

REFERENCES

- Abdulla-Al-Mamun M., Kusumoto Y., Islam M. S. "Enhanced photocatalytic cytotoxic activity of Ag@Fe-doped TiO₂ nanocomposites against human epithelial carcinoma cells," *Journal of Materials Chemistry*, **22** (2012) 5460-5469.
- Abhang D. K., Taralkar S. V. "Design of photocatalytic reactor for degradation of phenol in wastewater," *International Journal of Chemical Engineering and Applications*, **2** (2011) 337-341.
- Ajmal A., Majeed I., Malik R. N., Idriss H., Nadeem M. A. "Principles and mechanisms of photocatalytic dye degradation on TiO₂ based photocatalysts: a comparative overview," *RSC Advances*, **4** (2014):37003-37026.
- Akhundi, A., Habibi-Yangjeh A. "Graphitic carbon nitride nanosheets decorated with CuCr₂O₄ nanoparticles: Novel photocatalysts with high performances in visible light degradation of water pollutants," *Journal of Colloid and Interface Science*, **504** (2017)697-710.
- Al-Kattan A., Wichser A., Roger V., Brunner S., Ulrich A., Zuin S., Nowack B. "Release of TiO₂ from paints containing pigment-TiO₂ or nano-TiO₂ by weathering," *Environmental Science: Processes & Impacts*, **15** (2013) 2186-2193
- Ali T., Tripathi P., Ameer A., Waseem R., Arham S. A., Ateeq A., Muneer M. "Photocatalytic performance of Fe-doped TiO₂ nanoparticles under visible-light irradiation," *Materials Research Express*, **4** (2017):015022.
- Alwan, A. Burden: Mortality, morbidity and risk factors. Global status report on noncommunicable diseases, WHO, 2011.
- Amreetha S., Dhanuskodi S., Nithya A., Jothivenkatachalam K. "Three way electron transfer of a C-N-S tri doped two-phase junction of TiO₂ nanoparticles for efficient visible light photocatalytic dye degradation," *RSC Advances*, **6** (2016):7854-7863.
- Anandan S., Pugazhenthiran N., Lana-Villarreal T., Lee G. J., Wu J. J., "Catalytic degradation of a plasticizer, di-ethylhexyl phthalate, using N_x-TiO_{2-x} nanoparticles synthesized via co-precipitation," *Chemical Engineering Journal*, **231**(2013)182-189.
- Andrew F., Carroll E. C., Larsen D. S., Sarahan M., Browning N. D., Osterloh F. E., "First demonstration of CdSe as a photocatalyst for hydrogen evolution from water under UV and visible light," *Chemical Communications*, **19** (2008) 2206-2208.
- Anpo M, "Photocatalysis on titanium oxide catalysts: Approaches in achieving highly efficient reactions and realizing the use of visible light," *Catalysis Surveys from Asia*, **1** (1997)169-179.
- Anpo M., Ichihashi Y., Takeuchi M., Yamashita H., "Design of unique titanium oxide photocatalysts by an advanced metal ion-implantation method and photocatalytic reactions under visible light irradiation," *Research on Chemical Intermediates*, **24** (1998) 143-149.
- Anpo M., Ichihashi Y., Takeuchi M., Yamashita H., "Design and development of unique titanium oxide photocatalysts capable of operating under visible light irradiation by an advanced metal ion-implantation method," *Studies in Surface Science and Catalysis*, **121** (1999) 305-310.

Araoyinbo A. O., Bakri-Abdullah M. M. A., Anuar-Mohd M. A., Abdul-Aziz N. N., Iskandar A., "Phase study of Titanium dioxide nanoparticle prepared via sol-gel process," *Materials Science and Engineering*, **343** (2018) 12011-12021.

Asiltürk M., Sayılıkan F., Arpaç. E., "Effect of Fe³⁺ ion doping to TiO₂ on the photocatalytic degradation of Malachite Green dye under UV and vis-irradiation," *Journal of Photochemistry and Photobiology A: Chemistry*, **203** (2009) 64-71.

Bagwasi S., Tian B., Chen F., Zhang J., "Synthesis, characterization and application of iodine modified titanium dioxide in phototactical reactions under visible light irradiation," *Applied Surface Science*, **258** (2012):3927-3935.

Bandara J., Mielczarski J. A., Kiwi J., "Photosensitized degradation of azo dyes on Fe, Ti, and Al oxides mechanism of charge transfer during the degradation," *Langmuir*, **15** (1999) 7680-7687.

Barkul R. P., Patil M. K., Patil S. M., Shevale V. B., Delekar S. D., "Sunlight-assisted photocatalytic degradation of textile effluent and Rhodamine B by using iodine doped TiO₂ nanoparticles," *Journal of Photochemistry and Photobiology A: Chemistry*, **349** (2017) 138-147.

Behnajady M. A., Eskandarloo H., Modirshahla N., Shokri M., "Investigation of the effect of sol-gel synthesis variables on structural and photocatalytic properties of TiO₂ nanoparticles," *Desalination*, **278** (2011) 10-17.

Beltrán A., Gracia L., Andrés J., "Density functional theory study of the brookite surfaces and phase transitions between natural titania polymorphs," *Journal of Physical Chemistry B*, **110** (2006) 23417-23423.

Bianco A., Baiocchi C., Brussino M. C., Pramauro E., Savarino P., Augugliaro V., Marci G., Palmisano L., "Photocatalytic degradation of Acid Blue 80 in aqueous solutions containing TiO₂ suspensions," *Environmental Science & Technology*, **35** (2001) 971-976.

Bondi A., "Van der Waals Volumes and Radii," *Journal of Physical Chemistry*, **68** (1964):441-451.

Bouchy M., Zahraa O., "Photocatalytic reactors," *International Journal of Photoenergy*, **5** (2003) 191-197.

Bougarrani S., Skadell K., Arndt R., Azzouzi M. E., Gläser R., "Novel Ca_xMnO_y/TiO₂ composites for efficient photocatalytic degradation of methylene blue and the herbicide imazapyr in aqueous solution under visible light irradiation," *Journal of Environmental Chemical Engineering*, **6** (2018) 1934-1942.

Buraso W., Lachom V., Siriya P., Laokul P., "Synthesis of TiO₂ nanoparticles via a simple precipitation method and photocatalytic performance," *Materials Research Express*, **5** (2018) 115-134.

Burke A., Ito S., Snaith H., Bach U., Kwiatkowski J., Grätzel M., "The Function of a TiO₂ Compact Layer in Dye-Sensitized Solar Cells Incorporating "Planar" Organic Dyes," *Nano Letters* **8** (2008) 977-981.

Burnside S. D., Shklover V., Barbé C., Comte P., Arendse F., Brooks K., Grätzel M., “Self-organization of TiO₂ nanoparticles in thin films,” *Chemistry of Materials*, **10** (1998):2419-2425.

Cam-Loc L., Quoc-Tuan N., Thoang H. S., “Synthesis and characterization of Fe-doped TiO₂ photocatalyst by the sol-gel method,” *Advances in Natural Sciences: Nanoscience and Nanotechnology*, **1** (2010) 15008.

Chen L., Chen F., Shi Y., Zhang J., “Preparation and visible light photocatalytic activity of a graphite like carbonaceous surface modified TiO₂ photocatalyst,” *Journal of Physical Chemistry C*, **116** (2012) 8579-8586.

Chen X., Liu L., Yu P. Y., Mao S. S., “Increasing solar absorption for photocatalysis with black hydrogenated titanium dioxide nanocrystals,” *Science*, **331** (2011) 746-750.

Chen X., Wu Z., Liu D., Gao Z., “Preparation of ZnO photocatalyst for the efficient and rapid photocatalytic degradation of Azo dyes,” *Nanoscale Research Letters*, **12** (2017):143.

Cheng, L., Xiang Q., Liao Y., Zhang H., “CdS-Based photocatalysts,” *Energy & Environmental Science*, **11** (2018) 1362-1391.

Cheng X., Liu H., Chen Q., Li J., Wang P., “Preparation and characterization of palladium nano-crystallite decorated TiO₂ nano-tubes photoelectrode and its enhanced photocatalytic efficiency for degradation of diclofenac,” *Journal of Hazardous Materials*, **255** (2013) 141-148.

Choi W., Termin A., Hoffmann M. R., “Role of metal ion dopants in quantum-sized TiO₂: correlation between photo-reactivity and charge carrier recombination dynamics,” *Journal of Physical Chemistry*, **98** (1994) 13669-13679.

Daneshvar N., Salari D., Khataee A. R., “Photocatalytic degradation of azo dye Acid Red 14 in water: investigation of the effect of operational parameters,” *Journal of Photochemistry and Photobiology A: Chemistry*, **157** (2003) 111-116.

Deorsola F. A., Vallauri D., “Study of the process parameters in the synthesis of TiO₂ nanospheres through reactive microemulsion precipitation,” *Powder Technology*, **190** (2009) 304-309.

Devi M., Panigrahi M. R., Singh U. P., “Microstructures, optical and electrical properties of TiO₂ thin films prepared by unconventional sol-gel route,” *Journal of Materials Science: Materials in Electronics*, **26** (2015) 1186-1191.

Devi R. S., Venckatesh D. R., Sivaraj D. R., “Synthesis of Titanium Dioxide nanoparticles by sol-gel technique,” *International Journal of Innovative Research in Science, Engineering and Technology*, **3** (2014) 15206-15211.

Dhandapani P., Maruthamuthu S., Rajagopal G., “Bio-mediated synthesis of TiO₂ nanoparticles and its photocatalytic effect on aquatic biofilm,” *Journal of Photochemistry and Photobiology B: Biology B*, **110** (2012) 43-49.

Eskandarloo H., Badiei A., Behnajady M. A., "Optimization of UV/inorganic oxidants system efficiency for photo-oxidative removal of an azo textile dye," *Desalination and Water Treatment*, **55** (2015) 210-226.

Fiorenza R., Bellardita M., Scirè S., Palmisano L., "Effect of the addition of different doping agents on visible light activity of porous TiO₂ photocatalysts," *Molecular Catalysis*, **455** (2018) 108-120.

Fujishima A., Zhang X., Tryk D. A., "TiO₂ photocatalysis and related surface phenomena," *Surface Science Reports*, **63** (2008) 515-582.

Gandhi V.G, Kumar M., Joshi P., "A study on deactivation and regeneration of titanium dioxide during photocatalytic degradation of phthalic acid," *Journal of Industrial and Engineering Chemistry*, **18** (2012) 1902-1907.

Galindo C., Jacques P., Kalt A., "Photodegradation of the aminoazobenzene acid orange 52 by three advanced oxidation processes: UV/H₂O₂, UV/TiO₂ and VIS/TiO₂ Comparative mechanistic and kinetic investigations," *Journal of Photochemistry and Photobiology A: Chemistry*, **130** (2000) 35-47.

Ghorai T. K., Biswas S. K., Pramanik P., "Photooxidation of different organic dyes (RB, MO, TB, and BG) using Fe(III)-doped TiO₂ nanophotocatalyst prepared by novel chemical method," *Applied Surface Science*, **254** (2008):7498-7504.

Chaudhuri G., Paria R., Santanu, "Core/Shell Nanoparticles Classes, Properties, Synthesis Mechanisms, Characterization, and Applications," *Chemical Reviews*, **112** (2012) 2373-2433.

Giampiccolo A., Tobaldi D. M., Leonardi S. G., Murdoch B. J., Seabra M. P., Ansell M. P., Neri G., Ball R. J., "Sol gel graphene/TiO₂ nanoparticles for the photocatalytic-assisted sensing and abatement of NO₂," *Applied Catalysis B: Environmental*, **243** (2019) 183-194.

Haggerty J. E. S., Schelhas L. T., Kitchaev D. A., Mangum J. S., Garten L. M., Sun W., Stone K. H., Perkins J. D., Toney M. F., Ceder G., Ginley D. S., Gorman B. P., Tate J., "High-fraction brookite films from amorphous precursors," *Scientific Reports*, **7** (2017) 15232.

Haider A. J., Al-Anbari R. H., Kadhim G. R., Salame C. T., "Exploring potential Environmental applications of TiO₂ Nanoparticles," *Energy Procedia*, **119** (2017) 332-345.

Han C. H., Lee H. S., Han S. D., "Synthesis of nanocrystalline TiO₂ by sol-gel combustion hybrid method and its application to dye solar cells," *Bulletin of the Korean Chemical Society*, **29** (2008) 1495-1498.

Hanaor D. A. H., Sorrell C. C., "Review of the anatase to rutile phase transformation" *Journal of Materials Science*, **46** (2011) 855-874.

Haugen A. B., Kumakiri I., Simon C., Einarsrud M. A., "TiO₂, "TiO₂/Ag and TiO₂/Au" photocatalysts prepared by spray pyrolysis," *Journal of the European Ceramic Society*, **31** (2011) 291-298.

Hayle S. T., "Synthesis and characterization of Titanium oxide nanomaterials using sol-gel method," *American Journal of Nanoscience and Nanotechnology*, **2** (2014) 1-7.

- He Z., Xu X., Song S., Xie L., Tu J., Chen J., Yan B., "A Visible Light-Driven Titanium Dioxide Photocatalyst Codoped with Lanthanum and Iodine: An Application in the Degradation of Oxalic Acid," *The Journal of Physical Chemistry, C* **112** (2008) 16431-16437.
- Hema M., Arasi A. Y., Tamilselvi P., Anbarasan R., "Titania nanoparticles synthesized by sol-gel technique," *Chemical Science Transactions*, **2** (2012):239-245.
- Hengerer R., Bolliger B., Erbudak M., M. Gratzel M., "Structure and stability of the anatase TiO₂ (101) and (001) surfaces," *Surfaces Science*, **460** (2000) 162-169.
- Hoffmann M. R., Martin S. T., Choi W., Bahnemann D. W., "Environmental applications of semiconductor photocatalysis," *Chemical Reviews*, **95** (1995) 69-96.
- Hong X., Wang Z., Cai W., Lu F., Zhang J., Yang Y., Ma N., Liu Y., "Visible-light activated nanoparticle photocatalyst of iodine-doped Titanium dioxide," *Chemistry of Materials*, **17** (2005) 1548-1552.
- Hosseini Z. M., "Synthesis of TiO₂ nanoparticles by microemulsion/heat treated method and photodegradation of Methylene Blue," *Journal of Inorganic and Organometallic Polymers and Materials*, **21** (2011) 81-90.
- Hou Q., Zheng Y., Chen J. F., Zhou W., Deng J., Tao X., "Visible-light-response iodine-doped titanium dioxide nanocrystals for dye-sensitized solar cells," *Journal of Materials Chemistry*, **21** (2011) 3877-3883.
- Houas A., Lachheb H., Ksibi M., Elaloui E., Guillard C., Herrmann J. M., "Photocatalytic degradation pathway of methylene blue in water," *Applied Catalysis B: Environmental*, **31** (2001) 145-157.
- Hudec B., Husekova K., Tarre A., Hwan Han J., Han S., Rosova A., Lee W., Kasikov A., Ji Song S., Aarik J., Seong Hwang C., Fröhlich K., "Electrical properties of TiO₂-based MIM capacitors deposited by TiCl₄ and TTIP based atomic layer deposition processes," *Microelectronic Engineering*, **88** (2011) 1514-1516.
- Hung W.C., Chen Y.C., Chu H., Tseng T. K., "Synthesis and characterization of TiO₂ and Fe/TiO₂ nanoparticles and their performance for photocatalytic degradation of 1,2-dichloroethane," *Applied Surface Science*, **255** (2008) 2205-2213.
- Hussain M., Ceccarelli R., Marchisio D. L., Fino D., Russo N., Geobaldo F., "Synthesis, characterization, and photocatalytic application of novel TiO₂ nanoparticles," *Chemical Engineering Journal*, **157** (2010) 45-51.
- Jacobs J. F., van de Poel I., Osseweijer P., "Sunscreens with Titanium Dioxide (TiO₂) nanoparticles: A societal experiment," *Nanoethics*, **4** (2010) 103-113.
- Jadhav S. B., Surwase S. N., Kalyani D. C., Gurav R. G., Jadhav J. P., "Biodecolorization of Azo Dye Remazol Orange by pseudomonas aeruginosa BCH and toxicity (Oxidative Stress) reduction in Allium cepa root cells," *Applied Biochemistry and Biotechnology*, **168** (2012) 1319-1334.
- Jha A. K., Prasad K., Kulkarni A. R., "Synthesis of TiO₂ nanoparticles using microorganisms," *Colloids and Surfaces B: Biointerfaces*, **71** (2009) 226-229.

Kaixi S., Jiahong Z., Jianchun B., Yuying F., "Photocatalytic activity of (Copper, Nitrogen)-codoped Titanium Dioxide nanoparticles," *Journal of the American Ceramic Society*, **91** (2008) 1369-1371.

Khan H., Swati I. K., "Fe³⁺ doped Anatase TiO₂ with d-d transition, oxygen vacancies and Ti³⁺ centers: synthesis, characterization, UV-vis photocatalytic and mechanistic studies," *Industrial & Engineering Chemistry Research*, **55** (2016) 6619-6633.

Kirthi A. V., Rahuman A. A., Rajakumar G., Marimuthu S., Santhoshkumar T., Jayaseelan C., Elango G., Zahir A. A., Kamaraj C., Bagavan A., "Biosynthesis of titanium dioxide nanoparticles using bacterium *Bacillus subtilis*," *Materials Letters*, **65** (2011) 2745-2747.

Kočí K., Matějů K., Obalová L., Krejčíková S., Lacný Z., Plachá D., Čapek L., Hospodková A., Šolcová O., "Effect of silver doping on the TiO₂ for photocatalytic reduction of CO₂," *Applied Catalysis B: Environmental*, **96** (2010) 239-244.

Kočí K., Obalová L., Lacný Z., "Photocatalytic reduction of CO₂ over TiO₂ based catalysts," *Chemical Papers*, 62(2008)1-9.

Kuo C. Y., Yang Y. H., Hsiao H. M., Liao S. C., "Photodegradation of Bisphenol A (BPA) by carbon doped TiO₂ under sunlight irradiation," *Applied Mechanics and Materials*, **378** (2013) 121-124.

L. Hunger, K. Industrial Dyes: Chemistry, Properties, Application, Hoechst AG, Frankfrut, Germany, 2003.

Langhals H., Color Chemistry. "Synthesis, properties and applications of organic dyes and pigments," *Angewandte Chemie International Edition*, **43** (2004) 5291-5292.

Lee H., Song M. Y., Jurng J., Park Y. K., "The synthesis and coating process of TiO₂ nanoparticles using CVD process," *Powder Technology*, **214** (2011) 64-68.

Li G. L., Wang G. H., "Synthesis of nanometer-sized TiO₂ particles by a microemulsion method," *Nanostructured Materials*, **11** (1999) 663-668.

Li S., Ye G., Chen G., "Low-temperature preparation and characterization of nanocrystalline anatase TiO₂," *Journal of Physical Chemistry C*, **113** (2009) 4031-4037.

Li W., Liang R., Hu A., Huang Z., Zhou Y. N., "Generation of oxygen vacancies in visible light activated one-dimensional iodine TiO₂ photocatalysts," *RSC Advances*, **4** (2014) 36959-36966.

Li Y., Wang W. N., Zhan Z., Woo M. H., Wu C.-Y., Biswas P., "Photocatalytic reduction of CO₂ with H₂O on mesoporous silica supported Cu/TiO₂ catalysts," *Applied Catalysis B: Environmental*, **100** (2010) 386-392.

Li Z., Shen W., He W., Zu X., "Effect of Fe-doped TiO₂ nanoparticle derived from modified hydrothermal process on the photocatalytic degradation performance on methylene blue," *Journal of hazardous materials*, **155** (2008) 590-594.

Liang Y. C., Wang C. C., Kei C. C., Hsueh Y. C., Cho W. H., Perng T. P., "Photocatalysis of Ag-loaded TiO₂ nanotube arrays formed by atomic layer deposition," *Journal of Physical Chemistry C*, **115** (2011) 9498-9502.

- Liang Y., Gan S., Chambers S. A., Altman E. I., "Surface structure of anatase TiO₂ (001) Reconstruction, atomic steps, and domains," *Physical Review B*, **63** (2001) 235402-235409.
- Lin J., Shen J., Wang R., Cui J., Zhou W., Hu P., Liu D., Liu H., Wang J., Boughton R. I., Yue Y., "Nano-p-n junctions on surface-coarsened TiO₂ nanobelts with enhanced photocatalytic activity," *Journal of Materials Chemistry*, **21** (2011) 5106-5113.
- Lin Y., Jiang Z., Hu X., Zhang X., Fan J., "The electronic and optical properties of Eu/Si-codoped anatase TiO₂ photocatalyst," *Applied Physics Letters*, **100** (2012) 102105-102109.
- Liu G., Chen Z., Dong C., Zhao Y., Li F., Lu G. Q., Cheng H. M., "Visible light photocatalyst: iodine-doped mesoporous Titania with a bicrystalline framework," *Journal of Physical Chemistry B*, **110** (2006) 20823-20828.
- Lopez T., Moreno J. A., Gomez R., Bokhimi X., Wang J. A., Yee-Madeira H., Pecchi G., Reyes P., "Characterization of iron-doped titania sol-gel materials," *Journal of Materials Chemistry*, **12** (2002) 714-718.
- Lu J., Han Q., Wang Z., "Synthesis of TiO₂/Bi₂S₃ heterojunction with a nuclear-shell structure and its high photocatalytic activity," *Materials Research Bulletin*, **47** (2012) 1621-1624.
- Lu X., Mou X., Wu J., Zhang D., Zhang L., Huang F., Xu F., Huang S., "Improved-Performance Dye-Sensitized Solar Cells Using Nb-Doped TiO₂ Electrodes: Efficient Electron Injection and Transfer," *Advanced Functional Material*, **20** (2010) 509-515.
- Luttrell T., Halpegamage S., Tao J., Kramer A., Sutter E., Batzill M., "Why is anatase a better photocatalyst than rutile? Model studies on epitaxial TiO₂ films" *Scientific Reports*, **4** (2014) 4043-4051.
- Christie M. R. Environmental Aspects of Textile Dyeing, Woodhead Publishing, 2007.
- Mathews N. R., Cortes Jacome M. A., Angeles Chavez C., Toledo Antonio J. A., "Fe doped TiO₂ powder synthesized by sol gel method: structural and photocatalytic characterization," *Journal of Materials Science: Materials in Electronics*, **26** (2015) 5574-5584.
- Matsubara T., Suzuki Y., Tohno S., "Synthesis and characterization of TiO₂ powders by the double-nozzle electrospray pyrolysis method. Part 2. Material evaluation," *Comptes Rendus Chimie*, **19** (2016) 342-346.
- Meng A., Xing J., Guo W., Li Z., Wang X., "Electrospinning synthesis of porous Bi₁₂TiO₂₀/Bi₄Ti₃O₁₂ composite nanofibers and their photocatalytic property under simulated sunlight," *Journal of Materials Science*, **53** (2018) 14328-14336.
- Miranda García N., Suárez S., Maldonado M. I., Malato S., Sánchez B., "Regeneration approaches for TiO₂ immobilized photocatalyst used in the elimination of emerging contaminants in water," *Catalysis Today*, **230** (2014) 27-34.
- Moradi H., Eshaghi A., Hosseini S. R., Ghani K., "Fabrication of Fe doped TiO₂ nanoparticles and investigation of photocatalytic decolorization of Reactive Red 198 under visible light irradiation," *Ultrasonics Sonochemistry*, **32** (2016) 314-319.

Morozova M., Kluson P., Krysa J., Vesely M., Dzik P., Solcova O., "Electrochemical Properties of TiO₂ Electrode Prepared by Various Methods," *Procedia Engineering*, **42** (2012) 573-580.

Moulder J. F., Chastain J., Handbook of X-ray photoelectron spectroscopy: A reference book of standard spectra for identification and interpretation of XPS data: Physical Electronics Division, Perkin-Elmer Corporation (1992).

Muneer M. B. A., Abu Bakar A. H. K., Takriff M. S., Sopian K., "Synthesis and catalytic activity of TiO₂ nanoparticles for photochemical oxidation of concentrated chlorophenols under direct solar radiation," *International Journal of Electrochemical Science*, **7** (2012) 4871 - 4888.

Nagaveni K., Hegde M. S., Madras G., "Structure and photocatalytic activity of Ti_{1-x}M_xO_{2±δ} (M = W, V, Ce, Zr, Fe, and Cu) synthesized by solution combustion method," *Journal of Physical Chemistry B* **108** (2004) 20204-20212.

Namin H. E., Hashemipour H., Ranjbar M., "Effect of aging and calcination on morphology and properties of synthesized nanocrystalline TiO₂," *International Journal of Modern Physics B*, **22** (2008) 3210-3215.

Nasralla N., Yeganeh M., Astuti Y., Piticharoenphun S., Shahtahmasebi N., Kompany A., Karimipour M., Mendis B. G., Poolton N. R. J., Šiller L., "Structural and spectroscopic study of Fe-doped TiO₂ nanoparticles prepared by sol-gel method," *Scientia Iranica*, **20** (2013) 1018-1022.

Natarajan K., Natarajan T. S., Bajaj H. C., Tayade R. J., "Photocatalytic reactor based on UV-LED/TiO₂ coated quartz tube for degradation of dyes," *Chemical Engineering Journal*, **178** (2011) 40-49.

Patel M., Chavda A., Mukhopadhyay I., Kim J., Ray A., "Nanostructured SnS with inherent anisotropic optical properties for high photoactivity," *Nanoscale*, **8** (2016) 2293-2303.

Patra A. K., "Azo dyes and the German ban," *Man-Made Textiles in India*, **46** (2003) 355-360.

Pavasupree S., Ngamsinlapasathian S., Nakajima M., Suzuki Y., Yoshikawa S., "Synthesis, characterization, photocatalytic activity and dye-sensitized solar cell performance of nanorods/nanoparticles TiO₂ with mesoporous structure," *Journal of Photochemistry and Photobiology A: Chemistry*, **184** (2006) 163-169.

Pawar S. G., Patil S. L., Chougule M. A., Raut B. T., Pawar S. A., Mulik R. N., Patil V. B., "Nanocrystalline TiO₂ thin films for NH₃ monitoring: Microstructural and physical characterization," *Journal of Materials Science: Materials in Electronics*, **23** (2012) 273-279.

Perumal S., Monikanda P. K., Anantha K. S., "Synthesis and characterization studies of nano TiO₂ prepared via sol-gel method," *International Journal of Research in Engineering and Technology*, **3** (2014) 651-657.

Prajapati B., Kumar S., Kumar M., Chatterjee S., Ghosh A. K., "Investigation of the physical properties of Fe:TiO₂ diluted magnetic semiconductor nanoparticles," *Journal of Materials Chemistry C*, **5** (2017) 4257-4267.

Qian Y., Chen Q., Chen Z., Fan C., Zhou G., "Preparation of ultrafine powders of TiO₂ by hydrothermal H₂O₂ oxidation starting from metallic Ti," *Journal of Materials Chemistry*, **3** (1993) 203-205.

Qiu J., Zeng G., Ha M. A., Hou B., Mecklenburg M., Shi H., Alexandrova A. N., Cronin S. B., "Microscopic study of atomic layer deposition of TiO₂ on GaAs and its photocatalytic application," *Chemistry of Materials*, **27** (2015):7977-7981.

Ranade M. R., Navrotsky A., Zhang H. Z., Banfield J. F., Elder S. H., Zaban A., Borse P. H., Kulkarni S. K., Doran G. S., Whitfield H. J., "Energetics of nanocrystalline TiO₂," *Proceedings of the National Academy of Sciences*, **99** (2002) 6476-6481.

Rane A. V., Kanny K., Abitha V. K., Thomas S., Synthesis of inorganic nanomaterials, Woodhead Publishing, (2018) 312.

Ray A., Beenackers A., "Development of a new photocatalytic reactor for water purification," *Catalysis Today*, **40** (1998) 73-83.

Reddy B. M., Ganesh I., Reddy E. P., Fernández A., Smirniotis P. G., "Surface characterization of Ga₂O₃-TiO₂ and V₂O₅/Ga₂O₃-TiO₂ Catalysts," *Journal of Physical Chemistry B*, **105** (26) 6227-6235.

Ren C., Qiu W., Chen Y., "Physicochemical properties and photocatalytic activity of the TiO₂/SiO₂ prepared by precipitation method," *Separation and Purification Technology*, **107** (2013) 264-272.

Ren W., Ai Z., Jia F., Zhang L., Fan X., Zou Z., "Low temperature preparation and visible light photocatalytic activity of mesoporous carbon-doped crystalline TiO₂," *Applied Catalysis B: Environmental*, **69** (3) 138-144.

Rengaraj S., Li X. Z., "Enhanced photocatalytic activity of TiO₂ by doping with Ag for degradation of 2,4,6-trichlorophenol in aqueous suspension," *Journal of Molecular Catalysis A: Chemical*, **243** (2006) 60-67.

Reyes Coronado D., Rodríguez Gattorno G., Espinosa Pesqueira M. E., Cab C., De Coss R., Oskam G., "Phase-pure TiO₂ nanoparticles: anatase, brookite and rutile," *Nanotechnology* **19** (2008) 145605.

Rompelberg C., Heringa M. B., Van Donkersgoed G., Drijvers J., Roos A., Westenbrink S., Peters R., Van Bemmel G., Brand W., Oomen A. G., "Oral intake of added titanium dioxide and its nanofraction from food products, food supplements and toothpaste by the Dutch population," *Nanotoxicology*, **10** (2016) 1404-1414.

Ruzycki N., Herman G. S., Boatner L. A., Diebold U., "Scanning tunneling microscopy study of the anatase (100) surface," *Surface Science*, **529** (2003) 239-244.

Sahu M., Biswas P., "Single-step processing of copper-doped Titania nanomaterials in a flame aerosol reactor," *Nanoscale Research Letters*, **6** (2011) 441-455.

Sanchez D. M., Morales M. G., Rodriguez V. M. J., Ibarra M. C. C., Rodriguez R. A. A., Vela G. A. V., Perez G. S. A., Gomez R., "Synthesis of Zn-doped TiO₂ nanoparticles by the novel

oil-in-water (O/W) microemulsion method and their use for the photocatalytic degradation of phenol," *Journal of Environmental Chemical Engineering*, **3** (2015) 3037-3047.

Santos A. F. M., Macedo L. J. A., Chaves M. H., Espinoza C. M., Merkoçi A., Lima F. C. A, Cantanhêde W., "Hybrid self-assembled materials constituted by Ferromagnetic nanoparticles and tannic Acid: a theoretical and experimental investigation," *Journal of the Brazilian Chemical Society*, **27** (2016) 727-734.

Sarkar D., Ghosh C., Mukherjee S., Chattpadhyay K. K. "Three dimensional Ag₂O/TiO₂ Type-II (p-n) Nanoheterojunctions for superior photocatalytic activity," *ACS Applied Materials & Interfaces*, **5** (2012) 331-337.

Schneider J., Matsuoka M., Takeuchi M., Zhang J., Horiuchi Y., Anpo M., Bahnemann D. W., "Understanding TiO₂ photocatalysis: Mechanisms and materials," *Chemical Reviews*, **114** (2014) 9919-9986.

Sergio V. J. M., "Study of the bandgap of synthesized Titanium dioxide nanoparticles using the sol-gel method and a hydrothermal treatment," *The Open Materials Science Journal*, **4** (2010) 9-14.

Singh D., Yadav P., Singh N., Kant C., Kumar M., Sharma S. D., Saini K. K., "Dielectric properties of Fe-doped TiO₂ nanoparticles synthesised by sol-gel route," *Journal of Experimental Nanoscience*, **8** (2013) 171-183.

Singh L., Rai U. S., Mandal K. D., Singh N. B., "Progress in the growth of CaCu₃Ti₄O₁₂ and related functional dielectric perovskites," *Progress in Crystal Growth and Characterization of Materials*, **60** (2014) 15-62.

Singh P., Kim Y. J., Zhang D., Yang D. C., "Biological synthesis of nanoparticles from plants and microorganisms," *Trends in Biotechnology*, **34** (2016) 588-599.

Song S., Tu J. J., He Z. Q., Hong F. Y., Liu W. P., Chen J. M., "Visible light-driven iodine-doped titanium dioxide nanotubes prepared by hydrothermal process and post-calcination," *Applied Catalysis A: General*, **378** (2010) 169-174.

Sreeja S., Sreedhanya S., Smijesh N., Philip R., Muneera C. I., "Organic dye impregnated poly(vinyl alcohol) nanocomposite as an efficient optical limiter: structure, morphology and photophysical properties," *Journal of Materials Chemistry C*, **1** (2013) 3851-3861.

Štengl V., Grygar T. M., "The simplest way to iodine-doped anatase for photocatalysts activated by visible light," *International Journal of Photoenergy*, (2011)13.

Su W., Zhang Y., Li Z., Wu L., Wang X., Li J., Fu X., "Multivalency iodine doped TiO₂: Preparation, characterization, theoretical studies, and visible-light photocatalysis," *Langmuir*, **24** (2008) 3422-3428.

Sugimoto T., Zhou X., Muramatsu A., "Synthesis of uniform anatase TiO₂ nanoparticles by gel-sol method: 4. Shape control," *Journal of Colloid and Interface Science*, **259** (2003) 53-61.

Tanaka K., Padermpole K., Hisanaga T., "Photocatalytic degradation of commercial azo dyes," *Water Research*, **34** (2000) 327-333.

Thangavelu K., Annamalai R., Arulnandhi D., "Preparation and characterization of nanosized TiO₂ powder by sol-gel precipitation route," *International Journal of Emerging technology and Advanced Engineering*, **3** (2013) 636-639.

Thapa R., Maiti S., Rana T. H., Maiti U. N., Chattopadhyay K. K., "Anatase TiO₂ nanoparticles synthesis via simple hydrothermal route: Degradation of Orange II, Methyl Orange and Rhodamine B," *Journal of Molecular Catalysis A: Chemical*, **363** (2012) 223-229.

Venkatachalam N., Palanichamy M., Murugesan V., "Sol-gel preparation and characterization of nanosize TiO₂: Its photocatalytic performance," *Materials Chemistry and Physics*, **104** (2007) 454-459.

Wang C. Y., Bahnemann D. W., Dohrmann J. K., "A novel preparation of iron-doped TiO₂ nanoparticles with enhanced photocatalytic activity," *Chemical Communications*, (2000) 1539-1540.

Wang G., Wang H., Ling Y., Tang Y., Yang X., Fitzmorris R. C., Wang C., Zhang J. Z., Li Y., "Hydrogen-treated TiO₂ nanowire arrays for photoelectrochemical water splitting," *Nano Letters*, **11** (2011) 3026-3033.

Wang H., Liu Q., You C., "Regeneration of sulfur-deactivated TiO₂ photocatalysts," *Applied Catalysis A: General*, **572** (2019) 15-23.

Wang J., Zhou Y., Hu Y., O'Hayre R., Shao Z., "Facile synthesis of nanocrystalline TiO₂ mesoporous microspheres for Lithium-ion batteries," *Journal of Physical Chemistry C*, **115** (2011) 2529-2536.

Wang W. N., Lenggoro W., Terashi Y., Kim T., Okuyama K., "One-step synthesis of Titanium oxide nanoparticles by spray pyrolysis of organic precursors," *Materials Science and Engineering B*, **123** (2005) 194-202.

Wang Y., Ren J., Liu G., Peng P., "Synthesis and characterization of iodine ion doped mesoporous TiO₂ by sol-gel method," *Materials Chemistry and Physics* **130** (2011) 493-499.

Wen L., Liu B., Zhao X., Nakata K., Murakami T., Fujishima A., "Synthesis, characterization, and photocatalysis of Fe-Doped TiO₂: A combined experimental and theoretical study," *International Journal of Photoenergy*, (2012) 1-10.

Wu J. M., Song X. M., Yan M., "Alkaline hydrothermal synthesis of homogeneous Titania microspheres with urchin-like nanoarchitectures for dye effluent treatments," *Journal of hazardous materials*, **194** (2011) 338-344.

Wu J., Yu P., Susha A. S., Sablon K. A., Chen H., Zhou Z., Li H., Ji H., Niu X., Govorov A. O., Rogach A. L., Wang Z. M., "Broadband efficiency enhancement in quantum dot solar cells coupled with multispiked plasmonic nanostars," *Nano Energy*, **13** (2015) 827-835.

Wu N. L., Lee M. S., "Enhanced TiO₂ photocatalysis by Cu in hydrogen production from aqueous methanol solution," *International Journal of Hydrogen Energy*, **29** (2004) 1601-1605.

Wu Y., Li Y., Du Q., Zhang T., Wu J., Zhang G., "Deactivated mechanism and regeneration methods of TiO₂ during photocatalytic Congo Red," *Huanjing Kexue Xuebao/Acta Scientiae Circumstantiae*, **35** (2015) 1477-1482.

Xie H., Gao G., Tian Z., Bing N., Wang L., "Synthesis of TiO₂ nanoparticles by propane/air turbulent flame CVD process," *Particuology*, **7** (2009) 204-210.

Xin B., Jing L., Ren Z., Wang B., Fu H., "Effects of simultaneously doped and deposited Ag on the photocatalytic activity and surface states of TiO₂," *Journal of Physical Chemistry B*, **109** (2005) 2805-2809.

Xu G., Liu J., Liu B., Gong X., Wang S., Wang Q., Zhang J., "Development of a Wattecs parallel autoclave system synthesis technique for tailoring surface compositions and valence states of Pt-Fe alloys to realize bifunctional electrocatalysis," *CrystEngComm*, **19** (2017) 7322-7331.

Yamashita H., Nishida Y., Yuan S., Mori K., Narisawa M., Matsumura Y., Ohmichi T., Katayama I., "Design of TiO₂-SiC photocatalyst using TiC-SiC nanoparticles for degradation of 2-propanol diluted in water," *Catalysis Today*, **120** (2007) 163-167.

Yang H., Zhang K., Shi R., Li X., Dong X., Yu Y., "Sol-gel synthesis of TiO₂ nanoparticles and photocatalytic degradation of methyl orange in aqueous TiO₂ suspensions," *Journal of Alloys and Compounds*, **413** (2006) 302-306.

Yang X. J., Wang S., Sun H. M., Wang X. B., Lian J. S., "Preparation and photocatalytic performance of Cu-doped TiO₂ nanoparticles," *Transactions of Nonferrous Metals Society of China*, **25** (2015) 504-509.

Yu J. C., Yu H., Jiang Z., "Effects of F-doping on the photocatalytic activity and microstructures of nanocrystalline TiO₂ powders," *Chemistry of Materials*, **14** (2002) 3808-3816.

Yu S., Yun H. J., Lee D. M., Yi J., "Preparation and characterization of Fe-doped TiO₂ nanoparticles as a support for a high performance CO oxidation catalyst," *Journal of Materials Chemistry*, **22** (2012) 12629-12635.

Zeng G., Qiu J., Li Z., Pavaskar P., Cronin S. B., "CO₂ Reduction to methanol on TiO₂-passivated GaP photocatalysts," *ACS Catalysis*, **4** (2014) 3512-3516.

Zhan H., Tian H., "Photocatalytic degradation of acid azo dyes in aqueous TiO₂ suspension I. The effect of substituents," *Dyes and Pigments*, **37** (1998) 231-239.

Zhang H., Banfield J. F., "Understanding polymorphic phase transformation behaviour during growth of nanocrystalline aggregates: Insights from TiO₂," *Journal of Physical Chemistry B*, **104** (2000) 3481-3487.

Zhang J., Xi J., Ji Z., "Mo + N Codoped TiO₂ sheets with dominant {001} facets for enhancing visible-light photocatalytic activity," *Journal of Materials Chemistry*, **22** (2012) 17700-17708.

Zhang M., Bando Y., Wada K., "Sol-gel template preparation of TiO₂ nanotubes and nanorods," *Journal of Materials Science Letters*, **20** (2001) 167-170.

Zhang Q., Li Y., Ackerman E. A., Gajdardziska J. M., Li H., "Visible light responsive iodine-doped TiO₂ for photocatalytic reduction of CO₂ to fuels," *Applied Catalysis A: General*, **400** (2011) 195-202.

Zhao W., Feng L., Yang R., Zheng J., Li X., "Synthesis, characterization, and photocatalytic properties of Ag modified hollow SiO₂/TiO₂ hybrid microspheres," *Applied Catalysis B: Environmental*, **103** (2011) 181-189.

Zubieta C. E., Soltero M. F. A., Luengo C. V., Schulz P. C., "Preparation, characterization and photoactivity of TiO₂ obtained by a reverse microemulsion route," *Powder Technology*, **212** (2011) 410-417.