

REFERENCES

- Abed, C., Bouzidi, C., Elhouichet, H., Gelloz, B., and Ferid, M. 2015. Mg doping induced high structural quality of sol-gel ZnO nanocrystals: Application in photocatalysis. *Applied Surface Science*, 349: 855–863.
- Achouri, F., Corbel, S., Balan, L., Mozet, K., Girot, E., Medjahdi, G., ... Schneider, R. 2016. Porous Mn-doped ZnO nanoparticles for enhanced solar and visible light photocatalysis. *Materials and Design*, 101: 309–316.
- Adams, W. A., and Impellitteri, C. A. 2009. The photocatalysis of N,N-diethyl-m-toluamide (DEET) using dispersions of Degussa P-25 TiO₂ particles. *Journal of Photochemistry and Photobiology A: Chemistry*, 202(1): 28–32.
- Ahmad, A. L., Ismail, S., and Bhatia, S. 2003. Water recycling from palm oil mill effluent (POME) using membrane technology. *Desalination*, 157(1–3): 87–95.
- Ahmad, A. L., Ismail, S., and Bhatia, S. 2005. Ultrafiltration behavior in the treatment of agro-industry effluent: Pilot scale studies. *Chemical Engineering Science*, 60(19): 5385–5394.
- Ahmadi, M., Vahabzadeh, F., Bonakdarpour, B., Mofarrah, E., Mehranian, M., 2005. Application of the central composite design and response surface methodology to the advanced treatment of olive oil processing wastewater using Fenton's peroxidation. *J. Hazard. Mater.* 123, 187-195.
- Ahmad, Z., Ujang, Z., Olsson, G., and Latiff, a a A. 2009. Evaluation of Hybrid Membrane Bioreactor (MBR) For Palm Oil Mill Effluent (POME) Treatment. *International Journal of Integrated Engineering (Issue on Civil and Environmental Engineering)* *International Journal of Integrated Engineering (Issue on Civil and Environmental Engineering)*, 17–26.
- Ahmed, Y., Yaakob, Z., Akhtar, P., and Sopian, K. 2015. Production of biogas and performance evaluation of existing treatment processes in palm oil mill effluent (POME). *Renewable and Sustainable Energy Reviews*, 42: 1260–1278.
- Aljuboury, D. A. D. A., Palaniandy, P., Aziz, H. B. A., Feroz, S., 2015. Evaluating the TiO₂ as a solar photocatalyst process by response surface methodology to treat the petroleum waste water. *Karbala Int. J. Modern Sci.* 1, 78-85.
- Alvarez, P. M., Jaramillo, J., Lopez-Pinero, F., and Plucinski, P. K. 2010. Preparation and characterization of magnetic TiO₂ nanoparticles and their utilization for the degradation of emerging pollutants in water. *Applied Catalysis B: Environmental*, 100(1–2): 338–345.

- An, T., An, J., Yang, H., Li, G., Feng, H., and Nie, X. 2011. Photocatalytic degradation kinetics and mechanism of antivirus drug-lamivudine in TiO₂ dispersion. *Journal of Hazardous Materials*, 197: 229–36.
- An, T., Yang, H., Li, G., Song, W., Cooper, W. J., and Nie, X. 2010. Kinetics and mechanism of advanced oxidation processes (AOPs) in degradation of ciprofloxacin in water. *Applied Catalysis B: Environmental*, 94(3–4): 288–294.
- Antoniou, M. G., Shoemaker, J. A., de la Cruz, A. A., and Dionysiou, D. D. 2008. LC/MS/MS structure elucidation of reaction intermediates formed during the TiO₂ photocatalysis of microcystin-LR. *Toxicon*, 51(6): 1103–1118.
- Araujo, P. W., and Brereton, G. 1996. Experimental design. I. Screening. *TrAC - Trends in Analytical Chemistry*, 15(1): 26–31.
- Aris, A., Siew, O. B., Kee, K. S., and Ujang, Z. 2008. Tertiary treatment of palm oil mill effluent using Fenton oxidation. *Malaysian Journal of Civil Engineering*, 20(1): 12–25.
- Augustana University. n.d. IR Areas of Interest - Chem 201. <http://faculty.augie.edu/~duffy/irareaschem201.pdf> accessed on 11/10/15.
- Baruah, S., Thanachayanont, C., and Dutta, J. 2008. Growth of ZnO nanowires on nonwoven polyethylene fibers. *Science and Technology of Advanced Materials*, 9(2): 25009.
- Barr, G., 2010. Chemical and physical polishing of POME treatment. Seminar & Workshop on Palm Oil Mill Effluent Tertiary Treatment Technologies POMET³, Kota Kinabalu, Sabah, Malaysia.
- Berkani, M., Bouhelassa, M., & Bouchareb, M .K., 2015. Implementation of a venturi photocatalytic reactor: optimization of photodecolorization of an industrial Azo dye. Arab. J. Chem. <http://dx.doi.org/10.1016/j.arabjc.2015.07.004>
- Bennett, S. W., and Keller, A. A. 2011. Comparative photoactivity of CeO₂, Fe₂O₃, TiO₂ and ZnO in various aqueous systems. *Applied Catalysis B: Environmental*, 102(3–4): 600–607.
- Borges, M. E., Sierra, M., Cuevas, E., García, R. D., and Esparza, P. 2016. Photocatalysis with solar energy: Sunlight-responsive photocatalyst based on TiO₂ loaded on a natural material for wastewater treatment. *Solar Energy*, 135: 527–535.
- Boroski, M., Rodrigues, A. C., Garcia, J. C., Sampaio, L. C., Nozaki, J., and Hioka, N. 2009. Combined electrocoagulation and TiO₂ photoassisted treatment applied to wastewater effluents from pharmaceutical and cosmetic industries. *Journal of Hazardous Materials*, 162(1): 448–454.

Box, G. E. P. & Wilson, K. B. 1951. On the experimental attainment of optimum conditions. *J. Roy. Statist. Soc.*, B13, 1-38.

Cao, S., Yeung, K. L., and Yue, P. L. 2006. Preparation of freestanding and crack-free titania-silica aerogels and their performance for gas phase, photocatalytic oxidation of VOCs. *Applied Catalysis B: Environmental*, 68(3–4): 99–108.

Central Connecticut State University. 2001. Infrared Spectroscopy- IR Absorption for Representative Functional Groups. <http://www.instruction.greenriver.edu/kmarr/chem%20162/Chem162%20Labs/Interpreting%20IR%20Spectra/IR%20Absorptions%20for%20Functional%20Groups.html> accessed on 11/10/2015.

Chan, Y. J., Chong, M. F., and Law, C. L. 2010. Biological treatment of anaerobically digested palm oil mill effluent (POME) using a Lab-Scale Sequencing Batch Reactor (SBR). *Journal of Environmental Management*, 91(8): 1738–1746.

Chan, Y. J., Chong, M. F., and Law, C. L. 2011. Optimization on thermophilic aerobic treatment of anaerobically digested palm oil mill effluent (POME). *Biochemical Engineering Journal*, 55(3): 193–198.

Chan, Y. J., Chong, M. F., and Law, C. L. 2012. An integrated anaerobic-aerobic bioreactor (IAAB) for the treatment of palm oil mill effluent (POME): Start-up and steady state performance. *Process Biochemistry*, 47(3): 485–495.

Chen, H., and Dawson, J. A. 2015. Nature of nitrogen-doped anatase TiO₂ and the origin of its visible-light activity. *Journal of Physical Chemistry C*, 119(28): 15890–15895.

Chen, H. W., Ku, Y., and Kuo, Y. L. 2007. Effect of Pt/TiO₂ characteristics on temporal behavior of o-cresol decomposition by visible light-induced photocatalysis. *Water Research*, 41(10): 2069–2078.

Cheng, M., Zeng, G., Huang, D., Lai, C., Xu, P., Zhang, C., and Liu, Y. 2016. Hydroxyl radicals based advanced oxidation processes (AOPs) for remediation of soils contaminated with organic compounds: A review. *Chemical Engineering Journal*, 284: 582–598.

Cheng, X., Yu, X., Xing, Z., and Wan, J. 2012. Enhanced Photocatalytic Activity of Nitrogen Doped TiO₂ Anatase Nano-Particle under Simulated Sunlight Irradiation. *Energy Procedia*, 16: 598–605.

Choorit, W., and Wisarnwan, P. 2007. Effect of temperature on the anaerobic digestion of palm oil mill effluent. *Electronic Journal of Biotechnology*, 10(3): 376–385.

- Chong, M. T., 2010. Bio-chem POME tertiary treatment system. Seminar & Workshop on Palm Oil Mill Effluent Tertiary Treatment Technologies POMET³, Kota Kinabalu, Sabah, Malaysia.
- Chung, Y. C., and Chen, C. Y. 2009. Degradation of azo dye reactive violet 5 by TiO₂ photocatalysis. *Environmental Chemistry Letters*, 7(4): 347–352.
- Coronado, J. M., Fresno, F., Hernández-Alonso, M. D., & Portela, R. 2013. Design of advanced photocatalytic materials for energy and environmental applications. New York: Springer-Verlag London.
- Cullity, B. D. 1957. Elements of X-Ray Diffraction. *Physics Today*, 10(3): 50–51.
- Dalrymple, O. K., Isaacs, W., Stefanakos, E., Trotz, M. A., and Goswami, D. Y. 2011. Lipid vesicles as model membranes in photocatalytic disinfection studies. *Journal of Photochemistry and Photobiology A: Chemistry*, 221(1): 64–70.
- Daneshvar, N., Aber, S., Seyed Dorraji, M. S., Khataee, A. R., and Rasoulifard, M. H. 2007. Photocatalytic degradation of the insecticide diazinon in the presence of prepared nanocrystalline ZnO powders under irradiation of UV-C light. *Separation and Purification Technology*, 58(1): 91–98.
- Dean, J. A. 1990. *Lange'S Handbook of Chemistry. Materials and Manufacturing Processes* (Vol. 5).
- Di Mauro, A., Cantarella, M., Nicotra, G., Privitera, V., and Impellizzeri, G. 2016. Low temperature atomic layer deposition of ZnO: applications in photocatalysis. *Applied Catalysis B: Environmental*, 196: 68–76.
- Dias, M. G., and Azevedo, E. B. 2009. Photocatalytic decolorization of commercial acid dyes using solar irradiation. *Water, Air, and Soil Pollution*, 204(1–4): 79–87.
- Djerdj, I., and Tonejc, A. M. 2006. Structural investigations of nanocrystalline TiO₂ samples. *Journal of Alloys and Compounds*, 413(1–2): 159–174.
- Domen, K., Yoshimura, J., Sekine, T., Kondo, J., Tanaka, A., Maruya, K., and Onishi, T. 1993. A Novel Series of Photocatalysts with an Ion-Exchangeable Layered Structure of Niobate. *Studies in Surface Science and Catalysis*, 75(C): 2159–2162.
- Dong, H., Zeng, G., Tang, L., Fan, C., Zhang, C., He, X., and He, Y. 2015. An overview on limitations of TiO₂-based particles for photocatalytic degradation of organic pollutants and the corresponding countermeasures. *Water Research*, 79: 128–146.
- Echavia, G. R. M., Matzusawa, F., and Negishi, N. 2009. Photocatalytic degradation of organophosphate and phosphonoglycine pesticides using TiO₂ immobilized on silica gel. *Chemosphere*, 76(5): 595–600.

- Elmolla, E. S., and Chaudhuri, M. 2010. Photocatalytic degradation of amoxicillin, ampicillin and cloxacillin antibiotics in aqueous solution using UV/TiO₂ and UV/H₂O₂/TiO₂ photocatalysis. *Desalination*, 252(1–3): 46–52.
- Esparza, P., Borges, M. E., Diaz, L., Alvarez-Galvan, M. C., and Fierro, J. L. G. 2010. Photodegradation of dye pollutants using new nanostructured titania supported on volcanic ashes. *Applied Catalysis A: General*, 388(1–2): 7–14.
- Evgenidou, E., Fytianos, K., and Poulios, I. 2005. Semiconductor-sensitized photodegradation of dichlorvos in water using TiO₂ and ZnO as catalysts. *Applied Catalysis B: Environmental*, 59(1–2): 81–89.
- Fabbri, D., Crime, A., Davezza, M., Medana, C., Baiocchi, C., Prevot, A. B., and Pramauro, E. 2009. Surfactant-assisted removal of sweep residues from soil and photocatalytic treatment of the washing wastes. *Applied Catalysis B: Environmental*, 92(3–4): 318–325.
- Farbod, M., and Kajbafvala, M. 2013. Effect of nanoparticle surface modification on the adsorption-enhanced photocatalysis of Gd/TiO₂ nanocomposite. *Powder Technology*, 239: 434–440.
- Federal University of Minas Gerais. 2013. Characteristic Infrared Absorption bands of FunctionalGroups.
www.biomaterial.com.br/FTIR.pdf accessed on 11/10/2015.
- Fenoll, J., Hellín, P., Martínez, C. M., Flores, P., and Navarro, S. 2012. Semiconductor-sensitized photodegradation of s-triazine and chloroacetanilide herbicides in leaching water using TiO₂ and ZnO as catalyst under natural sunlight. *Journal of Photochemistry and Photobiology A: Chemistry*, 238: 81–87.
- Fogler, H. S. 1999. Elements of chemical reaction engineering. *Chemical Engineering Science*, 42: 1000.
- Fujishima, A., Rao, T. N., and Tryk, D. A. 2000. Titanium dioxide photocatalysis. *Journal of Photochemistry and Photobiology C: Photochemistry Reviews*, 1(1): 1–21.
- Gaya, U. I., Abdullah, A. H., Zainal, Z., and Hussein, M. Z. 2009. Photocatalytic treatment of 4-chlorophenol in aqueous ZnO suspensions: Intermediates, influence of dosage and inorganic anions. *Journal of Hazardous Materials*, 168(1): 57–63.
- Gilmour, C. 2012. Water Treatment using Advanced Oxidation Processes : Application Perspectives, (September): 1–111.
- Giraldo, A. L., Pevuela, G. A., Torres-Palma, R. A., Pino, N. J., Palominos, R. A., and Mansilla, H. D. 2010. Degradation of the antibiotic oxolinic acid by photocatalysis with TiO₂ in suspension. *Water Research*, 44(18): 5158–5167.

- Gligorovski, S., Strekowski, R., Barbati, S., and Vione, D. 2015. Environmental Implications of Hydroxyl Radicals ($\cdot\text{OH}$). *Chemical Reviews*, 115(24): 13051–13092.
- Goodenough, J. B., Hammet, A., Huber, G., Hullinger, F., LeiB, M., Ramasesha, S. K., & Werheit, H. 1984. Group III: Crystal and Solid State Physics, Berline: Springer-Verlag.
- Gorska, P., Zaleska, a, Suska, a, and Hupka, J. 2009. Photocatalytic Activity and Surface Properties of Carbon-Doped Titanium Dioxide. *Physicochemical Problems of Mineral Processing*, 43(43): 21–30.
- Gratzel, M. 1989 Heterogeneous Photochemical Electron Transfer; CRC Press: Boca Raton, FL.
- Gutowski, M., and Kowalczyk, S. 2013. A study of free radical chemistry: Their role and pathophysiological significance. *Acta Biochimica Polonica*, 60(1): 1–16.
- Haibo, O., Feng, H. J., Cuiyan, L., Liyun, C., and Jie, F. 2013. Synthesis of carbon doped ZnO with a porous structure and its solar-light photocatalytic properties. *Materials Letters*, 111: 217–220.
- Han, Y. W., and Anderson, a W. 1975. Semisolid fermentation of ryegrass straw. *Applied Microbiology*, 30(6): 930–4.
- Hapeshi, E., Achilleos, A., Vasquez, M. I., Michael, C., Xekoukoulotakis, N. P., Mantzavinos, D., and Kassinos, D. 2010. Drugs degrading photocatalytically: Kinetics and mechanisms of ofloxacin and atenolol removal on titania suspensions. *Water Research*, 44(6): 1737–1746.
- Henderson, M. A. 2005. Photooxidation of acetone on TiO₂(110): Conversion to acetate via methyl radical ejection. *Journal of Physical Chemistry B*, 109(24): 12062–12070.
- Henderson, M. A. 2008. Effect of coadsorbed water on the photodecomposition of acetone on TiO₂(110). *Journal of Catalysis*, 256(2): 287–292.
- Hernández-Alonso, M. D., Hungría, A. B., Martínez-Arias, A., Fernández-García, M., Coronado, J. M., Conesa, J. C., and Soria, J. 2004. EPR study of the photoassisted formation of radicals on CeO₂ nanoparticles employed for toluene photooxidation. *Applied Catalysis B: Environmental*, 50(3): 167–175.
- Hoigne, J. 1988. The chemistry of ozone in water. In process technology for water treatment, S. Stucki, Ed., New York: Plenum publishing corp.

- Huang, H., He, Y., He, R., Jiang, X., Lin, Z., Zhang, Y., and Wang, S. 2014. Novel Bi-based iodate photocatalysts with high photocatalytic activity. *Inorganic Chemistry Communications*, 40: 215–219.
- Ibach, H. & Luth, H. 2010. The elecrtonic band structure of solid. In: Solid-State Physics – An introduction to principles of materials science, Berline: Springer-Verlag, 159–189.
- Idris, M. A., Jami, M. S., and Muyibi, S. A. 2010. Tertiary Treatment of Biologically Treated Palm Oil Mill Effluent (POME) Using UF Membrane System : Effect of MWCO and Transmembrane Pressure. *International Journal of Chemical and Environmental Engineering*, 1(2): 109–112.
- Ingvarsson, P. T., Yang, M., Mulvad, H., Nielsen, H. M., Rantanen, J., and Foged, C. 2013. Engineering of an inhalable dda/tdb liposomal adjuvant: A quality-by-design approach towards optimization of the spray drying process. *Pharmaceutical Research*, 30(11): 2772–2784.
- Ji, Y., Zhou, L., Ferronato, C., Salvador, A., Yang, X., Chovelon, J-M. 2013. Degradation of sunscreen agent 2-phenylbenzimidazole-5-sulfonic acid by TiO₂ photocatalysis: Kinetics, photoproducts and comparison to structurally related compounds. *Applied Catalysis B: Environmental*, 140-141, 457-467.
- Jia, T., Wang, W., Long, F., Fu, Z., Wang, H., and Zhang, Q. 2009. Fabrication, characterization and photocatalytic activity of La-doped ZnO nanowires. *Journal of Alloys and Compounds*, 484(1–2): 410–415.
- Jung, S., and Yong, K. 2011. Fabrication of CuO-ZnO nanowires on a stainless steel mesh for highly efficient photocatalytic applications. *Chemical Communications (Cambridge, England)*, 47(9): 2643–2645.
- Jurgensen, E. J. 2010. Ozone and submerged fixed film biological process of POME polishing plant. Seminar & Workshop on Palm Oil Mill Effluent Tertiary Treatment Technologies POMET3, Kota Kinabalu, Sabah, Malaysia.
- Karunakaran, C., and Senthilvelan, S. 2006. Fe₂O₃-photocatalysis with sunlight and UV light: Oxidation of aniline. *Electrochemistry Communications*, 8(1): 95–101.
- Khalid, a. R., and Mustafa, W. A. W. 1992. External benefits of environmental regulation: Resource recovery and the utilisation of effluents. *The Environmentalist*, 12(4): 277–285.
- Khataee, A.R., Fathinia, M., Aber, S., Zarei, M., 2010. Optimization of photocatalytic treatment of dye solution on supported TiO₂ nanoparticles by central composite design: intermediates identification. *J. Hazard. Mater.* 181, 886-897.

- Khodja, A. A., Sehili, T., Pilichowski, J.-F., and Boule, P. 2001. Photocatalytic degradation of 2-phenylphenol on TiO₂ and ZnO in aqueous suspensions. *Journal of Photochemistry and Photobiology A: Chemistry*, 141(2–3): 231–239.
- Klug, H. P., & Alexander, L. 1956. *X-Ray Diffraction Procedures: For Polycrystalline and Amorphous Materials*. JOHN WILEY& SONS (Vol. 4).
- Kudo, A., and Miseki, Y. 2009. Heterogeneous photocatalyst materials for water splitting. *Chemical Society Reviews*, 38(1): 253–278.
- Kuo, T. J., Lin, C. N., Kuo, C. L., and Huang, M. H. 2007. Growth of ultralong ZnO nanowires on silicon substrates by vapor transport and their use as recyclable photocatalysts. *Chemistry of Materials*, 19(21): 5143–5147.
- Lazar, M. A., and Daoud, W. A. 2013. Achieving selectivity in TiO₂-based photocatalysis. *RSC Advances*, 3(13): 4130.
- Li, G., Park, S., Kang, D.-W., Krajmalnik-Brown, R., and Rittmann, B. E. 2011. 2, 4, 5-Trichlorophenol Degradation Using a Novel TiO₂-Coated Biofilm Carrier: Roles of Adsorption, Photocatalysis, and Biodegradation. *Environmental Science & Technology*, 8359–8367.
- Li, J., Xu, X., Liu, X., Yu, C., Yan, D., Sun, Z., and Pan, L. 2016. Sn doped TiO₂ nanotube with oxygen vacancy for highly efficient visible light photocatalysis. *Journal of Alloys and Compounds*, 679: 454–462.
- Li, Q., Wang, C., Ju, M., Chen, W., and Wang, E. 2011. Polyoxometalate-assisted electrochemical deposition of hollow ZnO nanospheres and their photocatalytic properties. *Microporous and Mesoporous Materials*, 138(1–3): 132–139.
- Li, Y., Zhao, X. & Fan, W. Structural, electronic, and optical properties of Ag-doped ZnO nanowires: first principles study. *J. Phys. Chem. C*, 1159, 3552–3557.
- Liao, S., Donggen, H., Yu, D., Su, Y., and Yuan, G. 2004. Preparation and characterization of ZnO/TiO₂, SO₄²⁻/ZnO/TiO₂ photocatalyst and their photocatalysis. *Journal of Photochemistry and Photobiology A: Chemistry*, 168(1–2): 7–13.
- Liew, L. L., Loh, S. K., Kassim, M. A., and Muda, K. 2015. Efficiency of Nutrients Removal From Palm Oil Mill Effluent Treatment Systems Efficiency of Nutrients Removal From Palm Oil Mill Effluent Treatment Systems. *Journal of Palm Oil Research*, 27(4): 433–443.
- Lightcap, I. V., Kosel, T. H., and Kamat, P. V. 2010. Anchoring semiconductor and metal nanoparticles on a two-dimensional catalyst mat. storing and shuttling electrons with reduced graphene oxide. *Nano Letters*, 10(2): 577–583.

- Lima, C. S., Batista, K. A., Garcia Rodriguez, A., Souza, J. R., and Fernandes, K. F. 2015. Photodecomposition and color removal of a real sample of textile wastewater using heterogeneous photocatalysis with polypyrrole. *Solar Energy*, 114: 105–113.
- Lin, Y. C., and Lee, H. S. 2010. Effects of TiO₂ coating dosage and operational parameters on a TiO₂/Ag photocatalysis system for decolorizing Procion red MX-5B. *Journal of Hazardous Materials*, 179(1–3): 462–470.
- Lin, Y., Ferronato, C., Deng, N., and Chovelon, J. M. 2011. Study of benzylparaben photocatalytic degradation by TiO₂. *Applied Catalysis B: Environmental*, 104(3–4): 353–360.
- Liu, J., Peng, K., Huang, X., Lu, L., Cheng, H., Yang, D., ... Deng, H. 2011. Je Sc Sc, 23(6): 1020–1026.
- Liu, W.-J., Zeng, F.-X., Jiang, H., Zhang, X.-S., and Li, W.-W. 2012. Composite Fe₂O₃ and ZrO₂/Al₂O₃ photocatalyst: Preparation, characterization, and studies on the photocatalytic activity and chemical stability. *Chemical Engineering Journal*, 180: 9–18.
- Liu, W. Z., Xu, H. Y., Ma, J. G., Liu, C. Y., Liu, Y. X., & Liu, Y. C. 2012. Effect of oxygen-related surface adsorption on the efficiency and stability of ZnO nanorod array ultraviolet light-emitting diodes. *Appl. Phys. Lett.*, 100, 203101.
- Liu, Y., He, X., Duan, X., Fu, Y., Fatta-Kassinos, D., and Dionysiou, D. D. 2016. Significant role of UV and carbonate radical on the degradation of oxytetracycline in UV-AOPs: Kinetics and mechanism. *Water Research*, 95: 195–204.
- Lomillo, M. A. A., Campo, F. J., Pascual, F. J. M. 2006. Preliminary contribution to the quantification of HMF in honey by electrochemical biosensor chips. *Electroanalysis*, 18, 2435–2440.
- Lopez, R., Goni, F., Etxandia, A., and Millan, E. 2007. Determination of organochlorine pesticides and polychlorinated biphenyls in human serum using headspace solid-phase microextraction and gas chromatography-electron capture detection. *Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences*, 846(1–2): 298–305.
- Lu, F., Cai, W., and Zhang, Y. 2008. ZnO hierarchical micro/nanoarchitectures: Solvothermal synthesis and structurally enhanced photocatalytic performance. *Advanced Functional Materials*, 18(7): 1047–1056.
- Ma, A. N. 1999. Treatment of palm oil mill effluent. In: Singh, G., Lim, K.H., Teo, L., David Lee, K. Eds., Oil Palm and the Environment. Malaysian Oil Palm Growers' Council, Malaysia.

- Makarova, O. V., Rajh, T., Thurnauer, M. C., Martin, A., Kemme, P. A., and Cropek, D. 2000. Surface modification of TiO₂ nanoparticles for photochemical reduction of nitrobenzene. *Environmental Science and Technology*, 34(22): 4797–4803.
- Mamani, M. C. V., Farfan, J. A., Reyes, F. G. R., and Rath, S. 2006. Simultaneous determination of tetracyclines in pharmaceuticals by CZE using experimental design. *Talanta*, 70(2): 236–243.
- Manassah, J. 2011. Treatment of highly polluted paper mill waste water by solar photocatalytic oxidation with synthesized nano TiO₂. *Proceedings of the International Conference on Green Technology and Environmental Conservation, GTEC-2011*, 168(1): 356–361.
- Manickam, S., Zainal Abidin, N. B., Parthasarathy, S., Alzorqi, I., Ng, E. H., Tiong, T. J., ... Ali, A. 2014. Role of H₂O₂ in the fluctuating patterns of COD (chemical oxygen demand) during the treatment of palm oil mill effluent (POME) using pilot scale triple frequency ultrasound cavitation reactor. *Ultrasonics Sonochemistry*, 21(4): 1519–1526.
- Metcalf & Eddy Inc. Tchobanoglous, G., Burton, F.L. and Stensel, H.D. ed. 2003, Wastewater engineering; treatment and reuse, McGraw-Hill, New York.
- Mijin, D., Savić, M., Snežana, P., Smiljanić, A., Glavaški, O., Jovanović, M., and Petrović, S. 2009. A study of the photocatalytic degradation of metamitron in ZnO water suspensions. *Desalination*, 249(1): 286–292.
- Minero, C., Mariella, G., Maurino, V., and Pelizzetti, E. 2000. Photocatalytic Transformation of Organic Compounds in the Presence of Inorganic Anions. 1. Hydroxyl-Mediated and Direct Electron-Transfer Reactions of Phenol on a Titanium Dioxide–Fluoride System. *Langmuir*, 16(6): 2632–2641.
- Miranda-Garcia, N., Maldonado, M. I., Coronado, J. M., and Malato, S. 2010. Degradation study of 15 emerging contaminants at low concentration by immobilized TiO₂ in a pilot plant. *Catalysis Today*, 151(1–2): 107–113.
- Miranda-Garcia, N., Suarez, S., Sanchez, B., Coronado, J. M., Malato, S., and Maldonado, M. I. 2011. Photocatalytic degradation of emerging contaminants in municipal wastewater treatment plant effluents using immobilized TiO₂ in a solar pilot plant. *Applied Catalysis B: Environmental*, 103(3–4): 294–301.
- Mohajeri, S., Aziz, H. A., Isa, M. H., Zahed, M. A., and Adlan, M. N. 2010. Statistical optimization of process parameters for landfill leachate treatment using electro-Fenton technique. *Journal of Hazardous Materials*, 176(1–3): 749–758.
- Montgomery, D. C. 2008. Design and Analysis of Experiment, Seventh ed. New York: Wiley.

- Morris, J. W. 2007. Chapter 4 : Defects in Crystals. *Materials Science*, 76–107.
- Muda, K., Liew, W. L., and Loh, S. K. 2016. Performance evaluation of pome treatment plants 1, 11(4): 2153–2159.
- Mumtaz, T., Abd-Aziz, S., Rahman, N. a, Yee, P. L., Shirai, Y., and Hassan, M. a. 2008. Pilot-scale recovery of low molecular weight organic acids from anaerobically treated palm oil mill effluent (POME) with energy integrated system. *African Journal of Biotechnology*, 7(21): 3900–3905.
- Murakami, N., Chiyoza, T., Tsubota, T., and Ohno, T. 2008. Switching redox site of photocatalytic reaction on titanium(IV) oxide particles modified with transition-metal ion controlled by irradiation wavelength. *Applied Catalysis A: General*, 348(1): 148–152.
- Murakami, N., Ono, A., Nakamura, M., Tsubota, T., and Ohno, T. 2010. Development of a visible-light-responsive rutile rod by site-selective modification of iron(III) ion on {1 1 1} exposed crystal faces. *Applied Catalysis B: Environmental*, 97(1–2): 115–119.
- Nesbitt, H. W., and Banerjee, D. 1998. Interpretation of XPS Mn(2p) spectra of Mn oxyhydroxides and constraints on the mechanism of MnO₂ precipitation. *American Mineralogist*, 83(3–4): 305–315.
- Nezamzadeh-Ejhieh, A., and Khodabakhshi-Chermahini, F. 2014. Incorporated ZnO onto nano clinoptilolite particles as the active centers in the photodegradation of phenylhydrazine. *Journal of Industrial and Engineering Chemistry*, 20(2): 695–704.
- Ng, Y. S., Lim, C. R., and Chan, D. J. C. 2016. Development of treated palm oil mill effluent (POME) culture medium for plant tissue culture of Hemianthus callitrichoides. *Journal of Environmental Chemical Engineering*, (2015).
- Nor, N. A. M., Jaafar, J., Ismail, A. F., Mohamed, M. A., Rahman, M. A., Othman, M. H. D., ... Yusof, N. 2015. Preparation and performance of PVDF-based nanocomposite membrane consisting of TiO₂ nanofibers for organic pollutant decomposition in wastewater under UV irradiation. *Desalination*, 391: 89–97.
- Oliveira, C., Alves, A., and Madeira, L. M. 2014. Treatment of water networks (waters and deposits) contaminated with chlorfenvinphos by oxidation with Fenton's reagent. *Chemical Engineering Journal*, 241: 190–199.
- Oo, C. W., Kassim, M. J., and Pizzi, A. P. 2009. Characterization and performance of Rhizophora apiculata mangrove polyflavonoid tannins in the adsorption of copper (II) and lead (II), (October).

- Palanisamy, B., Babu, C. M., Sundaravel, B., Anandan, S., and Murugesan, V. 2013. Sol-gel synthesis of mesoporous mixed $\text{Fe}_2\text{O}_3/\text{TiO}_2$ photocatalyst: Application for degradation of 4-chlorophenol. *Journal of Hazardous Materials*, 252–253: 233–242.
- Palominos, R. A., Mondaca, M. A., Giraldo, A., Peñuela, G., Pérez-Moya, M., and Mansilla, H. D. 2009. Photocatalytic oxidation of the antibiotic tetracycline on TiO_2 and ZnO suspensions. *Catalysis Today*, 144(1–2): 100–105.
- Pan, L., Muhammad, T., Ma, L., Huang, Z. F., Wang, S., Wang, L., ... Zhang, X. 2016. MOF-derived C-doped ZnO prepared via a two-step calcination for efficient photocatalysis. *Applied Catalysis B: Environmental*, 189: 181–191.
- Paola, A. Di, Bellardita, M., and Palmisano, L. 2013. *Brookite, the Least Known TiO_2 Photocatalyst. Catalysts* (Vol. 3).
- Papp, Z. 2014. Different silver-modified zinc oxides for photocatalytic degradation of imidacloprid. *Chemia*, 25(1): 1–4.
- Pastor, N., Weinstein, H., Jamison, E., and Brenowitz, M. 2000. A detailed interpretation of OH radical footprints in a TBP-DNA complex reveals the role of dynamics in the mechanism of sequence-specific binding. *Journal of Molecular Biology*, 304(1): 55–68.
- Peña-Farfal, C., Moreda-Piñeiro, A., Bermejo-Barrera, A., Bermejo-Barrera, P., Pinochet-Cancino, H., and De Gregori-Henríquez, I. 2004. Use of enzymatic hydrolysis for the multi-element determination in mussel soft tissue by inductively coupled plasma-atomic emission spectrometry. *Talanta*, 64(3): 671–681.
- Pereira, J. H. O. S., Vilar, V. J. P., Borges, M. T., González, O., Esplugas, S., and Boaventura, R. A. R. 2011. Photocatalytic degradation of oxytetracycline using TiO_2 under natural and simulated solar radiation. *Solar Energy*, 85(11): 2732–2740.
- Puzyn, T. & Mostrag-Szlichtyng, A. 2012. Organic Pollutants Ten Years After the Stockholm Convention - Environmental and Analytical Update. New York, NY: InTech.
- Qian, J., Chen, F., Wang, F., Zhao, X., and Chen, Z. 2012. Daylight photocatalysis performance of biomorphic CeO_2 hollow fibers prepared with lens cleaning paper as biotemplate. *Materials Research Bulletin*, 47(8): 1845–1848.
- Qourzal, S., Barka, N., Tamimi, M., Assabbane, A., Nounah, A., Ihlal, A., and Ait-Ichou, Y. 2009. Sol-gel synthesis of $\text{TiO}_2\text{-SiO}_2$ photocatalyst for ??-naphthol photodegradation. *Materials Science and Engineering C*, 29(5): 1616–1620.

- Rajh, T., Poluejtov, O. G., & Thurnauer, M. C. 2003. Charge separation in titanium oxide nanocrystalline semiconductors revealed by magnetic resonance. In: Chemical phusics of nanostructured semiconductors, Kokorin, A. I.& Bahnemann, D. W., Utrecht: VSP, 1-34.
- Rasmussen, S. E. 2003. Relative merits of reflection and transmission techniques in laboratort powder diffreaction. *Powder Diffr.*, 4, 18, 281-284.
- Ribeiro, A. R., Nunes, O. C., Pereira, M. F. R., and Silva, A. M. T. 2015. An overview on the advanced oxidation processes applied for the treatment of water pollutants defined in the recently launched Directive 2013/39/EU. *Environment International*, 75: 33–51.
- Rizzo, L., Meric, S., Kassinos, D., Guida, M., Russo, F., and Belgiorno, V. 2009. Degradation of diclofenac by TiO₂ photocatalysis: UV absorbance kinetics and process evaluation through a set of toxicity bioassays. *Water Research*, 43(4): 979–988.
- Rosa, P. A. J., Azevedo, A. M., and Aires-Barros, M. R. 2007. Application of central composite design to the optimisation of aqueous two-phase extraction of human antibodies. *Journal of Chromatography A*, 1141(1): 50–60.
- Rupani, P., and Singh, R. 2010. Review of current palm oil mill effluent (POME) treatment methods: Vermicomposting as a sustainable practice. *World Applied Sciences* ..., 11(1): 70–81.
- Salaeh, S., Juretic, D., Biosic, M., Kusic, H., Babic, S., Lavrencic, U., ... Loncaric, A. 2016. Diclofenac removal by simulated solar assisted photocatalysis using TiO₂ - based zeolite catalyst; mechanisms , pathways and environmental aspects. *Chemical Engineering Journal*, 304: 289–302.
- Sanchez, M., Rivero, M. J., and Ortiz, I. 2010. Photocatalytic oxidation of grey water over titanium dioxide suspensions. *Desalination*, 262(1–3): 141–146.
- Shahrezaei, F., Mansouri, Y., Zinatizadeh, A. A. L., and Akhbari, A. 2012. Photocatalytic degradation of aniline using TiO₂ nanoparticles in a vertical circulating photocatalytic reactor. *International Journal of Photoenergy*, 2012.
- Shen, M., and Henderson, M. A. 2011. Impact of solvent on photocatalytic mechanisms: Reactions of photodesorption products with ice overlayers on the TiO₂(110) surface. *Journal of Physical Chemistry C*, 115(13): 5886–5893.
- Smyth, M. S., and Martin, J. H. 2000. X Ray Crystallography. *Journal of Clinical Pathology: Molecular Pathology*, 53(1): 8–14.

- Stathatos, E., Pelentridou, K., Karasali, H., Dionysiou, D. D., and Lianos, P. 2008. Photocatalytic degradation of a water soluble herbicide by pure and noble metal deposited TiO₂ nanocrystalline films. *International Journal of Photoenergy*, 2008.
- Suib, S. L. 2008. Sieves and Octahedral Layered Materials. *Accounts of Chemical Research*, 41(4): 479–487.
- Sulaiman, N. M. N., and Chea, K. L. 2004. Membrane ultrafiltration of treated Palm Oil Mill Effluent (POME). 1–8.
- Sulong, M., Lim, W. K., Kandiah, S., & Top, A. G. T. 2007. Membrane Bioreactor Technology for Tertiary Treatment of Palm Oil Mill Effluent POME. MPOB Information Series. Malaysian Palm Oil Board, Malaysia.
- Sundram, K., Sambanthamurthi, R., and Tan, Y. A. 2003. Palm fruit chemistry and nutrition. *Asia Pacific Journal of Clinical Nutrition*, 12(3): 355–362.
- Tamada, I. S., Lopes, P. R. M., Montagnolli, R. N., and Bidoia, E. D. 2012. Biodegradation and toxicological evaluation of lubricant oils. *Brazilian Archives of Biology and Technology*, 55(6): 951–956.
- Tarr, M. a. 2003. *Chemical Degradation Methods for Wastes and Pollutants. Combustion*.
- Tian, L., Zhao, Y., He, S., Wei, M., and Duan, X. 2012. Immobilized Cu-Cr layered double hydroxide films with visible-light responsive photocatalysis for organic pollutants. *Chemical Engineering Journal*, 184: 261–267.
- Triantis, T. M., Fotiou, T., Kaloudis, T., Kontos, A. G., Falaras, P., Dionysiou, D. D., ... Hiskia, A. 2012. Photocatalytic degradation and mineralization of microcystin-LR under UV-A, solar and visible light using nanostructured nitrogen doped TiO₂. *Journal of Hazardous Materials*, 211–212: 196–202.
- Tripathy, N., Ahmad, R., Eun Song, J., Ah Ko, H., Hahn, Y. B., and Khang, G. 2014. Photocatalytic degradation of methyl orange dye by ZnO nanoneedle under UV irradiation. *Materials Letters*, 136: 171–174.
- Ugoji, E. O. 1997. Anaerobic digestion of palm oil mill effluent and its utilization as fertilizer for environmental protection. *Renewable Energy*, 10(2–3): 291–294.
- Valencia, S., Marin, J. M., and Restrepo, G. 2010. Study of the Bandgap of Synthesized Titanium Dioxide Nanoparticules Using the Sol-Gel Method and a Hydrothermal Treatment. *The Open Materials Science Journal*, 4(2): 9–14.

- Vaez, M., Moghaddam, A. Z., & Aljani, S. 2012. Optimization and modeling of photocatalytic degradation of azo dye using a response surface methodology (RSM) based on the central composite design with immobilized titania nanoparticles. *Ind. Eng. Chem. Res.* 51, 4199–4207.
- Vidal, L., Psillakis, E., Domini, C. E., Grané, N., Marken, F., and Canals, A. 2007. An ionic liquid as a solvent for headspace single drop microextraction of chlorobenzenes from water samples. *Analytica Chimica Acta*, 584(1): 189–195.
- Vilar, V. J. P., Pinho, L. X., Pintor, A. M. A., and Boaventura, R. A. R. 2011. Treatment of textile wastewaters by solar-driven advanced oxidation processes. *Solar Energy*, 85(9): 1927–1934.
- Wang, L. K., Tay, J., Tay, S. T. L., & Hung, Y. 2010. Handbook of Environmental Engineering, vol. 11: Environmental Bioengineering, New York, NY: Springer.
- Wang, T. C., Lu, N., Li, J., and Wu, Y. 2011. Plasma-TiO₂ catalytic method for high-efficiency remediation of p-nitrophenol contaminated soil in pulsed discharge. *Environmental Science and Technology*, 45(21): 9301–9307.
- Wang, X., He, Z., Zhong, S., and Xiao, X. 2007. Photocatalytic Synthesis of Hydrocarbon Oxygenates from C₂H₆ and CO₂ over Pd-MoO₃/SiO₂ Catalyst. *Journal of Natural Gas Chemistry*, 16(2): 173–178.
- Wang, X., Wang, W., Miao, Y., Feng, G., and Zhang, R. 2016. Facet-selective photodeposition of gold nanoparticles on faceted ZnO crystals for visible light photocatalysis. *Journal of Colloid and Interface Science*, 475: 112–118.
- Warren, B.E. 1969. X-Ray Diffraction, Addison-Wesley, New York.
- WebSpectral. 2000. Table of IR Absorption. <http://webspectra.chem.ucla.edu/irtable.html> accessed on 10/11/2015.
- White, J. M., and Henderson, M. A. 2005. Trimethyl acetate on TiO₂(110): Preparation and anaerobic photolysis. *Journal of Physical Chemistry B*, 109(25): 12417–12430.
- Williams, G., Seger, B., and Kamt, P. V. 2008. TiO₂-graphene nanocomposites. UV-assisted photocatalytic reduction of graphene oxide. *ACS Nano*, 2(7): 1487–1491.
- Wu, C., Shen, L., Zhang, Y. C., and Huang, Q. 2011. Solvothermal synthesis of Cr-doped ZnO nanowires with visible light-driven photocatalytic activity. *Materials Letters*, 65(12): 1794–1796.
- Wu, C., Zhang, Y. C., and Huang, Q. 2014. Solvothermal synthesis of N-doped ZnO microcrystals from commercial ZnO powder with visible light-driven photocatalytic activity. *Materials Letters*, 119: 104–106.

- Wu, T., Liu, G., Zhao, J., and Serpone, N. 1999. Evidence for H₂O₂ Generation during the TiO₂ -Assisted Photodegradation of Dyes in Aqueous Dispersions under Visible Light Illumination, 33(6): 4862–4867.
- Wu, T. Y., Mohammad, A. W., Md. Jahim, J., and Anuar, N. 2007. Palm oil mill effluent (POME) treatment and bioresources recovery using ultrafiltration membrane: Effect of pressure on membrane fouling. *Biochemical Engineering Journal*, 35(3): 309–317.
- Xia, H., Zhuang, H., Zhang, T., and Xiao, D. 2008. Visible-light-activated nanocomposite photocatalyst of Fe₂O₃/SnO₂. *Materials Letters*, 62(6–7): 1126–1128.
- Xu, Y., and Langford, C. H. 2001. UV- or visible-light-induced degradation of X3B on TiO₂ nanoparticles: The influence of adsorption. *Langmuir*, 17(3): 897–902.
- Y. Cho, W. Choi, C-H. Lee, T. Hyeon, H.-I. L. 2001. Visible Light-Induced Degradation of Carbon Tetrachloride on. *Environ. Sci. TechnolTechnol.*, 35(5): 966–970.
- Yacob, S., Ali Hassan, M., Shirai, Y., Wakisaka, M., and Subash, S. 2006. Baseline study of methane emission from anaerobic ponds of palm oil mill effluent treatment. *The Science of the Total Environment*, 366(1): 187–96.
- Yacob, S., Shirai, Y., Hassan, M. A., Wakisaka, M., and Subash, S. 2006. Start-up operation of semi-commercial closed anaerobic digester for palm oil mill effluent treatment. *Process Biochemistry*, 41(4): 962–964.
- Yu, Z., and Chuang, S. S. C. 2007. In situ IR study of adsorbed species and photogenerated electrons during photocatalytic oxidation of ethanol on TiO₂. *Journal of Catalysis*, 246(1): 118–126.
- Yusà, V., Pardo, O., Pastor, A., and De La Guardia, M. 2006. Optimization of a microwave-assisted extraction large-volume injection and gas chromatography-ion trap mass spectrometry procedure for the determination of polybrominated diphenyl ethers, polybrominated biphenyls and polychlorinated naphthalenes in sedime. *Analytica Chimica Acta*, 557(1–2): 304–313.
- Zafar, S. 2015. Properties of POME, accessed <http://www.bioenergyconsult.com/tag/properties-of-pome/> on 15 July 2015.
- Zahrim, A.Y., Rachel, F.M., Menaka, S., Su, S.Y., & Melvin, F. 2009. Decolourization of Anaerobic Palm Oil Mill Effluent via Activated Sludge-Granular Activated Carbon. *World Applied Sciences Journal*, 5(Special Issue for Environment): 126–129.
- Zhang, J., Jiang, J., and Zhao, X. S. 2011. Synthesis and Capacitive Properties of Manganese Oxide Nanosheets Dispersed on Functionalized Graphene Sheets. *The Journal of Physical Chemistry C*, 115(14): 6448–6454.

- Zhang, W., Li, Y., Su, Y., Mao, K., and Wang, Q. 2012. Effect of water composition on TiO₂ photocatalytic removal of endocrine disrupting compounds (EDCs) and estrogenic activity from secondary effluent. *Journal of Hazardous Materials*, 215–216: 252–258.
- Zhang, X., and Lei, L. 2008. Preparation of photocatalytic Fe₂O₃-TiO₂ coatings in one step by metal organic chemical vapor deposition. *Applied Surface Science*, 254(8): 2406–2412.
- Zhang, Y., Ram, M. K., Stefanakos, E. K., and Goswami, D. Y. 2012. Synthesis, characterization, and applications of ZnO nanowires. *Journal of Nanomaterials*, 2012.
- Zhou, J., Xu, N., and Wang, Z. L. 2006. Dissolving behavior and stability of ZnO wires in biofluids: A study on biodegradability and biocompatibility of ZnO nanostructures. *Advanced Materials*, 18(18): 2432–2435.
- Zhu, J., Chen, F., Zhang, J., Chen, H., and Anpo, M. 2006. Fe³⁺-TiO₂ photocatalysts prepared by combining sol-gel method with hydrothermal treatment and their characterization. *Journal of Photochemistry and Photobiology A: Chemistry*, 180(1–2): 196–204.
- Zhuang, J., Dai, W., Tian, Q., Li, Z., Xie, L., Wang, J., ... Wang, D. 2010. Photocatalytic degradation of RhB over TiO₂ bilayer films: Effect of defects and their location. *Langmuir*, 26(12): 9686–9694.
- Zinatizadeh, A. A. L., Mohamed, A. R., Abdullah, A. Z., Mashitah, M. D., Hasnain Isa, M., and Najafpour, G. D. 2006. Process modeling and analysis of palm oil mill effluent treatment in an up-flow anaerobic sludge fixed film bioreactor using response surface methodology (RSM). *Water Research*, 40(17): 3193–3208.

APPENDIX A

LIST OF PUBLICATIONS

A1 Journal Publication

- **Ng, K. H.** & Cheng, C. K. (2017). Photocatalytic degradation of palm oil mill effluent over ultraviolet-responsive titania: Successive assessments of significance factors and process optimization. *Journal of Cleaner Production*, 142, 2073 - 2083.
- **Ng, K. H.** and Cheng, C. K. (2017). Optimization of Photocatalytic Degradation of Palm Oil Mill Effluent in UV/ZnO system based on Response Surface Methodology. *Journal of Environmental Management*, 184, 487-493.
- **Ng, K. H.** and Cheng, C. K. (2016). Photo-polishing of POME into CH₄-lean biogas over UV-responsive ZnO photocatalyst. *Chemical Engineering Journal*, 300, 127-138.
- **Ng, K. H.**, Lee, C. H., and Cheng, C. K. (2015). Photocatalytic degradation of recalcitrant POME waste over silver doped titania: Photokinetics and scavenging studies. *Chemical Engineering Journal*, 286, 282-290.
- Cheng, C. K., Deraman, M. R., **Ng, K. H.**, and Khan, M. R. (2015). Preparation of titania doped argentum photocatalyst and its photoactivity towards palm oil mill effluent degradation. *Journal of Cleaner Production*, 112, 1128-1135.
- **Ng, K. H.** and Cheng, C. K. (2015). A Novel Photomineralization of POME over UV-Responsive TiO₂ Photocatalyst: Kinetics of POME Degradation and Gaseous Product Formations. *RSC Advances*, 5, 53100-53110.
- **Ng, K. H.**, Deraman, M. D., Ang, C. H., Chong, S. K., Kong, Z. Y., Khan, M. R., and Cheng, C. K. (2014). Phototreatment of Palm Oil Mill Effluent (POME) over Cu/TiO₂ Photocatalyst. *Bulletin of Chemical Reaction Engineering and Catalysis*, 9(2), 121-127.

A2 Conference Proceedings

International

- **Ng, K. H.**, Kong, Z. Y., Chong, S. K., Ang, C. H., and Cheng, C. K. Phototreatment of palm oil mill effluent (POME) over Cu/TiO₂ photocatalyst, ISCRE 23 and APCRE 7, 2014. (7th - 10th September 2014; Bangkok)
- Ang, C. H., Kong, Z. Y., **Ng, K. H.**, Chong, S. K., and Cheng, C. K. A study into the photoreaction of glycerol aqueous solution, ISCRE 23 and APCRE 7, 2014. (7th - 10th September 2014; Bangkok)

Local

- **Ng, K. H.** and Cheng, C. K. Photo-polishing of palm oil mill effluent (POME) over UV/ZnO system. ICAT2016, 2016. (20th- 21st September 2016; JB)
- **Ng, K. H.**, Khan, M. R., Cheng, C. K. Photocatalytic degradation of palm oil mills effluent (POME) over UV-responsive titania. ICENV2015, 2015. (18th - 19th August 2015; Penang)