

DAFTAR PUSTAKA

- Abdelkareem, E. K., Karine., M., Claude G., Francoise, Q., and Daniel, B., 2008, Design of stable nanoporous hybrid chitosan/titania as cooperative bifunctional catalysts, *Chem. Mater.*, 20, 2198–2204
- Akpan, U. G., and Hameed, B. H., 2009, Parameter affecting the photocatalytic degradation of dyes using TiO₂-based photocatalyst, *J. Hazard.Mater.*, 170, 520–529
- Ahmad, Z., and Sarwar, M. I., 1997, Preparation and properties of hybrid organic-inorganic composites prepared from Poly(phenylene terephthalamide) and titania, *Polym.* 38, 17, 4523–4529
- Ahmad, Z., and Sarwar, M.I., 2000, Preparation and properties of polyamide–titania nanocomposites, *J. Sol-Gel Sci. Techno.*, 44, 41–46
- Alves, N.M., Manoa, J. F., Chitosan derivatives obtained by chemical modifications for biomedical and environmental applications, *Int. J. Biol. Macromol.*, 43, 401–414
- Almquist, C., and Bishwas, P., 2002, Role of synthesis method and particle size of nanostructured TiO₂ on its photocactivity, *J. Catal.*, 212, 145-156
- Amornrat, L., Keiichi, N., Kozo, O., and Kenji, O., 2004, Plausible molecular and crystal structures of chitosan/HI type II salt, *Carbohydr. Res.*, 339, 835–843
- Andayani, W., dan Sumartono, A., 2007, TiO₂ and TiO₂/Active carbon photocatalysts immobilized on titanium plates, *Indo. J. Chem.*, 7, 3, 238–241
- Andrea, A. H., Silvio, L. P. D., Jordana, R. R., Flavio, A. P., Edilson, V. B., and Eder, C. L., 2008, Methylene blue immobilized on cellulose acetate with titanium dioxide: An application as sensor for ascorbic acid, *J. Braz. Chem. Soc.* 19, 5-11
- Angela, W., Walid, A.D., Hanhua L., Yau Shan S., The effect of aging and precursor concentration on room-temperature synthesis of nanocrystalline anatase TiO₂, *Mater. Letters*, 2014, 117, 82-85
- Annadurai, G., Juang, R.S., Lee, D.J., 2002, Use of cellulose-based wastes for adsorption of dyes from aqueous solutions, *J. Hazard Mater.* 10, 92, 263-74



- Anuar, K., and Marc, P., 2012, Reinforced materials based on chitosan, TiO₂ and Ag composit, *Polym.*, 4, 590–599
- Banfield, J. F., and Zhang H., 2001, Nanoparticles in the environment. *Rev. Mineral. Geochem.*, 44, 1-58
- Barka, N., Assabbanel A. N., Dussaud, Y., and Ait I., 2008, Photocatalytic degradation of metil orange with immobilized TiO₂ nanoparticles: effect of pH and some inorganic anion, *Phys. Chem. News*, 41, 85-88
- Bleuzen, A., Barboux-Doeuff, Claud, C., and Sanches, P., 1994, Rheological study of titanium oxide based gels, *Mater. Res. Bull.*, 29, 1223-1232
- Buraidah, M. H., Teo S., Yusuf, M. M., Noor, M. Z., and Kufian, M. A., 2011, TiO₂/Chitosan-NH₄I (+I₂)-BMII-based dye-sensitized solar cells with anthocyanin dyes extracted from black rice and red cabbage, *Eur. Polym. J.*, 36, 89 – 94 Article ID 273683, 11 pages doi:10.1155/2011/273683
- Camelia, O., Victor, C., and Gabriel, P., 2008, Investigation of nanocrystals using tem micrograph and electron diffraction, *Rom. Journ. Phys.*, Vol. 53, No. 1–2, 223–230
- Chang Sung, L., Jeong Ho, R., Do-Hwan, K., Sung-Yong, C., and Won-Chun, O., 2010, Reaction morphology and the effect of pH on the preparation of TiO₂ nanoparticles by a sol-gel method, *J. Ceram. Process. Res.* Vol. 11, No. 6, 736-741
- Chukwuocha, E.O, Onyeaju, M.C., 2012, Effect of Quantum Confinement on The Wavelength of CdSe, ZnS And GaAs Quantum Dots (Qds), *Intl. J. Sci. Tech. Res.*, 1, 7, 2277-8616
- Chen, Y., Kan Wang, Liping, L., 2004, Photodegradation of dye pollutants on silica gel supported TiO₂ particles under visible light irradiation, *J. Photochem. Photobiol. A: Chem.*, 163, 281-287
- Cheewita, S., Avinash, J. P., Ravinash, K. K., Sumpun, W. S. M., 2009, Fabrication of ice-templated macroporous TiO₂-chitosan scaffolds for photocatalytic applications, *J. Mater. Chem.*, 19, 8478–8483
- Colón, G., and Hidalgo, J.A., 2001, Photocatalytic deactivation of commercial TiO₂ samples during simultaneous photoreduction of Cr(VI) and photooxidation of salicylic acid, *J.Photochem. Photobiol. A.*, 138, 79–85
- Cordero-Arias, L., Cabanas-Polo, S., Haoxiang, G., Gilabert, J., Sanchez, E., and Roether, J. A., Virtanene and Boccaccinia A. R., 2013, Electrophoretic deposition

of nanostructured-TiO₂/chitosan composite coatings on stainless steel, DOI: 10.1039/c3ra40535d RSC advances

Chun He., Ya Xiong and Xi Hai, Z., 2002, A novel regeneration method of Cu(0)-deposited TiO₂ photocatalytic film: Air-assisted electrochemical oxidation, *Chinese Chem. Lett.*, 13, 11, 1127 – 1130

David, B., 2007, Self cleaning titania polyurethane composites, *Monograph Thesis*, Master of Engineering Science, Univ. Of Western Ontario London, Canada

Doeuff S, Henry M., and Sanchez, C., 1990, Sol-gel synthesis and characterization of titanium oxo-acetate polymers, *Mat. Res. Bul.*, 25, 1519 – 1529

Dorofeev, G. A., Streletskii, Povstugar, A. N., Protasov, I. V., and Elsukov, A. V., 2012, Determination of nanoparticle sizes by X-Ray diffraction, *Colloid J.*, 74, 6, 675-685

Dorian, A. H., Charles, C. S., 2011, Review of the anatase to rutile phase transformation, *Mater. Sci*, 46, 855–874

Dunbar, P., Birnie IIIa, and Norbert, J. B., 1999, ¹H and ¹³C NMR observation of the reaction of acetic acid with isopropoxide, *Mater. Chem. Physics*, 59, 26 – 35

Ephrem, O. C., Michael, C. O., Taylor, S. T. 2012, Theoretical Studies on the Effect of Confinement on Quantum Dots Using the Brus Equation, *World J. Condensed Matter Physics*, 2, 96-100

Esam, A. E., Elham, S. E., and Azizah, M., 2010, Characterization of chitosan in acetic acid: rheological and thermal studies, *Turk. J. Chem.*, 34, 47 – 56

Fajriati, I., Rusdi, M., 2015, Preparasi campuran TiO₂-kitosan film untuk fotodegradasi metil orange, *Proceeding Seminar Nasional Kimia dan Pendidikan Kimia (SNKPK 2015)*, Universitas Negeri Semarang, 104-107

Françoise, Q., Romain, V., Francesco Di, R., 2008, Aerogel materials from marine polysaccharides, *New J. Chem.*, 32, 1300-1310

García, M.F., Wang, X., Belver, C., Rodriguez, J., 2007, Anatase-TiO₂ Nanomaterials: Morphological/Size Dependence of the Crystallization and Phase Behavior Phenomena, *J. Phys. Chem. C*, 2007, 111 (2), pp 674–682. DOI: 10.1021/jp065661i

- Guibal, E., 2005, Heterogeneous catalysis on chitosan-based materials: a Review, *Prog. Polym. Sci.* 30, 71–109
- Guettai, N., and Ait Amar, 2005, Photocatalytic oxidation of methyl orange in presence of titanium dioxide in aqueous suspension. Part II: Kinetics study, *Desalination*, 185, 439 – 448
- Guivarch, E., Stephane, T., Claude, L., and Mehmet, A. O., 2003, Degradation of azo dyes in water by electro-fenton process, *Environ. Chem. Lett.*, 1:38–44
- Gunlazuardi, J., dan Thahjanto, T.R., 2001, Preparasi lapisan tipis TiO₂ sebagai fotokatalis: keterkaitan antara ketebalan dan aktivitas fotokatalis, *Makara*, Jurnal Penelitian Universitas Indonesia, Vol 5, 2, Seri Sains, Desember, 81-91
- Gurusamy, A., 2002, Adsorption of Basic Dye on Strongly Chelating Polymer: Batch Kinetics Studies, *Iranian Polymer. J.*, Vol 2, 4, 1026-1265
- Habib M.P., Woo Young K., Kwang-Deog J., Oh-Shim J., 2005, A chemical route to room-temperature synthesis of nanocrystalline TiO₂ thin films, *Appl. Surface Sci.*, 246, 72–76
- Hassen, T., Moncef, K., Olfa, H., dan Mohamed, K., 2013, Titanium Dioxide Mediated Photodegradation of Methyl Orange by Ultraviolet Light, *Toxicol. Environ. Chem.* Vol. 95, No. 4, 543–558
- Hagfeldt, A., and Grätzel, M., 1995, Light-Induced Redox Reactions in Nanocrystalline Systems. *Chemical. Review*, 95, 49-68.
- Herrmann, J. M., 2005, Heterogeneous Photocatalysis: State of the Art and Present Applications, *Top. Catal.*, Vol. 34, Nos. 1–4
- Herrmann, J.M., 1999, Heterogeneous photocatalysis: fundamentals and applications to the removal of various types of aqueous pollutants, *Catal. Today*, 53, 115–129
- Hernández-Perez, Maubert, A. M., Luis Rendón, Patricia, S., Herrera-Hernández, H., Díaz-Barriga, A., Garibay, F. Zv., Eduardo, P., and González-Reyes, 2012, Ultrasonic Synthesis: Structural, Optical and Electrical Correlation of TiO₂ Nanoparticles, *Int. J. Electrochem. Sci.*, 7, 8832 – 8847
- Hoffmann, M. R., Martin, S. T., Choi, W., and Bahnemann, D. W., 1995, Environmental Application of Semiconductor Photocatalysis, *J. Chem. Rev.*, 95,1, 69-96.



- Hosseingholi, M., Pazouki, A. H., and Aboutalebi, S. H., 2011, Room Temperature Synthesis of Nanocrystalline Anatase Sols and Preparation of Uniform Nanostructured TiO₂ Thin Films: Optical and Structural Properties, *J. Appl. Phys.* 44,(8pp) doi:10.1088/0022-3727/44/5/055402
- Huguenin, F., Valtencir, Z., Antonio, J.F., Ernesto, R., and Osvaldo, N.O., 2005, Layer by Layer Hybrid Films Incorporating WO₃, TiO₂ and Chitosan, *Chem. Mater.* 17, 6739 – 6745
- Huaming, Y., Ke Zhang, Rongrong, S., Xianwei Li, Xiao, D., and Yongmei, Y., 2006, Sol–Gel Synthesis of TiO₂ Nanoparticles and Photocatalytic Degradation of Methyl Orange in Aqueous TiO₂ Suspensions, *J. Alloy Compd.*, 413, 302–306
- Ingolf, K., Oliver T., Sabine, T., Hannes, R., Bernd Grünler, Steffen, H., Maik, S., Michael, M., and Stefan, S., 2011, Functional Mesoporous Aluminosilicate Nanoparticles as Host Material to Fabricate Photo-Switchable Polymer Films Show Affiliations, *J. Mater. Chem.*, 21, 5083-5088
- Inger, M.N., Volda, K. M., Eric, G., and Olav, S., 2003, Binding of ions to chitosan—selectivity studies, *Carbohydr. Polym*, 54, 471–477
- Jayakumar, R., Roshni, R., Divyaranian, V. V., Chennazhia, K. P., Tamurab, H., and Naira, S. V., 2011, Fabrication of Chitin–Chitosan/nano TiO₂-Composite Scaffolds for Tissue Engineering Applications, *Int. J. Bio. Macromol.*, 48, 336–344
- Janus, M., Ewelina, K. N., Antoni, M. W., 2011, Determination of the Photocatalytic Activity of TiO₂ with High Adsorption Capacity, *React. Kinet. Mech. Cat*, 103, 279 – 278
- Jeong Ah, C., Muga Vithal, and Chan, B., 2009, Morphological and Phase Evolution of TiO₂ Nanocrystals Prepared from Peroxotitanate Complex Aqueous Solution: Influence of Acetic Acid, *J. Solid State Chem.* 182, , 749 –756
- Jun, Z., Yupeng, Z., Yinkai, L., and Chunxu Pan, 2011, Photocatalytic and Degradation Mechanisms of Anatase TiO₂: a HRTEM Study, *Catal. Sci. Technol.*, 1, 273–278
- Jonathan, D. C., Susan, E. D., and Andrea, M. D., 2006, Evaluation of Copper Speciation and Water Quality Factors that Affect Aqueous Copper Tasting Response, *Senses*, 31: 689–697
- Kabra, K., Rubina, C., Rameshwar, L. S., 2004, Treatment of Hazardous Organic and Inorganic Compounds through Aqueous-Phase Photocatalysis: A Review, *Ind. Eng. Chem. Res.*, 43, 7683-7696

- Kabra, K., Rubina, C., Rameshwar, L. S., 2008, Solar photocatalytic removal of Cu(II), Ni(II), Zn(II) and Pb(II): Speciation modeling of Metal–Citric Acid Complexes, *J. Hazard. Mater.*, 155, 4, 424–432
- Kaihong, Q., and John, H. X., 2010, Room Temperature Synthesis of Single-Phase Anatase TiO₂ by Aging and its Self-Cleaning Properties, *Appl. Mater. Inter.*, 2, 12, 3479 – 3485
- Kasetsart, J., Kheamrutai, T., Pichet, L., and Boonlaer, G., 2008, Phase Characterization of TiO₂ Powder by XRD and TEM, *Nat. Sci.*, 42 : 357 – 361
- Murugan, K., 2010, Tata N. Rao, Ashutosh S. Gandhi, B.S. Murty, Effect of aggregation of methylene blue dye on TiO₂ surface in self cleaning studies. *Catalyst. Com.* 11, 518–521
- Dai, Hao, C., Tianyaou, P., Dingning, K., and Huabing, Y., 2007, Photocatalytic Degradation of Methyl Orange in Aqueous Suspension of Mesoporous Titania Nanoparticle, *Chemosphere*, 69, 1361-1367
- Khezrianjoos, H.D., and Revanasiddappa, 2012, Langmuir-Hinshelwood Kinetic Expression for the Photocatalytic Degradation of Metanil Yellow Aqueous Solutions by ZnO Catalyst, *Chem. Sci. J.*, CSJ-85
- Kumirska, J., Czerwicka, M., Kaczynski, Z., Bychowska, A., Brzozowski, K., Thoming, J., and Stepnowski, P., 2010, Application of Spectroscopic Methods for Structural Analysis of Chitin and Chitosan, *Mar. Drugs.*, 8, 5, 1567-1636
- Lachheb, H., Eric, P., Houas, A., Ksibi, M., Elimame, E., Herrmann, J.M., 2002, Photocatalytic degradation of various types of dyes (Alizarin S, Crocein Orange G, Methyl Red, Congo Red, Methylene Blue) in water by UV-irradiated titania, *App. Catal.B: Environ.* 39, 75–90
- Linsebigler, A.L., Lu G., and Yates, Jr. J.T., 1995, Photocatalysis on TiO₂ Surfaces: Principles, Mechanisms, and Selected Results. *Chem. Rev.*, 95, 735-758
- Ling, C., Yee, Y., and Eng, H.S., 2011. Removal of A Cationic Dye using Deacetylated Chitin (Chitosan). *J. Appl. Sci.*, 11: 1445-1448.
- Madhusudan, R., Sunkara, V. M., and Ramachandra, R. A., 2002, Bandgap Studies on Anatase Titanium Dioxide Nanoparticles, *Mater. Chem. Phys.*, 78, 239–245



- Maria, V. D., Alessia, S., and Elena, S., 2012, Cr(VI) Photocatalytic Reduction: Effects of Simultaneous Organics Oxidation and of Gold Nanoparticles Photodeposition on TiO₂, *J. Hazar. Mater.*, 211– 212, 188– 195
- Madrazo, A, O., David, L., Trombotto S, L., Peniche-Covas, C., Domard A., 2010, Kinetics study of the solid-state acid hydrolysis of chitosan: evolution of the crystallinity and macromolecular structure, *Biomacromol.*, 11, 5, 1376-86. DOI: 10.1021/bm1001685
- Marcelo, R., 2001, *Studies of Photochemical Kinetic of the Methylene Blue with Reductants*, Thesis, Dept of Chemistry, University of Karachi Pakistan
- Maryam, H. Z., 2011, Synthesis of TiO₂ Nanoparticles by Microemulsion/Heat Treated Methods and Photodegradation of Methylene Blue, *J. Inorg. Organomer Polym.*, 21, 81 – 90
- Matthews, F.L., and Rawling, RD., 1993, *Composite Material Engineering and Science*, Imperial College of Science, Technology and Medicine, London, UK
- Mehri-Saddat, Ekrami-Kakhki, Mozghan Khorosani, and Meissam Noroozifar, 2011, Platinum Nanoparticles Self-Assembled onto Chitosan Membrane as Anode for Direct Methanol Fuel cell, *J. Appl. Electrochem.*, 41, 527 – 534
- Morten, S. E., Erik, G., Sjøgaard, 2010, Sol–gel reactions of titanium alkoxides and water: influence of pH and alkoxy group on cluster formation and properties of the resulting products, *J. Sol-Gel Sci. Technol.*, 53, 485–497
- Monshi, A. M., and Mohammad, R. F., 2012. Modified Scherrer Equation to Estimate More Accurately Nano-Crystallite Size Using XRD. *World Journal of Nano Science and Engineering (WJNSE)*, 2, 154-160
- Mohammad, A. B., Hamed, E., Nasser, M., Mohammad S., 2011, Sol-Gel Low-temperature Synthesis of Stable Anatase-type TiO₂ Nanoparticles Under Different Conditions and its Photocatalytic Activity, *Photochem. Photobiol.*, 87, 1002–1008
- Murphy, A.B., 2007, Band-gap determination from diffuse reflectance measurements of semiconductor films, and application to photoelectrochemical water-splitting, *Solar Energy Materials & Solar Cells*, 91, 1326–1337
- Nawi, M.A, Sabar, S., Jawad, A.H., Wan Ngah, W.S., 2010, Adsorption of Reactive Red 4 by Immobilized Chitosan on Glass Plates: Towards the Design of Immobilized TiO₂–Chitosan Synergistic Photocatalyst-Adsorption Bilayer System, *Biochem. Eng. J.*, 49, 317–325

- Nawi, M.A., Jawad, A. H., Sabar, S., Wan Ngah, W.S., 2011, Photocatalytic-Oxidation of Solid State Chitosan by Immobilized Bilayer Assembly of TiO₂-Chitosan Under a Compact Household Fluorescent Lamp Irradiation, *Carbohyd. Polym.*, 83, 1146–1152
- Nawi, M.A., and Sabar, S., Photocatalytic Decolourisation of Reactive Red 4 Dye by an Immobilised TiO₂/Chitosan Layer by Layer System, 2012, *J. Colloid Inter. Sci.*, 372, 80–87
- Niederberger, N, and Pinna, N., 2009, *Metal oxide nanoparticles in organic solvent, synthesis, assembly and application*: Chapter 2. Aqueous and Nonaqueous Sol-Gel Chemistry, Springer
- Niancai, C., Richard, A. W., Mu, P., Shichun, M., Liza, R., Shik, C. T., and Frank, M., 2010, One-Step Growth of 3–5nm Diameter Palladium Electrocatalyst in a Carbon Nanoparticle-Chitosan Host and Characterization for Formic Acid Oxidation, *Electrochim. Acta*, 55, 6601–6610
- Niu, X., Li S., Chu, H. and Zhou, J., 2011, Preparation, Characterization of Y³⁺ - doped TiO₂ Nanoparticles and their Photocatalytic Activities for Methyl Orange Degradation, *J. Rare Earths*, Vol. 29, No. 3, 225 – 22
- Nguyen, T. D., Eun, W. S., 2011, Morphological Effect of TiO₂ Catalyst on Photocatalytic Degradation of Methylene Blue, *J. Ind. Eng. Chem.*, 17, 397-400
- Nogueira, R.F.P., and Jardim, W.F., 1993, Photodegradation of Methylene Blue Using Solar Light and Semiconductor (TiO₂), *J. Chem. Ed.*, 70, 10, 861-862
- Okuyama, K., Noguchi, K., Miyazawa, T., Tui, T., and Ogawa, K., 1997, Molecular and Crystal Structural of Hydrated Chitosan, *J. Bio Macromol*, 30, 5849 – 5855
- Okuyama, K., Noguchi, K., Hanafusa, T., Tui, T., and Ogawa, K., 1999, Structural Study of Anhydrous Tendon Chitosan Obtained via Chitosan/Acetic Complex, *J. Bio Macromol*, 26, 285-293
- Okuyama, K., Noguchi, K., Kanenari, M., Egawa, T., Osawa, K., and Ogawa, K., 2000, Structural Diversity of Chitosan and Its Complexes, *J. Carbohydr. Polym*, 41, 237-247
- Ommeaymen, S., Feng, Z., Ali, R. D., Erfan, K., Yudong, H., 2014, Precursor and Reaction Time Effects in Evaluation of Photocatalytic Properties of TiO₂

Nanoparticles Synthesized via Low Temperature, *Int. J. Electrochem. Sci.*, 9, 3068 – 3077

Ozerin, A. N., Zelenetskii, A. N., Akopova, T. A., Pavlova-Verevkina, O. B., Ozerina, L. A., and Kechek'yan, S. A., 2006, Nanocomposites Based on Modified Chitosan and Titanium Oxide, *Polym. Sci., Ser. A*, Vol. 48, No. 6, pp. 638–643.

Pandiangan, D.K., dan Simanjuntak, W., 2013, Transesterification of coconut oil using dimethyl carbonated and TiO₂/SiO₂ heterogeneous catalyst, *Indo. J. Chem.*, 13, 1, 47–52

Parra, R. M. S., Góes, M. S., Castro, E. L. and Varela, J. A., 2008, Reaction Pathway to the Synthesis of Anatase via the Chemical Modification of Titanium Isopropoxide with Acetic Acid, *Chem. Mater.*, 20, 143–150

Ponton, S., and Barboux-Doeuff, Sanchez, C., 1999, Rheology of Titanium Oxide Based Gels: Determination of Gelation Time Versus Temperature, *Colloids Surfaces A*, 162, 177–192

Phonthammachai, N., Chairassameewong, T., Gulari, T., Wongkasemjit, S., 2003, Structural and rheological aspect of mesoporous nanocrystalline TiO₂ synthesized via sol–gel process, *Micropor. Mesopor. Mater.* 66, 261–271

Prairie, M.N., Lindsey, R., Bertha, M.S., Sheryl, L.M., 1993, An investigation of titanium dioxide photocatalysis for the treatment of water contaminated with metals and organic chemicals, *Environ. Sci. Technol.*, 27, 9, 1776–1782

Rekasa, A., Trenczek-Z., and Zakrzewskab, 2008, Importance of the Band Gap Energy and Flat Band Potential for Application of Modified TiO₂ Photoanodes in Water Photolysis, *J. Power Sources*, 181, Issue 1, 15 June, 46–55

Raju, K., and Marshal, D., 2008, Electrochemical Studies of Novel Chitosan/TiO₂ Bioactive Electrode for Biosensing Application, *Electrochem. Comm.* 10, 263 – 267

Ralph, W. M., 1989, Photocatalytic Oxidation and Adsorption of Methylene Blue on Thin Film of Near-Ultraviolet-Illuminated TiO₂, *J. Chem. Soc., Faraday Trans. I.*, 85, 1291 – 1302

Rouquerol, J., Rouquerol, F., Kenneth, S., 2007, *Adsorption by powders and porous solids: Chapter 7 Assessment of mesoporosity*, Elsevier Copyright, 204-206

- Santen, R.A., Leeuwen, PWNM., Moulijn, J.A., Averil, B.A., 1999, *Catalysis: An Integrated Approach*, Netherland Institute for Catalysis Research, Amsterdam
- Silva, M.A., Andrea, C. K., Theo, G.K., 2012, Modelling natamycin release from alginate/chitosan active films, *Int. J. Food Sci. Tech.*, 47, 740–746
- Sugimoto, T., Zhao, X., Anda, M., 2002, Synthesis of uniform anatase TiO₂ nanoparticle by sol gel methods. Solution chemistry of Ti(OH)₆⁽⁴⁻ⁿ⁾ complexes, *J. Coll. Interf. Sci.*, 252, 339-346
- Sharif, S., Masoud A., Sadrnezhad, S.K., 2011, Gel–sol synthesis and aging effect on highly crystalline anatase nanopowder, *Bull. Mater. Sci.*, 34, 6, 1189–1195
- Sagheer, F.A., and Merchant, 2011, Visco-Elastic Properties of Chitosan–Titania Nano-Composites, *Carbohyd. Polym.*, 85, 356–362
- Sagheer, F.A., and Muslim, S., 2010, Thermal and Mechanical Properties of Chitosan/SiO₂ Hybrid Composites, *J. Nanomater.*, Article ID 490679, 7 pages, DOI: 10.1155/2010/490676
- Schimdt, H., Johnchker, G., Goedicke, M., and Mennig, 2000, The Sol-Gel Process as a Basic Technology for Nanoparticles – Dispersed Inorganic–Organic Composites, *J. Sol Gel Sci. Tech.* 19, 39–51
- Schmuhl, R., Krieg, H. M., and Keizer, K., 2001, Adsorption of Cu(II) and Cr(VI) ions by chitosan: Kinetics and equilibrium studies, *Water SA*, Vol. 27. 1
- Shan, W., Yi, H., Minyan, Z., Yongsheng, W., Siping, H., and Yuanzi, G., 2011, Synthesis of MS (M=Zn, Cd and Pb)–Chitosan Nanocomposite Film Via Simulating Biomineralization Method, *Adv. Polym. Tech.*, Vol. 30, No. 4, 269–275
- Sergio, V., Juan, M. M., and Gloria, R., 2010, Study of the Bandgap of Synthesized Titanium Dioxide Nanoparticles Using the Sol Gel Method and a Hydrothermal Treatment, *The Open Material Science Journal*, 4, 9 – 14
- Shapovalov, V. I., 2010, Nanopowders and Film of Titanium Oxide for Photocatalysis: Review, *Glass Phys. Chem.*, 36, 2, 121 – 157
- Sing, K.S.W., Everett, D.H., Haul, R.A.W., Moscou, L., Pierotti, R.A., Rouquérol, J., and Siemieniewska, T., 1985, Reporting Physisorption Data for Gas/Solid Systems with Special Reference to the Determination of Surface Area and Porosity, *Pure Appl. Chem.* 57, 603–619



- Stroyuk, A. L., Kryukov, A.I., and Kuchmi, 2005, Quantum Size Effect in Semiconductor Photocatalysis, *Theoretical and Experimental Chemistry*, 41(4), 207 – 228
- Shu-quan, C., Bin K., Yao-dong, D., Hong-xu, Z. and Da, C., 2011, One-Step Fabrication of Biocompatible Chitosan Coated ZnS and ZnS: Mn²⁺Quantum Dots via a Gradation Route, *Nanoscale Res. Lett.*, 6, 591
- Su, H., Li, Q., Tianwei, T., 2006, Double-Functional Characteristics of a Surface Molecular Imprinted Adsorbent With Immobilization of Nano-TiO₂, *J. Chem. Technol. Biotechnol.* 81: 1797-1802
- Su, H., Li, Q., Tianwei, T., 2008, Synthesis of Ion-Imprinted Chitosan – TiO₂ Adsorbent and Multi-functional Performances, *Biochem. Eng. J.* 38, 212-218
- Su, H., Xiaolei, Z., Qiang, L., Xin, Z., Kai, L., and Anzan, C., 2010, Simultaneous Removal of Metal Ions and Methyl Orange by Combined Selective Adsorption dan Photocatalysis, *AIChE, Environmental Progress & Sustainable Energy* (Vol.00, No.00) DOI 10.1002
- Su, H., Wang, L.J and Tianwei, T., 2002, Adsorption of Heavy Metal Ions by Adsorbent From Waste Mycelium Chitin. *Chin. J. Chem. Eng.*, 10:650–652
- Su, H., Enzan, C., and Tianwei, T., 2010, Antimicrobial Properties of Silver Nanoparticles Synthesized by Bioaffinity Adsorption Coupled with TiO₂ Photocatalysis, *J. Chem. Technol. Biotechnol.*, 86: 421–427
- Su, H., Tingting, Q., Tianwei, T., 2011, The Bactericidal and Mildew-Proof Activity of a TiO₂–Chitosan Composite, *J. Photochem. Photobiol. A: Chem.*, 218, 130–136
- Suwanchawalit, A., Patil, J., Ravinash, K. K., Sumpun, W., and Stephen, M., 2009, Fabrication of Ice-Templated Macroporous TiO₂–Chitosan Scaffolds for Photocatalytic Applications, *J. Mater. Chem.*, 19, 8478–8483
- Tae, Y. K., Yeon, H. L., and Kyung, H. P., 2005, A Study of Photocatalysis of TiO₂ Coated onto Chitosan Beads and Activated Carbon, *Res. Chem. Intermed.*, 31, 4 – 6, 343 – 358
- Tao, Y., Jun, P., Shilei, Y., Bin, T., and Longbao, Z., 2007, Tensile Strength Optimization and Characterization of Chitosan/TiO₂ Hybrid Film, *Mater. Sci. Eng. B*; 138, 84–89
- Tao, Y., Lianbin, Y., Jun, P., Yaoming, W., Bin, T., 2009, Removal of Pb(II) from Aqueous Solution on Chitosan/TiO₂ Hybrid Film, *J. Hazard. Mater.* 161, 718-722

- Vijay, K. M., and Meena, R.C., 2010, Studies on Photodegradation of Methyl Orange in Aqueous Solution using Immobilized Dowex-11 photocatalyst, *J. Ind. Council Chem.*, Vol. 27, No. 2, 180-184
- Visurraga, J.D., Melendrez, M.F., Garzia, A., Paulraj, M., dan Cardenas, G., 2010, Semitransparent Chitosan–TiO₂ Nanotubes Composite Film for Food Package Applications, *J. Appl. Polym. Sci.*, 116, 3503 – 3515
- Wade, J., 2005, *An Investigation of TiO₂-ZnFe₂O₄ Nanocomposites for Visible Light Photocatalysis*, Ph.D Thesis, Department of Electrical Engineering, College of Engineering, University of South Florida
- Waldemar, M., 2011, Chitin, Chitosan, Oligosaccharides and Their Derivatives: X-Ray Diffraction Studies of Chitin, Chitosan, and Their Derivatives, Edited by Se-Kwon Kim CRC Press, Taylor & Francis Group, New York
- Wahyuni, E.T., 2003, Synthesis of Iron Oxide Nanoparticle in the Zeolite-NaY Structure, *Disertasi*, Univ. Gadjah Mada, Yogyakarta
- Wahyuni, E.T., Hidayat, N.A., An-Nisa H.F., Nurhayati, S., 2008, Pengaruh asam oksalat dan malonat terhadap fotoreduksi ion Cu(II) yang terkatalisis TiO₂, *J. Manusia Lingkungan*, 15, 1, 10-15
- Wahyuni, E.T., Kunarti, E.S., and Mudasir, 2010, Preparation of TiO₂-Resin Nanocomposite by Ion Exchange as Photocatalyst for Mercury Removal by Photoreduction Method, *J. Ion Exchange*, Vol. 21, No. 3. Pp. 304 – 309, ISSN. 1884-3360
- Wahyuni, E.T., Nurul Hidayat Aprilita, Husnul Hatimah, Afifah Maya Wulandari, and Mudasir, 2011, Removal of Toxic Metal in Wastewater by Photocatalytic Methods, *Proceeding of The 3th Conference on Environmental Pollution and Human Health*, London, 21-25 November 2011
- Weiwei, Z., Shougang, C., Shuaiqin, Y., and Yansheng, Y., 2007, Experimental and Theoretical Investigation of the pH Effect on the Titania Phase Transformation during the Sol-Gel Process, *J. Crystal Growth*, 308, 122 – 129
- Weon, D. L., Hosun, L., Ha, N. C., and Woo, S. S., 2009, Advances in Chitosan Material and its Hybrid Derivatives: A Review, *The Open Biomaterials Journal*, 1, 10-20
- Wijaya, K., Kunarti, S. E., and Fatimah, I., 2006, Utilisasi TiO₂ – Zeolit dan Sinar UV untuk Fotodegradasi Zat Warna Congo Red, *Jurnal Teknoin*, 11, 3, 199 – 209

- Wong, A., Szeto, Y.S., Cheung, W.H., and McKay, G., 2004, Adsorption of acid dyes on chitosan—equilibrium isotherm analyses, *Process Biochemistry*, 39, 693–702
- Wynetta, S., and John, R. S., 1979, Study of Monomer-Dimer Equilibrium of MB in Aqueous Solution, *J. Phys.Chem*, Vol 83. NO 12.
- Xiaobo, C., and Samuel, S. M., 2007, Titanium Dioxide Nanomaterials: Synthesis, Properties, Modifications and Applications, *Chem. Rev.*, 107, 2891 – 2896
- Xiliang, N., Shuping, Z., Gloria, M., dan Karl, S., 2009, Doping of TiO₂ Polymorphs for Altered Optical and Photocatalytic Properties, *Int'l. J. Photoenergy*, Article ID 294042, doi.org/10.1155/2009/294042
- Yasuhiro, S., Yoshitsune, S., Daisuke, I., and Takayuki, H., 2009, Effect of Substrate Polarity on Photocatalytic Activity of Titanium Dioxide Particles Embedded in Mesoporous Silica, *J. Catalyst.*, 264, 175 – 183
- Yanasigawa, K., and Ovenstone, J., 1999, Crystallization of Anatase from Amorphous Titania Using the Hydrothermal Technique: Effects of Starting Material and Temperature, *J. Phys. Chem.*, B, 7781-7787
- Yanrong, Z., Jian, W., Youqing, K., 2010, A Novel Approach of Preparing TiO₂ Film at Low Temperature and Its Application in Photocatalytic Degradation of Methyl Orange, *J. Hazard.Mater.*, 177, 750 – 754
- Yuanhua, H., Franz, G., Muthupandian, A., 2011, The Mechanism of Sonophotocatalytic Degradation of Methyl Orange and Its Products in Aqueous Solutions, *Ultrason. Sonochem.*, 18, 974–980
- Yuvaraj, H., and Jae-Jin, S., 2013, Multifunctional Chitosan-Copper Oxide Hybrid Material: Photocatalytic and Antibacterial Activities, *Int. J. Photoenergy*, Article ID 245646, 8 pages, doi.org/10.1155/2013/245646
- Zhang, X., Xiaolei, Z., and Haijia, S., 2011, Degradation Characteristic of TiO₂-Chitosan Adsorbent on Rhodamin B and Purification of Industrial wastewater, *Korean J. Chem. Eng.*, 28 (5), 1241 – 1246
- Zhang, H., Wang, L.L., 2010, Study on the Properties of Woolen Fabric Treated with Chitosan/TiO₂ Sol, *The Journal of The Textile Institute*, 101, 9, 842 – 848



- Zhao, X., Gang, X., Xin, Z., Su, H., and Tianwei, T., 2010, The Effect of Ni²⁺ and Cu²⁺ on the Photocatalytic Degradation of Dyes by the Chitosan–TiO₂ Complex, *Appl. Biochem. Biotechnol.* DOI 10.1007/s12010-011-9407-8
- Zhao, L., Jiang, C., and Wanyin, Z., 2009, Preparataion and HHL-7702 Cell Functionality of Titania/Chitosan Composite Scaffolds, *J. Mater. Sci: Mater. Med.*, 20, 949 – 967
- Zhu, H., Ru, J., and Yongqian, F., 2012, Effective Photocatalytic Decolorization of Methyl Orange Utilizing TiO₂/ZnO/Chitosan Nanocomposite Film Under Simulated Solar Irradiation, *Desalination*, 286, 41 – 48
- Zainal, Z., Chong, Y. L., Anuar, K., Hussein, M. Z., and Azah, N. Y., 2007, Photoelectrochemical Degradation of Methyl Orange Using TiO₂/Ti Films Prepared via Sol-Gel Technique, *Acta Chim. Slov.* 54, 166–174
- Zainal, Z., Lee Kong, Hussein, M. Z., Abdul, H. A., and Imad, R., 2009, Characterization of TiO₂–Chitosan/Glass Photocatalyst for The Removal of Monoazo Dye via Photodegradation – Adsorption Process, *J. Hazard. Mater.*, 164, 138-145
- Zubieta, C.E., Paula, V.M., Carina, L., Mariana, D., Olga, P., and Pablo, C.S., 2008, Reactive Dyes Remotion by Porous TiO₂–Chitosan Material, *J. Hazard. Mater.* 152, 765-777