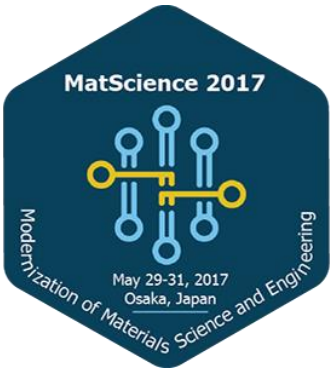
出國報告（出國類別：國際會議）

Thermally stable, organosoluble of co-polynaphthalimides based on 1,4,5,8-naphthalene tetracarboxylic dianhydride, 9,9-bis(4-aminophenyl)fluorine, and various aromatic diamines

（8th International Conference and Exhibition on Materials Science and Engineering）



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派赴國家：日本

出國期間：2017.05.27-2017.06.01

會議期間：2017.05.29-2017.05.31

報告日期：2015.6.02

摘要

A series of novel co-polynaphthalimides (**III**$_{a-h}$) were synthesized from 1,4,5,8-naphthalene tetracarboxylic dianhydride with 9,9-bis(4-aminophenyl)fluorine and its equimolar mixtures with various aromatic diamines by high-temperature solution ploycondensation. Series **III** had inherent viscosity ranging from 0.77-1.17 dL/g, respectively. Most of the films were soluble in m-cresol and some of them were dissolve in 1-methyl-2-pyrrolidone (NMP). These polymers could afford transparent and tough films with Strength at Break of 77-100 MPa via casting relative m-cresol solutions. These PNIs also exhibited high thermal stability, with glass-transition temperatures of 218–239 ^{o}C, 10% weight loss temperatures above 500 ^{o}C in nitrogen or air, and char yields at 800 ^{o}C in nitrogen higher than 40%.

目次

一、目的

第八屆國際材料科學與工程會議(8th International Conference and Exhibition on Materials Science and Engineering)，於 2017 年 5 月 29 日~5 月 31 日在日本大阪舉行為期三天之國際研討會。預計發表海報會議論文編號 MSC104，主題為 Thermally stable, organosoluble of co-polynaphthalimides based on 1,4,5,8-naphthalene tetracarboxylic dianhydride, 9,9-bis(4-aminophenyl)fluorine, and various aromatic diamines

出差流程

本次會議為 8th International Conference and Exhibition on Materials Science and Engineering 於 5/29~5/31, 2017 日本大阪舉行，其會議內容涵蓋了能源材料、奈米材料、高性能材料及觸媒材料等主題。本人於 5/27 晚上抵達日本大阪，於 5/29 報到並於 5/30 下午 16:30~18:00 發表論文，6/1 抵達台灣。本次大會包含了數十場演講與數十篇海報之呈現供與會學者進行研究與討論，除了討論研究藉以激發研究上的想法外，亦可認識國外學者以期望有進一步合作之可能與空間。

二、過程

演講部分

(1) Prof. Jun Ding (National University of Singapore)闡述了有關 3D 列印的方法與應用，其團隊利用 DLP process 製備一具有樹脂與陶瓷複合材料之成品，我與 Prof. Ding 會後有談論到有機無機分散之方法，而在我的研究領域中有一部分是針對光固化起始劑作研究與開發，此複合材料之概念可用於我未來之研究主題。另外也有針對 3D 列印之應用如:3D electrodes for water splitting、removal of heavy metal ions 及 Electro-less Nickel Plating 等都值得去延伸與探討。

(2) Prof. Sirikanjana Thongmee (Kasetsart University, Thailand)以 ZnO 為基體利用半導體概念摻雜不同的元素，利用水熱法製備複合材料，其晶格排列與 PL 或是磁性行為皆會隨著摻雜量不同而不同。

(3) Prof. Amina OUADAH (BIT, China)設計一具有親疏水性之 block copolymer 用於燃料電池中，利用不同進料量達到不同親疏水性比例之高分子並探討其電性之差異。

海報部分

海報部分展出時間為一個半小時，並與與會學者進行解說與討論。其中遇到高雄醫學大學與會之教授，除了對我的領域有興趣之外，另外也提到了她們光固化系統用牙醫補強材之研究，可能可以進行多方面跨領域之合作，以我們這邊提供高分子以及光固化系統結合她們的陶瓷與生醫檢測技術來發展下一代的牙醫補強材料。

大會議程簡介

Day 1 May 29, 2017

8:00-9:00	**Registrations**

Sapphire

conferenceseries.com 09:00-09:25 **Opening Ceremony**

Keynote Forum

09:25-09:30	**Introduction**
09:30-10:10	**Title: Molecular dynamics analysis of thermodynamic and kinetic properties of surfaces and interfaces of Pdhx** **Xiaowang Zhou**, Sandia National Laboratories, USA
10:10-10:50	**Title: Energy-saving fabrication of Ag2Te-Te and Co1-x-yNixFey thermoelectric materials** **Chia-Jyi Liu**, National Changhua University of Education, Taiwan

Group Photo

Networking and Refreshments Break @ Foyer 10:50-11:10

11:10-11:50	**Title: Syntesis and properties of metal doped zno nanostructures for devices applications** **Sirikanjana Thongmee**, Kasetsart University, Thailand

Session:
Materials for Energy Applications | Metallurgy and Materials Science | Materials in Research | Nanomaterials

Session Introduction

Session Chair: Xiaowang Zhou, Sandia National Laboratories, USA
Session Co-Chair: Chia-Jyi Liu, National Changhua University of Education, Taiwan

11:50-12:20	**Title: Ceramic structures made by additive manufacturing** **Jun Ding**, National University of Singapore, Singapore
12:20-12:50	**Title: The mechanism of Mn, Si, Al, O segregation in FSW of DH36 steel** **Montadhar Almoussawi**, Sheffield Hallam University, UK

Lunch Break @ Regency-DE 12:50-13:40

13:40-14:10	**Title: Dynamic decellularization and recellularization of vascular grafts** **Jana Zarubova**, Czech Technical University, Czech Republic
14:10-14:40	**Title: Prospects of nanostructured semiconductor thin films and composites for solar hydrogen energy conversion and storage** **Meng Nan Chong**, Monash University, Malaysia

Session:
Materials in Research | Materials Science & Engineering | Materials for Energy Applications | Nanomaterials | Nanotechnology in Materials Science

Session Introduction

Session Chair: Sirikanjana Thongmee, Kasetsart University, Thailand
Session Co-Chair: Meng Nan Chong, Monash University, Malaysia

14:40-15:10	**Title: Magnetic properties of Titanium dioxide – Reduce Graphene Oxide composite** **Dusadee Khamboonrueang**, Kasetsart University, Thailand
15:10-15:40	**Title: A feasibility study of raak kaew energy plant as fuel on the sustainable electricity biomass generation** **Somkiat kruaysawat**, Sripatum University, Thailand
15:40-16:10	**Title: Magnetic properties in multi-layer ferrite thin films via spin-spray deposition** **Hyoung Woo Yang**, Korea Electronics Technology Institute, Republic of Korea

Networking and Refreshments Break @ Foyer 16:10-16:30

16:30-17:00	**Title: Synthesis and magnetic behavior of Fe-Co nanoparticles** **Pimsiri Potpattanapol**, Kasetsart University,Thailand
17:00-17:30	**Title: 3,4 -Dihydro-1,3-2H-Benzoxazine: Novel Reducing Agent for Ag(I) Ion toward Nano Metallic Silver and its Applications** **Attaphon Kaewvilai**, Kasetsart University, Thailand

17:30-18:00	**Title: Preparation of grapheme aerogel for absorption radionuclide form Iodine in water** **Tanate Suksompong,** Kasetsart University, Thailand
	Panel Discussion

Day 2 May 30, 2017

Sapphire

Keynote Forum

09:30-10:10	**Title: Fabrication and application of microlattices made by additive manufacturing** **Jun Ding,** National University of Singapore, Singapore
10:10-10:50	**Title: Crystallography of the corneal nanonipple structure on butterfly eyes** **Uwe Erb,** University of Toronto, Canada
	Networking & Refreshments Break @ Foyer 10:50-11:10
11:10-11:50	**Title: Study of Mechanical behavior of cryogenic rolled pure metals** **Osvaldo Mitsuyuki Cintho,** UEPG, Brazil
	Session: Catalytic Materials | Materials Science and Engineering | Nanomaterials | Materials in Research | Materials for Energy Applications
	Session Introduction
	Session Chair: Jun Ding, National University of Singapore, Singapore **Session Co-Chair: Uwe Erb,** University of Toronto, Canada
11:50-12:20	**Title: Applications of chalcogenide Ge-Sb-Se glass used for the molded lens of thermal camera using far infrared** **June Park,** Photonics Technology Institute, Republic of Korea
12:20-12:50	**Title: Impact of Molecular Dynamics (MD) simulations in materials research** **Xiaowang Zhou,** Sandia National Laboratories, USA
	Lunch Break @ Regency-DE 12:50-13:40
13:40-14:10	**Title: Enhanced 1.53 μm emission from Er/Yb fluorophosphate glasses for optical amplifiers** **Ganesh Agawane,** Photonics Technology Institute, Republic of Korea
14:10-14:40	**Title: Synthesis of novel copolymer based butylimidazolium ionic liquid and polybenzimidazole as anion exchange membrane for fuel cell application** **Amina OUADAH,** BIT, China
14:40-15:10	**Title: Diamond-like carbon thin film deposition by filtered cathodic vacuum arc source for wear resistance improvement of zirconia toughened alumina** **Ju Hyeon Choi,** Photonics Technology Institute, Republic of Korea
	Young Researchers Forum
	Session Chair: Uwe Erb, University of Toronto, Canada **Session Co-Chair: Sirikanjana Thongmee,** Kasetsart University, Thailand
15:10-15:30	**Title: A novel ternary eRGO/NiO/α-Fe_2O_3 nanostructured photoanode with enhanced charge transfer properties for efficient solar hydrogen energy conversion in a photoelectrochemical cell** **Yi Wen Phuan,** Monash University, Malaysia
15:30-15:50	**Title: Insight into controllable synthesis of zinc oxide-based nanomaterials and their toxicity effects on biological wastewater treatment processes** **Jang Sen Chang,** Monash University, Malaysia
15:50-16:10	**Title: Enhanced catalytic activity of Ag-Ni alloyed nanoparticles immobilized in –COOH functionalized SBA-16 for the reduction of 4-nitrophenol** **Canggih Budi,** National Central University, Taiwan
	Networking & Refreshments Break @ Foyer 16:10-16:30
16:30-16:50	**Title: Fabrication of a heterojunction V_2O_5/$BiVO_4$ photoanode with improved photoelectrochemical performance for water splitting reaction** **Chong Siang Yaw,** Monash University, Malaysia

16:50-17:10	**Title: Development of molybdenum trioxide-based photoanodes with charge storage capacity for photoelectrochemical water oxidation under illuminated and non-illuminated conditions** **Chun Yuan Chot**, Monash University, Malaysia
Poster Presentations 16:30-18:00	
Poster Judge: Xiaowang Zhou, Sandia National Laboratories, USA	
MSC101	**Title: Cobalt nanoparticles immobilized in 3D mesoporous silica KIT-6 for excellent catalytic hydrogen generation from ammonia borane** **Mu-Hsin Lee**, National Central University, Taiwan
MSC102	**Title: Bipolar resistive switching in cobalt oxide thin film studied by I-V characterization and conductive atomic force microscopy** **JIAN YANG**, University of New South Wales, Sydney, Australia
MSC103	**Title: Development of ion adsorbent from polybenzoxazine-based nanoporous materials** **Chanapon Pongteeraporn**, Chulalongkorn University, Thailand
MSC104	**Title: Thermally stable, organosoluble of co-polynaphthalimides based on 1,4,5,8-naphthalene tetracarboxylic dianhydride, 9,9-bis(4-aminophenyl)fluorine, and various aromatic diamines** **Yung-Chung Chen**, National Kaohsiung University of Applied Sciences, Taiwan
MSC105	**Title: Direct fabrication of micro-patterned conductive polymer device using spray coating with metal shadow mask** **Yi-Ting Lee**, National Kaohsiung University of Applied Sciences, Taiwan
MSC106	**Title: Novel Thermo-responsive Hydrogel from Gellan Gum and Methylcellulose for Use as Advanced Wound Dressing** **Nattakarn Wankama**, Chulalongkorn University, Thailand
MSC107	**Title: Optimal shell thickness for Al_2O_3-encapsulated Ag NPs for enhancing polaron generation in P3HT** **Wei Peng Goh**, Nanyang Technological University, Singapore
MSC108	**Title: Controlling crystal formation for more efficient and reproducible perovskite solar cells** **Siew Lay Lim**, Institute of Materials Research and Engineering, Singapore
MSC109	**Title: Tuning the electroluminescence of an ionic small molecules in light-emitting electrochemical cells** **Shanmugasundaram Kanagaraj**, Pusan National University, Republic of Korea
MSC110	**Title: Evaluation of high quality steel plate plates in FCAW steel plate** **Hyun soo song**, Ulsan technopark, Republic of Korea
MSC111	**Title: The preparation and photocatalytic water splitting of NdVO4-V2O5 powders** **Tzu Hsuan Chiang**, National United University, Taiwan
MSC112	**Title: Shape-shifting 3D protein microstructures with programmable directionality via quantitative nanoscale stiffness modulation** **Mian Rong Lee**, Nanyang Technological University, Singapore
MSC113	**Title: Electrochemical characteristics of PFO based pitch prepared by chemical activation for lithium ion battery** **Jin Ung Hwang**, Chungbuk National University, Republic of Korea
MSC114	**Title: Porous silica/polymer composite films for antireflective coatings** **Ting-Hsuan Lin**, National Cheng Kung University, Taiwan
MSC115	**Title: Synthesis of poly(l-lysine)-based star polypeptides as potent antimicrobial agents combating multidrug-resistant bacteria** **Ying Da Lai**, National Cheng Kung University, Taiwan
MSC116	**Title: Synthesis of miserite glass-ceramics by controlled crystallization heat treatment** **Young Ju Song**, Soonchunhyang University, Korea
MSC117	**Title: Fabrication and characterization of SiO_2-CaO-Na_2O-K_2O-MgO-P_2O_5 based glass coatings** **Si-Won Seong**, Soonchunhyang University, Republic of Korea
MSC118	**Title: Casting Characteristics of A356 aluminum alloy on Sn addition** **Seoyeong Kim, Sugun Lim**, Gyeongsang National University, Republic of Korea
MSC119	**Title: Characterization of the structural and optical properties of ZnO nanostructures by X-ray diffraction** **Ya-Fen Wu**, Ming Chi University of Technology, Taiwan

MSC120	**Title: Comparison of EMI shielding effectiveness for polymer/carbon fiber composites prepared by different processing methods** **Jae Young Kim,** Korea University, Republic of Korea
MSC121	**Title: EMI shielding effectiveness of polypropylene/poly(lactic acid)/carbon fiber/MWCNT composites prepared by injection molding and screw extrusion** **Myung Geun Jang,** Korea University, Republic of Korea
MSC122	**Title: The study on correlation among electric potential of different materials of crown in different corrosion status(artificial saliva)** **Huey-Er Lee, Ju-Hui Wu, Yan-Ting Pan, Yu-Ting Jhong,** Kaohsiung Medical University, Taiwan
MSC123	**Title: The Study of Pull off Adhesion for Aluminum Wire Grade 1350 on Carbon Steel ASTM A36 by Thermal Wire Arc Spray** **Trinet Yingsamphancharoen,** King Mongkut's University of Technology, Thailand
MSC124	**Title: Collagen/poly(D,L-lactic-co-glycolic acid) composite fibrous scaffold prepared by independent nozzle control multi-electrospinning apparatus** **Heung Jae Chun, Yang D H, You S J, Kim J K, Ko J H, Park Y H,** The Catholic University of Korea, Republic of Korea
MSC125	**Title: Utilization of blast furnace by-product in application of high ductile fiber-reinforced cement-free composites** **Chang-Geun Cho,** Chosun University, Republic of Korea

Panel Discussion

Award Ceremony

Day 3 May 31, 2017

Panel Discussions and Networking Lunch @ 12:00-13:30

三、心得及建議事項

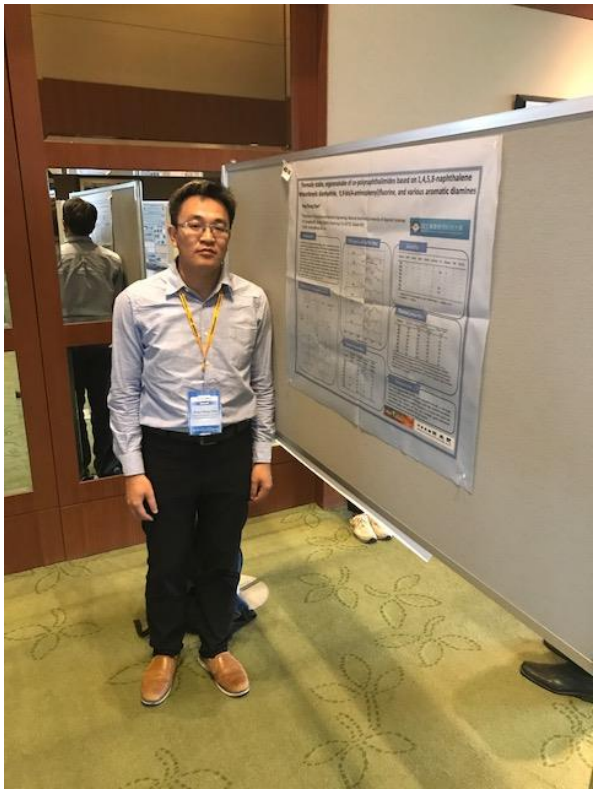
這次出國參加的會議是 8th International Conference and Exhibition on Materials Science and Engineering，發表 "Thermally stable, organosoluble of co-polynaphthalimides based on 1,4,5,8-naphthalene tetracarboxylic dianhydride, 9,9-bis(4-aminophenyl)fluorine, and various aromatic diamines"一文。在會議過程中其演講內容除了以高分子外亦有聽到了其他的研究以增加自己的知識並擴展自己研究之領域。會中並與 Prof. Jun Ding (National University of Singapore)，Dr. Xiaowang Zhou (Sandia National Laboratories, USA)及 Dr. Uwe Erb (University of Toronto, Canaada)交談討論，討論研究與科研方面之心得。最後要感謝產碩班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。

建議事項:鼓勵台灣學者多多參與國際會議，可以找到不同領域之合作之可能性。

四、攜回資料

本次攜回會議的議程書一份，其內容包括會議期間各演講者之題目與摘要，另外也包含了 Poster 的摘要部分。

附錄 (會議剪影與發表論文海報)

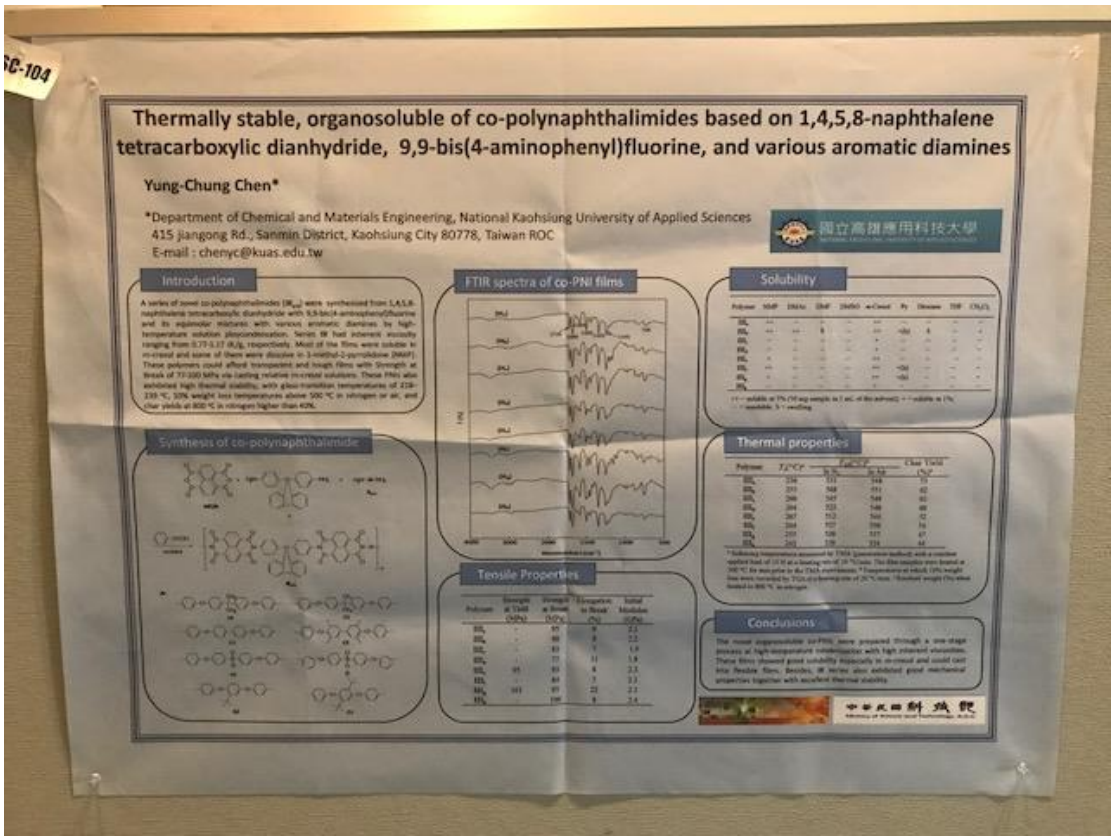


圖一、筆者於研討會會場

圖二、筆者於研討會會場與 Dr. Xiaowang Zhou (Sandia National Laboratories, USA) 合影

圖三、研討會會場剪影

圖四、Day 1 註冊會場剪影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Thermally stable, organosoluble of co-polynaphthalimides based on 1,4,5,8-naphthalene tetracarboxylic dianhydride, 9,9-bis(4-aminophenyl)fluorine, and various aromatic diamines
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Introduction
FTIR spectra of co-PNI films
Solubility
Synthesis of co-polynapthalimide
Thermal properties
Tensile Properties
Conclusions

圖五、發表論文海報