出國報告 (出國類別: 國際會議)

2015 Global Engineering & Applied Science Conference

服務機關：國立高雄應用科技大學 化材系
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派赴國家：日本
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目錄

摘要

Bi_2WO_6 was synthesized via solvothermal method with different solvents. The precursors of Bi and W were $Bi(NO_3)_3 \cdot 5H_2O$ and $Na_2WO_4 \cdot 2H_2O$, respectively. The solvents were water and ethylene glycol (EG) and the prepared Bi_2WO_6 photocatalysts were denoted as EG0 and EG70, respectively. The surface characteristics of Bi_2WO_6 were analyzed by X-ray diffraction (XRD), UV-Vis diffusion reflectance spectrophotometry (UV-Vis-DRS), scanning electron microscopy (SEM), transmission electron microscopy (TEM) and BET surface area analysis. The photocatalytic activity of Bi_2WO_6 was evaluated by decolorizing C.I. Reactive Red 2 (RR2) under visible-light irradiation ($\lambda > 420$ nm). The average diameter, BET surface area, pore volume, pore width and band gap of EG0 were 17.5 nm, 24.2 m^2/g, 0.14 cm^3/g, 23.2 nm and 2.8 eV, respectively; and those of EG70 were 4.7 nm, 100.8 m^2/g, 0.28 cm^3/g, 11.1 nm and 2.9 eV, respectively. The photodegradation rate constants (k) of RR2 fitted pseudo-first-order kinetics and the k values of EG0 and EG70 were 0.174 and 1.644 hr^{-1}, respectively.

目的

至 2015 Global Engineering & Applied Science Conference，發表"Synthesis, characterization and environmental application of Bi_2WO_6"一文。

過程

本次會議於日本東京舉行(12/03/2015-12/04/2015)，本人於 12/02/2015 抵達東京，12/03/2015 報到並進行論文發表，12/05/2015 返台。本次 2015 Global Engineering & Applied Science Conference 論文以口頭及海報兩種型態進行，會議內容包含: 機械工程、電子工程、生命科學、化學工程、基礎及應用科學、數位科技、電腦及資訊科學、環境科學、生醫及生物工程、材料科學及土木工程。此研討會同時與 International Symposium on Electrical, Electric Engineering and Digital Technology, The International Symposium on Business and Social Sciences, Annual Conference on Social Studies, Communication and Education 及 International Conference on Life Science and Biological Engineering 共同舉行成聯合會，本次 2015 Global Engineering & Applied Science Conference 會議共有 30 篇論文口頭發表及 40 篇海報發表，參與人員來自泰國、義大利、台灣、英國、香港、日本、馬來西亞、柬埔寨、印尼、中國、波蘭、沙烏地阿拉伯、韓國、哈薩克、馬來西亞、捷克及菲律賓等十七國，會議議程相當豐富。本人於此次大會發表" Synthesis, characterization and environmental application of Bi_2WO_6"一文，會後並與多名學者進行意見交流。

與會心得與建議事項

這次出國參加的會議是2015 Global Engineering & Applied Science Conference，發表"Synthesis, characterization and environmental application of Bi_2WO_6"一文。在會議的過程中不只聽到了一些與自己研究有相關的演講外，還可以聽到其他的研究以增加自己的知識。藉由參加這次研討會，不但增加了許多新知也得到許多的資訊，而這些資訊讓我可以了解各國實驗室的實驗進展，也可以督促自己研究之腳步。這次在本研討會中出席之台灣人員包括來自台灣大學、成功大學、中山大學、海洋大學、明志科大、嘉南藥理科大及雲科大等校不同科系之教授。最後要感謝學校計畫結餘款補助我出國的經費，讓我能以較小的經濟壓力下出國參加會議學習。本次出席該會議與大會其他與會人員交換意見，獲益良多。

攜回資料名稱及內容

2015 Global Engineering & Applied Science Conference (GEASC), Tokyo. Japan

Mechanical Engineering

Session Chair: Prof. Felix T.S. Chan

GEASC-1241	Development of Computerized Maintenance Management System for Printed Circuit Board Assembly Machine	Somkiat Tangjitsitcharoen—Chulalongkorn University Nungruthai Chudpia—Chulalongkorn University
GEASC-1288	FE Analysis of an Ablative Thermal Protection Systems for Re-Entry Vehicles	Francesco Raimondo—Second University of Naples Aniello Riccio—Second University of Naples Andrea Sellitto—Second University of Naples
GEASC-1304	Thermal Resistance of Perforated Heat Sinks with Circular Pin Fins Cooled by Forced Convection	Mao-Yu Wen—Cheng Shiu University Cheng-Hsiung Yeh—Cheng Shiu University
GEASC-1315	A Stochastic Production-Inventory Model in a Two-State Production System with Deteriorating Product, Rework Process and Backordering	N. Li—The Hong Kong Polytechnic University Felix T.S. Chan—The Hong Kong Polytechnic University S.H. Chung—The Hong Kong Polytechnic University Allen H. Tai—The Hong Kong Polytechnic University M. Saadat—University of Birmingham Z.X. Wang—The Hong Kong Polytechnic University
GEASC-1382	Performance of Heat Transfer via Thermosyphon Heat Exchanger with Silver-Nanofluid as Working Fluid	Pattanapol Meena—Mahasarakham University P. Tammasaeng—Mahasarakham University J. Kanphirom—Mahasarakham University C. Plybour—Mahasarakham University A. Ponkho—Mahasarakham University S. Setwong—Mahasarakham University
GEASC-1419	Optimization of Microturbine Performance from First Generation Biodiesel to Second Generation Biodiesel	Ee Sann Tan—Universiti Tenaga Nasional Kumaran Palanisamy—Universiti Tenaga Nasional T.M. Indra Mahlia—Universiti Tenaga Nasional Kunio Yoshikawa—Tokyo Institute of Technology
GEASC-1187	Manufacturing Process Development of Precision Rapid Tooling with High-Aspect-Ratio Microstructures	Chil-Chyuan Kuo—Ming Chi University of Technology Bo-Chao Zhuang—Ming Chi University of Technology

Electrical and Electronic Engineering (1)

Session Chair: Prof. Saroj Hlungnamtip

GEASC-1247	Application of Intensified Current Search to 4-DOF Controller Design for Scaled Vehicle Yaw Rate Control System	Saroj Hlungnamtip—South-East Asia University Chaiyo Thammarat—South-East Asia University Deacha Puangdownreong—South-East Asia University Supaporn Suwannarongsri—King Mongkut's University of Technology North Bangkok
GEASC-1261	Multiobjective Optimization of PID Controller of Three-Phase Induction Motor Speed Control using Intensified Current Search	Satean Tunyasrirut—Pathumwan Institute of Technology Chaiyo Thammarat—South-East Asia University Deacha Puangdownreong—South-East Asia University Auttarat Nawikavatan—Pathumwan Institute of Technology
GEASC-1277	ATS Based I-PD Controller Optimization for DC Motor Speed Control System	Thanet Ketthong—Pathumwan Institute of Technology Deacha Puangdownreong—South-East Asia University Satean Tunyasrirut—Pathumwan Institute of Technology
GEASC-1282	Application of Cuckoo Search to Design Optimal PID/PI Controllers of BLDC Motor Speed Control System	Chookiat Kiree—Pathumwan Institute of Technology Deacha Puangdownreong—South-East Asia University Danupon Kumpanya—Pathumwan Institute of Technology Satean Tunyasrirut—Pathumwan Institute of Technology
GEASC-1305	Optimal Tuning of 2DOF-PID Controllers of BLDC Motor Speed Control System by Intensified Current Search	Chookiat Kiree—Pathumwan Institute of Technology Deacha Puangdownreong—South-East Asia University Danupon Kumpanya—Pathumwan Institute of Technology Satean Tunyasrirut—Pathumwan Institute of Technology

Chemical Engineering/ Fundamental and Applied Sciences (1)

Session Chair: Prof. Shingjiang Jessie Lue

GEASC-1309	High-Performance Quaternized Polyvinyl Alcohol Nanofiber Membrane Electrolyte for Direct Methanol Alkaline Fuel Cells	Guan-Ming Liao｜Chang Gung University Pin-Chieh Li｜Chang Gung University Shingjiang Jessie Lue｜Chang Gung University
GEASC-1311	Effect of Synthesis Parameters on Crystal Size and Perfection of Mordenite and Analcime	Zehui Du—Kasetsart University Chaiwat Prapainainar—King Mongkut's University of Technology North Bangkok Paisan Kongkachuichay—Kasetsart University Paweena Prapainainar—Kasetsart University
GEASC-1371	Hydrogen Production by Photocatalytic Water-Splitting Using Pt-Doped TiO2-ZnO Composite Material under Visible Light	Meng-Yu Xie—Providence University Yi Siao—Providence University Ren-Jang Wu—Providence University
GEASC-1428	Phase-Change Solvent for Carbon Dioxide Capture: An Equilibrium Model Representation	Sholeh Ma'mun—Islamic University of Indonesia Faisal R. M.—Islamic University of Indonesia Pratikno Hidayat—Islamic University of Indonesia
GEASC-1366	Effect of Micro-Bubbles Ozone for Inactivation of Escherichia Coli O157:H7 on Fresh-Cut Pineapple cv. Phu Lae	Angkhana Chuajedton—Chiang Mai University H. Aoyagi—University of Tsukuba J. Uthaibutra—Chiang Mai University K. Whangchai—Chiang Mai University
GEASC-1374	Efficiency of Ethyl Acetate Extracts of Some Thai Herbs on the Growth Inhibition of Fungi on Rubber Sheet	Saisamorn Lumlong—Ubon Ratchathani University Wilaiwan Srilawan—Ubon Ratchathani University
GEASC-1443	Effect of Extraction Solvent/Technique on the Antioxidant Activity of Selected Edible Wild Mushrooms	Somjintana Taveepanich—Ubon Ratchathani University

Computer and Information Sciences / Technologies and Applications / Digital Technology (2)

Session Chair: Prof. Wiboonsak Watthayu

GEASC-1228	Spatio-Temporal Chaos Based MRI Image Encryption with Dynamic Feedback Mechanism	Lin Yang-Fei—Fuzhou University Ye Shao-Zhen—Fujian Key Laboratory of Medical Instrumentation & Pharmaceuical Technology
GEASC-1338	Alternating Directions Solver for Isogeometric Simulations of Non-Linear Problems	Marcin Łoś—AGH University of Science and Technology Maciej Woźniak—AGH University of Science and Technology

		Maciej Paszyński—AGH University of Science and Technology
GEASC-1444	Ant Colony Classification for Regional Climate Change Data in Thailand	Wiboonsak Watthayu—King Mongkut's University of Technology Thonburi

Fundamental and Applied Sciences (2)/ Electrical and Electronic Engineering (2)

Session Chair: Prof. Yi-You Hou

GEASC-1356	Effectiveness of Hands-on Examination and Activities on Student's Achievement	Jutharat Sunprasert—King Mongkut's University of Technology Thonburi Jintana Wongta—King Mongkut's University of Technology Thonburi
GEASC-1467	The Study of the Local Groundwater for the Domestic Water Supply in a Rural Community: Tambol Boong Mai, Ubon Ratchathani	Rossukon Laopaiboon—Ubon Ratchathani University Chidhathai Petchuay—Ubon Ratchathani University Sansanee Chawanakul—Ubon Ratchathani University Vonlaya Viriyasenkul—Ubon Ratchathani University
GEASC-1466	Rational Deign of DprE1 Inhibitors in Class of 4-Aminoquinolone Piperidine Amides as Promising Anti-Tuberculosis Agents thought 3D-QSAR Studies and Molecular Docking Calculations	Chayanin Hanwarinroj—Ubon Ratchathani University Pharit Kamsri—Ubon Ratchathani University Pijittra Meewong—Ubon Ratchathani University Naruedon Phusi—Ubon Ratchathani University Auradee Punkvang—Nakhon Phanom University Patchareenart Saparpakornc—Ubon Ratchathani University Supa Hannongbua—Kasetsart University Ubolsree Leartsakulpanich—National Science and Technology Development Agency Pornpan Pungpo—Ubon Ratchathani University

Environmental Science/ Life Science (2)

Session Chair: Prof. Porpattama Hammachukiattikul

GEASC-1297	Optimization and Validation of a Thiocarbamide Functional Sulfur Adsorbent Extraction for Determination of Mercury in Seawater by AFS	Tanita Gettongsong—Chulalongkorn University Sirichai Thammavanit—Chulalongkorn University
GEASC-1343	Diesel Oil Contaminated Soil Washing by Ethylene Glycol Monobutyl Ether: Optimization	Aekapope Yotto—Chia Nan University of Pharmacy and Science Chia-Yuan Chang—Chia Nan University of

	with Response Surface Methodology	Pharmacy and Science Suraphong Wattanachira—Chiang Mai University
GEASC-1355	Impact of Winter Monsoon Cold Surge for Tropical Cyclone Development in the Gulf of Thailand	Porpattama Hammachukiattikul—Phuket Rajabhat University
GEASC-1437	Adsorptions of Brilliant Green on Thai Natural Clays: Isotherm and Kinetics Studies	Malee Prajuabsuk—Ubon Ratchathani University Rarai Jettana—Ubon Ratchathani University Thanyanat Saiboh—Ubon Ratchathani University Jeeranan Chaleamrat—Ubon Ratchathani University Pornpan Pungpo—Ubon Ratchathani University Parjaree Thavorniti—National Metal and Materials Technology (MTEC)

Biomedical/ Biological Engineering

Session Chair: Prof. Maciej Paszyński

GEASC-1340	Simulations of the Propagation of Electromagnetic Waves over a Human Head Based on Projection Based Interpolation of MRI Scan Data	Maciej Woźniak—AGH University of Science and Technology Marcin Sieniek—AGH University of Science and Technology Maciej Paszyński—AGH University of Science and Technology

Material Science

Session Chair: Prof. Hyoung Jin Choi

GEASC-1250	Fabrication and Electro-Responsive Characteristics of Polymeric Soft Matter Suspensions under Applied Electric Fields	Hyoung Jin Choi—Inha University
GEASC-1324	Modeling on Flow Stress in Contribution of Twins and Grain Refinement	Wing Yan, Leung—The Hong Kong Polytechnic University Haihui Ruan—The Hong Kong Polytechnic University Jian, Lu—The Hong Kong Polytechnic University San Qiang, Shi—The Hong Kong Polytechnic University Limin, Zhou—The Hong Kong Polytechnic University
GEASC-1360	Thermomechanical Effects of Electrical Energy Harvested from Laminated Piezoelectric Devices	Pornrawee Thonapalin—King Mongkut's University of Technology Thonburi Sontipee Aimmanee—King Mongkut's University

		of Technology Thonburi Pitak Laoratanakul—National Science and Technology Development Agency
GEASC-1375	Effect of γ and γ Precipitates on the Properties of Cu-Be Alloy	Masoud Ibrahim Masoud—Northern Border University

Engineering

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GEASC-1256	Long-Term Seismic Responses Monitoring of Building Structures for Seismic Hazard Mitigation	Chin-Hsiung Loh—National Taiwan University Tzu-Hsiu Wu—National Science and Technology Center for Disaster Reduction
GEASC-1264	Seismic Damage of Reinforced Concrete Structures by Cyclic Pushover Analysis	Phaiboon Panyakapo—Sripatum University
GEASC-1308	Selection of Exterior Wall Materials Considering Defects Prevention and Maintenance Efficiency	Jae Seob Lee—Dongguk Univ.
GEASC-1417	Development of Crack Propagation Method Using Vector Form Intrinsic Finite Element Method	Ren-Zuo Wang—National Center for Research on Earthquake Engineering

Poster Session (2)

Civil Engineering/Material Science/Electrical and Electronic Engineering/Digital Technology

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GEASC-1440	Non-Destructive Stress Measurement of Civil Structural Steel Using Magnetic Anisotropy Sensor	Dae-Sung, Kim—Kyungil University Ji-Hyeung, Yoo—Kyungil University Hong-Duk, Moon—Gyeongnam National University of Science and Technology
GEASC-1464	A Study on the Analysis of Space and Structural Interface for Improvement of the Transfer Path in a Metro Station	Heekyu Kim—MORE Engineering & Architecture Minjung Shin—MORE Engineering & Architecture Jinho Hur—MORE Engineering & Architecture Youngsam Moon—MORE Engineering & Architecture
GEASC-1321	Properties of Ferrofluids Using Polydimethylsiloxane and Perfluoropolyether Bases	Jong-Hee Kim—Chungnam National University Keun-Bae Park—Chungnam National University

GEASC-1347	Controlled Synthesis of La1xSrxCrO3 Nanoparticles by Hydrothermal Method with Nonionic Surfactant and Their ORR Activity in Alkaline Medium	Jong Hyuk Shin—Pusan National University Shin-Ae Park—Pusan National University Yong-Tae Kim—Pusan National University
GEASC-1370	Pineapple Peel Fiber Based Biocomposites for Green Packaging	Roshafima Rasit Ali—Universiti Teknologi Malaysia Wan Azian Wan Abdul Rahman—Universiti Teknologi Malaysia Rafiziana Md Kasmaini—Universiti Teknologi Malaysia Norazana Ibrahim—Universiti Teknologi Malaysia Aziatul Niza Sadikin—Universiti Teknologi Malaysia Umi Aisah Asli—Universiti Teknologi Malaysia Hasrinah Hasbullah—Universiti Teknologi Malaysia
GEASC-1412	Preliminary Research on Strength Properties of Polymer Modified Concrete with Copolymer of Natural Rubber as Concrete Additive	Sih Wuri Andayani—Bandung Institute of Technology
GEASC-1433	Shell Waste Transfer into a Red-Emitting Phosphors $Ca_9Gd(PO_4)_7$: Eu^{3+} with Magnetic Property	Tsung-Yuan Chang—National Taiwan Ocean University Hsiu-Mei Lin—National Taiwan Ocean University Tai-Yuan Lin—National Taiwan Ocean University
GEASC-1462	Study Changes in the Structure and Phase Formation in the Welded Joints of the Alloy 47Crinimo	Yelubek Akzholov—I.Zhansugurov Zhetysu State University Marat Maltekbassov—I.Zhansugurov Zhetysu State University Yerkat Mukazhanov—I.Zhansugurov Zhetysu State University Aygul Aldabergenova—I.Zhansugurov Zhetysu State University
GEASC-1316	Design of Dual-Band Ambient RF Energy Harvesting Systems	Hao-Hui Chen—Nat'l Kaohsiung First University of Science and Technology Young-Huang Chou—Huafan University
GEASC-1329	Support Vector Machine with Artificial Bee Colony for Central Air-Conditioning System	Whei-Min Li—National Sun Yat-Sen University Chia-Sheng Tu—National Sun Yat-Sen University Cheng-Yu Tsai—National Sun Yat-Sen University

		Ming-Tang Tsai—Cheng-Shiu University Fu-Sheng-Cheng—Cheng-Shiu University Chi-Chun Lo—Chang Cung Memorial Hospital
GEASC-1332	Self-Adaptation Swarm Optimization Algorithm for Dynamic Economic Dispatch with Demand Response	Whei-Min Li—National Sun Yat-Sen University Cheng-Yu Tsai—National Sun Yat-Sen University
GEASC-1336	A Study of Contact Resistance Test for Couplers in Electric Bus with Battery-Swapping System	Kwangmin Kim—Hanyang University Ju lee—Hanyang University
GEASC-1438	The Improvement of Loading Margin and Losses Using Optimal Power Flow Based on Static Line Voltage Stability Indices	Natakorn Thasnas—Khon Kaen University Apirat Siritaratiwat—Khon Kaen University

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GEASC-1312	Development of Healthy Ice Cream for the Elderly	Benjang Aschariyaphotha—Valaya Alongkorn Rajabhat University
GEASC-1318	Reduction of Polycyclic Aromatic Hydrocarbon Content of Charcoal Smoke during Grilling Process by Charcoal Preparation	Suriyapong Chaemsai—King Mongkut's University of Technology Thonburi Thiranan Kunanopparat—King Mongkut's University of Technology Thonburi Walaiporn Srichumpoung—King Mongkut's University of Technology Thonburi Montira Nopharatana—King Mongkut's University of Technology Thonburi Chairath Tangduangdee—King Mongkut's University of Technology Thonburi Suwit Siriwattanayotin—King Mongkut's University of Technology Thonburi
GEASC-1363	The Organizing of Multidisciplinary Project to Enhance Students' Perceptions and Attitudes toward Science	Jintana Wongta—King Mongkut's University of Technology Thonburi Nion Vinarukwong—King Mongkut's University of Technology Thonburi Ekapong Hirunsirisawat—King Mongkut's University of Technology Thonburi Tanawin Intaravicha—Silpakorn University Niphon Chanlen—Institute for the Promotion of Teaching Science and Technology

GEASC-1416	The Identification of Polyethylene Terephthalate (PET) Waste Fungi in Phathuntani Province (Thailand) that Produce Cutinase for Application in Polyester Fiber Modification	Wattana Aschariyphotha—Valaya Alongkorn Rajabhat University
GEASC-1420	Collaborative Learning and Team Member Perceptions of Multidisciplinary Project	Nion Vinarukwong—King Mongkut's University of Technology Thonburi Jintana Wongta—King Mongkut's University of Technology Thonburi
GEASC-1424	Oven Heat and Hot Water Treatments: A Comparison Study of Heat Treatments for Improvement of Sun Sweet Cantaloupe Melon Quality	Kanyarat Lueangprasert—Burapha University Sakaeo Campus
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Poster Session (5)

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GEASC-1350	Production of Biogas via Anaerobic Digestion from Coconut Copra Waste and Cow Manure	Norazana Ibrahim—Universiti Teknologi Malaysia Rafiziana MD. Kasmani—Universiti Teknologi Malaysia Hasrinah Hasbullah—Universiti Teknologi Malaysia Mohd Kamaruddin bin Abd. Hamid—Universiti Teknologi Malaysia Roshafima Rasit Ali—Universiti Teknologi Malaysia

		Aziatul Niza Sadikin—Universiti Teknologi Malaysia
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GEASC-1364	The Effect of Acid and Alkali Pre-Treatment Methods on Pineapple Peel Waste for Bio-Ethanol Production	Aziatul Niza Sadikin—Universiti Teknologi Malaysia Roshafima Rasit Ali—Universiti Teknologi Malaysia Rafiziana Kasmani—Universiti Teknologi Malaysia Norazana Ibrahim—Universiti Teknologi Malaysia Hasrinah Hasbullah—Universiti Teknologi Malaysia
GEASC-1377	Experimental and Numerical Study on Hydrogen Enriched Biogas Explosion in Tee-Junction Pipe	Rafiziana Md Kasmani—Universiti Teknologi Malaysia Khairul Aizat Salleh—Universiti Teknologi Malaysia Norazana Ibrahim—Universiti Teknologi Malaysia Roshafima Rasit Ali—Universiti Teknologi Malaysia

		Hasrinah Hasbullah—Universiti Teknologi Malaysia Siti Zubaidah Sulaiman—Universiti Teknologi Malaysia Aziatul Niza Sadikin—Universiti Teknologi Malaysia
GEASC-1380	Physical Property of PEG Compatibilized PLA/PBS Blends	Achirasit Wisutthiphat—Chulalongkorn University Siriwan Phattanarudee—Chulalongkorn University
GEASC-1456	Regenerable Zinc Ferrite Sorbents for the Removal of Hydrogen Sulfide at Moderate Temperatures	Yu-Ming Su—Institute of Nuclear Energy Research Ching-Ying Huang—Institute of Nuclear Energy Research Yau-Pin Chyou—Institute of Nuclear Energy Research Karel Svoboda—Institute of Chemical Process Fundamentals of the ASCR
GEASC-1335	On the Performance Test of the Piezoelectric-Hydraulic Pump	Yong-Hwi Joo—Korea Aerospace University Jong-Hoon Lee—Agency for Defense Development Jun-Yong Kwon—Agency for Defense Development Jai-Hyuk Hwang—Korea Aerospace University Jae-Sung Bae—Korea Aerospace University
GEASC-1344	Adaptive Screw Inspection of Motor Engine Using RGB-D Images and Template Matching	Chien-Chun Kuo—Industrial Technology Research Institute (ITRI) South Hian-Kun Tenn—Industrial Technology Research Institute (ITRI) South Ko-Shyang Wang—Industrial Technology Research Institute (ITRI) South Yao-Yang Tsai—Industrial Technology Research Institute (ITRI) South Chung-Li Tai—Industrial Technology Research Institute (ITRI) South Han-Wei Hsia—Industrial Technology Research Institute (ITRI) South Wen-Hung Ting—Industrial Technology Research Institute (ITRI) South
GEASC-1384	Textile Design Innovation Using Developed RtR Sputter Coating System	Shou Xiang Kinor Jiang—The Hong Kong Polytechnic University

GEASC-1407	Performance of the Low-Cost Solar Assisted Cabinet Dryer for Green Banana: Evaluation of the Closed-Loop Thermosyphon Water Heater	Cresencio P. Genobiagon Jr—University of Mindanao
GEASC-1450	Development and Evaluation of Ultra-High-Speed Micro Processing Machines Using Ultra-Precision Magnetic Abrasive Machining	Rui Wang—Chonbuk National University Pyo Lim—Chonbuk National University Lida Heng—Chonbuk National University Nam-Jun Park—Chonbuk National University Min-Soo Kim—Chonbuk National University
GEASC-1441	Design and Performance Evaluation on the Hybrid Auxiliary Heater for Cabin Heating and Battery TMS of an Electric Vehicle	Jae-Hyeong Seo—NTF TECH Company You-Ma Bang—Dong-A University Mahesh Suresh Patil—Dong-A University Seong-Hoon Jeong—Dong-A University Chong-Pyo Cho—Korea Institute of Energy Research Moo-Yeon Lee—Dong-A University
GEASC-1359	Study of Homocysteine Biosensors Based on Titania Nanotubes as Electrodes and Immobilization of Amino Acid Oxidase	Lu Yu Lung—Huafan University Huang Yu Pei—Huafan University Chang Rong Wei—Huafan University Lin Jyh Ling—Huafan University
GEASC-1263	Synthesis, Characterization and Environmental Application of Bi2WO6	Chung-Hsin Wu—National Kaohsiung University of Applied Sciences Chao-Yin Kuo—National Yunlin University of Science and Technology Yong-Huei, Lin—National Kaohsiung University of Applied Sciences Yu-Sheng Kuan—National Kaohsiung University of Applied Sciences Kuan-Lin Chiu—National Kaohsiung University of Applied Sciences Te-Chuan Wang—National Kaohsiung University of Applied Sciences
GEASC-1326	Optimization of Kaolin Modified Nanoiron Synthesis Using Reactive Red as a Chemical Probe	Visanu Tanboonchuy—Khon Kaen University Wannakan Thongkao—Thammasat University Pummarin Khamdahsag—Chulalongkorn University Apichart Saowapakpongchai—Thammasat University Nurak Grisdanurak—Thammasat University
GEASC-1352	Sorption of Carbon Dioxide from Oxy-Fuel Combustion by Calcium-Based Slags	Ning-Yao Shen—National Cheng Kung University Shin-Yi Shie—National Cheng Kung University Tsai-Chi Lian—National Cheng Kung University

		Hsin Chu—National Cheng Kung University Ting-Ke Tzeng—National Cheng Kung University
GEASC-1337	Factor Affecting of Cholinesterase Levels in Farmers Exposed to Pesticide	Watcharaporn Wongsakoonkan—Valaya Alongkorn Rajabhat University under Royal Patronage

圖一：筆者於研討會會場

發表論文海報

2015 Global Engineering & Applied Science

Synthesis, characterization and environmental application of Bi_2WO_6

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Abstract

Bi_2WO_6 was synthesized via a solvothermal method with different solvents. The solvents were water and ethylene glycol (EG) and the prepared Bi_2WO_6 photocatalysts were denoted as EG0 and EG70, respectively. The surface characteristics of Bi_2WO_6 were analyzed by X-ray diffraction (XRD), UV-Vis diffusion reflectance spectrophotometer (UV-Vis DRS), scanning electron microscope (SEM), transmission electron microscope (TEM), and BET surface area analysis. The photocatalytic activity of Bi_2WO_6 was evaluated by decolorization of Reactive Red 2 (RR2) under visible-light irradiation (λ > 420 nm). The average diameter, BET surface area, pore volume, pore width and band gap of EG0 were 17.5 nm, 24.2 m^2/g, 0.14 cm^3/g, 23.2 nm and 2.8 eV, respectively, and those of EG70 were 4.7 nm, 100.8 m^2/g, 0.28 cm^3/g, 11.1 nm and 2.9 eV, respectively. The photodegradation constant (k) of RR2 fitted pseudo-first-order kinetics and the k values of EG0 and EG70 were 0.174 and 1.644 hr^{-1}, respectively.

Introduction

Bismuth tungstate (Bi_2WO_6) is a promising visible-light-driven photocatalyst. In this study, a solvothermal method with different solvents was utilized to synthesize Bi_2WO_6. The photocatalytic activity of the resultant photocatalysts in the photodegradation of C.I. Reactive Red 2 (RR2) under visible-light irradiation was evaluated.

Materials and Methods

Bi_2WO_6 was prepared using $Bi(NO_3)_3 \cdot 5H_2O$ and $Na_2WO_4 \cdot 2H_2O$ with different solvents via a one-step solvothermal method. Figure 1 presents the procedure by which Bi_2WO_6 was prepared. All experiments were conducted at pH 3 and 25℃. The RR2 concentration and photocatalyst dosage were 20 mg/L and 0.5 g/L, respectively. The source of visible light was a 450 W Xe lamp.

Results and Discussion

Figures 2-5 show the XRD patterns, UV-Vis DRS spectra, SEM and TEM images of the prepared Bi_2WO_6, respectively. Table 1 lists the surface characteristics of the prepared photocatalysts. Figure 6 shows the removal of RR2 by adsorption and photodegradation with Bi_2WO_6. The photodegradation rate constants (k) of RR2 fit pseudo-first-order kinetics and the k value of EG70 exceeded that of EG0.

Table 1 Surface characteristics of the prepared photocatalysts

Photocatalysts	EG0	EG70
Average diameter	17.5	4.7
BET surface area (m^2/g)	24.2	100.8
Pore volume (cm^3/g)	0.14	0.28
Pore width (nm)	23.2	11.1
Band gap (eV)	2.8	2.9
k (h^{-1})	0.174	1.644

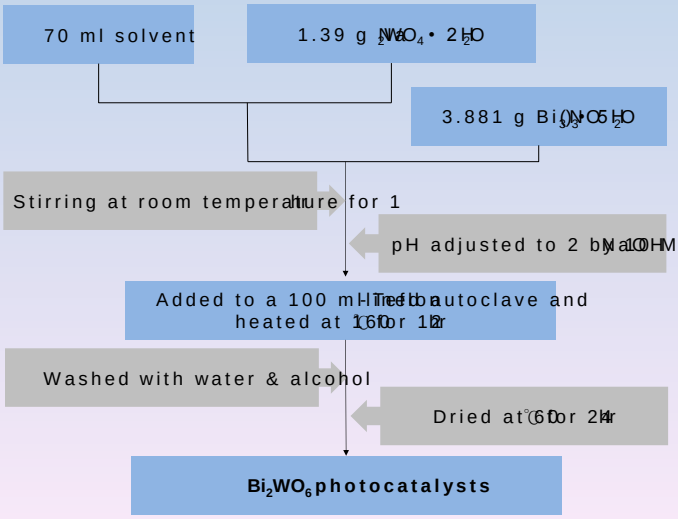

Fig. 1 Procedure of Bi_2WO_6 preparation

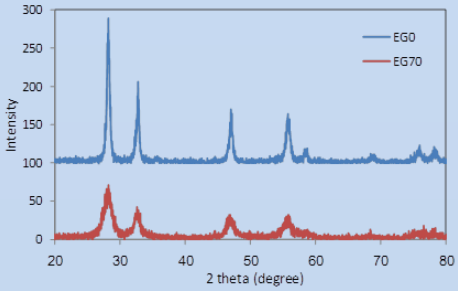

Fig. 2 XRD patterns of EG0 and EG70

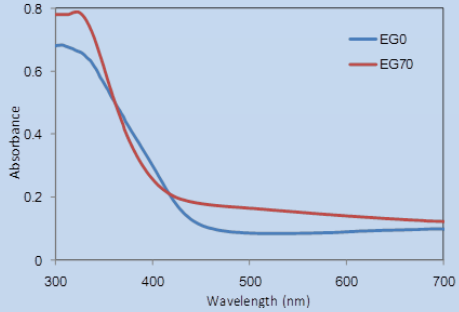

Fig. 3 UV-Vis DRS spectra of EG0 and EG70

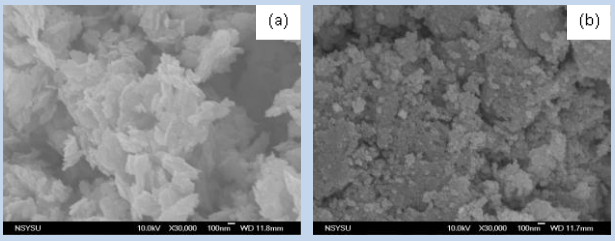

Fig. 4 SEM images of Bi_2WO_6 (a) EG0 (b) EG70

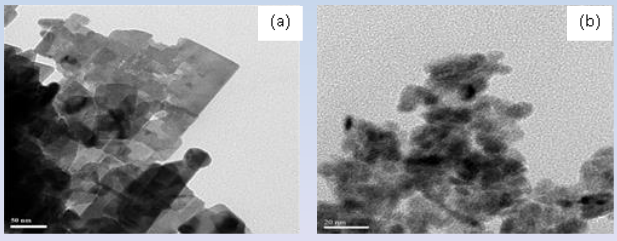

Fig. 5 TEM images of Bi_2WO_6 (a) EG0 (b) EG70

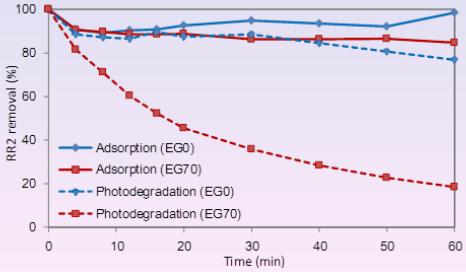

Fig. 6 Adsorption and photodegradation of RR2 by Bi_2WO_6