chung, J.S., Hur, S.H., 2017. Multi-dimensional Ag/NiO/reduced graphene oxide nanostructures for a highly sensitive non-enzymatic glucose sensor. *Journal of Alloys and Compounds* 712, 742–751.
- Nguyen, D.-T., Nguyen, C.-C., St-Jean, M., Chabot, S., Kaliaguine, S., Do, T.-O., 2018. All in One: Contributions of Ni Dopants and Ni/NiS Dual Cocatalysts to the Enhanced Efficiency of TiO₂ Photocatalyst for the Degradation of Organic Pollutants. *ACS Appl. Nano Mater.* 1, 6864–6873.
- Pan, C., Xu, J., Wang, Y., Li, D., Zhu, Y., 2012. Dramatic Activity of C₃N₄/BiPO₄ Photocatalyst with Core/Shell Structure Formed by Self-Assembly. *Advanced Functional Materials* 22, 1518–1524.
- Pandey, S.K., Tripathi, M.K., Ramanathan, V., Mishra, P.K., Tiwary, D., 2021a. Enhanced photocatalytic efficiency of hydrothermally synthesized g-C₃N₄/NiO heterostructure for mineralization of malachite green dye. *Journal of Materials Research and Technology* 11, 970–981.
- Pandey, S.K., Tripathi, M.K., Ramanathan, V., Mishra, P.K., Tiwary, D., 2021b. Highly facile Ag/NiO nanocomposite synthesized by sol-gel method for mineralization of rhodamine B. *Journal of Physics and Chemistry of Solids* 159, 110287.
- Parashar, M., Shukla, V.K., Singh, R., 2020. Metal oxides nanoparticles via sol–gel method: a review on synthesis, characterization and applications. *J Mater Sci: Mater Electron*

References

- 31, 3729–3749.
- Pardeshi, S.K., Patil, A.B., 2009. Solar photocatalytic degradation of resorcinol a model endocrine disrupter in water using zinc oxide. *Journal of Hazardous Materials* 163, 403–409.
- Pare, B., Sarwan, B., Jonnalagadda, S.B., 2011. Photocatalytic mineralization study of malachite green on the surface of Mn-doped BiOCl activated by visible light under ambient condition. *Applied Surface Science* 258, 247–253.
- Park, Y.R., Kim, K.J., 2003. Sol–gel preparation and optical characterization of NiO and $\text{Ni}_{1-x}\text{Zn}_x\text{O}$ thin films. *Journal of Crystal Growth* 258, 380–384.
- Peng, Y., Hou, H., Wang, S., Cui, Y., Zhiguo, Y., 2008. Nitrogen and phosphorus removal in pilot-scale anaerobic-anoxic oxidation ditch system. *Journal of Environmental Sciences* 20, 398–403.
- Peng, Y., Zhou, L., Wang, L., Lei, J., Liu, Y., Daniele, S., Zhang, J., 2019. Preparation of NiCoP-decorated g- C_3N_4 as an efficient photocatalyst for H_2O_2 production. *Res Chem Intermed* 45, 5907–5917.
- Perfecto, T.M., Zito, C.A., Volanti, D.P., 2021. Effect of NiS nanosheets on the butanone sensing performance of ZnO hollow spheres under humidity conditions. *Sensors and Actuators B: Chemical* 334, 129684.
- Pignatello, J.J., 1992. Dark and photoassisted iron (3+)-catalyzed degradation of chlorophenoxy herbicides by hydrogen peroxide. *Environ. Sci. Technol.* 26, 944–951.
- Pignatello, J.J., Liu, D., Huston, P., 1999. Evidence for an Additional Oxidant in the Photoassisted Fenton Reaction. *Environ. Sci. Technol.* 33, 1832–1839.
- Prabakaran, K., Oh, H., Manivannan, R., Hyeong Park, S., Son, Y.-A., 2022. A novel class of

- xanthene dyes with chemically linked UV absorber molecule and their photophysical properties. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 279, 121437.
- Pradhan, G.K., Reddy, K.H., Parida, K.M., 2014. Facile fabrication of mesoporous α -Fe₂O₃/SnO₂ nanoheterostructure for photocatalytic degradation of malachite green. *Catalysis Today, Photocatalytic Processes for Environmental Remediation*, in honor of Prof. Jincai Zhao of the Chinese Academy of Sciences. 224, 171–179.
- Prado, A.G.S., Costa, L.L., 2009. Photocatalytic decoloration of malachite green dye by application of TiO₂ nanotubes. *Journal of Hazardous Materials* 169, 297–301.
- Prakash, V., Niyogi, U.K., Diwan, R.K., 2015. Characterization of synthesized copper oxide nanopowders and their use in nanofluids for enhancement of thermal conductivity. *Indian Journal of Pure & Applied Physics (IJPAP)* 53, 753–758.
- Prasannalakshmi, P., Shanmugam, N., kumar, A.S., Kannadasan, N., 2016. Phase-dependent electrochemistry of TiO₂ nanocrystals for supercapacitor applications. *Journal of Electroanalytical Chemistry* 775, 356–363.
- Qian, L.-L., Li, Y., Li, J., Wang, C.-W., 2018. Enhanced photocatalytic performance from NiS/TiO₂ p-n heterojunction nanosheet arrays. *Superlattices and Microstructures* 117, 317–329.
- Qu, X., Alvarez, P.J.J., Li, Q., 2013. Applications of nanotechnology in water and wastewater treatment. *Water Research, Nanotechnology for Water and Wastewater Treatment* 47, 3931–3946.
- Qusti, A.H., Malkhasian, A.Y.S., Salam, M.A., 2018. Enhancement of CdS nanoparticles photocatalytic activity by Pt and In₂O₃ doping for the degradation of malachite green

References

- dye in water. *Journal of Molecular Liquids* 255, 364–369.
- Rajeshwar, K., Osugi, M.E., Chanmanee, W., Chenthamarakshan, C.R., Zaroni, M.V.B., Kajitvichyanukul, P., Krishnan-Ayer, R., 2008. Heterogeneous photocatalytic treatment of organic dyes in air and aqueous media. *Journal of Photochemistry and Photobiology C: Photochemistry Reviews* 9, 171–192.
- Ramesan, M.T., Santhi, V., 2017. In situ synthesis, characterization, conductivity studies of polypyrrole/silver doped zinc oxide nanocomposites and their application for ammonia gas sensing. *J Mater Sci: Mater Electron* 28, 18804–18814.
- Rani Rosaline, D., Inbanathan, S.S.R., Suganthi, A., Rajarajan, M., Kavitha, G., Srinivasan, R., Hegazy, H.H., Umar, A., Algarni, H., Manikandan, E., 2020. Visible-Light Driven Photocatalytic Degradation of Eosin Yellow (EY) Dye Based on NiO-WO₃ Nanoparticles. *Journal of Nanoscience and Nanotechnology* 20, 924–933.
- Rao, K.V.K., 1995. Inhibition of DNA synthesis in primary rat hepatocyte cultures by malachite green: a new liver tumor promoter. *Toxicology Letters* 81, 107–113.
- Rao, S.S., 2020. Synthesis of CNTs on ZnO/NiS composite as an advanced electrode material for high-performance supercapacitors. *Journal of Energy Storage* 28, 101199.
- Raval, N.P., Shah, P.U., Shah, N.K., 2017. Malachite green “a cationic dye” and its removal from aqueous solution by adsorption. *Appl Water Sci* 7, 3407–3445.
- Reddy, B., 2011. Advances in nanocomposites: synthesis, characterization and industrial applications. BoD–Books on Demand.
- Rohilla, S., Gupta, A., Kumar, V., Kumari, S., Petru, M., Amor, N., Noman, M.T., Dalal, J., 2021. Excellent UV-Light Triggered Photocatalytic Performance of ZnO.SiO₂

References

- Nanocomposite for Water Pollutant Compound Methyl Orange Dye. *Nanomaterials* 11, 2548.
- Romão, J.I.S., 2015. Photocatalytic water treatment (PhD). University of Twente, Enschede, The Netherlands.
- Sabouri, Z., Akbari, A., Hosseini, H.A., Hashemzadeh, A., Darroudi, M., 2019. Bio-based synthesized NiO nanoparticles and evaluation of their cellular toxicity and wastewater treatment effects. *Journal of Molecular Structure* 1191, 101–109.
- Saikia, L., Bhuyan, D., Saikia, M., Malakar, B., Dutta, D.K., Sengupta, P., 2015. Photocatalytic performance of ZnO nanomaterials for self sensitized degradation of malachite green dye under solar light. *Applied Catalysis A: General* 490, 42–49.
- Santhy, K., Selvapathy, P., 2006. Removal of reactive dyes from wastewater by adsorption on coir pith activated carbon. *Bioresource Technology* 97, 1329–1336.
- Santos, V.P., Pereira, M.F.R., Órfão, J.J.M., Figueiredo, J.L., 2010. The role of lattice oxygen on the activity of manganese oxides towards the oxidation of volatile organic compounds. *Applied Catalysis B: Environmental* 99, 353–363.
- Saravanan, R., Karthikeyan, S., Gupta, V.K., Sekaran, G., Narayanan, V., Stephen, A., 2013. Enhanced photocatalytic activity of ZnO/CuO nanocomposite for the degradation of textile dye on visible light illumination. *Materials Science and Engineering: C* 33, 91–98.
- Saravanan, R., Mansoob Khan, M., Gupta, V.K., Mosquera, E., Gracia, F., Narayanan, V., Stephen, A., 2015. ZnO/Ag/CdO nanocomposite for visible light-induced photocatalytic degradation of industrial textile effluents. *Journal of Colloid and Interface Science* 452, 126–133.

References

- Saravanan, R., Sacari, E., Gracia, F., Khan, M.M., Mosquera, E., Gupta, V.K., 2016. Conducting PANI stimulated ZnO system for visible light photocatalytic degradation of coloured dyes. *Journal of Molecular Liquids* 221, 1029–1033.
- Sarmah, S., Kumar, A., 2011. Photocatalytic activity of polyaniline-TiO₂ nanocomposites. *Indian J Phys* 85, 713.
- Saucedo-Lucero, J.O., Arriaga, S., 2013. Photocatalytic degradation of hexane vapors in batch and continuous systems using impregnated ZnO nanoparticles. *Chemical Engineering Journal* 218, 358–367.
- Sayilkan, F., Asiltürk, M., Tatar, P., Kiraz, N., Arpaç, E., Sayilkan, H., 2007. Preparation of re-usable photocatalytic filter for degradation of Malachite Green dye under UV and vis-irradiation. *Journal of Hazardous Materials* 148, 735–744.
- Schneider, V., 2015. The heavy toll of coal mining in South Africa. *Al Jazeera* 2.
- Schwarzenbach, R.P., Escher, B.I., Fenner, K., Hofstetter, T.B., Johnson, C.A., von Gunten, U., Wehrli, B., 2006. The Challenge of Micropollutants in Aquatic Systems. *Science* 313, 1072–1077.
- Selvarajan, S., Suganthi, A., Rajarajan, M., 2018. Fabrication of g-C₃N₄/NiO heterostructured nanocomposite modified glassy carbon electrode for quercetin biosensor. *Ultrasonics Sonochemistry* 41, 651–660.
- Sharma, J., Vashishtha, M., Shah, D.O., n.d. Crystallite Size Dependence on Structural Parameters and Photocatalytic Activity of Microemulsion Mediated Synthesized ZnO Nanoparticles Annealed at Different Temperatures 2.
- Shi, W., Guo, F., Chen, J., Che, G., Lin, X., 2014. Hydrothermal synthesis of InVO₄/Graphitic carbon nitride heterojunctions and excellent visible-light-driven

References

- photocatalytic performance for rhodamine B. *Journal of Alloys and Compounds* 612, 143–148.
- Shu, H., Xie, J., Xu, H., Li, H., Gu, Z., Sun, G., Xu, Y., 2010. Structural characterization and photocatalytic activity of NiO/AgNbO₃. *Journal of Alloys and Compounds* 496, 633–637.
- Song, J., Xu, L., Xing, R., Qin, W., Dai, Q., Song, H., 2013. Ag nanoparticles coated NiO nanowires hierarchical nanocomposites electrode for nonenzymatic glucose biosensing. *Sensors and Actuators B: Chemical* 182, 675–681.
- Sood, S., Umar, A., Mehta, S.K., Kansal, S.K., 2015. Highly effective Fe-doped TiO₂ nanoparticles photocatalysts for visible-light driven photocatalytic degradation of toxic organic compounds. *Journal of Colloid and Interface Science* 450, 213–223.
- Štrbac, D., Aggelopoulos, C.A., Štrbac, G., Dimitropoulos, M., Novaković, M., Ivetić, T., Yannopoulos, S.N., 2018. Photocatalytic degradation of Naproxen and methylene blue: Comparison between ZnO, TiO₂ and their mixture. *Process Safety and Environmental Protection* 113, 174–183.
- Sun, J., Li, X., Zhao, Q., Tadé, M.O., Liu, S., 2017. Construction of p-n heterojunction β -Bi₂O₃/BiVO₄ nanocomposite with improved photoinduced charge transfer property and enhanced activity in degradation of ortho-dichlorobenzene. *Applied Catalysis B: Environmental* 219, 259–268.
- Sun, S., Wang, W., Zhang, L., Shang, M., Wang, L., 2009a. Ag@C core/shell nanocomposite as a highly efficient plasmonic photocatalyst. *Catalysis Communications* 11, 290–293.
- Sun, S., Wang, W., Zhang, L., Zhou, L., Yin, W., Shang, M., 2009b. Visible Light-Induced

- Efficient Contaminant Removal by Bi₅O₇I. *Environ. Sci. Technol.* 43, 2005–2010.
- Takata, T., Domen, K., 2009. Defect Engineering of Photocatalysts by Doping of Aliovalent Metal Cations for Efficient Water Splitting. *J. Phys. Chem. C* 113, 19386–19388.
- Thaweesak, S., Lyu, M., Peerakiatkhajohn, P., Butburee, T., Luo, B., Chen, H., Wang, L., 2017. Two-dimensional g-C₃N₄/Ca₂Nb₂TaO₁₀ nanosheet composites for efficient visible light photocatalytic hydrogen evolution. *Applied Catalysis B: Environmental* 202, 184–190.
- Tian, M.-J., Liao, F., Ke, Q.-F., Guo, Y.-J., Guo, Y.-P., 2017. Synergetic effect of titanium dioxide ultralong nanofibers and activated carbon fibers on adsorption and photodegradation of toluene. *Chemical Engineering Journal* 328, 962–976.
- Tian, N., Li, Z., Xu, D., Li, Y., Peng, W., Zhang, G., Zhang, F., Fan, X., 2016. Utilization of MoS₂ Nanosheets To Enhance the Photocatalytic Activity of ZnO for the Aerobic Oxidation of Benzyl Halides under Visible Light. *Ind. Eng. Chem. Res.* 55, 8726–8732.
- Tobajas, M., Belver, C., Rodriguez, J.J., 2017. Degradation of emerging pollutants in water under solar irradiation using novel TiO₂-ZnO/clay nanoarchitectures. *Chemical Engineering Journal* 309, 596–606.
- Tollefson, J., 2011. How green is my future? UN panel foresees big growth in renewable energy, but policies will dictate just how big. *Nature* 473, 134–136.
- Torki, F., Faghihian, H., 2018. Visible Light Degradation of Naproxen by Enhanced Photocatalytic Activity of NiO and NiS, Scavenger Study and Focus on Catalyst Support and Magnetization. *Photochemistry and Photobiology* 94, 491–502.
- Torki, F., Faghihian, H., 2017. Photocatalytic activity of NiS, NiO and coupled NiS–NiO for

References

- degradation of pharmaceutical pollutant cephalexin under visible light. *RSC Advances* 7, 54651–54661.
- Van Viet, P., Nguyen, T.-D., Bui, D.-P., Thi, C.M., 2022. Combining SnO_{2-x} and $\text{g-C}_3\text{N}_4$ nanosheets toward S-scheme heterojunction for high selectivity into green products of NO degradation reaction under visible light. *Journal of Materiomics* 8, 1–8.
- Wang, J., Qiao, M., Wei, K., Ding, J., Liu, Z., Zhang, K.-Q., Huang, X., 2011. Decolorizing Activity of Malachite Green and Its Mechanisms Involved in Dye Biodegradation by *Achromobacter xylosoxidans* MG1. *MIP* 20, 220–227.
- Wang, J., Yang, J., Li, Xiuyan, Wei, B., Wang, D., Song, H., Zhai, H., Li, Xuefei, 2015. Synthesis of $\text{Fe}_3\text{O}_4@\text{SiO}_2@\text{ZnO-Ag}$ core-shell microspheres for the repeated photocatalytic degradation of rhodamine B under UV irradiation. *Journal of Molecular Catalysis A: Chemical* 406, 97–105.
- Wang, P., Huang, B., Qin, X., Zhang, X., Dai, Y., Wei, J., Whangbo, M.-H., 2008. $\text{Ag}@\text{AgCl}$: A Highly Efficient and Stable Photocatalyst Active under Visible Light. *Angewandte Chemie International Edition* 47, 7931–7933.
- Wang, P., Wang, J., Wang, X., Yu, H., Yu, J., Lei, M., Wang, Y., 2013. One-step synthesis of easy-recycling $\text{TiO}_2\text{-rGO}$ nanocomposite photocatalysts with enhanced photocatalytic activity. *Applied Catalysis B: Environmental* 132–133, 452–459.
- Wang, Qingyuan, Jiang, H., Zang, S., Li, J., Wang, Qiaofeng, 2014. Gd, C, N and P quaternary doped anatase- TiO_2 nano-photocatalyst for enhanced photocatalytic degradation of 4-chlorophenol under simulated sunlight irradiation. *Journal of Alloys and Compounds* 586, 411–419.
- Wang, Yin, Niu, C.-G., Zhang, L., Wang, Ying, Zhang, H., Huang, D.-W., Zhang, X.-G.,

- Wang, L., Zeng, G.-M., 2016. High-efficiency visible-light AgI/Ag/Bi₂MoO₆ as a Z-scheme photocatalyst for environmental applications. *RSC Advances* 6, 10221–10228.
- Wei, A., Liu, B., Zhao, H., Chen, Y., Wang, W., Ma, Y., Yang, H., Liu, S., 2014. Synthesis and formation mechanism of flowerlike architectures assembled from ultrathin NiO nanoflakes and their adsorption to malachite green and acid red in water. *Chemical Engineering Journal* 239, 141–148.
- Wu, B., Sheng, M., Gao, S., Wang, Y., Liao, F., 2017. Single-source precursor to Ag/NiO composite for rechargeable charge storage. *Journal of Alloys and Compounds* 692, 34–39.
- Wu, D., Wang, F., Tan, Y., Li, C., 2016. Facile synthesis of NiS/CdS nanocomposites for photocatalytic degradation of quinoline under visible-light irradiation. *RSC Advances* 6, 73522–73526.
- Wu, X., Wang, X., Wang, F., Yu, H., 2019. Soluble g-C₃N₄ nanosheets: Facile synthesis and application in photocatalytic hydrogen evolution. *Applied Catalysis B: Environmental* 247, 70–77.
- Wu, Y., He, Y., Wu, T., Chen, T., Weng, W., Wan, H., 2007. Influence of some parameters on the synthesis of nanosized NiO material by modified sol–gel method. *Materials Letters* 61, 3174–3178.
- Wu, Y., Passananti, M., Brigante, M., Dong, W., Mailhot, G., 2014. Fe(III)–EDDS complex in Fenton and photo-Fenton processes: from the radical formation to the degradation of a target compound. *Environ Sci Pollut Res* 21, 12154–12162.
- Xepapadeas, A., 2011. The Economics of Non-Point-Source Pollution. *Annu. Rev. Resour.*

References

- Econ. 3, 355–373.
- Xiang, Q., Yu, J., Jaroniec, M., 2012. Graphene -based semiconductor photocatalysts. *Chemical Society Reviews* 41, 782–796.
- Xie, J., Zhou, Z., Lian, Y., Hao, Y., Li, P., Wei, Y., 2015. Synthesis of α -Fe₂O₃/ZnO composites for photocatalytic degradation of pentachlorophenol under UV–vis light irradiation. *Ceramics International* 41, 2622–2625.
- Xin, X., Lü, Z., Zhou, B., Huang, X., Zhu, R., Sha, X., Zhang, Y., Su, W., 2007. Effect of synthesis conditions on the performance of weakly agglomerated nanocrystalline NiO. *Journal of Alloys and Compounds* 427, 251–255.
- Xu, F., Zhang, L., Cheng, B., Yu, J., 2018. Direct Z-Scheme TiO₂/NiS Core–Shell Hybrid Nanofibers with Enhanced Photocatalytic H₂-Production Activity. *ACS Sustainable Chem. Eng.* 6, 12291–12298.
- Xu, Y., Schoonen, M.A.A., 2000. The absolute energy positions of conduction and valence bands of selected semiconducting minerals. *American Mineralogist* 85, 543–556.
- Yang, Q., Chen, F., Li, X., Wang, D., Zhong, Y., Zeng, G., 2016. Self-assembly Z-scheme heterostructured photocatalyst of Ag₂O@Ag-modified bismuth vanadate for efficient photocatalytic degradation of single and dual organic pollutants under visible light irradiation. *RSC Advances* 6, 60291–60307.
- Yang, S., Park, H.-K., Kim, J.-S., Phark, S.-H., Chang, Y.J., Noh, T.W., Hwang, H.-N., Hwang, C.-C., Kim, H.-D., 2013. Reduction of charge fluctuation energies in ultrathin NiO films on Ag(001). *Surface Science* 616, 12–18.
- Yang, X., Xu, L., Yu, X., Li, W., Li, K., Huo, M., Guo, Y., 2008. Enhanced photocatalytic activity of Eu₂O₃/Ta₂O₅ mixed oxides on degradation of rhodamine B and 4-

References

- nitrophenol. *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 320, 61–67.
- Yang, Y., Meng, Q., Jiang, X., Meng, S., Zheng, X., Zhang, S., Fu, X., Chen, S., 2020. Photocatalytic Performance of NiS/CdS Composite with Multistage Structure. *ACS Appl. Energy Mater.* 3, 7736–7745.
- Yu, C., Li, G., Kumar, S., Yang, K., Jin, R., 2014. Phase Transformation Synthesis of Novel Ag₂O/Ag₂CO₃ Heterostructures with High Visible Light Efficiency in Photocatalytic Degradation of Pollutants. *Advanced Materials* 26, 892–898.
- Yu, C., Yang, K., Zhou, W., Fan, Q., Wei, L., Yu, J.C., 2013. Preparation, characterization and photocatalytic performance of noble metals (Ag, Pd, Pt, Rh) deposited on sponge-like ZnO microcuboids. *Journal of Physics and Chemistry of Solids* 74, 1714–1720.
- Yu, K., Yang, S., Liu, C., Chen, H., Li, H., Sun, C., Boyd, S.A., 2012. Degradation of Organic Dyes via Bismuth Silver Oxide Initiated Direct Oxidation Coupled with Sodium Bismuthate Based Visible Light Photocatalysis. *Environ. Sci. Technol.* 46, 7318–7326.
- Zhang, C., Fei, W., Wang, H., Li, N., Chen, D., Xu, Q., Li, H., He, J., Lu, J., 2020. p-n Heterojunction of BiOI/ZnO nanorod arrays for piezo-photocatalytic degradation of bisphenol A in water. *Journal of Hazardous Materials* 399, 123109.
- Zhang, C., Hao, R., Liao, H., Hou, Y., 2013. Synthesis of amino-functionalized graphene as metal-free catalyst and exploration of the roles of various nitrogen states in oxygen reduction reaction. *Nano Energy* 2, 88–97.
- Zhang, C., Li, T., Zhang, J., Yan, S., Qin, C., 2019. Degradation of p-nitrophenol using a

References

- ferrous-tripolyphosphate complex in the presence of oxygen: The key role of superoxide radicals. *Applied Catalysis B: Environmental* 259, 118030.
- Zhang, H., Lv, X., Li, Y., Wang, Y., Li, J., 2010. P25-Graphene Composite as a High Performance Photocatalyst. *ACS Nano* 4, 380–386.
- Zhang, J., Xu, Q., Feng, Z., Li, M., Li, C., 2008. Importance of the Relationship between Surface Phases and Photocatalytic Activity of TiO₂. *Angewandte Chemie* 120, 1790–1793.
- Zhang, L., Tian, B., Chen, F., Zhang, J., 2012. Nickel sulfide as co-catalyst on nanostructured TiO₂ for photocatalytic hydrogen evolution. *International Journal of Hydrogen Energy, HySafe* 1 37, 17060–17067.
- Zhang, S., Li, H., Yang, Z., 2017. Controllable synthesis of WO₃ with different crystalline phases and its applications on methylene blue removal from aqueous solution. *Journal of Alloys and Compounds* 722, 555–563.
- Zhang, W., Zhou, L., Deng, H., 2016. Ag modified g-C₃N₄ composites with enhanced visible-light photocatalytic activity for diclofenac degradation. *Journal of Molecular Catalysis A: Chemical* 423, 270–276.
- Zhang, Y., Wang, J., Wan, P., Ye, J., Hussain, S., Wei, H., Hou, D., 2016. Ag₂O loaded NiO ball-flowers for high performance supercapacitors. *Materials Letters* 177, 71–75.
- Zhang, Z., Jiang, D., Xing, C., Chen, L., Chen, M., He, M., 2015. Novel AgI-decorated β -Bi₂O₃ nanosheet heterostructured Z-scheme photocatalysts for efficient degradation of organic pollutants with enhanced performance. *Dalton Transactions* 44, 11582–11591.
- Zhang, Z., Liu, H., Zhang, H., Dong, H., Liu, X., Jia, H., Xu, B., 2014. Synthesis of spindle-

References

- like Ag/ZnO heterostructure composites with enhanced photocatalytic performance. *Superlattices and Microstructures* 65, 134–145.
- Zhao, H., Dong, Y., Jiang, P., Wang, G., Miao, H., Wu, R., Kong, L., Zhang, J., Zhang, C., 2015. Light-Assisted Preparation of a ZnO/CdS Nanocomposite for Enhanced Photocatalytic H₂ Evolution: An Insight into Importance of in Situ Generated ZnS. *ACS Sustainable Chem. Eng.* 3, 969–977.
- Zhao, J., Ji, Z., Shen, X., Zhou, H., Ma, L., 2015. Facile synthesis of WO₃ nanorods/g-C₃N₄ composites with enhanced photocatalytic activity. *Ceramics International* 41, 5600–5606.
- Zhou, G., Wang, D.-W., Yin, L.-C., Li, N., Li, F., Cheng, H.-M., 2012. Oxygen Bridges between NiO Nanosheets and Graphene for Improvement of Lithium Storage [WWW Document]. ACS Publications.
- Zhou, L., Liu, Z., Guan, Z., Tian, B., Wang, L., Zhou, Yi, Zhou, Yanbo, Lei, J., Zhang, J., Liu, Y., 2020. 0D/2D plasmonic Cu_{2-x}S/g-C₃N₄ nanosheets harnessing UV-vis-NIR broad spectrum for photocatalytic degradation of antibiotic pollutant. *Applied Catalysis B: Environmental* 263, 118326.
- Zhou, L.-X., Yang, Y.-Y., Zhu, H.-L., Zheng, Y.-Q., 2021. In situ synthesis of Ag/NiO derived from hetero-metallic MOF for supercapacitor application. *Chem. Pap.* 75, 1795–1807.
- Zong, Y., Li, Z., Wang, X., Ma, J., Men, Y., 2014. Synthesis and high photocatalytic activity of Eu-doped ZnO nanoparticles. *Ceramics International* 40, 10375–10382.
- Zyoud, A., Zu'bi, A., Helal, M.H.S., Park, D., Campet, G., Hilal, H.S., 2015. Optimizing photo-mineralization of aqueous methyl orange by nano-ZnO catalyst under

References

simulated natural conditions. J Environ Health Sci Engineer 13, 46.

List of Publications

List of Publications

1. Pandey, S. K., Tripathi, M. K., Ramanathan, V., Mishra, P. K., and Tiwary, D., Enhanced photocatalytic efficiency of hydrothermally synthesized g-C₃N₄/NiO heterostructure for mineralization of malachite green dye, J. of Mater. Res. and Tech., 11, 2021, 970-981.
2. Pandey, S. K., Tripathi, M. K., Ramanathan, V., Mishra, P. K., and Tiwary, D., Highly facile Ag/NiO nanocomposite synthesized by sol-gel method for mineralization of rhodamine B, J. of Phy. and Chem. of Sol., 159, 2021, 110287.
3. Pandey, S. K., Mishra, P.K., and Tiwary, D., Enhanced photocatalytic performance of NiS/ZnO nanocomposite for the remediation of PNP and RhB dye, J. of Environ. Chemi. Engg., 10, no. 3, 2022, 107459.
4. Singh, S., Kumar, A., Pandey, S. K., Kumar, V., Verma, M. K., Gupta, A., and Mandal, K. D., Synthesis of Bi₄Ti₃O₁₂-BaTiO₃ nanocomposite, manifesting high dielectric and unique magnetic nature applicable in heterogeneous photocatalytic activity for degradation of rhodamine B dye, Mater. Tech., 36, no. 8, 2021, 476-491.
5. Singh, S., Kumar, A., Pandey, S. K., Singh, D. K., Kumar, V., Verma, M. K., Gupta, A., Tiwary, D., Mandal, K. D., Facile synthesis of efficient heterogeneous photocatalytic and highly dielectric Bi₄BaTi₄O₁₅ ceramic with remarkable applicability in the degradation of rhodamine B dye, Mater. Tech., 37, no. 9, 2022, 880-896.