

DAFTAR PUSTAKA

- Asahi, R., Morikawa, T., Ohwaki, T., Aoki, K. and Taga, Y., 2001, Visible-light Photocatalysis in Nitrogen-Doped Titanium Oxides, *Science* (80-.), (Vol 293), pp.269–271.
- Balachandran, K., Venckatesh, R., Sivaraj, R. and Rajiv, P., 2014, Spectrochimica Acta Part A : Molecular and Biomolecular Spectroscopy TiO₂Nanoparticles Versus TiO₂-SiO₂Nanocomposites: A Comparative Study of Photocatalysis on Acid Red 88, *Spectrochim. Acta Part A Mol. Biomol. Spectrosc.*, 128, pp.468–474.
- Bellardita, M., Addamo, M., Paola, A. Di, Marci, G., Palmisano, L., Cassar, L. and Borsa, M., 2010, Photocatalytic Activity of TiO₂/SiO₂Systems, *J. Hazard. Mater.*, 174, pp.707–713.
- Bhatia, R.B. and Brinker, C.J., 2000, Aqueous Sol-Gel Process for Protein Encapsulation, *Chem. Mater.*, 12(8), pp.2434–2441.
- Boer, K.W., 1992, *Survey of Semiconductor Physics*, Van Nostrand Reinhold, New York.
- Bonne, M., Pronier, S., Can, F., Courtois, X., Valange, S., Tatibouet, J.-M., Royer, S., Marecot, P. and Duprez, D., 2010, Synthesis and Characterization of High Surface Area TiO₂/SiO₂ Mesostructured Nanocomposite, *Solid State Sci.*, 12, pp.1002–1012.
- Braydich-Stolle, L., Hussain, S., Schlager, J.J. and Hofmann, M.-C., 2005, In Vitro Cytotoxicity of Nanoparticles in Mammalian Germline Stem Cells, *Toxicol Sci.*, 88(2), pp.412–419.
- Brus, L.E., 1984, Electron-electron and Electron-hole Interactions in Small Semiconductor Crystallites: The Size Dependence of The Lowest Excited Electronic State, *J. Chem. Phys.*, 80(9), pp.4403–4409.
- Burrows, H.D., Ernestova, L.S., Kemp, T.J., Skurlatov, Y.I., Purnal, A.P. and Yermakov, A.N., 1998, Kinetics and Mechanism of Photodegradation of Chlorophenols, *Prog. React. Kinet.*, 23, pp.145–207.
- Butterman, W.C. and Hilliard, H.E., 2005. *Silver*, U.S. Geological Survey, Virginia.
- Byrne, J.A., Eggins, B.R., Brown, N.M.D., Mckinney, B. and Rouse, M., 1998, Immobilisation of TiO₂ Powder for The Treatment of Polluted Water, *Appl. Catal. B Environ.*, 17, pp.25–36.
- Cappel, C.R., 1997, *Silver Compounds*. In *Kirk-Othmer Encyclopedia of Chemical Technology* 4th Ed, Vol 22, John Wiley and Sons Inc, New York.
- Chatti, R., Ã, S.S.R., Dubey, N., Labhsetwar, N. and Devotta, S., 2007, Solar-Based Photoreduction of Methyl Orange Using Zeolite Supported Photocatalytic Materials, *Sol. Energy Mater. Sol. Cells*, 91, pp.180–190.

- Chen, D. and Ray, A.K., 2001, Removal of Toxic Metal Ions From Wastewater by Semiconductor Photocatalysis, *Chem. Eng. Sci.*, 56, pp.1561–1570.
- Chen, X. and Schluesener, H.J., 2008, Nanosilver: A Nanoproduct in Medical Application, *Toxicol. Lett.*, 176, pp.1–12.
- Cotton, F.A. and Wilkinson, G., 1972, *Advanced Inorganic Chemistry - A Comprehensive Text*. 3th Ed., Interscience Publisher, New York.
- Day, R.A. dan Underwood, A.L., 2002, *Analisis Kimia Kuantitatif, edisi keenam*, Erlangga, Jakarta.
- Dorcheh, A.S. and Abbasi, M.H., 2008, Silica Aerogel; Synthesis, Properties and Characterization, *J. Mater. Process. Technol.*, 199, pp.10–26.
- Eisler, R., 1996, *A Review of Silver Hazard to Plants and Animals*, Maryland.
- Etris, S.F., 1997, *Silver and Silver Alloys*. In *Kirk-Othmer Encyclopedia of Chemical Technology* 4th Ed, Vol 22, John Wiley and Sons Inc, New York.
- Evitasari, F., 2012. Fotoreduksi Ion Hg(II) Terkatalisis TiO₂-Lignin : Pengaruh Waktu Penyinaran dan Konsentrasi Hg, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Greenwood, N.N. and Earnshaw, A., 1997, *Chemistry of The Element*, 2nd Ed., Oxford: Butterworth-Heinemann.
- Guibal, E., 2004, Interactions of Metal Ions With Chitosan-Based Sorbents: A Review, *Sep. Purif. Technol.*, 38, pp.43–74.
- Haq, I.U., Akhtar, K. and Malik, A., 2014, Effect of Experimental Variables on The Extraction of Silica From The Rice Husk Ash, *J. Chem. Soc. Pak.*, 36(3), pp.382–387.
- Hatimah, H., 2009, Kajian Pengaruh Ion Cd(II) dan Cr(VI) Terhadap Efektivitas Fotoreduksi Ion Cu(II) Terkatalisis TiO₂, *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Hogstrand, C. and Wood, C.M., 1996, *The Toxicity of Silver to Marine Fish*, Kentucky.
- Hoffmann, M.R., Martin, S.T., Choi, W. and Bahnemann, D.W., 1995, Environmental Applications of Semiconductor Photocatalysis, *Chem. Rev.*, 95(1), pp.69–96.
- Huang, M., Xu, C., Wu, Z., Huang, Y., Lin, J. and Wu, J., 2008, Photocatalytic Discolorization of Methyl Orange Solution by Pt Modified TiO₂ Loaded on Natural Zeolite, *Dye. Pigment.*, 77, pp.327–334.
- Jaroenworarluck, A., Pijarn, N., Kosachan, N. and Stevens, R., 2012, Nanocomposite TiO₂-SiO₂ Gel for UV Absorption, *Chem. Eng. J.*, 181-182, pp.45–55.
- Kalpathy, U., Proctor, A. and Shultz, J., 2000, A Simple Method for Production of Pure Silica From Rice Hull Ash, *Bioresour. Technol.*, 73, pp.257–262.

- Kamath, S.R. and Proctor, A., 1998, Silica Gel from Rice Hull Ash: Preparation and Characterization, *Cereal Chem.*, 75(4), pp.3–6.
- Keawthun, M., Krachodnok, S. and Chaisena, A., 2014, Conversion of Waste Glasses Into Sodium Silicate Solutions, *Int. J. Chem. Sci.*, 12(1), pp.83–91.
- Klankaw, P., Chawengkijwanich, C., Grisdanurak, N. and Chiarakorn, S., 2012, Superlattices and Microstructures The Hybrid Photocatalyst of TiO₂-SiO₂ Thin Film Prepared from Rice Husk Silica, *Superlattices Microstruct.*, 51, pp.343–352.
- Ko, S., Fleming, P.D., Joyce, M. and Ari-Gur, P., 2009, High Performance Nano-Titania Photocatalytic Paper Composite. Part II: Preparation and Characterization of Natural Zeolite-Based Nano-Titania Composite Sheets And Study of Their Photocatalytic Activity, *Mater. Sci. Eng. B*, 164, pp.135–139.
- Kuswati, H., Handoyo, D. and Kohar, I., 2003, Limbah Cair Pencucian Film Studio Dibanding Film X-Ray Dengan Menggunakan Metode SN Flake. *Unitas*, 11(2), pp.46–56.
- Lasko, C.L. and Hurst, M.P., 1999, An Investigation into The Use of Chitosan for The Removal of Soluble Silver from Industrial Wastewater, *Environ. Sci. & Technology*, 33(20), pp.3622–3626.
- Liu, G.Q., Jin, Z.G., Liu, X.X., Wang, T. and Liu, Z.F., 2007, Anatase TiO₂ Porous Thin Films Prepared by Sol-Gel Method Using CTAB Surfactant, *J. Sol-Gel Sci. Techn.*, 41, pp.49–55.
- Luttrell, T., Halpegamage, S., Tao, J., Kramer, A., Sutter, E. and Batzill, M., 2014, Why is Anatase a Better Photocatalyst TiO₂ Films, *Sci. Rep.*, 4(4043), pp.1–8.
- Mahyar, A., Behnajady, M.A. and Modirshahla, N., 2010, Characterization and Photocatalytic Activity of SiO₂-TiO₂ Mixed Oxide Nanoparticles Prepared by Sol-Gel Method, *Indian J. Chem.*, 49A, pp.1593–1600.
- Martra, G., 2000, Lewis Acid and Base Sites at The Surface of Microcrystalline TiO₂ Anatase: Relationships Between Surface Morphology and Chemical Behaviour, *Appl. Catal. A Gen.* 200, pp.275–285.
- Mittal, D., 1997, Silica from Ash. *Resonance*, pp.64–66.
- Murashkevich, A.N., Lavitskaya, A.S., Barannikova, T.I. and Zharskii, I.M., 2008, Infrared Absorption Spectra and Structure of TiO₂-SiO₂ Composites, *J. Appl. Spectrosc.*, 75(5), pp.724–728.
- Nurhayati, S., 2007. Kajian Pengaruh pH Larutan, Massa Fotokatalis, dan Asam Askorbat terhadap Efektivitas Fotoreduksi Ion Cu(II) Terkatalisis TiO₂, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Nyquist, R.A. and Kagel, R.O., 1971, *Infrared Spectra of Inorganic Compounds*, New York: Academic Press.

- Peter, A., Mihaly-cozmuta, L., Mihaly-cozmuta, A. and Nicula, C., 2013, Photocatalytic Efficiency of Zeolite-Based TiO₂ Composites for Reduction of Cu (II): Kinetic Models, *Int. J. Appl. Ceram. Technol.*, pp.1–14.
- Prabawati, P.T., 2009. Kajian Pengaruh Ion klorida (Cl⁻) dan Ion Sulfat (SO₄²⁻) Terhadap Efektivitas Fotoreduksi Ion Hg(II) Terkatalisis TiO₂, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Razali, M.H., N., A.-F.M., Mohamed, A.R. and Sreekantan, S., 2013, Physical Properties Study of TiO₂ Nanoparticle Synthesis Via Hydrothermal Method Using TiO₂ Microparticles as Precursor, *Adv. Mater. Res.*, 772, pp.365–370.
- Ren, C., Qiu, W. and Chen, Y., 2013, Physicochemical Properties and Photocatalytic Activity of The TiO₂/SiO₂ Prepared by Precipitation Method, *Sep. Purif. Technol.*, 107, pp.264–272.
- Rezaee, A., Pourtaghi, G.H., Mamoori, R.S., Ghaneian, M.T. and Godini, H., 2008, Photocatalytic Decomposition of Gaseous Toluene by TiO₂ Nanoparticles Coated Activated Carbon, *Iran. J. Environ. Heal. Sci. Eng.*, 5(4), pp.305–310.
- Sari, E.K., 2013. Pengaruh Ion Cu(II) dan Ion Ni(II) Terhadap Efektivitas Fotoreduksi Ion Cr(VI) Terkatalisis TiO₂, *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Serpone, N., Dondi, D., and Albini, A., 2007, Inorganic and Organic UV Filters: Their Role and Efficacy in Sunscreens and Suncare Products, *Inorganica Chim. Acta*, 360 pp. 794–802.
- Sharma, M.V.. P., Kumari, V.. D. and Subrahmanyam, M., 2008, Chemosphere TiO₂ Supported Over SBA-15: An Efficient Photocatalyst for The Pesticide Degradation Using Solar Light, *Chemosphere*, 73(9), pp.1562–1569.
- Shi, H., Magaye, R., Castranova, V. and Zhao, J., 2013, Titanium Dioxide Nanoparticles: a Review of Current Toxicological Data, *Part. Fibre Toxicol.*, 10(15), pp.1–33.
- Sukarman dan Dariah, A., 2014, *Tanah Andosol di Indonesia* M. Anda, Hikmatullah, & Y. Suleman, eds., Bogor: Balai Besar Penelitian dan Pengembangan Sumberdaya Lahan Pertanian.
- Suraini, H.K., 2012. Pengaruh Suhu Kalsinasi Pada Preparasi TiO₂-Lignin terhadap karakter dan Aktivasinya Dalam Proses Fotoreduksi Ag(I), *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Wang, L.K., Hung, Y.-T., Lo, H.H. and Yapijakis, C. eds., 2004, *Handbook of Industrial and Hazardous Wastes Treatment*, 2nd Ed., Marcel Dekker, Inc, New York.
- Wijayanti, N.I., 2009, Kajian Pengaruh Ion Cu(II) Terhadap Efektivitas Fotoreduksi Ion Ag(I) Terkatalisis TiO₂, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.

- Volesky, B., 2001, Detoxification of Metal-Bearing Effluents: Biosorption for The Next Century, *Hydrometallurgy*, 59, pp.203–216.
- Vuk, A.Š., Ješe, R., Orel, B. and Dražic, G., 2005, The Effect of Surface Hydroxyl Groups on The Adsorption Properties of Nanocrystalline TiO₂ Films, *Int. J. Photoenergy*, 07, pp.163–168.
- Yener, H.B. and Helvacı, S.S., 2015, Effect of Synthesis Temperature on The Structural Properties and Photocatalytic Activity of TiO₂/SiO₂ Composites Synthesized Using Rice Husk Ash as a SiO₂ Source, *Sep. Purif. Technol.*, 140, pp.84–93.
- Yuefeng, C., Hui, W., Mingjuan, H. and Guofeng, G., 2009, Photocatalytic Degradation of Organic Pollutants in Purified Terephthalic Acid Wastewater with Activated Carbon Supported Titanium Dioxide, In *International Conference on Energy and Environment Technology*. pp. 658–661.
- Zaky, R.R., Hessien, M.M., El-midany, A.A., Khedr, M.H., Abdel-Aal, E.A. and El-Barawy, K.A., 2008, Preparation of Silica Nanoparticles from Semi-Burned Rice Straw Ash, *Powder Technol.*, 185, pp.31–35.
- Zhu, H.Y., Orthman, J.A., Li, J.-Y., Zhao, J.-C., Churchman, G.J. and Vansant, E.F., 2002, Novel Composites of TiO₂ (Anatase) and Silicate Nanoparticles, *Chem. Mater.*, 14(12), pp.5037–5044.
- Zou, J. and Gao, J., 2011, H₂O₂-sensitized TiO₂/SiO₂ Composites With High Photocatalytic Activity Under Visible Irradiation, *J. Hazard. Mater.*, 185(2-3), pp.710–716.
- Zou, X., Li, X., Qu, Z., Zhao, Q., Shi, Y., Chen, Y., Tade, M. and Liu, S., 2012, Photocatalytic Degradation of Gaseous Toluene Over TiO₂-SiO₂ Composite Nanotubes Synthesized by Sol-Gel With Template Technique, *Mater. Res. Bull.*, 47(2), pp.279–284.