



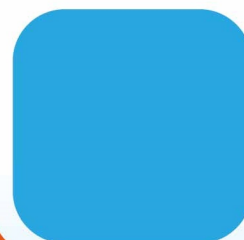
IUMRS-ICA 2017

18th International Union of Materials Research Societies - International Conference in Asia

IUMRS-ICA 2017 Program

5-9 November 2017

Taipei Nangang Exhibition Hall, Taipei, Taiwan



科技
Ministry of Science and Technology



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Industrial Technology Research Institute



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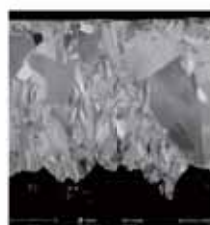
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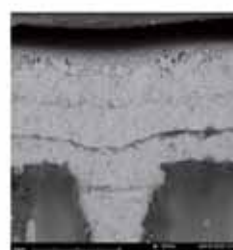
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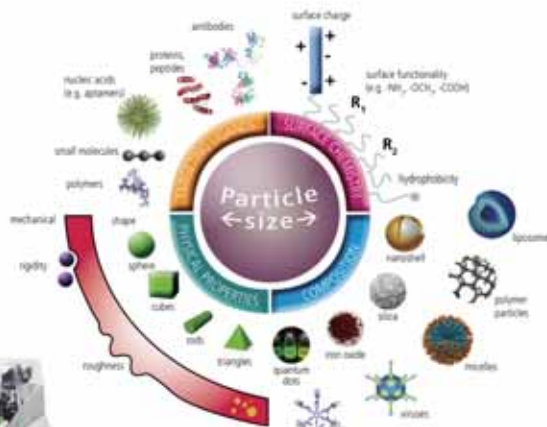
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IUMRS-ICA 2017

Program



18th International Union of Materials Research
Societies-International Conference in Asia

5-9 November 2017
Taipei Nangang Exhibition Hall, Taipei, Taiwan



Materials Research Societies of Taiwan (MRS-T)



觀光傳播局
Department of Information and Tourism

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Table of Contents

» Exhibition and Advertisement	
» Preface	4
» Committees	5
» Conference Information	8
» Schedule Overview	9
» Venue for Oral and Poster Sessions	10
» Floor Guide	11
» Plenary Speakers, Symposia	15
» Program	
Plenary Lectures	21
Symposia	
A. Electronic Materials	
A-1 Two-Dimensional and Related Materials: Fundamental Science, Preparation, and Applications	26
A-2 Compound Semiconductor and Wide Bandgap Materials for Electronic and Optical Devices	29
A-3 Advanced Interconnects and Packaging, Materials, Characterization, and Methodology ...	31
A-4 Advanced Technologies for Memory Devices and Flexible Electronics	36
A-5 Advanced Materials and Related Technology for Next Generation Displays	39
A-6 Plasmonics and Metamaterials	41
B. Energy and Environment Materials	
B-1 Solar Cells (Organic Solar Cells, Si-based Solar Cells, Perovskite Solar Cells)	44
B-2 Photocatalysis and Photosynthesis (Photocatalytic Water Splitting, Photocatalytic CO ₂ Reduction, Photoelectrochemical Cells, Solar Fuel Generation, Interfacial Charge Dynamics)	47
B-3 Energy Conversion and Storage (Electrochemical Batteries, Supercapacitors, Thermoelectrics)	51
B-4 Bio-based Fuel and Chemical	57
C. Bio-Materials	
C-1 Biomimetic Materials: Characterization, Chemistry and Self-Assembly	60
C-2 Biocompatible Materials for Regenerative Medicine and Tissue Engineering	62
C-3 Biomaterials for Device Biointerface with Anti-infective and Antibacterial Applications	65
C-4 Functional Nanomaterials for Therapeutic Delivery, Diagnosis and Detection	67
C-5 Biomedical Sensing Materials, Electrodes, and Devices	71
D. Advanced Functional Materials	
D-1 Advanced Carbon Materials	74
D-2 Advanced Ceramic Materials	77
D-3 Advanced Polymeric Materials	81

D-4	Advanced Magnetic Materials	87
D-5	Nanomaterials and Composites	91
D-6	Advanced Optoelectronic Materials	98
D-7	Smart Materials	101
E. Advanced Structure Materials		
E-1	High-Entropy Alloys and Metallic Glass Materials	106
E-2	Structural Light Alloys	111
E-3	Advanced Steels	113
E-4	Advanced Structure Materials: Superalloys	116
E-5	3D Additive Manufacturing Materials and Technology	120
E-6	Metals, Ceramics and Composite Materials	123
F. Materials Modeling, Theory, Characterization, and Processing		
F-1	Materials Modeling of Structure, Defect and Property	128
F-2	Materials Design, Discovery and Optimization Based on Computation	131
F-3	Advanced Characterization for Materials Genome & ICME: TEM, Synchrotron X-ray, and Neutron	134
F-4	Manufacturing technology of thin film materials for sustainable energy, semiconductor, optical, optoelectronic, tribological, protective and biological applications	137
F-5	Nanofabrication, Nanodevices, NEMS/MEMS and Sensor Technology	139
» Abstracts		
	Plenary Lectures	144
» Sponsor, Exhibition and Advertisement		
		158

Preface

Welcome Message from the MRS-T

Alex Peng, President



Materials Research Society-Taiwan (MRS-T) is honored to host the 2017 International Union of Materials Research Societies (IUMRS)-International Conference in Asia (ICA), i.e., IUMRS-ICA 2017. On behalf of the organizing committee, I would like to welcome all of you, from every corner of the world, to attend this conference.

ICA is one of the most important serial conferences supported by the IUMRS. The first IUMRS-ICA was organized by C-MRS in September, 1993 on a ship in the Yangtze River. MRS-T then hosted the second ICA in December, 1994. Since then, IUMRS-ICA has been organized by the adhering bodies of IUMRS in the Asian area. In 2004 and 2011, the ICA was twice organized by MRS-T, and now this is the fourth time for MRS-T to host the ICA. This conference provides an opportunity for scientists and engineers from not only Asia but also around the world to exchange their recent achievements and new ideas to advance the R&D of materials science and technology.

IUMRS-ICA 2017 is organized by MRS-T and IUMRS ,co-organized by C-MRS. In addition it is also greatly assisted by MRS-J, and MRS-K. It covers six fields: (1) Electronic Materials; (2) Energy and Environment Materials; (3) Bio-Materials; (4) Advanced Functional Materials; (5) Advanced Structure Materials; and (6) Materials Modeling, Theory, Characterization, and Processing. In total, 33 symposia will be held in session in this conference. In summary 1236 papers from 16 countries have been received, including some 651 oral and 585 poster presentations. About 1100 participants are expected to attend this conference. Among the papers received, 100, 87, and 78 are from Japan, China, and Korea, in addition to 913 from the locals.

Finally, I would like to take this opportunity to express my sincere appreciation to Prof. Chih Chen, Chairman of Department of Materials Science and Engineering, National Chiao Tung University, and Prof. Cheng-Hsun Hsu, Chairman of Department of Materials Science and Engineering, Tatung University, for their great effort in helping organize this conference. I am grateful to the members of Program Committee, General Affairs Committee, Technical Committee and MRS-T staff members for their endless hard work. Special thanks also go to the members of International Advisory Committee and the organizers of each symposium for their valuable contribution to the conference. I would also like to thank all our participants. Without your participation, this conference would not be otherwise possible.

I wish you all a fruitful experience from the conference and an enjoyable stay in Taipei.

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Conference Information

Dates	November 5(Sun.)-9(Thu.), 2017
Conference Site	Taipei Nangang Exhibition Hall No.1, Jingmao 2nd Rd., Nangang District, Taipei City 11568, Taiwan
Welcome Reception	Date & Time: November 5(Sun.) 18:00-20:00
Plenary Lectures	<p>*Plenary 1 Lih-Juann Chen, Chair Professor of National Tsing Hua University Date & Time: November 5(Sun.) 16:30-17:15 Place: Room 402</p> <p>*Plenary 2 Atsushi Takahara, Institute of Materials Chemistry and Engineering, Kyushu University, Japan Date & Time: November 5 (Sun.) 17:15-18:00 Place: Room 402</p> <p>*Plenary 3 Samuel I. Stupp, Director, Simpson Querrey Institute for BioNanotechnology, Northwestern University, USA. Date & Time: November 6 (Mon.) 11:45-12:30 Place: Room 504</p> <p>*Plenary 4 Bruce S. Dunn, Professor of University of California, Los Angeles Date & Time: November 7 (Tue.) 11:00-11:45 Place: Room 504</p> <p>*Plenary 5 Ick Chan Kwon, Principle Researcher, KIST Korea Institute of Science and Technology, Seoul. Date & Time: November 7 (Tue.) 11:45-12:30 Place: Room 504</p> <p>*Plenary 6 King-Ning Tu, International College of Semiconductor Technology, National Chiao Tung University, Hsinchu, Taiwan. Date & Time: November 7 (Tue.) 14:00-14:30 Place: Room 504b</p> <p>*Plenary 7 Burn J. Lin, Chair Professor of National Tsing Hua University, TSMC fellow. Date & Time: November 8 (Wed.) 11:00-11:45 Place: Room 504</p>
Banquet	Date & Time: November 7(Tue.) 18:30-20:00
Best Poster Award Presentation/Lottery Draw:	Date & Time: November 8 (Wed.) 16:00-18:00

Schedule Overview

	Sunday, November 5 th	Monday, November 6 th	Tuesday, November 7 th	Wednesday, November 8 th	Thursday, November 9 th
09:00 10:30	Half-day local tour check-in	Parallel Sessions	Parallel Sessions	Parallel Sessions	Parallel Sessions
10:30 11:00		Coffee Break	Coffee Break	Coffee Break	Coffee Break
11:00 12:30		Opening Remarks 11:00-11:45 Plenary Talk Dr. Samuel I Stupp 11:45-12:30	Plenary Talks Dr. Bruce S. Dunn Dr. Ick Chan Kwon	Plenary Talk Dr. Burn J. Lin	Parallel Sessions
12:30 14:00	Local Meeting	Lunch	Lunch / 台灣美光記憶體 人才招募 Publish successfully in Wiley / José Oliveira (R403, 12:50)	Lunch / Poster Sessions 12:00-14:00	Closing
14:00 15:30	Half-day local tour	Parallel Sessions	Parallel Sessions	Parallel Sessions	
15:30 16:30		Coffee Break / Poster Sessions	Coffee Break / Poster Sessions	Coffee Break 15:30-16:00	
16:30 17:15		Parallel Sessions	Parallel Sessions 16:30-17:40	Parallel Sessions / Best Poster Award Presentation / Lottery Draw 16:00-18:00	
17:15 18:00	Plenary Talk Dr. Lih-Juann Chen Plenary Talk Dr. Atsushi Takahara				
18:00 20:00	Welcome Reception		Conference Banquet 18:30-20:00		

Venue for oral and poster sessions

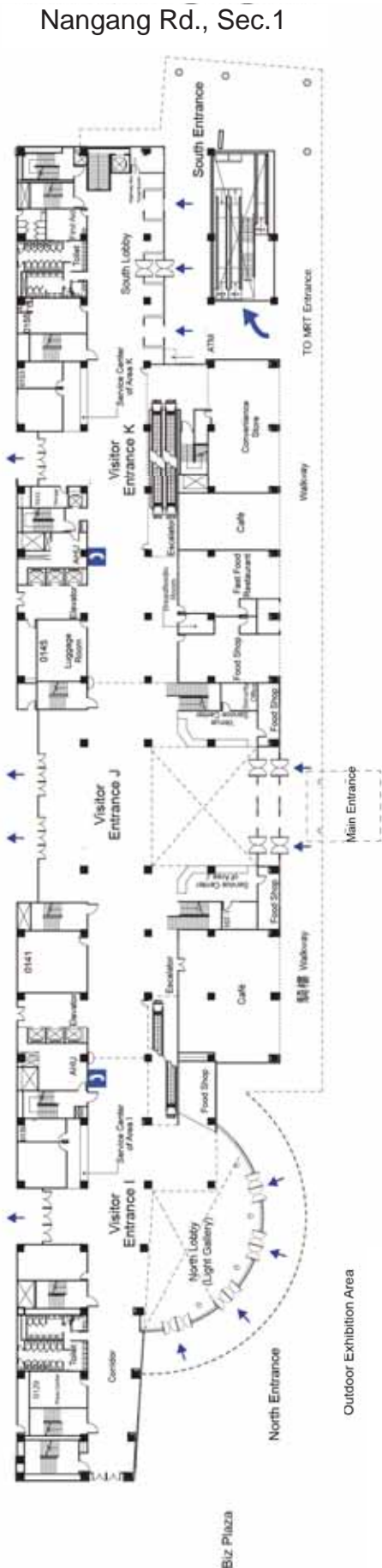
Taipei Nangang Exhibition Center, Hall 1, a.k.a TWTC Nangang Exhibition Hall

Oral												
Room	11/6 9:00-10:30	11/6 14:00-15:30	11/6 16:30-18:00	11/7 9:00-10:30	11/7 14:00-15:30	11/7 16:30-17:40	11/8 9:00-10:30	11/8 14:00-15:30	11/8 16:30-18:00	11/9 9:00-10:30	11/9 11:00-12:30	
504a	D-3	D-3	D-3	D-3	D-3	D-3		D-3				
504b	D-2	D-2	D-2	C-2	A-3	A-3	A-3	A-3	A-3			
504c	D-5	D-5	D-5	D-5	D-5	D-5	D-5	B-4	A-2			
614	B-2	B-2	B-2	B-2	B-2	B-2	B-2	B-2				
505	D-4	D-4	D-4	D-4	D-4	D-4	D-4	D-4	D-4			
616	E-1	E-1	E-1	E-1	E-1	E-1	E-4	E-4	E-4			
403	C-2	C-2	C-2	C-4	C-4	C-4	C-4	C-4	C-4	E-4	E-4	
402b	A-1	A-1	A-1	A-1	A-1 / D-1		E-2	E-2	E-2			
503	F-1	F-1	F-1	D-7	D-7	D-7	D-7	D-7	D-7			
402c	F-5	F-5	F-5	B-3	B-3	B-3	B-3	B-3	B-3	A-2		
501	F-3	F-3	F-3	F-3	F-3	E-5	D-6	D-6	E-5			
402a	C-5	A-4	A-4	A-4	A-4	A-4		C-5	C-5	A-3	A-3	
404	E-3	E-3	E-3	E-3	C-1	C-1	D-1	D-1	D-1			
502	C-3	C-3	E-5	F-2	F-2	F-2	E-6	E-6	E-6			
521				F-4	F-4	F-4						
534				A-5	A-5	C-5						
535				D-6	B-1	B-1						
441				A-6 11:00-12:30	A-6	A-6						

Poster			Session	
Date	Room	Time		
11/6	401	15:30-16:30	A1, C1, C2, C3, D2, D3, D4, D5, E1, E3, F3, F5	
11/7		15:30-16:30	A4, A5, B1, B2, C4, D3, D7, E5, F1, F2, F4	
11/8		12:00-14:00	A2, A3, A6, B3, B4, C5, D1, D6, E2, E4, E6	

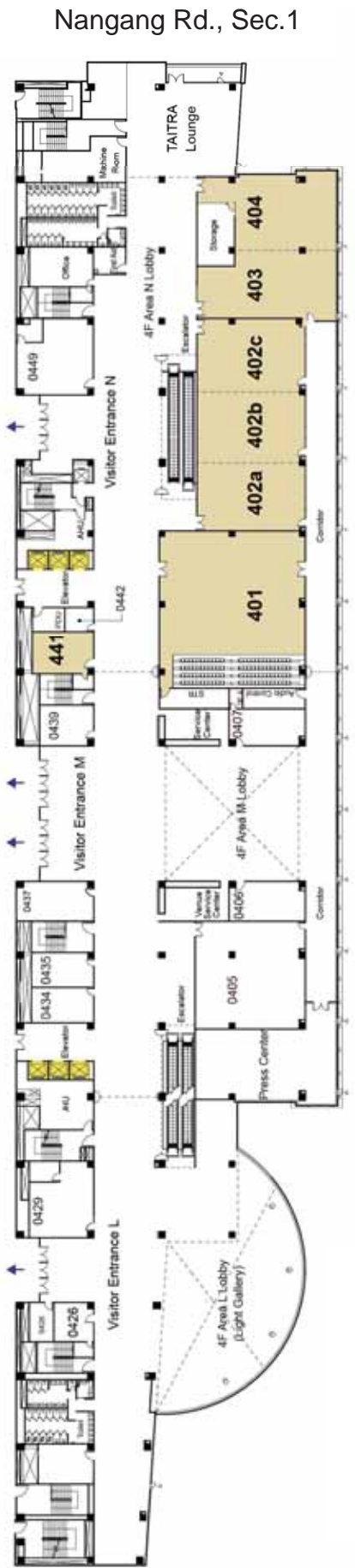
Floor guide

1F West Side Floor Plan



Jingmao 2nd Rd.

4F West Side Floor Plan



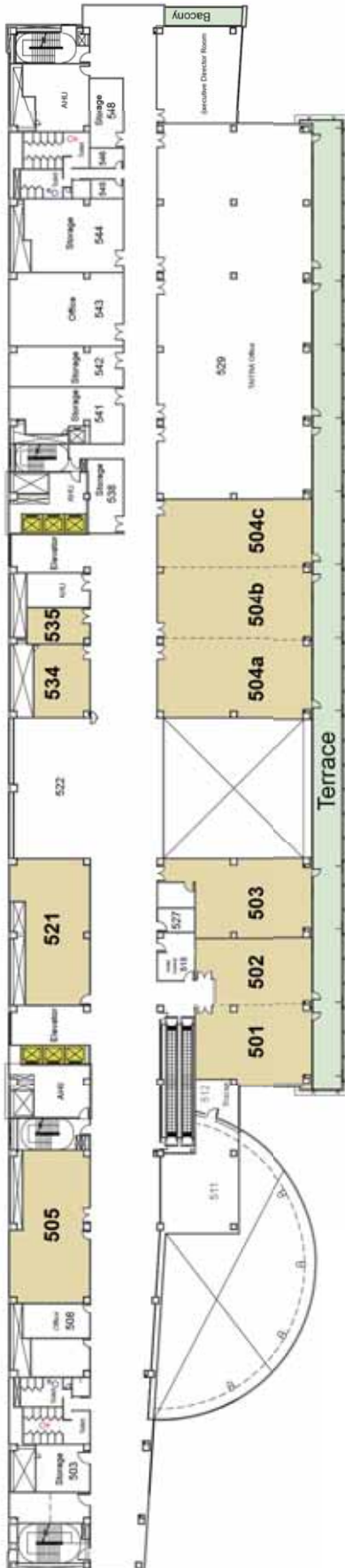
Jingmao 2nd Rd.

Conference Room
Elevator

Floor guide

5F West Side Floor Plan

Nangang Rd., Sec.1

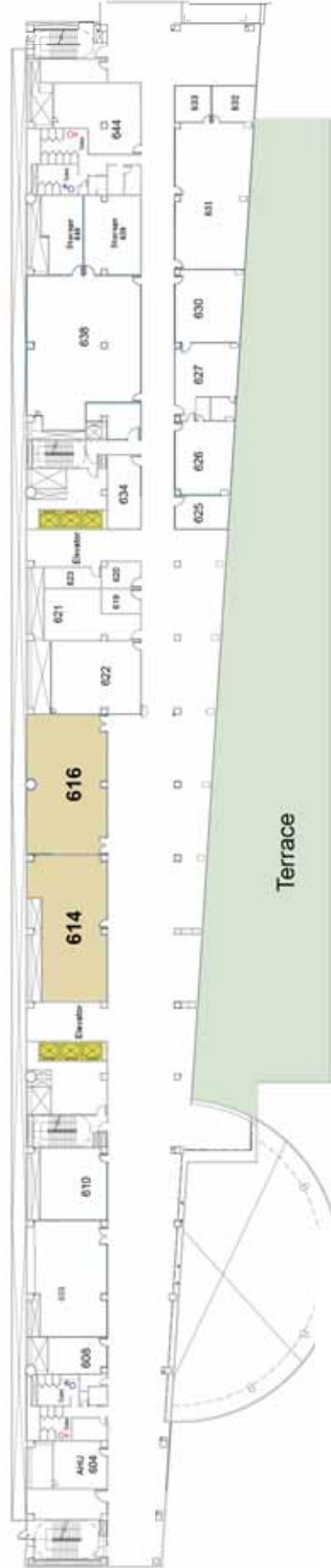


Jingmao 2nd Rd.

Conference Room
Elevator

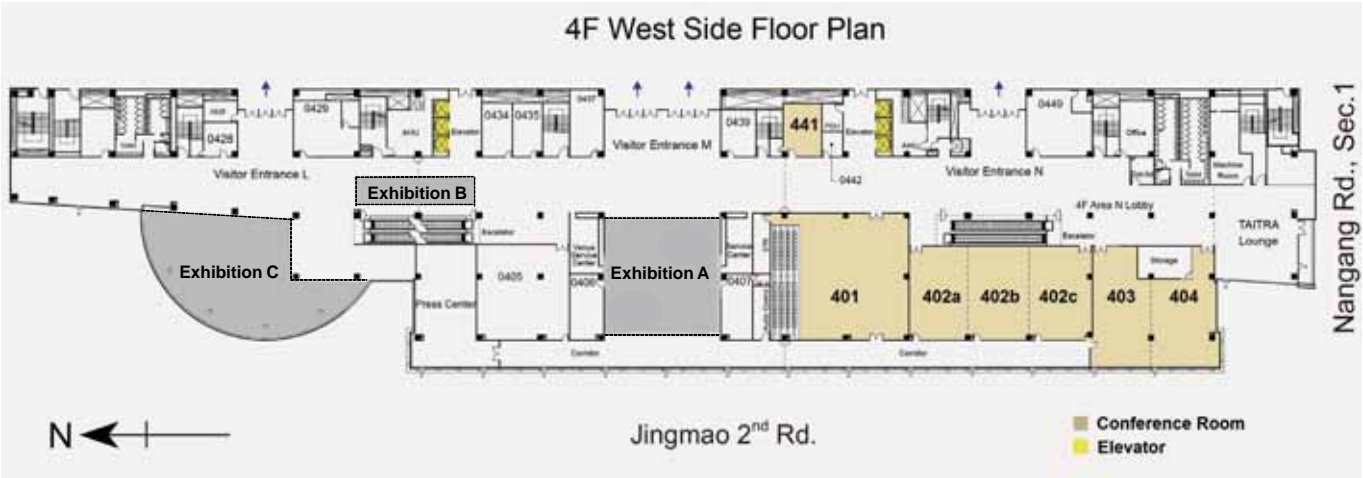
6F West Side Floor Plan

Nangang Rd., Sec.1



Jingmao 2nd Rd.

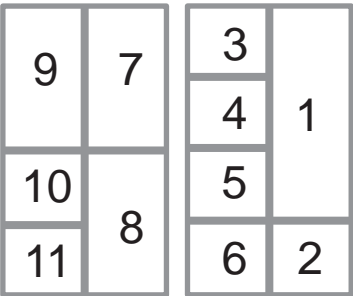
Conference Room
Elevator



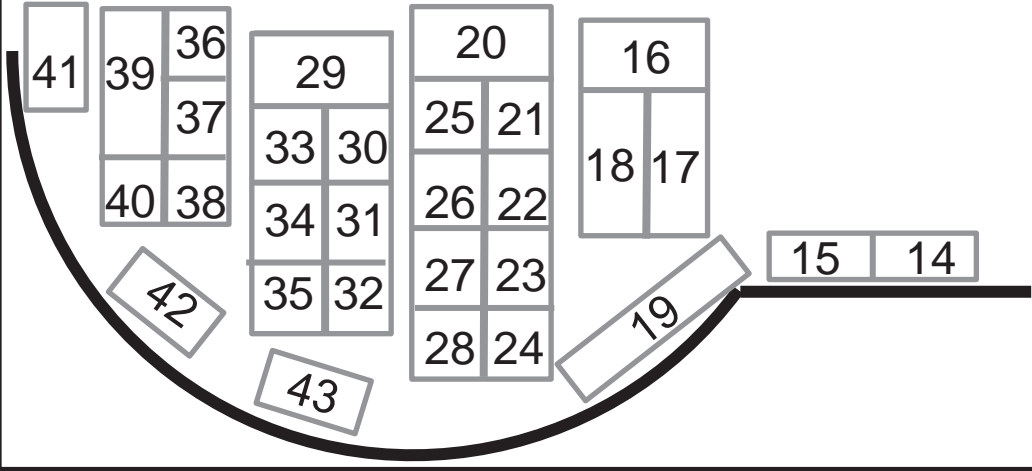
Exhibition B



Exhibition A



Exhibition C



Floor guide

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9	Jie Dong Co., Ltd.	02-23952978
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11	National Nano Device Laboratories(NDL)	03-5726100
12	Bruker Taiwan Co., Ltd.	02-86981212
13	Zensor R&D Co., Ltd.	04-24075415
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15	Tatung University	02-21822928
16	National Chung Shan Institute of Science&Technology.	02-26739638
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18	Bio-Check Laboratories, Ltd.	02-22467799
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30	Key bond Technology Inc.	02-87892585
31	ProTrustech Co., Ltd.	06-2892081
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40	IUMRS	
41	Sunway Scientific Corporation	02-27718337
42	Utek material Co., Ltd.	02-27933133
43	Sciencetech Corporation	02-87512323

Plenary Lectures and Technical Symposia

» Plenary lectures

1. Lih-Juann Chen, Chair Professor of National Tsing Hua University.
Advanced Nanodevices with Plasmonic Enhancement
2. Atsushi Takahara, Institute of Materials Chemistry and Engineering, Kyushu University, Japan.
Design and Surface Functional Properties of Ionic Polymer Brushes
3. Samuel I. Stupp, Director, Simpson Querrey Institute for BioNanotechnology, Northwestern University, USA.
Bio-Inspired Self-Assembling Materials
4. Bruce S. Dunn, Professor of University of California, Los Angeles.
Creating Pseudocapacitive Materials for High Rate Energy Storage
5. Ick Chan Kwon, Principle Researcher, KIST Korea Institute of Science and Technology, Seoul.
Molecular Imaging with Polymeric Nanoparticles
6. King-Ning Tu, International College of Semiconductor Technology, National Chiao Tung University, Hsinchu, Taiwan.
Effect of Joule heating on electromigration and thermomigration in 3D IC packaging technology
7. Burn J. Lin, Chair Professor of National Tsing Hua University, TSMC fellow.
Innovations scaling 5 μ m to 5 nm

» Symposia

- A-1 Two-Dimensional and Related Materials: Fundamental Science, Preparation, and Applications
- A-2 Compound Semiconductor and Wide Bandgap Materials for Electronic and Optical Devices
- A-3 Advanced Interconnects and Packaging, Materials, Characterization, and Methodology
- A-4 Advanced Technologies for Memory Devices and Flexible Electronics
- A-5 Advanced Materials and Related Technology for Next Generation Displays
- A-6 Plasmonics and Metamaterials
- B-1 Solar Cells (Organic Solar Cells, Si-based Solar Cells, Perovskite Solar Cells)
- B-2 Photocatalysis and Photosynthesis (Photocatalytic Water Splitting, Photocatalytic CO₂ Reduction, Photoelectrochemical Cells, Solar Fuel Generation, Interfacial Charge Dynamics)
- B-3 Energy Conversion and Storage (Electrochemical Batteries, Supercapacitors, Thermoelectrics)
- B-4 Bio-based Fuel and Chemical
- C-1 Biomimetic Materials: Characterization, Chemistry and Self-Assembly
- C-2 Biocompatible Materials for Regenerative Medicine and Tissue Engineering
- C-3 Biomaterials for Device Biointerface with Anti-infective and Antibacterial Applications
- C-4 Functional Nanomaterials for Therapeutic Delivery, Diagnosis and Detection
- C-5 Biomedical Sensing Materials, Electrodes, and Devices
- D-1 Advanced Carbon Materials
- D-2 Advanced Ceramic Materials
- D-3 Advanced Polymeric Materials
- D-4 Advanced Magnetic Materials

Plenary Lectures and Technical Symposia

- D-5 Nanomaterials and Composites
- D-6 Advanced Optoelectronic Materials
- D-7 Smart Materials
- E-1 High-Entropy Alloys and Metallic Glass Materials
- E-2 Structural Light Alloys
- E-3 Advanced Steels
- E-4 Advanced Structure Materials: Superalloys
- E-5 3D Additive Manufacturing Materials and Technology
- E-6 Metals, Ceramics and Composite Materials
- F-1 Materials Modeling of Structure, Defect and Property
- F-2 Materials Design, Discovery and Optimization Based on Computation
- F-3 Advanced Characterization for Materials Genome & ICME: TEM, Synchrotron X-ray, and Neutron
- F-4 Manufacturing technology of thin film materials for sustainable energy, semiconductor, optical, optoelectronic, tribological, protective and biological applications
- F-5 Nanofabrication, Nanodevices, NEMS/MEMS and Sensor Technology

Program

Plenary Lectures

Lecture 1 Advanced Nanodevices with Plasmonic Enhancement
November 5 (Sun.), Room 402

Lecture 2 Design and Surface Functional Properties of Ionic
Polymer Brushes
November 5 (Sun.), Room 402

Lecture 3 Bio-Inspired Self-Assembling Materials
November 6 (Mon.), Room 504

Lecture 4 Creating Pseudocapacitive Materials for High Rate
Energy Storage
November 7 (Tue.), Room 504

Lecture 5 Molecular Imaging with Polymeric Nanoparticles
November 7 (Tue.), Room 504

Lecture 6 Effect of Joule heating on electromigration and
thermomigration in 3D IC packaging technology
November 7 (Tue.), Room 504b

Lecture 7 Innovations scaling 5 μm to 5 nm
November 8 (Wed.), Room 504

Plenary Lectures

November 5-8, 2017

Plenary 1 & 2
Sunday, November 5, 2017
Room 402

16:30-17:15

Advanced Nanodevices with Plasmonic Enhancement

Lih-Juann Chen ¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, 30013, Taiwan
Host: Prof. Shangjr Gwo



17:15-18:00

Design and Surface Functional Properties of Ionic Polymer Brushes

Atsushi Takahara ¹

¹Kyushu University Fukuoka, JAPAN.

Host: Prof. Rong-Ming Ho



Plenary 3
Monday, November 6, 2017
Room 504

11:45-12:30

Bio-Inspired Self-Assembling Materials

Samuel I. Stupp ¹

¹. Departments of Materials Science and Engineering, Chemistry, Medicine, and Biomedical Engineering, Simpson Querrey Institute for BioNanotechnology, Center for Bio-Inspired Energy Science, Northwestern University, 2220 Campus Drive, Evanston, Illinois 60208, USA

Host: Prof. Haydn Chen



Plenary 4 & 5
Tuesday, November 7, 2017
Room 504

11:00-11:45

Creating Pseudocapacitive Materials for High Rate Energy Storage

Bruce S. Dunn ¹

¹Department of Materials Science and Engineering, University of California, Los Angeles, Los Angeles, CA 90095 USA.

Host: Prof. Pu-Wei Wu



11:45-12:30

Molecular Imaging with Polymeric Nanoparticles

Ick Chan Kwon ¹

¹Center for Theragnosis, Korea Institute of Science and Technology, 5. Hwarang-ro 14-gil, Seongbuk-gu, Seoul 02792, Republic of Korea.

Host: Prof. Hsing-Wen Sung



Plenary 6
Tuesday, November 7, 2017
Room 504b

14:00-14:30

Effect of Joule heating on electromigration and thermomigration in 3D IC packaging technology

K. N. Tu ¹

¹ International College of Semiconductor Technology, National Chiao Tung University, Hsinchu, Taiwan.

Host: Prof. C. Robert Kao



Plenary 7
Wednesday, November 8, 2017
Room 504

11:00-11:45

Innovations scaling 5 μm to 5 nm

Burn J. Lin ¹

¹National Tsing Hua University, Hsinchu/Taiwan R.O.C..

Host: Prof. Yi-Chang



Technical Symposia

Symposia A

Electronic Materials

Symposium A1

Two-Dimensional and Related Materials: Fundamental Science, Preparation, and Applications

November 6-7, 2017

Organizers

Ching-Yuan Su	National Central University, Taiwan
Albert Yi-Hsien Lee	National Tsing Hua University, Taiwan
Seiji Samukawa	Institute of Fluid Science, Tohoku University, Japan

Oral Session

Monday, November 6, 2017

Room 402b

Chairperson: Wei-Yen Woon

09:00-09:30 A1-01 Keynote

Engineering two-dimensional van der Waals materials for novel nanoelectronics, valleytronics, spintronic and optoelectronics

N.-C. Yeh¹, M.L. Teague¹, W.-H. Lin², C.-C. Hsu¹, J.-Q. Wang¹

¹Department of Physics, California Institute of
Technology, Pasadena, California 91125,
USA, ²Department of Applied Physics, California
Institute of Technology, Pasadena, California 91125,
USA.

09:30-10:00 A1-02 Keynote

Emergent opportunities in two-dimensional material research

Yuanbo Zhang¹

¹Department of physics, Fudan University, China.

10:00-10:30 A1-03 Keynote

Novel two-dimensional materials for photon-to-energy conversions

Chun-Wei Chen¹

¹Department of Materials Science and Engineering,
National Taiwan University, Taipei 106, Taiwan.

Oral Session

Monday, November 6, 2017

Room 402b

Chairperson: Chi-Hsien Huang

14:00-14:30 A1-04 Keynote

Neutral Beam Technology for Future Nano-materials and nano-devices

Seiji Samukawa¹

¹Institute of Fluid Science and Advanced Institute for
Materials Research, Tohoku University, Sendai
980-8577, Japan.

14:30-14:50 A1-05 Invited

Enabling applications of 2D materials

Mario Hofmann¹

¹NTU.

14:50-15:10 A1-06 Invited

Manipulation and characterization of defects in Graphene

Wei-Yen Woon¹, Hung-Chieh Tsai¹, Min-Chiang
Chuang¹, Yi-Zhe Hong¹, Andreas Johannsson², Mika
Pettersson², Chia-Hao Chen³

¹National Central University, ²University of
Jyväskylä; Mika Pettersson, ³Nation Synchrotron
Radiation Research Center.

15:10-15:25 A1-07

Transfer-free and patterned growth of graphene using self-assembled monolayer on an arbitrary substrate

Gwangseok Yang¹, Sooyeoun Oh¹, Janghyuk Kim¹,
Hong-Yeol Kim¹, Ji Hyun Kim¹

¹Korea University.

15:25-15:35 Coffee break

Oral Session

Monday, November 6, 2017

Room 402b

Chairperson: Mario Hofmann

16:30-17:00 A1-08 Keynote

Controlled Functionalization of 2D Graphitic Materials for Multifunctional Applications

Liming Dai¹

¹Center of Advanced Science and Engineering for
Carbon (Case4Carbon), Departments of
Macromolecular Science and Engineering.

17:00-17:20 A1-09 Invited

Superior thermal conductivity enhancement of polymer composites with bioinspired graphene architecture

Cheng-Te Lin¹

¹Chinese Academy of Sciences.

17:20-17:40 A1-10 Invited

Growth and device integration technologies of atomic-layer 2D materials for ultra-low power and 3D integrated systems

T. Irisawa¹, N. Okada¹, A. Ando¹, T. Mori¹, K. Endo¹, S.
Sasaki², T. Endo², S. Yoshimura², Y. Kobayashi², Y.
Miyata³, Ming Chi University of Technology⁴, Ming Chi
University of Technology

¹National Institute of Advanced Industrial Science and
Technology (AIST), Tsukuba, Japan, ²Dept of Physics,
Tokyo Metropolitan University, Tokyo, Japan, ³Dept of
Physics, Tokyo Metropolitan University, Tokyo, Japan.

17:40-18:00 A1-11 Invited

Large-scale Graphene Oxide Sheet Containing High Density Carboxyl Group and its application for RNA Sensors

Chi-Hsien Huang¹, Chia-Heng Chiang¹

¹Ming Chi University of Technology.

Oral Session
Tuesday, November 7, 2017
Room 402b
Chairperson: Guo Hong

09:00-09:20 A1-12 Invited**Scalable and Self-aligned growth of two-dimensional transition metal dichalcogenides lateral heterojunctions for optoelectronic applications**

Ming-Yang Li¹, Jiang Pu², Jing-Kai Huang³, Y. Miyauchi⁴, K. Matsuda⁴, Taishi Takenobu², Lain-Jong Li³

¹Research Center for Applied Sciences, Academia Sinica, Taipei, Taiwan, ²Dept of Applied Physics, Nagoya University, Nagoya, Japan, ³Physical Science and Engineering Division, King Abdullah University of Science and Technology, Thuwal, Kingdom of Saudi Arabia, ⁴Institute of Advanced Energy, Kyoto University, Kyoto, Japan.

09:20-09:35 A1-13**Strain-Induced Modification of Electronic States and Optical Properties of MX₂ Monolayer**

Ashim Kumar Saha¹, Masato Yoshiya¹

¹Department of Adaptive Machine Systems, Osaka University, Suita, Osaka, Japan.

09:35-09:50 A1-14**High quality graphene transistor by new fabrication approach**

Nguyen Thi Hai Yen¹, Mario Hofmann², Ya-Ping, Hsieh³

¹Graduate Institute of Applied Physics, National Taiwan University, Taipei, Taiwan, ²Department of Physics, National Taiwan University, Taipei, Taiwan, ³Institute of Atomic and Molecular Science, Academia Sinica, Taipei, Taiwan.

09:50-10:10 A1-15 Invited**Exploring electronic transport properties of 2D-semiconductor field-effect devices**

Y.T.Huang^{1,2}, Y.J.Ho^{1,2}, Y.C.Wu¹, R.Sankar³, F.C.Chou³, C.W.Chen⁴, and*W.H.Wang¹

¹Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei 106, Taiwan. ²Department of Physics, National Taiwan University, Taipei 106, Taiwan. ³Center of Condensed Matter Sciences, National Taiwan University, Taipei 106, Taiwan. ⁴Department of Materials Science and Engineering, National Taiwan University, Taipei 106, Taiwan.

10:10-10:30 A1-16 Invited**Two-dimensional MoTe₂ materials: from synthesis, identification, and charge transport to electronics applications**

Yen-Fu Lin¹

¹Department of Physics, National Chung Hsing University, Taichung 40227, Taiwan.

10:30-11:00 Coffee break

Oral Session
Tuesday, November 7, 2017
Room 402b
Chairperson: Wei-Hua Wang

14:00-14:20 A1-17 Invited**Interface Engineering of Low-Dimensional materials: The Future of Electronic Devices**

Guo Hong¹

¹Institute of Applied Physics and Materials Engineering, University of Macau.

14:20-14:35 A1-18**Increasing the doping efficiency by surface energy control for ultra-transparent graphene conductors**

Kai Wen Chang¹, Ya-Ping Hsieh², Chu-Chi Ting², Yen-Hsun Su¹, Mario Hofmann³

¹Department of Material Science and Engineering, National Cheng Kung University, ²Graduate Institute of Opto-Mechatronics, National Chung Cheng University, ³Department of Physics, National Taiwan University.

14:35-15:05 D1-01(A1-19) Keynote**HIPIMS Deposition of DLC Coatings**

Ralf Bandorf¹

¹Fraunhofer Institute for Surface Engineering and Thin Films IST, Braunschweig, Germany.

Poster Session

Monday, November 6, 2017

15:30-16:30

Room 401

A1-P01**Self-Assembly of Aligned Graphene Nanoribbons with Small Molecules**

He, Shih-Ming¹, Su, Ching-Yuan¹

¹Graduate Institute of Energy Engineering, National Central University, Taiwan.

A1-P02**Efficient collection of liquid-phase exfoliated phosphorene by electrophoresis deposition**

Yu-Ling Hsieh¹, Cheng-Chun Huang¹, Ching-Yuan Su¹

¹Dept of Mechanical Engineering, National Central University, Chungli, Taiwan.

A1-P03**Synthesis of Epitaxial WS₂/WSe₂ Lateral Heterojunctions on Sapphire Substrates**

Chen-Han Lee¹, Ming-Yen Lu¹, Ming-Pei Lu²

¹Department of Materials Science and Engineering, National Tsing Hua University, ²National Nano Device Laboratories.

A1-P04**Piezo-Catalytic Effect of the Single and Few-Layers MoS₂ Nanoflowers**

Wei En Chang¹, Yu Ting Chang¹, Chih Kai Chang¹, Yun Jung Chung¹, Jyh Ming Wu¹

¹National Tsing Hua University.

A1-P05

In-situ Characterization of Poly (Propylene Oxide) (PPO) Electrodeposition through a Graphene-Based Sensor

Ian Daniell Santos¹, Mario Hofmann²

¹National Cheng-Kung University, ²National Taiwan University.

A1-P06

Functional groups dependent redox dynamics in graphene

Yi-Zhe Hong¹, Hung-Chieh Tsai¹, Chia-Hao Chen², Wei-Yen Woon¹

¹Department of Physics, National Central University, Jungli, 32054, Taiwan, ²National Synchrotron Radiation Research Center (NSRRC), Hsinchu 30076, Taiwan.

A1-P07

Characteristic of defect generated on graphene through pulsed scanning probe lithography

Jhe-Wei Liou¹

¹Department of Physics, National Central University.

A1-P08

Defect formation on graphene by carbon ion implantation

W.J Huang¹, W.Y Woon²

Department of Physics, National Central University,

A1-P09

Monolayer MoS₂ Schottky Device as Hydrogen Gas Sensor

Nhan Ai Tran¹, Chih-Ya Tsai¹, Han Yeh¹, Wen-Hao Chang¹, Jeng-Tzong Sheu¹

¹National Chiao Tung University.

A1-P10

One-Step Synthesis of Antioxidative Graphene-Wrapped Copper Nanoparticles on Flexible Substrates for Electronic and Electrocatalytic Applications

Chi-Ang Tseng¹, Chiao-Chen Chen¹, Rajesh Kumar Ulaganathan¹, Chuan-Pei Lee¹, Hsu-Cheng Chiang¹, Chin-Fu Chang¹, Yit-Tsong Chen¹, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan

¹Department of Chemistry, National Taiwan University, Taipei, Taiwan.

A1-P11

Fabrication and Optical Characteristics of Two-Dimensional Molybdenum Disulfide Thin Film

Zhen-Wei Liu¹, Wei-De Chien¹, Lin- Zhen Guo², Chi-Chang Tsai¹, Wan-Ting Yang², Hang-Hsaing Cheng², Jun-Xin Ding¹, Wei-Jhih Su², Kuei-Yi Lee³

¹Dept of Electronic and Computer Engineering, National Taiwan University of Science and Technology, ²Graduate Institute of Electro-Optical Engineering, National Taiwan University of Science and Technology

A1-P12

SMR devices with dual mode resonant frequencies using ZnO and AlN thin films

Y.C. Chang¹, Y.C. Chen², W.C. Shih³, Y.H. Liu³, C.C. Cheng⁴, K.S. Kao⁵, W.T. Chang⁶, H.Y. Lee⁷

¹ Department of Electrical Engineering, National Sun Yat-Sen University, Kaohsiung, Taiwan, ² Department of Electronic Engineering, De Lin Institute of Technology, Taipei, Taiwan, ³ Department of Computer and Communication, Shu-Te University, Kaohsiung, Taiwan, ⁴Metal Industries Research & Development Centre, Kaohsiung, Taiwan,

A1-P13

UV-light-activated TiO₂ thin film for H₂S sensing at room temperature

N.D.Chinh, C.J.Kim, and *D.J.Kim

Dept of Materials Science and Engineering, Chungnam National University, Daejeon, Korea

A1-P14

Synthesis and Properties of Multilayer Graphene Coated with Sn/SnO₂

WONG ZHEN XUN¹, Kwang-Lung Lin¹

¹NCKU.

A1-P15

Fabrication and structural characterization of BiCuSeO thin films

Yi-Ping Luo¹, Mei Jing Huang¹, Xiaoding Qi¹

¹National Cheng Kung University.

A1-P16

Thin film growth and electric properties of La and Y doped SrTiO₃

Chen-Yuan Guo¹, Xiao-Ding Qi¹, Chin-Chun Wu¹

¹National Cheng Kung University.

A1-P17

Observing the Phase Conversion of CVD-grown MoS₂ via Atomic Resolution TEM

Kuo-Lun Tai¹, Guan-Min Huang¹, Chun-Wei Huang¹, Tsung-Chun Tsai¹, Wen-Wei Wu¹

¹Department of Materials Science and Engineering, National Chiao Tung University.

A1-P18

Formation of photonic crystal cavities in SOI substrate and emission characteristics of quantum dots

Toshiki Matsutomi¹, Takeshi Hayashi¹, Koudai Watanabe¹, Yasuhiro Tamayama¹, Ariyuki Kato¹

¹Nagaoka University of Technology.

Symposium A2

Compound Semiconductor and Wide Bandgap Materials for Electronic and Optical Devices

November 8-9, 2017

Organizers

Bae-Heng Tseng National Sun Yat-sen University,
Taiwan
Jen-Sue Chen National Cheng Kung University,
Taiwan

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Applied Materials Taiwan
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Oral Session

Wednesday, November 8, 2017

Room 504c

Chairperson: Ching-Hwa Ho

16:30-16:50 A2-01 Invited

Orientation and Polarity of Transparent Conductive Ga-doped ZnO Nanoneedle and Its Application to Solar Cell Anti-reflection

Chih-Chung Yang

Institute of Photonics and Optoelectronics, National Taiwan University, Taipei, Taiwan

16:50-17:10 A2-02 Invited

Synthesis and optical characterization of II-VI and III-VI wide bandgap sulfide compounds for UV-visible optoelectronics application

Ching-Hwa Ho

Institute of Applied Science and Technology, National Taiwan University of Science and Technology

17:10-17:25 A2-03

InGaN-based Resonant Cavity Light Emitting Diode with an Electrochemical Treated Porous-GaN Reflectors

Bo-Syun, Hong¹, Yi-Yun Chen¹, Tsung-Lian Tsai², Chia-Feng Lin¹

¹National Chung Hsing University, ²Lextar Electronics Corporation.

17:25-17:40 A2-04

Surface Diffusion of Ga Droplet on Si(110) in Metal-organic Molecular Beam Epitaxy

T. Ozawa¹, Y. Igarashi¹, Y. Shimomura¹, S. Kimura¹, K. Obara¹, K. Uesugi¹

¹Division of Information and Electronic Engineering, Muroran Institute of Technology, Muroran, Japan.

17:40-17:55 A2-05

Highly transparent and flexible beta-Ga₂O₃ based solar-blind photodetector

Sooyoun Oh¹, Gwangseok Yang¹, Janghyuk Kim¹, Jihyun Kim¹

¹Department of Chemical and Biological Engineering, Korea University, Seoul, Korea

Oral Session

Thursday, November 9, 2017

Room 402c

Chairperson: Dong-Sing Wu

09:00-09:25 A2-06 Keynote

Evolution of Transistor Gate Stack Technology for High Performance Applications

Steven CH Hung¹

¹Applied Materials.

09:20-09:45 A2-07 Invited

Aluminum-Gallium-Oxides: from Thin Films Growth to Device Application

Dong-Sing Wu

Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan

09:45-10:00 A2-08

High-Performance InGaAs FinFET Using In-Situ Plasma Gas Treatment for Logic Applications

Q.H.Luc¹, K.S.Yang², J.W.Lin³, C.C.Chang⁴, C.C.F.Chiang², H.B.Do¹, Y.C.Lin¹, and E.Y.Chang^{1,3,5}

¹ Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan. ² Institute of Photonic System, National Chiao Tung University, Hsinchu, Taiwan. ³ Department of Electronic Engineering, National Chiao Tung University, Hsinchu, Taiwan. ⁴ Institute of Lighting and Energy Photonics, National Chiao Tung University, Hsinchu, Taiwan. ⁵ International College of Semiconductor Technology, National Chiao Tung University, Hsinchu, Taiwan

10:00-10:15 A2-09

Low-temperature synthesis and crystallization kinetics study of high conductivity nickel oxide thin films

Chien-Chen Cheng¹, Meng-Huan Jao¹, Wei-Fang Su¹

¹Department of Materials Science and Engineering, National Taiwan University, Taipei 10617, Taiwan

10:15-10:30 A2-10

Epitaxial Growth and Characterization of Cu₂O by Molecular Beam Epitaxy and Electrodeposition

P. Y. Huang, H.H. Yeh, M. C. Wen, L. Chang and M. M.C. Chou

Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Kaohsiung, Taiwan

10:30-10:45 A2-11

Highly Stable White Light-Emitting Diode with Colloidal Quantum Dots Embedded in Ionic Crystal

C.P.Yu¹, L.A.Ke¹, Y.M.Huang¹, S.C.Hsu¹, C.C.Lin¹, T.M.Chen² and H.C.Kuo³

¹ Institute of Photonic System, National Chiao Tung University, Tainan, Taiwan. ² Department of Applied Chemistry, National Chiao-Tung University, Hsinchu, Taiwan. ³ Institute of Electro-Optical Engineering, National Chiao Tung University, Hsinchu, Taiwan.

10:45-11:00 Coffee Break

Poster Session
Wednesday, November 8, 2017
12:00-14:00
Room 401

A2-P01

Higher Manganese Silicide Nanowire Arrays Grown by Chemical Vapor Deposition

C.L.Shen¹, M.C.Lin¹, K.C.Lu¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan

A2-P02

Investigation of device performance for thin film transistors fabricated by In and Ga-doped ZnO films

L.C.K. Liao¹, J.S. Huang¹, T.Y. Kuo¹

¹Dept. of Chemical Engineering and Materials Science, National United University, Miaoli, Taiwan

A2-P03

Nonpolar ZnO films grown using catalytically-generated high-energy H₂O

Yuki Adachi¹, Munrnori Ikeda¹, Ryoichi Tajima¹, Ariyuki Kato¹

¹Department of Electrical, Electronics and Information Engineering, Nagaoka University of Technology, Japan

A2-P04

Microstructure analysis and phase transformation of GaN quantum dots grown by droplet epitaxy

Chi-Yu Tsai¹, Yang-Che Su¹, Ing-Song Yu¹

¹Department of Materials Science and Engineering, National Dong Hwa University, Hualien, Taiwan.

A2-P05

High Ideality Factor in 280 nm AlGaIn Light Emitting Diode with Different Temperature

Chung-I Yang¹, Ting-Chang Chang², Bo-Wei Chen³, Wu-Ching Chou¹, Wei-Hong Guo⁴, Suh-Fang Lin⁴, Yi-Keng Fu⁴, Chia-Lung Tsai⁴

¹Department of Electrophysics, National Chiao Tung University, ²Department of Physics, National Sun Yat-sen University, ³Department of Photonics, National Sun Yat-Sen University, ⁴Electronic and Optoelectronic System Research Laboratories, Industrial Technology Research Institute.

A2-P06

Highly Efficient Yellow OLED with a Wet-Process Feasible Iridium Complex

S.C.Fu¹, M.R.Jiang¹, H.F. Lin¹, C.L.Chin², J.H.jou¹

¹Department of Materials Science and Engineering, National Tsing Hua University, ²Material and Chemical Research Laboratories, ITRI, Hsinchu, Taiwan

A2-P07

The Effects of Substrate Temperature on Sn-doped InGaIn Films Deposited by RF Reactive Sputtering Technology

Chao-Wei Ting¹, Cao Phuong Thao¹

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology,

Taipei, Taiwan

A2-P08

Synthesis and properties of CdSxSe1-x nanocrystals and CdSxSe1-x/ZnS core/shell nanoparticles

Cian-Hao Huang¹, Yueh-Chi Chung¹, Hao-Wen Zheng¹

¹National University of Kaohsiung, Taiwan

A2-P09

Investigation on Characteristics of Tantalum/Molybdenum and Titanium/Zirconium Isomorphous Alloy Gates on Hafnium Oxide Dielectrics

Hung-Yi Yu¹, Hwa-Kai Lu¹, Yong-Jhong Deng¹, Yi-Sheng Lai¹

¹National United University, Miaoli, Taiwan

A2-P10

Study of SZO thin films by sol-gel method and the application for thin film transistor

Chew-Ming Hsu¹, Yung-Der Juang¹

¹Department of Materials Science, National University of Tainan, Taiwan

A2-P11

Oxide Semiconductor Materials for Photosensor and RRAM Applications

Ying-Jhan Hong¹, Kai-Wei Lan¹, Yu-Ming Hsu¹, Chen-Te Chu¹, Tri-Rung Yew¹

¹Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

A2-P12

Dark current suppression of lateral a-Se metal-semiconductor-metal photodetector by TEOS-SiO_x insertion between electrodes

Cheng-Yi Chang¹, Fu-Ming Pan¹, Yu-Wei Huang¹

¹Department of Materials Science and Engineering, National Chiao-Tung University, Hsinchu, Taiwan

A2-P13

Manufacturing Process and Application of Nanowire Field Effect Transistor

Chih-Kao, Kung¹, Hue-Min, Wu²

¹Institute of Nanomaterials, ²Department of Optoelectronics, Chinese Culture University, Taipei, Taiwan

A2-P14

Control of silver diffusion in low-temperature co-fired diopside glass-ceramic microwave dielectrics

Po-Hsien Wu, Guang-Yu Chen, Chun-Yao Chang, Yen-Ming Chen, Chen-Chia Chou

Department of Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

Symposium A3

Advanced Interconnects and Packaging,
Materials, Characterization, and Methodology

November 7-9, 2017

Organizers

Jenn-Ming Song	National Chung Hsing University, Taiwan
Jihperng (Jim) Leus	National Chiao Tung University, Taiwan
C. Robert Kao	National Taiwan University, Taiwan
Chih Chen	National Chiao Tung University, Taiwan
Kuan-Neng Chen	National Chiao Tung University, Taiwan

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艾克爾國際科技股份有限公司



Oral Session

Tuesday, November 7, 2017
Room 504b

Chairpersons: C. Robert Kao and Albert Wu

14:00-14:30 A3-01 Plenary

Effect of Joule heating on electromigration and thermomigration in 3D IC packaging technology
K. N. Tu

International College of Semiconductor Technology,
National Chiao Tung University, Hsinchu, Taiwan.

14:30-14:00 A3-02 Keynote

Novel 3D/2.5D Heterogeneous Integration Technologies for IoT and AI Era
Mitsumasa Koyanagi
Tohoku University.

15:00-15:30 A3-03 Keynote

Interface Bonding Technology by Surface Activated Bonding (SAB)
Tadatomo Suga
University of Tokyo.

15:30-16:00 A3-04 Keynote

Metrology Challenges and Opportunities for Emerging Technology Development
Zhiyong Ma
Intel.

16:30-17:00 A3-05 Keynote

Reliability challenges in a connected world
Jun He
TSMC.

17:00-17:20 A3-06 Invited

Heterogeneous integration trend & challenges for SiP
S. H. Chao
ASE.

17:20-17:40 A3-07 Invited

Innovative Material and Packaging Solutions in High Performance Computing
Max Lu
SPIL.

17:40-18:00 A3-08 Invited

Wafer level package excellence
Min Yoo
Amkor.

18:00-18:20 A3-09 Invited

Electromigration-induced failure map at micro Cu/Sn joint interface
Cheng-Yi Liu
National Central University.

Oral Session

Wednesday, November 8, 2017
Room 504b

Chairperson: Hiroshi Nishikawa

09:00-09:20 A3-10 Invited

Heterogeneous nucleation of β Sn in solder joints
Chris Gourlay
Imperial College.

09:20-09:40 A3-11 Invited

Real time X-ray imaging of soldering processes
Kazuhiro Nogita
The University of Queensland.

09:40-09:55 A3-12

Copper-to-Copper direct bonding on highly (111) oriented nano-twinned copper without vacuum ambient

J.Y.Juang^{1,2}, C.C.Liu¹, T.C.Chang², C.Chen¹

¹ Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan

² Electronic and Optoelectronic System Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

09:55-10:10 A3-13
Study of Low Temperature Cu-to-Cu Direct Bonding with Chemical Mechanical Planarized Nanotwinned Cu Films

P.F. Lin¹, S.Y. Chang¹, C.Chen¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

10:10-10:25 A3-14
Grain growth in direct Cu-to-Cu bonding by <111>-oriented nanotwinned copper and nanocrystalline copper films

Y.C Cheng¹, Hung-Che Liu¹, C.Chen¹

¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

10:25-10:40 A3-15
Low-Temperature and Pressureless Cu-to-Cu Bonding by Electroless Plating

H. T. Hung, S. Yang C. R. Kao

Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 504b

Chairperson: Jae-Ho Lee

14:00-14:20 A3-16 Invited
Science and Practice of Sintered-Silver Bonding (SSB) for Power Packaging

Yunhui Mei

Tianjin University.

14:20-14:40 A3-17 Invited
New bonding process using microscale particles for die-attach in power devices

Hiroshi Nishikawa

Osaka University.

14:40-14:55 A3-18
Study of interfacial reaction between solder and n-type Bi₂Te₃ and shear strength for n- and p-type thermoelectric modules

Wen-Chih Lin¹, Ying-Sih Li¹, Albert T. Wu¹

¹Department of Chemical and Materials Engineering, National Central University, Taoyuan, Taiwan.

14:55-15:10 A3-19
Evaluation of Interfacial Stability for Co Diffusion Barrier between n-PbTe/electrode

*H. C. Hsieh¹, C. H. Wang¹, T. H. Lee², H. S. Chu², Albert T. Wu¹

¹Department of Chemical and Materials Engineering, National Central University, Taoyuan, Taiwan

²Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

15:10-15:25 A3-20
Interconnect Reliability of Photonic-sintered Submicron/nano Silver Particles

Guo-Lun Huang, Chun-Shiuan Tsai, Chi-Nan Cheng
Jenn-Ming Song

Department of Materials Science and Engineering,
National Chung Hsing University, Taichung, Taiwan.

15:25-15:40 A3-21
Indium/Bi₂Te₃-based thermoelectric materials interfacial reactions

Sinn-wen Chen, Y. Hutabalian, Shi-Ting Lu

Department of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 504b

Chairperson: Chih-Ming Chen

16:30-16:50 A3-22 Invited
Electrochemical Study on Etching Behaviors of Galvanic Coupled Metals in PCB Applications

Jae-Ho Lee

Hongik University.

16:50-17:05 A3-23
Micropatterning of Reduced Graphene Oxide by Meniscus-Guided Printing

Won Suk Chang^a, Hwakyung Jeong^a, Jung Hyun Kim^a, Sanghyeon Lee^a, Muhammad , Wajahata, ^b, Seung Kwon Seol^{a, b}

^aNano Hybrid Technology Research Center, Korea Electrotechnology Research Institute(KERI), Changwon-si, Gyeongsangnam-do, 51543, Republic of Korea
^bElectrical Functional Material Engineering, Korea University of Science and Technology(UST), Changwon-si, Gyeongsangnam-do, 51543, Republic of Korea

17:05-17:20 A3-24
Fabrication and characterization of (100)-oriented single crystalline Cu lines

Tien-Lin Lu, Yu-An Shen, Chih Chen

Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

17:20-17:35 A3-25
The Mechanism of Anisotropic Single-crystal Growth in Nanotwinned Copper

I-Hsin Tseng¹

¹Department of Materials Science and Engineering, National Chiao Tung University.

17:35-17:50 A3-26
High-speed Cu Electrodeposition and Paddle Speed Effect on Its Microstructure

C. H. Yang¹, B. C. Huang¹, Y. S. Wu¹, H. C. Liu², C. E. Ho¹

¹Department of Chemical Engineering & Materials Science, Yuan Ze University, Taiwan, R.O.C.

²Kinsus Interconnect Technology Corp., Taiwan, R.O.C.

17:50-18:05 A3-27

Comparative Study between Au/Pd (EPIG) and Au/Pd(P)/Au (IGEPIG) Surface Finishes: Corrosion Characteristics and Thermal Stability

Y.H. Huang¹, Y.X. Wang^{1,2}, P.T. Lee¹, T.T. Kuo^{1,3}, and C.E. Ho¹

¹ Department of Chemical Engineering & Materials Science, Yuan Ze University, Taiwan, R.O.C. ² Department of Civil Engineering & Architecture, Anhui University of Science and Technology, Huainan, China. ³ Taiwan Uyemura Limited Company, Taiwan, R.O.C.

Oral Session

Thursday, November 9, 2017

Room 402a

Chairperson: Jenn-Ming Song

09:00-09:20 A3-28 Invited

The Application of Phase Diagram in Materials Science and Engineering

Yee-Wen Yen

National Taiwan University of Science and Technology.

09:20-09:35 A3-29

Effects of Zn Addition on Cu-Sn Microjoints for Chip-Stacking Applications

Y. W. Wang, T. L. Yang, and C. R. Kao

Department of Materials Science & Engineering, National Taiwan University, Taipei City, Taiwan.

09:35-09:50 A3-30

Thermomigration of Cu-Sn and Ni-Sn intermetallic compounds during reliability test in SnAg solder joints

Po-Ning Hsu¹, Nien-Ti Tsou¹, Chih Chen¹

¹ Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

09:50-10:05 A3-31

The Temperature Cycling Test and Thermal Stability Study of Fan-Out Wafer Level Package with Nano-twinned Copper.

Yu-Jin Li, Yin Ju Chen, Kuan Ju Chen, Chih Chen

Depart of Materials Science and Engineering, National Chiao Tung University.

10:05-10:20 A3-32

Effect of Tin Orientation on Electromigration Failure of 20-um Microbumps

Kai Cheng Shie¹ and Chih Chen²

¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

10:20-10:35 A3-33

Effect of Sn Grain Orientation on Thermomigration in Sn2.3Ag Microbumps

Yu-AnShen¹, Fan-YiOuyang², andChihChen¹

¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan. ²Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

Oral Session

Thursday, November 9, 2017

Room 402a

Chairperson: Yee-Wen Yen

11:00-11:15 A3-34

Micromechanical Properties of Single Crystalline (Cu,Ni)6Sn5 by Micropillar Compression and Nanoindentation

Jui-Yang Wu and C.R. Kao

Dept of Materials Science and Engineering, National Taiwan University.

11:15-11:30 A3-35

Edge effect and phase formation in Cu-Sn-Ni micro joints during solid-state aging

Haiyang Yu and C. R. Kao

Department of Materials Science and Engineering, National Taiwan University.

11:30-11:45 A3-36

The Dielectric Properties of Package Material in mmWave by Fabry-Perot Open Resonator Methods Measurement

Chun-An Lu and C.H.Chen

Industrial Technology Research Institute.

11:45-12:00 A3-37

Combustion Synthesis of h-BN and its Applications in High Thermal Conductivity Polymer Composites

Shyan-Lung Chung^{1,2}, and Jeng-Shung Lin²

¹ Advanced Optoelectronic Technology Center, National Cheng Kung University, Tainan 70101, Taiwan. ² Department of Chemical Engineering, National Cheng Kung University, Tainan 70101, Taiwan.

12:00-12:15 A3-38

Silane-compound-assisted metallization of silicon

Y.Z.Lai and C.M.Chen

National Chung Hsing University.

12:15-12:30 A3-39

Electroplated (111)-oriented Au films in the study of Au-Au direct bonding

John Aaron Wu and Chih Chen

¹Department of Materials Science and Engineering, National Chiao Tung University.

Poster Session
Wednesday, November 8, 2017
12:00-14:00
Room 401

A3-P01

A New Low Dk and Low Loss Tangent LTCC Material at 10GHz

Chun-An Lu
Industrial Technology Research Institute.

A3-P02

The Interfacial Reactions in Pd-Coated Copper Wire Bonding under Current Stressing

Z.X.Tsai¹
¹National Cheng Kung University.

A3-P03

Surface oxidation effect on the adhesion strength between epoxy molding compounds and lead frames

Shih-Chieh Chao¹
¹National Chung Hsing University.

A3-P04

Strong Effects of Ge Content on the Interfacial Reactions between Sn-Ag Solders and Co Substrate at 250 °C

Ke-Hsing Chen¹
¹Department of Chemical Engineering, National Chung Cheng University, Chia-yi, Taiwan.

A3-P05

Formation Mechanism of the IMC Microstructure in the Soldering

Tai-Yu Chang¹
¹Department of Chemical Engineering, National Chung Cheng University, Taiwan.

A3-P06

Development of direct copper bonding for package-on-package integration

Shang-Kun Huang¹
¹ASE Group.

A3-P07

Inhibition of impurity incorporation and void formation in Sn/electroplated Cu solder joints

Hsuan Lee
National Chung Hsing University.

A3-P08

Interfacial reaction of 68In32Bi and 33In67Bi low melting alloy on Cu substrate

C.H.Wang¹, Albert.T.Wu¹
¹Dept of Chemical and Materials Engineering, National Central University, Taoyuan, Taiwan.

A3-P09

Impurity effects on the interfacial reactions between electroplated Cu and Sn under various aging temperatures

Shan-Chen Tsai
National Chung Hsing University.

A3-P10

Growth of intermetallic compound in Co/Sn3.5Ag/Co and Co/Sn3.5Ag/Cu structure under thermomigration

Yung-Ting Tai¹
¹National Tsing Hua University, Hsinchu.

A3-P11

Microstructure evolution of Al wire bonded on Cu metallization under Electromigration test

Yu-Chi Fang¹
¹National Tsing Hua University.

A3-P12

Interfacial reaction of 68In32Bi and 33In67Bi low melting alloy on Cu substrate

C.H.Wang¹, Albert.T.Wu¹
¹Dept of Chemical and Materials Engineering, National Central University, Taoyuan, Taiwan.

A3-P13

Electrochemical Migration Behavior of Fine-pitch Ag Interconnects

JOU-HSUAN LI¹
¹National Tsing Hua University.

A3-P14

Thermal stress behavior of PECVD silicon carbonitride films

T.-J. Chen¹
¹Department of Materials Science and Engineering, National Chiao Tung University.

A3-P15

Optical properties of PECVD SiC_xN_y films using single-precursors

Wei-Yuan Chang
National Chiao Tung University.

A3-P16

Tensile Tests of Highly <111>-oriented Nanotwinned Cu Films

Wei-Ling Lai¹
¹Dept of Materials Science and Engineering, National Chiao Tung University.

A3-P17

Grain Growth of <111> Nanotwinned Copper on <100>-oriented and Random Copper Films

Hsin-Yong Liu¹
¹National Chiao Tung University.

A3-P18

Study of Electrodeposition of Nanotwinned Cu Films at Different Bath Temperatures

Yen-Chieh Chen¹
¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

A3-P19

Effect of seed layers and substrates on the growth of electroplated nanotwinned-copper

Liang-Hsien Chang¹

¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

A3-P20

Wetting and Oxidation Behavior of Zn-25Sn-xCu High Temperature Pb-free Solder Alloys

Che-Wei Yeh¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

A3-P21

Development of Cu/Ag Nanocomposite Pastes for Low-Temperature Low-Pressure Bonding

Ting-Jui Wu¹

¹National Chung Hsing University.

A3-P22

Enhancement of Direct Cu Bonding by Inducing Compressive Residual Stress

Sin-Yong Liang¹, David Tarn², Chih-Pin Hung²

¹Department of Materials Science and Engineering, National Chung Hsing University, Taichung 402, Taiwan, ²Advanced Semiconductor Engineering Group, Kaohsiung 811 Taiwan.

A3-P23

Micro-galvanic Corrosion in Advanced Microelectronic Interconnections

SYUAN-LIN GUO¹

¹Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan.

A3-P24

Highly-reliable Low-temperature-sintered Circuits using Thermal Spray Pyrolyzed Submicron Silver Particles

Chi-Nan Cheng¹

¹Department of Materials Science and Engineering, National Chung Hsing University, Taichung 402, Taiwan.

A3-P25

Effects of Current Stressing on Microstructure and Mechanical Properties of Ag-Pd-In Alloy Wire

Mei-Chen Su¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

A3-P26

Oxide Growth Rate of (111), (100) and Random Copper Films at Low Temperatures for the Application of Cu-to-Cu Direct Bonding

Chih-Han Tseng¹

¹Depart of Materials Science and Engineering, National Chiao Tung University.

A3-P27

The Microstructure and Tensile Properties of Zn-25Sn-xCu High Temperature Pb-free Solder Alloys

WEI-TING GUO¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

A3-P28

Conductive characteristics of copper-germanium eutectic nanowires obtained by vacuum injection molding process

WEI-HAO FENG¹

¹Nation Taiwan University of Science and Technology.

A3-P29

Interfacial Reactions in the Sn-Ag-Cu/Cu-Be Alloy (Alloy25) couple

J.S. Chang

National Taiwan University of Science and Technology.

Symposium A4

Advanced Technologies for Memory Devices and Flexible Electronics

November 6-7, 2017

Organizers

Tzong-Ming Lee	Industry Technology Research Institute, Taiwan
Wen-Wei Wu	National Chiao Tung University, Taiwan
Fu-Hsiang Ko	National Chiao Tung University, Taiwan
Jr-Hau He Kin	Abdullah University of Science & Technology, Saudi Arabia
Qi Liu	Institute of Microelectronics, Chinese Academy of Sciences, China
Tuo-Hung Hou	National Chiao Tung University, Taiwan
Jupiter Hu	Industry Technology Research Institute, Taiwan
Hsien-Kuang Lin	Industry Technology Research Institute, Taiwan

Oral Session

Monday, November 6, 2017

Room 402a

Chairperson: Tuo-Hung Hou

14:00-14:30 A4-01 Keynote

Advanced Physical Characterization Techniques in FinFET and RRAM Study

K.L. Pey¹, S. Mei¹, A. Ranjan¹, N. Raghavan¹, K. Shubhakar¹, R. Thamankar¹, M. Bosman², S. J. O'Shea²

¹Singapore University of Technology and Design, ²Institute of Materials Research and Engineering, A*STAR.

14:30-14:50 A4-02 Invited

Filament based Analog RRAM for Neuromorphic Computing

Bin Gao¹, Huaqiang Wu¹, Wei Wu¹, Peng Yao¹, He Qian¹

¹Tsinghua University.

14:50-15:10 A4-03 Invited

Hafnium Oxide and Silicon Oxide based Memristors for Unconventional Computing

Qiangfei Xia¹, Hao Jiang¹, Can Li¹

¹University of Massachusetts Amherst.

15:10-15:30 A4-04 Invited

Two dimensional hexagonal boron nitride thin films for flexible functional nonvolatile resistive random access memory (RRAM)

Pooi See Lee¹, Kai Qian¹

¹School of Materials Science and Engineering, Nanyang Technological University.

Oral Session

Monday, November 6, 2017

Room 402a

Chairperson: Ping-Hung Yeh

16:30-17:00 A4-05 Keynote

Status of ZnO-Based Transparent Resistive Switching Memories

Tseung-Yuen Tseng¹

¹National Chiao Tung University.

17:00-17:20 A4-06 Invited

High performance self-selective cell for 3D VRRAM architecture

Hangbing Lv¹, Xiaoxin Xu¹, Qing Luo¹, Tiancheng Gong¹, Ming Liu¹

¹Key Laboratory of Microelectronics Devices & Integrated Technology, Institute of Microelectronics, Chinese Academy of Sciences, Beijing, China.

17:20-17:40 A4-07 Invited

Fabrication of Nanostructures in Oxide Films by Electric Field and Resistive Switching Effects

Gang Liu¹, Run-Wei Li¹

¹Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences.

17:40-17:55 A4-08

Engineered Resistive Switching in ALD-grown Ni/HfO₂/TiN RRAM Devices

V. Mani Teja, Boris Hudec, Che-Chia Chang, Tzu-Yun Wu, Ying Chen, Tuo-Hung Hou

National Chiao Tung University, Hsinchu, Taiwan.

17:55-18:10 A4-09

Influences of top electrode material selection to the switching characteristics of tantalum oxide-based resistive switching memories

Tse-Ming Ding, Yi-Ju Chen, Jen-Sue Chen

Department of Materials Science and Engineering, National Chen Kung University, Tainan, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 402a

Chairperson: Cheng-Lun Hsin

09:00-9:30 A4-10 Keynote

Silicon nitride ALD

Woochul Jang¹, Hyunjung Kim², Hyeongtag Jeon²

¹Division of Materials Science and Engineering, Hanyang University, Seoul 04763, Korea, ²Department of Nano-scale Semiconductor Engineering, Hanyang University, Seoul 04763, Korea.

09:30-9:50 A4-11 Invited

Parylene-based Flexible Multi-functional Electronic Device Fabricated by CMOS process

Yimao Cai¹, Min Lin¹, Qingyu Chen¹, Zongwei Wang¹, Yichen Fang¹, Yuchao Yang¹, Wei Wang¹, Ru Huang¹

¹Institute of Microelectronics, Peking University.

09:50-10:05 A4-12

Abnormal Sub-Channel Formation Induced by PBTS for Hydrogenated a-InGaZnO Thin Film Transistors

*Y. C. Yang¹, T. C. Chang^{2,3}, T. M. Tsai¹, H. C. Chiang¹

¹Department of Materials and Optoelectronic, Sun Yat-Sen University, Kaohsiung 80424, Taiwan²

Department of Physics, National Sun Yat-Sen University, Kaohsiung 80424, Taiwan³ Advanced Optoelectronics Technology Center, National Cheng Kung University, Tainan 800, Taiwan.

10:05-10:20 A4-13

The flexible and transparent devices based on perovskite oxide ferroelectric films

Guoliang Yuan¹

¹Nanjing University of Science and Technology.

10:25-10:40 A4-14

Compact Circuit Model of RRAM-based Synapse under Arbitrary Stimulation for Neuromorphic Computing Application

Ying Chen¹, Boris Hudec¹, Che-Chia Chang¹, Tuo-Hung Hou¹

¹Dept of Electronics Engineering and Institute of Electronics, National Chiao Tung University.

Oral Session
Tuesday, November 7, 2017
Room 402a
Chairperson: Ji-Ping Hu

14:00-14:30 A4-15 Keynote

Triboelectric Properties in Graphene for Energy Harvesting and Tribotronics

Sang-Woo Kim¹

¹Sungkyunkwan University (SKKU).

14:30-15:00 A4-16 Keynote

Developing the Next Generation Flexible Displays

Janglin Chen¹

¹Display Technology Center, ITRI.

15:00-15:20 A4-17 Invited

Solution Processed OLEDs using Novel Phosphorescent Green Emitter

Jung-Yu Liao¹, Jin-Sheng Lin¹, Jia-Lun Liou¹, Mei-Rung Tseng¹

¹Industrial Technology Research Institute.

15:20-15:40 A4-18 Invited

Raspberry-like Particles for Enhancing Light Extraction Efficiency of Organic Light-Emitting Diodes

Pei-Chi Chien¹, Patrick Chen²

Oral Session

Tuesday, November 7, 2017

Room 402a

Chairperson: Kuo-Chang Lu

16:30-16:50 A4-19 Invited

Developing low-dimensional nanostructures for flex

Guozhen Shen^{1,2}, Zheng Lou¹

¹State Key Laboratory for Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences, Beijing 100083, China. ² College of Materials Science and Opto-electronic Technology, University of Chinese Academy of Sciences, Beijing 100029, China.

16:50-17:05 A4-20

Highly Stable Copper Nanowire: Low Cost Transparent Conducting Electrode and High Efficient Hydrogen Evolution Catalyst

Arumugam Manikandan¹, Ling Lee¹, Yi-Chung Wang¹, Chia-Wei Chen¹, Yu-Ze Chen¹, Henry Medina¹, Jiun-Yi Tseng¹, Zhiming M. Wang², Yu-Lun Chueh³,

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, 30013, Taiwan, R.O.C, ²Institute of Fundamental and Frontier Sciences, University of Electronic Science and Technology of China, Chengdu 611731, P.R. China, ³Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, 30013, Taiwan, R.O.C.

17:05-17:20 A4-21

Advanced Sensor for Flexible Electronic

M.T.Hsieh¹, Y.C. Chiang², C.M. Leu³

17:20-17:35 A4-22

Dual-Mode Resistance Change Based on Electronic Switching Mechanism

Che-Chia Chang¹, Boris Hudec¹, V. Mani Teja¹, Ying Chen¹, Po-Tsun Liu¹, Tuo-Hung Hou¹

¹National Chiao Tung University.

17:35-17:50 A4-23

Foldable OLED Display with Plastic Window and Edge Sealing

Jian-Lung Chen, Chun-Ko Chen, Pei-Pei Cheng, Chih-Chia Chang, Yu-Hsin Lin
Display Technology Center, Industrial Technology Research Institute.

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

A4-P01

Paste Modification for Roll-to-Roll Metal Mesh Printing

Cheng-Yi Shih¹, Shih-Ming Lin¹, Hsi-Hsuan Yen¹,
Jung-Shiuan Liou¹, Je-Ping Hu¹

¹Industrial Technology Research Institute.

A4-P02

Resistive Switching Characteristics of 1S1R with Single-layer Magnesium Oxide Based Selectors

Chun-An Lin¹, Yan-Ze Wu¹, Tseung-Yuen Tseng¹

¹Dept of Electronics Engineering, National Chiao Tung University, Hsinchu, Taiwan.

A4-P03

The degradation mechanism of tungsten electrode on HfO₂-based RRAM

Ting-Yang Chu¹, Ting-Chang Chang², Tsung-Ming Tsai¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Kaohsiung, 804, Taiwan, ²Department of Physics, National Sun Yat-Sen University, Kaohsiung, 804, Taiwan.

A4-P04

Wafer-Scale and transfer-free Growth of WSe₂ Monolayers by A Low Temperature Plasma-Assisted Selenization Process with a sub ppb NOx gas Sensing

Ting Wan Hsu¹

A4-P05

Synthesis of 2D Materials via Laser Annealing on Insulating Substrates: A non-transfer, fast and patternable approach

Henry Medina¹, Yu-Ze Chen¹, Chih-Chi Huang¹,
Yu-Lun Chueh¹

¹National Tsing Hua University.

A4-P06

Directly Observation of the Switching Behaviors in VCM-based Ta₂O₅ Resistive Random Access Memory

Jui-Yuan Chen¹, Chun-Wei Huang¹, Wen-Wei Wu¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan..

A4-P07

High Performance Flexible Photodetector Based on ZnSe Nanowires

Tse-Ning Yang¹, Lih-Juann Chen¹

¹National Tsing Hua University.

A4-P08

Liquid Crystal Polymer film surface metallization

S. H. Chang¹, L. J. Chen¹, C. Y. Chiu¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

A4-P09

One-step synthesis of core-shell gold nanoparticles for nanocrystal memory application

Yu-Fan Tseng¹, Ching-Chieh Leu¹

¹Department of Chemical and Materials Engineering, National University of Kaohsiung.

A4-P10

PbS-seeded growth of CH₃NH₃PbI₃ thin film for resistance memory application

Y.F.Chen¹, C.F. Shih¹, C.C. Leu²

¹National Cheng Kung University, ²National University of Kaohsiung.

A4-P11

Recovery of failed RRAM devices by a low temperature supercritical treatment

Cheng-Hsien Wu¹, Tsung-Ming Tsai², Ting-Chang Chang³

A4-P12

Resistive Switching Properties and Behaviors in Core-Shell Ni/NiO/HfO₂ Nanowire RRAM Devices

Ting-Kai Huang¹, Jui-Yuan Chen¹, Yi-Hsin Ting¹,
Wen-Wei Wu¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

A4-P13

Observation of Resistive Switching Behavior in Crossbar Core-shell Ni/NiO Nanowires Memristor

Yi-Hsin Ting¹, Jui-Yuan Chen¹, Chun-Wei Huang¹,
Ting-Kai Huang¹, Wen-Wei Wu¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

A4-P14

In-situ observation of dual-filament switching behaviors in Ag/Ta₂O₅/Pt memristors

Chia-Fu Chang¹, Jui-Yuan Chen², Chun-Wei Huang³,
Chung-Hua Chiu⁴, Ting-Yi Lin⁵, Ping-Hung Yeh⁶,
Wen-Wei Wu⁷

Symposium A5

Advanced Materials and Related Technology for Next Generation Displays

Tuesday, November 7, 2017

Organizers

Hsueh-Shih Chen	National Tsing Hua University, Taiwan
Shu-Ru Chung	National Formosa University, Taiwan
Vasant Kumar	University of Cambridge, UK
Yung-Hui Yeh	Industrial Technology Research Institute, Taiwan

Oral Session

Tuesday, November 7, 2017

Room: 534

Chairperson: Hsueh-Shih Chen

09:00-9:30 A5-01 Keynote

Recent Advanced Achievement of micro-LED in ITRI, and Beyond the Next ?!

Chih-I Wu¹, Ming-Jer Kao¹, Chien-Chung Lin¹,
Yen-Hsiang Fang¹

¹Electronic and Optoelectronic System Research
Laboratories, Industrial Technology Research Institute.

09:30-9:50 A5-02 Invited

A High Performance Organic Upconversion Electronic Imaging System with Near-Infrared Charge Generation Layer

Shun-Wei Liu, Sajal Biring¹

¹Department of Electronic Engineering, Ming Chi
University of Technology, New Taipei City 24301,
Taiwan

²Organic Electronics Research Center, Ming Chi
University of Technology, New Taipei City 24301,
Taiwan

09:50-10:10 A5-03 Invited

Quantum-Dot Based Full-Color Micro Light Emitting Diode Display

Chin-Wei Sher¹, Chu-Kuo Hsiung², Hao-Chung Kuo²

¹Fok Ying Tung Research Institute, Hong Kong
University of Science and Technology, Hong Kong.

²Department of Photonics and Institute of
Electro-Optical Engineering, National Chiao Tung
University, Hsinchu 30010, Taiwan.

10:10-10:25 A5-04

Synthesis and Characterization of Highly Luminescent Indium Phosphide Quantum Dots

Pin-Ru Chen¹, Hsueh-Hsih Chen¹

¹Department of Materials Science and Engineering,
National Tsing Hua University, Hsinchu, Taiwan.

14:00-14:30 A5-05 Keynote

Analysis of Molecular Orientations of Vapor-Deposited Organic Semiconductor Molecules

for OLEDs: Coexistence of Randomization and Constraint of Molecular Orientation

Masahito Oh-e

Department of Electrical Engineering, Institute of
Photonics Technologies, National Tsing Hua University.

14:30-14:50 A5-06 Invited

Thick-Shelled Quantum Dots for Display Applications

Ray-Kuang Chiang

Nanomaterials Lab., Far East University, Hsin-Shih,
Tainan 74448, Taiwan, R.O.C..

14:50-15:10 A5-07 Invited

Optical Properties and Charge Carrier Dynamics of Organolead Halide Perovskite Nanocrystals

Ying-Chih Pu, Hsiao-Chuan Fan

Department of Materials Science, National University
of Tainan, Tainan, Taiwan.

15:10-15:25 A5-08

Stability of ZnCdSe/SiO₂ Quantum Dots

C.R.Huang, K.L.Chen, S.R.Chung

Dept. of Materials Science and Engineering, National
Formosa University.

Poster Session

Tuesday, November 7, 2017

15:30-16:30

Room 401

A5-P01

Synthesis and Application of Quantum Dots-Silicone Hybrid for Light Emitting Diodes

Shang-Chieh Huang¹, Meng-Chi Liu¹, Guan-Hong
Chen¹, Chang-Wei Yeh¹, Shih-Jung Ho¹, and
Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering,
National Tsing Hua University, Hsinchu, Taiwan.

A5-P02

Improved Performance of QD Film Encapsulating Silica-coated ZnCdSSe QD

Wen-Hsin Tsai¹, Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering,
National Tsing Hua University, Hsinchu, Taiwan.

A5-P03

Synthesis and Characterization of Large-Sized Cd_xZn_{1-x}Se_yS_{1-y} Based Composition Gradient Quantum Dots by Multiple Injections

Ming Hua Yeh, Shih-Jung Ho, Chang-Wei Yeh,
Man-Lin Liao and Hsueh-Shih Chen

¹ Department of Materials Science and Engineering,
National Tsing Hua University, Hsinchu, Taiwan.

A5-P04

Modification of the Quantum Dot Surface by Polyacrylate Cladding

Meng-Chi Liu¹, Hsueh-Shih Chen¹

¹Department of Materials Science and Engineering,
National Tsing Hua University, Hsinchu, Taiwan.

A5-P05

Synthesis of CdZnSeS/ZnS Alloyed Core/Shell Quantum Dots Through Multiple Hot Injections

Man-Lin Liao¹ and Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

A5-P06

Enhanced Quantum Dot Film with Polymer Scatters for Backlit Display Application

Guan-Hong Chen¹, Shih-Jung Ho¹, Ming Hua Yeh¹ and Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P07

Investigation of High Efficiency Quantum Dot Light Emitting Diode

Yao-Tang Chang¹, Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P08

CIS/ZnS Quantum Dot Modified YAG-based White LED

C.W.Zhang¹, C.C.Hsiao¹, S.R.Chung¹

¹Dept of Materials Science and Engineering, National Formosa University, Yunlin, Taiwan

A5-P09

Fabrication and Characterization of QD-polymer Microspheres and Photonic Crystal Application

Shih-Jung Ho, Yu-Hsiang Hsueh, Ming-Hua Yeh, Chang-Wei Yeh, Shang-Jie Huang and Hsueh-Shih Chen

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P10

Investigation of Quantum Dot Luminescent Down-shifting Layer for Photovoltaic Applications

Ying-Ju Chen, Guan-Hong Chen, Yao-Tung Chang and Hsueh-Shih Chen

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P11

Study of Morphology of Perovskite Thin Film for Solar Cells

Tang-Hui Xu¹, Yao-Tang Chang¹, Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P12

Growth and Characteristics of Long Zn/ZnO Nanowires for Field Emission Display Application

Su-Hua Yang, Nai-Chieh Hsu, and Chih-Fu Kuo

Department of Electronic Engineering, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan

A5-P13

Exciton Dynamic Study of Quantum Dots with Various Surface Treatments

Chang-Wei Yeh, Kai-Cheng Wang Ching-Che Hun and Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P14

Light Emitting Diodes Based on Narrow Emission Bandwidth Quantum Dots and Transfer Printing Techniques for the Pixelated Patterning

Kuo Yang Lai, Man-Lin Liao, Yao-Tang Chang, Hsueh-Shih Chen

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

A5-P15

Fatigue Tests of Thin Films for Flexible Display

Yi-Chia Liao¹, Jui-Chang Chuang², Chun-Hway Hsueh¹

¹Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan

²Display Technology Center, Industrial Technology Research Institute, Hsinchu, Taiwan

A5-P16

Embedding Perovskite Nanocrystals into NaNO₃ and PMMA for Enhancement of Stability

Wei-Chung Chen¹, Yuan-Zhi Zhang and Ing-Chi Leu

¹Department of Materials Science, National Univer of Tainan, Tainan, Taiwan

A5-P17

Multicolored Light-Emitting Diodes Based on Composition-Tunable Alloyed Quantum Dots

Shuan Yang¹, Yao-Tang Chang¹, and Hsueh-Shih Chen¹

¹ Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan

Symposium A6

Plasmonics and Metamaterials

November 7-8, 2017

Organizers

Ta-Jen Yen | National Tsing Hua University,
Taiwan

Oral Session

Tuesday, November 7, 2017

Room: 441

Chairperson: Yun-Chorng Chang

11:00-11:25 A6-01 Keynote

Perfect Absorbers Structured by Glancing Angle Deposition - Applications to Sensing, Optical Elements, and Microfluidics

Motofumi Suzuki.

11:25-11:45 A6-02 Invited

Designing and realizing Harry Potter's invisible cloak through dielectric metamaterials

Tsung-Yu Huang¹, Jian-Hui Lin¹, Tung Lee¹, Ta-Jen Yen¹

¹NTHU, Taiwan.

11:45-12:05 A6-03 Invited

Polarization-conversion effect of a gammadion-shaped metasurface

Chu-En Lin¹, Ta-Jen Yen², Chih-Jen Yu³, Cheng-Min Hsieh³, Min-Han Lee², Chii-Chang Chen⁴, Cheng-Wei Chang²

¹Department of Mechanical Engineering, National Chin-Yi University of Technology, ²Department of Material Science and Engineering, National Tsing Hua University, ³Graduate Institute of Electro-Optical Engineering, Chang Gung University, ⁴Department of Optics and Photonics, National Central University.

12:05-12:20 A6-04

Experimentally Demonstrate Topological Phase Transition of One Dimensional Hyperbolic Metamaterial contributing to two-status Surface State in Otto and KR configuration

Ze An Chen¹, Ieng Wai Un¹, Ta Jen Yen¹

¹National Tsing Hua University Department of Materials Science and Engineering.

12:20-12:30 A6-05

Dynamical pixel manipulation of Metasurfaces

Chin-Chien Chung¹, Tsung-Yu Huang¹

¹Department of Materials Science and Engineering, National Tsing Hua University.

Oral Session

Tuesday, November 7, 2017

Room: 441

Chairperson: Yung-Chiang Lan

14:00-14:25 A6-06 Keynote

Surface-enhanced infrared plasmonic sensing for bio and environmental sensing

Tadaaki Nagao

14:25-14:45 A6-07 Invited

Coherent superresolution assisted by surface plasmons but not microlenses

Chih-Wei Chang¹, Pin-Yi Li¹, Shi-Wei Chu²

Wei-Liang Chen

¹Center for Condensed Matter, National Taiwan University, ²Department of Physics, National Taiwan University.

14:45-15:00 A6-08

Manipulating Circular Polarization of Localized Surface Plasmon Resonance in Nanorod Based Metasurface

Hsiang-Ting Lin¹, Chiao-Yun Chang¹, Pi-Ju Cheng¹, Ming-Sheng Lai², Shu-Wei Chang², Pei-Kuen Wei¹, Min-Hsiung Shih³

¹Research Center of Applied Sciences (RCAS), Academia Sinica, ²Research Center of Applied Sciences (RCAS), Academia Sinica / Department of Photonics & Institute of Electro-Optical Engineering, National Chiao Tung University, ³Research Center of Applied Sciences (RCAS), Academia Sinica / Department of Photonics & Institute of Electro-Optical Engineering, National Chiao Tung University / Department of Photonics, National Sun Yat-sen University.

15:00-15:15 A6-09

GaAs-based Electrically Pumped Photonic Crystal Surface Emitting Lasers with ITO as the Top Cladding Layer

Han-Lun Chiu¹, Shen-Che Huang², Kuo-Bin Hong³, Shao-Wun Lan⁴, Tien-Chang Lu⁵.

15:15-15:30 A6-10

Nonlinear scattering of single gold nanoparticle with continuous-wave excitation

I-Cheng Su¹, Shi-Wei Chu¹

¹Department of Physics, National Taiwan University, Taipei, Taiwan.

Oral Session
Tuesday, November 7, 2017
Room: 441
Chairperson: Tsung-Yu Huang

16:30-16:50 A6-11 Invited

Surface plasmon manipulated Smith-Purcell radiation on periodic and chirped gratings

Yung-Chiang Lan¹, Yi-Chieh Lai¹, Bo-Han Cheng¹, Hsin-Yu Kuo¹, Tzu Cheng Kuang¹

¹Department of Photonics, National Cheng Kung University.

16:50-17:10 A6-12 Invited

Fabrication of chiral metamaterials using Nanospherical-Lens Lithography and Hole-Mask Lithography

Chang-Han Wang¹, Jyun-De Wu¹, Chi-Ching Liu¹

Yun-Chorng Chang

¹Academia Sinica.

17:10-17:25 A6-13

Flexible Nano-disk Localized Surface Plasmon Resonance Sensor based on Metal-Insulator-Metal structure

Chiao-Yun Chang¹, Hsiang-Ting Lin¹, Teng-Yi Shieh², Min-Hsiung Shih³

¹Academia Sinica, ²Academia Sinica and National Chiao Tung University, ³Academia Sinica, National Chiao Tung University and National Sun Yat-sen University.

17:25-17:40 A6-14

Rapid Biochemical Mixture Screening by Three-Dimensional Patterned Multifunctional Substrate with Ultra-Thin Layer Chromatography (UTLC) and Surface Enhanced Raman Scattering (SERS)

Bi-Shen Lee,¹ Pi-Chen Lin,¹ Ding-Zheng Lin,² Ta-Jen Yen¹

¹Dept of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan. ²Dept of Material and Chemical Research Laboratories, Industrial technology and research institute (ITRI), Hsinchu, Taiwan.

Poster Session
Wednesday, November 8, 2017
12:00-14:00
Room 401

A6-P01

Smart Radiative cooling based on thermally tunable metasurface

Chih-Ming Wang¹, Sheng-Rui Wu¹, Kuan-Lin Lai¹

¹Department of Opto-electronic Engineering, National Dong Hwa University.

Symposia B

Energy and Environment Materials

Symposium B1

Solar Cells (Organic Solar Cells, Si-based Solar Cells, Perovskite Solar Cells)

Tuesday, November 7, 2017

Organizers

Kung-Hwa Wei	National Chiao Tung University, Taiwan
Chih-Wei	Chu Academia Sinica, Taiwan
Cheng-Si Tsao	Institute of Nuclear Energy Research Atomic Energy Council, Executive Yuan, Taiwan
Song-Yeu Tsai	Industrial Technology Research Institute, Taiwan

Oral Session

Tuesday, November 7, 2017

Room: 535

Chairperson: Hao-Wu Lin

14:00-14:30 B1-01 Keynote

Nickel oxide electrode interlayer in perovskite-based hybrid solar cells

Tzung-Fang Guo¹, Wei-Chih Lai¹, Peter Chen¹

¹Department of Photonics, National Cheng Kung University, Tainan, Taiwan 701.

14:30-14:45 B1-02

Analytical Calculation and Simulation of Short-circuit Current and Series Resistance of Interdigitated Back Contact Silicon Solar Cells

Yin-Wei Peng, Jon-Yiew Gan

Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

14:45-15:00 B1-03

Broadband Light Absorption Enhancement in Structured Silicon

M.Q. Wei¹, F.H. Ko¹, P.H. Tseng¹, B.Y. Chen², Y.S. Lai²

¹ Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan. ² National Nano Device Laboratories, National Applied Research Laboratories, Hsinchu, Taiwan.

15:00-15:15 B1-04

Above 10 % Efficient Earth-abundant Cu₂ZnSn(S,Se)₄ Solar Cells with Introducing Alkali Metal Fluoride Electron-selective Contacts

Cheng-Ying Chen^{1*}, Bandiyah Sri Aprillia^{1,2,3}, Wei-Chao Chen¹, Yen-Ching Teng^{1,3,4}, Chih-Yuan Chiu^{1,3}, Ruei-San Chen², Kuei-Hsien Chen³, Li-Chyong Chen^{1*}

¹Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan. ²Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology, Taipei, Taiwan. ³Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan. ⁴Institute of Optoelectronic Sciences, National Taiwan Ocean University, Keelung, Taiwan.

15:15-15:30 B1-05

Front and rear surface passivation influence on passivated emitter and rear cell

Chao-Cheng Lin¹, Fu-Ming Lin¹, Chorng-Jye Huang¹, Sung-Yu Chen¹, Yu-Hsuan Lin¹

¹Green Energy & Environment Research Laboratories, Industrial Technology Research Institute.

Oral Session

Tuesday, November 7, 2017

Room: 535

Chairperson: Tzung-Fan Guo

16:30-17:00 B1-06 Keynote

One-step sputtering process for high-efficiency Cu(In,Ga)Se₂ thin film solar cells

Chih-Huang Lai¹

¹National Tsing Hua University.

17:00-17:15 B1-07 Invited

Efficient Perovskite Solar Cells Fabricated by All Vacuum Process

Chien-Yu Chen¹, Wei-Lun Tsai¹, Hung-Yu Lin¹, Yang Lin¹, He-Jun Chou¹, Wan-Ju Tsai¹, Hao-Wu Lin¹

¹Department of Materials Science and Engineering, National Tsing Hua University.

17:15-17:30 B1-08 Invited

Temperature dependent aggregation enables efficient fullerene and non-fullerene organic solar cells -- A new path toward next generation organic solar cells

He Yan¹, Jing Liu¹, Shangshang Chen¹

¹Hong Kong University of Science and Technology.

17:30-17:45 B1-09

The effect of Ag-alloying on the material properties of the kesterite ACZTSSe solar cells

Wei-Chih Huang¹, Shih-Yuan Wei¹, Chung-Hao Cai¹, Chih-Huang Lai¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

17:45-18:00 B1-10

Understanding the ALD Virtual Buffer for CIGS Solar Cell with Numerical Simulation

Xu, Wei-lun¹, Huang, Ju-chun², Center for Nano-Science and Technology, University System of Taiwan, Hsinchu, Taiwan³, Department of Materials Science and Engineering, National Tsing Hua University

¹Department of Materials Science and Engineering, National Tsing Hua University, ²Center for Nanotechnology, Materials science, and Microsystem, Hsinchu, National Tsing Hua University, ³Lai, Chih-huang.

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

B1-P01**Characterization of wide-gap Cu(In,Ga)S₂ Films**

Chia-Wen Chang¹, Yung-Tsung Liu¹, Wei-Sheng Lin¹,
Chia-Chun Tai², Jyh-Jier Ho², Bo-Zhang Lai³, Jinn P
Chu³, Tung-Po Hsieh¹, Song-Yeu Tsai¹, Fu-Ming Lin¹

¹Industrial Technology Research Institute
(ITRI), ²National Taiwan Ocean University
(NTOU), ³National Taiwan University of Science and
Technology (NTUST).

B1-P02**Gold nanorods self-assembly by dielectrophoretic and applications in solar cells**

Wen-Hsien Sun¹, Wei-Ling Lin², Tsung-Tso Tsai²,
Fu-Hsiang Ko², Jing-Wen Tang¹, Ching-Chang Lin²
¹ITRI, ²NCTU.

B1-P03**Fabrication and Characteristics of Reduced Lead Perovskite Solar Cells**

Ming-Chung Wu¹, Shun-Hsiang Chan¹, Ying-Han Liao¹,
Wei-Fang Su²
¹Chang Gung University, ²National Taiwan University.

B1-P04**Achieving Efficient and Stable Large-Area ITO-Free Perovskite Solar Cells with Thiol-Functionalized Self-Assembled Monolayers**

Bo-Chou Tsai, Yu-Cheng Hsiao, Chih-Yu Chang
Department of Materials Science and Engineering, Feng
Chia University, Taichung, Taiwan.

B1-P05**Highly-Efficient and Long-Term Stable Perovskite Solar Cells with a Novel Cross-Linkable N-Doped Hybrid Cathode Interfacial Layer**

Yu-Cheng Hsiao, Bo-Chou Tsai, Chih-Yu Chang
Department of Materials Science and Engineering, Feng
Chia University, Taichung, Taiwan.

B1-P06**Preparation and characterization of heterojunction with nano-p-a-Si/p-a-Si/i-a-Si/n-c-Si thin film solar cells**

Lu Huang¹, Qi Jin¹, Xingling Qu¹, Jing Jin¹, Weiguang
Yang¹, Linjun Wang¹, Weimin Shi¹
¹School of Materials Science and Engineering, Shanghai
University.

B1-P07**High efficiency bulk heterojunction perovskite solar cell fabricated from single solvent, one step solution process: film characterization and formation mechanism**

Chun-Yu Chang¹, Chieh-Ping Wang¹, Raja Rathinum²,
Leeyih Wang², Cheng-Si Tsao³, Bo-Ting Li¹, Wei-Fang
Su¹
¹Department of Materials Science and Engineering,
National Taiwan University, Taipei 10617,
Taiwan, ²Center of Condensed Matter Science, National

Taiwan University, Taipei 10617, Taiwan, ³Institute of
Nuclear Energy Research, Taoyuan 32546, Taiwan.

B1-P08**Fabrication of planar all-inorganic perovskite solar cells employing low-temperature solution processed TiO₂**

Yu-Cheng Chen¹, Ing-Chi Leu²
Department of Materials Science, National University of
Tainan, Tainan, ROC.

B1-P09**Earth-abundant Cu₂ZnSn(S,Se)₄ Solar Cells with Efficiency over 9% by Defect-controlled Engineering**

Chih-Yang Huang^{1,2}, Cheng-Ying Chen^{1*}, Wei-Chao
Chen¹, Septia Kholimatussa'diah¹, Kuei-Hsien Chen³
and Li-Chyong Chen^{1*}

¹Center for Condensed Matter Sciences, National
Taiwan University, Taipei, Taiwan. ²Institute of
Optoelectronic Sciences, National Taiwan Ocean
University, Keelung, Taiwan. ³Institute of Atomic and
Molecular Sciences, Academia Sinica, Taipei, Taiwan.

B1-P10**49% Performance Enhancement in Earth-abundant Cu₂ZnSn(S,Se)₄ Solar Cells by Back Contact Engineering**

Naili Saidatin^{1,2}, Cheng-Ying Chen^{1*}, Wei-Chao Chen¹,
Septia Kholimatussa'diah¹, Ruei-San Chen²,
Kuei-Hsien Chen³ and Li-Chyong Chen^{1*}

¹Center for Condensed Matter Sciences, National
Taiwan University, Taipei, Taiwan. ²Graduate Institute
of Applied Science and Technology, National Taiwan
University of Science and Technology, Taipei, Taiwan.
³Institute of Atomic and Molecular Sciences, Academia
Sinica, Taipei, Taiwan.

B1-P11**Earth-abundant Cu₂ZnSn(S,Se)₄ Solar Cells with 9.75% Efficiency via Interface Engineering of CdS/Zn(O,S) Double Buffer Layers**

Yen-Ching Teng^{1,2,3}, Cheng-Ying Chen¹, Wei-Chao
Chen¹, Chih-Yuan Chiu^{1,3}, Jih-Shang Hwang²,
Kuei-Hsien Chen³, and Li-Chyong Chen^{1*}

¹Center for Condensed Matter Sciences, National
Taiwan University, Taipei, Taiwan. ²Institute of
Optoelectronic Sciences, National Taiwan Ocean
University, Keelung, Taiwan. ³Institute of Atomic and
Molecular Sciences, Academia Sinica, Taipei, Taiwan.

B1-P12**The New Package Structure for Solar Cell System**

Meng-hsuan Lin, Shang-Ping Ying
Department of Optoelectronic System Engineering,
Minghsin University of Science & Technology.

B1-P13**Porous scattering layer collocated with atomic layer deposition to improve the performance of dye-sensitized solar cell**

Hsi-Wen Yu, Chun-Pei Cho
Department of Applied Materials and Optoelectronic
Engineering, National Chi Nan University.

B1-P14

Titanium dioxide microspheres with a hierarchical structure applied to dye-sensitized solar cells

Hao-Yu Li, Chun-Pei Cho

Department of Applied Materials and Optoelectronic Engineering, National Chi Nan University.

B1-P15

Improvement of Photo-Stability of Highly Efficient Organic Photovoltaics by Surface Modification of ZnO Nanoparticles

Yun-Ming Sung¹, Ching-Yu Lee¹, Yu-Ching Huang¹, Zheng-Lin Yu¹, Hou-Chin Cha¹, Chia-Te Yen¹, Tsui-Yun Chung¹, Cheng-Yu Chen¹, Zhe-Cheng Hu¹, Cheng-Si Tsao¹

¹Institute of Nuclear Energy Research, Longtan, Taoyuan, 32546, Taiwan.

B1-P16

Towards Highly Efficient Organic Photovoltaics under Indoor Light Illumination

Chia-Te Yen¹, Zhe-Cheng Hu¹, Yu-Ching Huang¹, Zheng-Lin Yu¹, Yun-Ming Sung¹, Hou-Chin Cha¹, Tsui-Yun Chung¹, Cheng-Yu Chen¹, Ching-Yu Lee¹, Cheng-Si Tsao¹

¹Institute of Nuclear Energy Research, Longtan, Taoyuan, 32546, Taiwan.

B1-P17

Roll-to-roll Printing Fabrication Fully-Solution Large-Area Flexible Organic Photovoltaic Modules under Air

Hou-Chin Cha¹, Tsui-Yun Chung¹, Yu-Ching Huang¹, Yun-Ming Sung¹, Chia-Te Yen¹, Zheng-Lin Yu¹, Cheng-Yu Chen¹, Ching-Yu Lee¹, Zhe-Cheng Hu¹, Cheng-Si Tsao¹

¹Institute of Nuclear Energy Research, Longtan, Taoyuan, 32546, Taiwan.

B1-P18

Ni/Cu metallization for front side metallization of silicon solar cells

Shu Huei Hsieh¹, Jhong Min Hsieh², Wen Jauh Chen², Chia-Chih Chuang³

¹Department of Materials Science and Engineering, National Formosa University, ²Graduate School of Materials Science, National Yunlin University of Science and Technology, ³Motech Industries Inc..

B1-P19

High Performance Microwave Driven Plasma Light Source for Solar Simulator Application

Jen-Hung Hsu¹, Hong-Jen Lai¹, Alan Liang²

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan, ²King Design Industrial Co., Ltd, Taipei, Taiwan.

B1-P20

Synthesis and the electric and photovoltaic characterization of Fe-self doped BiFeO₃

Shih Hui, Chen¹, Xiao Ding, Qi¹, Yen wen, Lu¹

¹Department of Materials science and Engineering, National Cheng Kung University.

B1-P21

The Effects of Additional Si on Non-vacuum Printed Cu₂ZnSn(SSe)₄ Thin Films

M.C.Hsieh, H.R.Lin, W.P. Chuang, C.Y.Chiu, B.Y.Chen, L.C.Yang

Department of Materials Science and Green Energy Engineering, National Formosa University, Yunlin, Taiwan.

B1-P22

Si Effects on the Non-vacuum Coated Cu(InGa)Se₂ Thin Films

W.P. Chuang, H.R. Lin, M.C.Hsieh, K.J. Hsiao, B.Y. Chen, L.C. Yang.

Department of Materials Science and Green Energy Engineering, National Formosa University, Yunlin, Taiwan.

B1-P23

Atmospheric pressure plasma surface treatments on fluorine doped tin oxide for perovskite solar cell application

Jui-Hsuan Tsai¹, I-Chun Cheng¹, Cheng-Che Hsu¹, Jian-Zhang Chen¹

¹National Taiwan University.

B1-P24

Enhancement Photoelectric Conversion Efficiency by Charge-Storage Photovoltaic Device

Yu-Ting Su¹, Bo-Wei Chen², Ting-Chang Chang¹, Chao-Cheng Lin³, Sung-Yu Chen³, Chen-Cheng Lin³, Chun-Heng Chen³, Yih-Shing Lee³, Li-Yang Chuang³

¹Department of Physics, National Sun Yat-Sen University, ²Department of Photonics, National Sun Yat-Sen University, ³Silicon Solar Cell Department, Photovoltaic Technology Division Green Energy & Environment Research Laboratories (GEL) Industrial Technology Research Institute (ITRI).

Symposium B2

Photocatalysis and Photosynthesis
(Photocatalytic Water Splitting, Photocatalytic
CO₂ Reduction, Photoelectrochemical Cells,
Solar Fuel Generation, Interfacial Charge
Dynamics)

November 6-8, 2017

Organizers

Yung-Jung Hsu	National Chiao Tung University, Taiwan
Kijung Yong	Pohang University of Science and Technology, Korea
Ken-Ichi Katsumata	Tokyo University of Science, Japan
Kao-Shuo Chang	National Cheng Kung University, Taiwan

Oral Session

Monday, November 6, 2017

Room 614

Chairperson: Yung-Jung Hsu

09:05-09:15 Welcome Remarks

09:15-09:30 B2-01 Invited

Latest Advances in Water Splitting

Lionel Vayssieres¹

¹ International Research Center for Renewable Energy,
School of Energy & Power Engineering, Xian, China.

09:30-09:45 B2-02 Invited

Solution Phase Synthesis of Near-IR-responsive ZnTe-AgInTe₂ Solid Solution Nanocrystals and Their Photoelectrochemical Properties

Tsukasa Torimoto¹, Kouta Sugiura¹, Susumu Kuwabata²,
Tatsuya Kameyama¹

¹Nagoya University, ²Osaka University.

09:45-10:00 B2-03 Invited

Solar hydrogen production from water on high performance photocatalysts

Hiroshi Nishiyama¹, Taro Yamada², Kazunari Domen²

¹ARPCHEM R&D, The University of Tokyo, ²Faculty of
Engineering, The University of Tokyo.

10:00-10:30 B2-04 Keynote

Surface Chemistry Approach to Enhancing Stability of Organo-metal Halide (OMH) Perovskite Quantum Dots (PQDs) and Films for Solar Energy Conversion

Jin Z Zhang¹

¹University of California Santa Cruz.

Oral Session

Monday, November 6, 2017

Room 614

Chairperson: Sue-Min Chang

14:00-14:30 B2-05 Keynote

Interfacial Engineering of Semiconductor Hybrids for Water Oxidation and H₂O₂ Production

Wonyong Choi¹, T.H. Jeon¹, G.-h. Moon¹

¹POSTECH.

14:30-14:45 B2-06 Invited

Combinational Bio-mimicking of Natural Leaf : Regeneration of non-wetting surface by solar water splitting

Kijung Yong¹, Seunghyun Baek¹, Sangkuk Kim¹,
Junghan Lee¹

¹POSTECH.

14:45-15:00 B2-07 Invited

Green Synthesis of Carbon Quantum Dots Embedded onto Titanium Dioxide Nanowires for Enhancing Photocurrent

Kuan-Jiuh Lin¹

¹National Chung Hsing University.

15:00-15:15 B2-08 Invited

Construction of Hierarchical TiO₂ Nanodendrite Array Photoanode for Efficient Photoelectrochemical Water Splitting

Jih-Sheng Yang¹, Jih-Jen Wu¹

¹National Cheng Kung University.

15:15-15:30 B2-09 Invited

Synthesis of Multifunctional Photocatalysts and Their Application on Smart Window

Shu YIN¹, Xiaoyong WU², Yusuke ASAKURA¹,

Kenichi KATSUMATA³, Kazumichi YANAGISAWA⁴

¹IMRAM, Tohoku University, ²Wuhan University of
Technology, ³Tokyo University of Science, ⁴Kochi
University.

Oral Session

Monday, November 6, 2017

Room 614

Chairperson: Kijung Yong

16:30-17:00 B2-10 Keynote

Defect Engineering in 2D Materials towards Highly Efficient Solar-fuel Photo-catalysts for CO₂ Reduction to Selective Hydrocarbons

Li-Chyong Chen¹, He-Yun Du¹, Indrajit Shown²,
Kuei-Hsien Chen²

¹National Taiwan University, ²Academia Sinica.

17:00-17:15 B2-11 Invited

Utilization of carbon source: solar light-driving photoconversion of CO₂ into renewable hydrocarbon fuels

Yong Zhou¹

¹Nanjing University.

17:15-17:30 B2-12 Invited
Semiconductor-based Artificial Photosynthesis, Visible-light-driven Selective CO₂ Reduction through Water Oxidation

Masahiro Miyauchi¹, Ge Yin¹, Hiroshi Sako¹, Shusaku Shoji¹, Akira Yamaguchi¹, Hideki Abe²
¹Tokyo Institute of Technology, ²NIMS.

17:30-17:45 B2-13 Invited
Solution-Processed ZnO Nano-Rod Array and Photocatalytic Properties

N. Matsushita¹, R. Kobayashi¹, H. Wagata², J.S. Hong³, K. Katsumata⁴, T. Kishi¹, T. Yano¹
¹Tokyo Institute of Technology, ²Meiji University, ³Nagoya Institute of Technology, ⁴Tokyo University of Science.

17:45-18:00 B2-14 Invited
Photocatalytic Behavior of W-doped TiO₂ for CO₂ Reduction

Sue-Min Chang¹
¹Institute of Environmental Engineering, National Chiao Tung University

Oral Session

Tuesday, November 7, 2017

Room 614

Chairperson: Chun-Yi Chen

09:00-09:15 B2-15 Invited
Copper-based Catalysts for the Electrochemical Reduction of Carbon Dioxide to C₂-C₃ products

Louisa Ting¹, Boon Siang YEO¹, Solar Energy Research Institute of Singapore, National University of Singapore, 7 Engineering Drive 1, Singapore 117574
¹Department of Chemistry, National University of Singapore, 3 Science Drive 3, Singapore 117543.

09:15-09:30 B2-16 Invited
Harvesting Energy in Electrospun Titania Nanofibers for Photocatalytic Reduction of Carbon Dioxide

Ika Silviana Widiarti¹, Changshu Kuo¹
¹Department of Materials Science and Engineering, National Cheng Kung University.

09:30-09:45 B2-17 Invited
Realizing the Electro(photo)chemical Behavior in Liquid Electrolyte through In situ Methodology

Hao Ming Chen¹
¹National Taiwan university.

09:45-10:00 B2-18 Invited
Materials Design for Solar-Driven Water Splitting

Hui Pan¹
¹Institute of Applied Physics and Materials Engineering, University of Macau.

10:00-10:30 B2-19 Keynote
Near-field dielectric scattering promotes optical absorption by metal nanoparticles for solar energy conversion

Yi-Jun Xu¹
¹State Key Laboratory of Photocatalysis on Energy and

Environment, College of Chemistry, Fuzhou University.

Oral Session

Tuesday, November 7, 2017

Room 614

Chairperson: Ken-ichi Katsumata

14:00-14:30 B2-20 Keynote
New Insights on the Facet-Dependent Photocatalytic Properties of Cu₂O Nanocrystals

Michael H. Huang¹
¹National Tsing Hua University.

14:30-14:45 B2-21 Invited
Anodic Ti-Nb-Ta-Zr-O Nanotubes Array and Its Application for Photoelectrochemical Water Splitting

Chun-Yi Chen¹, Yi-Hsuan Chiu², Tso-Fu Mark Chang³, Yung-Jung Hsu², Mitsuo Niinomi⁴, Nobuhiro Matsushita³, Masato Sone³
¹Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan & CREST, Japan Science and Technology Agency, Yokohama, Japan, ²Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan & Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan, ³Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan & CREST, Japan Science and Technology Agency, Yokohama, Japan & Department of Materials Science and Engineering, Tokyo Institute of Technology, Tokyo, Japan, ⁴Institute for Materials Research, Tohoku University, Sendai, Japan.

14:45-15:00 B2-22 Invited
Recent advance in nitride photocatalyst materials

Tomoaki Watanabe¹
¹Meiji University.

15:00-15:15 B2-23 Invited
Advances of Atomic Layer Deposition in Photoelectrochemical Water Splitting

Liang Li¹
¹Soochow University.

15:15-15:30 B2-24 Invited
Electrochemical and photoelectrochemical water splitting enabled by nanostructured electrodes consisting of earth-abundant element

Lifeng Liu¹, Wei Li¹, Mouli Thalluri¹, Dehua Xiong¹
¹International Iberian Nanotechnology Laboratory.

Oral Session

Tuesday, November 7, 2017

Room 614

Chairperson: Yung-Jung Hsu

16:30-17:00 B2-25 Keynote
Applications of Heterogeneous Fenton Catalysts in Pollutant Degradation, Sensing, and Cancer Cell Treatment

Shih-Yuan Lu¹
¹Dept. of Chemical Engineering, National Tsing Hua

University.

17:00-17:15 B2-26 Invited

Hydrogen production of FeOOH with photo-self-reduction

Ken-ichi Katsumata¹

¹Tokyo University of Science.

17:15-17:30 B2-27 Invited

From 2D inorganic nanosheets to 3D energy-functional nanohybrids

Seong-Ju Hwang¹

¹Dept of Chemistry and Nanoscience, Ewha Womans University.

17:30-17:45 B2-28 Invited

Interfacial Modification of Heterojunction Metal Oxide Photoelectrodes for Efficient Solar Water Splitting

Y.G.Lin¹, Y.C.Lin², Y.H.Chang¹, L.C.Hsu¹, P.Y.Peng¹

¹Scientific Research Division, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, ²Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

17:45-18:00 B2-29

Tin based carbon doped binary chalcogenide nanostructure as a highly efficient photocatalyst for CO₂ reduction solar fuels under visible light

Indrajit Shown¹, Satyanarayana Samireddi², Li-Chyong Chen², Kuei-Hsien Chen³

¹Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan, ²Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan, ³Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 614

Chairperson: Tsukasa Torimoto and Yung-Jung Hsu

09:15-09:30 B2-30

Synthesis of Magneli Phases and Application to the Photoelectrochemical Electrode

Jihwan Park¹, Haneul Yang¹, Soonghyun Hong¹, Nguyen Duc chihn¹, Chunjoong Kim¹, Dojin Kim¹

¹Department of Materials Science and Engineering, Chungnam National University.

09:30-09:45 B2-31

A Combinatorial Study of Density Gradient TiO₂-rGO Nanorod Nanocomposites for Photocatalytic Applications

W.C.Lu¹, K.S.Chang²

¹Department of Materials Science & Engineering, National Cheng Kung University, Tainan, Taiwan, ²Department of Materials Science & Engineering, National Cheng Kung University, Tainan, Taiwan Promotion Center for Global Materials Research (PCGMR), National Cheng Kung University, Tainan, Taiwan.

09:45-10:00 B2-32

Stabilized cuprous oxide for photoelectrochemical reduction of CO₂

Hongkwan Yun¹, Dojin Kim¹, Chunjoong Kim¹

¹Chungnam National University.

10:00-10:15 B2-33

Engineering Surface Structures of Cu₂O-based Photocathode for Efficient Solar Water Splitting

P.Y.Peng¹, Y.G.Lin¹, H.Y.Lee¹, Y.C.Lin², L.C.Hsu¹, Y.H.Chang¹, S.Y.Chen²

¹Scientific Research Division, National Synchrotron Radiation Research Center, ²Dept of Materials Science and Engineering, National Chiao Tung University.

10:15-10:30 B2-34

Electrical Properties of Photocatalytic TiO₂-Y₂O₃ Nanorod Combinatorial Libraries

Neon Vicente Bacarro Rosell III¹, Kao-Shuo Chang¹

¹Department of Materials Science and Engineering, NCKU.

Oral Session

Wednesday, November 8, 2017

Room 614

Chairperson: Yan-Gu Lin and Ying-Chih Pu

14:00-14:15 B2-35 Invited

Synthesis and Characterization of F-doped BiOI as visible-light-driven photocatalyst by sonochemical method

Prakasit Intaphong¹, Anukorn Phuruangrat¹

¹Department of Materials Science and Technology, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90112, Thailand.

14:15-14:30 B2-36 Invited

Spherical graphitic carbon nitride nano-composite with Ag₂ZrO₃ for photodegradation of herbicide MTSM

Tahir Muhmood¹, Mingzhu Xia¹, Wu Lei¹, Fengyun Wang¹

¹School of Chemical Engineering, Nanjing University of Science & Technology, Nanjing, P.R. China.

14:30-14:45 B2-37

Seed Layer Assisted TiO₂ Nanowire for Solar Fuel Generation

Yu-Chun Kuo, Yu-Lin Chen, Ying-Chih Pu

Department of Materials Science, National University of Tainan, Tainan 70005, Taiwan.

14:45-15:00 B2-38

Photocatalytic performance of core-shell heterojunction TiO₂ nanofibers

Yin-Hsuan Chang¹, Kai-Chi Hsiao¹, Ming-Chung Wu¹

¹Chang Gung University.

15:00-15:15 B2-39

Sandwich Nanostructure with Alloy Nanoparticle as Plasmonic Photosensitizer for Solar Hydrogen Application

Yu-Chang Lin¹, Yan-Gu Lin², Liang-Ching Hsu², Po-Yang Peng², Yu-Hsueh Chang², San-Yuan Chen¹

¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan, ²Scientific Research Division, National Synchrotron Radiation Research Center, Hsinchu, Taiwan.

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

B2-P01

Liquid-phase exfoliated WS₂-MoS₂ heterostructure for photocatalytic hydrogen evolution

Guan-Jie Lai¹, Ming-Yen Lu²

Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

B2-P02

The Characterizations and Photochemical Water Splitting of One-dimensional ZnSnO₃ Nanowires

Yu-Ting Chang¹, Yi-Ling Liu¹, Chyi-Ming Leu², Jyh-Ming Wu¹

¹Department of Materials Science and Engineering, National Tsing Hua University, ²Material and Chemical Research Laboratories, Industrial Technology Research Institute.

B2-P03

Synergistic Effect of Hydrogenation and Thiocyanate Treatments on Ag-Loaded TiO₂ Nanoparticles for Hydrogen Evolution

Yan-Gu Lin¹, Liang-Ching Hsu¹, Ming-Chang Lin²

¹National Synchrotron Radiation Research Center, ²National Chiao Tung University.

B2-P04

A Lightweight Flexible Electrode with Graphene Oxide-wrapped Copper Oxide Nanoparticle Catalysts for Efficient Hydrogen Evolution Electrolysis

Chuan-Pei Lee¹, Chi-Ang Tseng², Yu-Ching Chang², Yit-Tsong Chen³

¹Institute of Atomic and Molecular Sciences, Academia Sinica, ²Department of Chemistry, National Taiwan University, ³Institute of Atomic and Molecular Sciences, Academia Sinica & Department of Chemistry, National Taiwan University.

B2-P05

One-step Synthesis of Nanostructured Cu₂ZnSnS₄ Photocathode for Photoelectrochemical Hydrogen Generation

Chin Hsu¹, Yi-Hsuan Lai¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-sen University.

B2-P06

Structural and Photocatalytic Properties of TiO₂ Prepared by Dip-coating and Hydrothermal Method

Yuan-Cheng Luo, Zhen-Yu Lin, Kun-Dar Li

Department of Materials Science, National University of Tainan, Tainan, Taiwan.

B2-P07

Atmospheric-pressure-plasma-jet processed Pt/ZnO composite counter electrodes for dye-sensitized solar cells

Chia-Chun Lee¹, I-Chun Cheng¹, Cheng-Che Hsu¹, Jian-Zhang Chen¹

¹National Taiwan University.

B2-P08

Enhancement of visible light photocatalytic property of reduced graphene oxide-decorated ZnO hybrid-nanostructures

Chih-Chiang Wang¹, Ya-Chyi Chen¹, Fuh-Sheng Shieu¹, Han C. Shih²

¹National Chung Hsing University, ²Chinese Culture University.

B2-P09

Improving the Hydrogen Production in Water Splitting by a Simple Hot-press Process and Spontaneous Spatial Charge Separation Effect

Wei-Hsuan Hung, Chien-Jung Peng, Kun-Lin Yang, Sz-Nian Lai, Chin-Ru Yang

Department of Materials Science and Engineering, Feng Chia University, Taichung, Taiwan.

B2-P10

Enhancement of Photocatalytic Activity of TiO₂ by Ag Nanoparticles Underneath

Yueh-Ching Chung¹, Yu-Ting Huang¹, Chung-Chi Chen¹, Shyankay Jou¹

¹Dept of Materials Science and Engineering, National Taiwan University of Science and Technology.

B2-P11

Photo-illumination Enhancement on Gold Nano-particles Assisted Chemical Etching of Silicon

Yung-Sheng Lin¹, Chou-Pu Lai¹, Nien-Nan Chu², Chun-Ting Lin², Yi-Mei Lin², Ming-Hua Shiao²

¹Department of Chemical Engineering, National United University, ²Instrument Technology Research Center, National Applied Research Laboratories.

B2-P12

Visible Light-enhanced MOR of Au DNFs with TiN Layer

Yung-Sheng Lin¹, Pin-Hsi Chen¹, Chun-Ting Lin², Bo-Huei Liao², Nien-Nan Chu², Ming-Hua Shiao²

¹Department of Chemical Engineering, National United University, ²Instrument Technology Research Center, National Applied Research Laboratories.

B2-P13

Preparation of visible-light-driven Br-doped Bi₂WO₆ photocatalyst by hydrothermal method

Anukorn Phuruangrat¹

¹ Department of Materials Science and Technology, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90112, Thailand.

Symposium B3

Energy Conversion and Storage
(Electrochemical Batteries, Supercapacitors,
Thermoelectrics)

November 7-8, 2017

Organizers

Chun-Hua Chen	National Chiao Tung University, Taiwan
Jenq-Gong Duh	National Tsing Hua University, Taiwan
Chien-Neng Liao	National Tsing Hua University, Taiwan
Kuei-Hsien Chen	IAMS, Academia Sinica, Taiwan
Pu-Wei Wu	National Chiao Tung University, Taiwan
Po-Chun Chen	National Taipei University of Technology

Oral Session

Tuesday, November 7, 2017

Room 402c

Chairperson: Chien-Neng Liao

09:00-09:25 B3-01 Keynote

**Enhancing Thermoelectric Properties through
Controlling Heterophase and Modulating Crystal
Structure**

M. W. Oh¹, J. K. Lee², B. Ryu³, J. E. Lee³, B. S. Kim³, B.
K. Min³, S. J. Joo³, H. W. Lee³, S. D. Park³

¹Department of Materials Science and Engineering,
Hanbat National University, Daejeon 34158,
Korea, ²Institute for Metallic Materials, Leibniz Institute
for Solid State and Materials Research, Dresden, 01069,
Germany, ³Thermoelectric Conversion Research Center,
Korea Electrotechnology Research Institute, Changwon,
51543, Korea.

09:25-9:50 B3-02 Keynote

**GeSbTe Thin Film for Ultra High Thermoelectric
Performance**

Kuei-Hsien Chen¹, Deniz P. Wong¹, Tse-Hsien Shen¹,
Kuei-Kuan Wu¹, Li-Chyong Chen²

¹Institute of Atomic and Molecular Sciences, Academia
Sinica, Taipei, Taiwan, ²Center for Condensed Matter
Sciences, National Taiwan University, Taipei, Taiwan.

09:50-10:10 B3-03 Invited

**Effective Medium Approximation Model for
Thermal Conductivity of Nanocomposites**

M.J. Huang, C.P. Chuang, Y.C. Hou
Dept of Mechanical Engineering, National Taiwan
University, Taipei, Taiwan.

10:10-10:30 B3-04 Invited

**Low Temperature Thermoelectric Properties of
Cubic Ge₂Sb₂Te₅ Bulk Material**

Atsuko Kosuga¹

¹Department of Physical Science, Graduate School of
Science, Osaka Prefecture University.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Oral Session

Tuesday, November 7, 2017

Room 402c

Chairperson: Pu-Wei Wu

14:00-14:25 B3-05 Keynote

**Photocathodes for Photoelectrochemical Hydrogen
Evolution Using Heterostructure of Si and CoM₂ (M
= Se or S)**

Ru-Shi Liu¹ and Shu-Fen Hu²

¹Department of Chemistry, National Taiwan University,
Taipei, Taiwan. ²Department of Physics, National
Taiwan Normal University, Taipei, Taiwan.

14:25-14:50 B3-06 Keynote

**MoS₂-based Nanocomposites for Use as electrode
material of Supercapacitor**

Fitri Nur Indah Sari¹, Jyh-Ming Ting¹

¹Dept of Materials Science and Engineering, National
Cheng Kung University, Tainan, Taiwan.

14:50-15:10 B3-07 Invited

**Improving effects of poly (vinyl pyrrolidone)
addition on Pt/copper phosphate hydroxide/carbon
black bifunctional catalysts for fuel cells**

Shiow-Kang Yen¹, Jian-hong Lin²

¹Department of Materials Science and Engineering,
National Chung Hsing University, Taiwan.

15:10-15:30 B3-08 Invited

**Li-Ion Exchanged Sodium Vanadium
Fluorophosphate for High-power Battery Cathode
Materials**

Chun-Han (Matt) Lai¹, Ryan DeBlock¹, Qiulong
Wei^{1,2}, Liqiang Mai², and Bruce Dunn¹

¹Materials Science and Engineering, University of
California Los Angeles, Los Angeles, California, 90095,
USA, ²State Key Laboratory of Advanced Technology
for Materials Synthesis and Processing, School of
Materials Science and Engineering, Wuhan University
of Technology, Wuhan 430070, China.

15:30-16:30 Coffee break & poster

Oral Session

Tuesday, November 7, 2017

Room 402c

Chairperson: Chun-Hua Chen

16:30-16:55 B3-09 Keynote

**Development of Thermoelectric Borides, Sulfides,
Oxides, Nitrides, and Mixed Anion Compounds**

Takao Mori¹

¹International Center for Materials Nanoarchitectonics,
National Institute for Materials Science (NIMS),
Tsukuba, Japan.

16:55-17:20 B3-10 Keynote

Effect of current-induced Sb nanoprecipitates on electrical and thermal transport properties of $\text{Bi}_{0.4}\text{Sb}_{1.6}\text{Te}_3$ compounds

Yao-Hsiang Chen¹, Chien-Neng Liao¹, Hsu-Shen Chu²

¹Dept of Materials Science and Engineering, National Tsing Hua University, ²Material and Chemical Research Laboratories, Industrial Technology Research Institute.

17:20-17:40 B3-11 Invited

The past and the future of thermoelectric materials and their applications

Y. Y. Chen¹, C.L. Chen¹

¹Institute of Physics, Academia Sinica, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 402c

Chairperson: Po-Chun Chen

09:00-09:25 B3-12 Keynote

TiO₂ Supported Pt Nanocatalysts for Oxygen Reduction Reaction

M. C. Tsai¹, W. N. Su², B. J. Shieh¹, B. J. Hwang^{1,3}

¹Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan

²Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology, Taipei, Taiwan ³National Synchrotron Radiation Research Center, Hsinchu, Taiwan

09:25-09:45 B3-13 Invited

Formation of Carbon-nanocapsule@MnO₂ Core-shell Material for Zinc-air Battery Application

Y.Y. Li¹

¹Dept of Chemical Engineering, National Chung Cheng University.

09:45-10:05 B3-14 Invited

Dispersity of LiFePO₄ in the Water-based Electrode Slurries

C.C. Li¹, S.J. Chang², C.S. Tuan², and F.-Y. Tsai¹

¹Institute of Materials Science and Engineering, and Department of Materials & Mineral Resources Engineering, National Taipei University of Technology, Taipei 10608, Taiwan, ²Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu 30011, Taiwan.

10:05-10:25 B3-15

A Mo-V-mixed Polyoxometalate as Electrode Material for Lithium-ion and Sodium-ion Batteries

Chi-Ting Hsu¹, Shao-Chu Huang¹, Chia-Chin Lin¹, Han Yi Chen¹

¹Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Oral Session

Wednesday, November 8, 2017

Room 402c

Chairperson: Chia-Chen Li

14:00-14:20 B3-16 Invited

Activity and Stability of Pt Alloys in Oxygen Reduction Reaction

Jeng-Han Wang¹, Kuan-Wen Wang²

¹Department of Chemistry, National Taiwan Normal University, ²Institute of Materials Science and Engineering, National Central University.

14:20-14:40 B3-17 Invited

Effect of doped metal on ionic conductivity of

$\text{Bi}_{0.77}\text{Ta}_{0.23-x}\text{M}_x\text{O}_{1.73-\delta}$ (M = Mg, Sm, Eu, Zr)

Chi-Shen Lee¹, Chia-Kan Hao¹, Wan-Hsin Huang¹

¹Department of Applied Chemistry, National Chiao Tung University.

14:40-15:00 B3-18 Invited

Structure Dependence on Reduction Stability of Inorganic Ionic Conductors against Metallic Li

K.Z. Fung, S.Y. Tsai, and D.B. Su

Dept of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

15:00-15:20 B3-19

The characteristics of 5 V $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ positive electrodes for lithium-ion batteries

Cheng Zhang Lu, Chi-Hsun Tsai¹, Shih-Chieh Liao¹, Jin-Ming Chen¹, Jui-Hsiung Huang², Wei Kong Pang³, Vanessa K. Peterson³

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Taiwan, ²Chinese Petroleum Corporation, Taipei, Taiwan, ³Australian Nuclear Science and Technology Organization, Australia.

15:30-16:30 Coffee break & poster

Oral Session

Wednesday, November 8, 2017

Room 402c

Chairperson: Chun-Hua Chen

16:30-16:50 B3-20 Invited

Thermoelectric properties of hot-forged materials and durability of modules

Ryoji Funahashi¹

¹Inorganic Functional Material Research Institute, National Institute of Advanced Industrial Science & Technology, Osaka, Japan.

16:50-17:10 B3-21 Invited

Engineering thermoelectric materials: their high zT values, microstructures and related phase equilibria

Hsin-jay Wu¹

¹Department of Materials and Optoelectronic science, National Sun Yat-sen University.

17:10-17:30 B3-22 Invited**Synthesis of Large-Area Inverse Opaline Structures for Energy-related technologies**Pu-Wei Wu¹¹ Department of Material Science and Engineering, National Chiao Tung University.**17:30-17:50 B3-23****Super-insulation Materials with Comparable Thermal Insulation Performance to Vacuum Insulation Panels for Use in Thermal Management Applications**Rudder T. WU¹, Takao MORI¹¹Thermal Energy Materials Group, National Institute for Materials Science, Tsukuba, Japan.**17:50-18:10 B3-24****Sustainable energy materials as aids to power generation**

M.K. Banerjee, K. Sachdev

Materials Research Centre, MNIT Jaipur-302017, Rajasthan, India.

Poster Session

Wednesday, November 8, 2017

12:00-14:00

Room 401

B3-P01**Hydrothermal synthesis of hexagonal WO₃ nanowires with high aspect ratio and their electrochemical properties for lithium-ion batteries**Anukorn Phuruangrat¹¹Prince of Songkla University.**B3-P02****Structure and Electrochemical Performance of LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ Cathodes by the Coprecipitation Method**Hsiu-Fen Lin¹, Han-Lin Guo¹, Sheng-Chieh Hsiao¹¹National Formosa University.**B3-P03****High Performance Silicon/ Graphene Nanocomposites Anode Material for Lithium-ion Batteries**Chun-Yu Chen¹, C.C.Wu¹, C.L.Chang¹¹NCSIST.**B3-P04****Enhancing the high-rate discharge performance through incorporating the silica in lead-acid battery**Kuan-Chen Kung¹, Hsiao-Han Huang¹, Yen-Ting Liu¹, Fu-Lu Huang¹, James Wei¹¹R&D Deapartment, Hitachi Chemical Energy Technology Co., Ltd..**B3-P05****The grown morphologies of ZnO nanowire array catalyzed from Au nucleation sites by hydrothermal method**C-W Lin¹, P-K Chiu², C-T Yang³, D-R Huang¹, D. Chiang²¹National Chiao Tung University, ²National Applied Research Laboratories, ³Industrial Technology Research

Institute.

B3-P06**Enhanced cycling stability of SiOx/Si/nickel foam thin film anodes for lithium ion batteries**K.-F. Chiu¹, K.-C. Li¹¹Department of Materials Science and Engineering, Feng-Chia University.**B3-P07****Novel Fe₂P@Carbon Nanotube modified with MOF as a superior material for highly activity of oxygen reduction reaction in alkaline media**Cheng-Hao Wu¹, Chia-Chi Liu¹, Chen-Hao Wang¹, Hsin-Chih Huang¹, Sun-Tang Chang²¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, ²National Synchrotron Radiation Research Center, Hsinchu, Taiwan.**B3-P08****Stoichiometry Dependence of the Electrochemical Behavior of Silicon Oxide Thin Film as Anode Materials for Lithium Ion Battery**C. H. Hsu¹, C. J. Tsai¹¹National Tsing-Hua University, Department of Material Science and Engineering.**B3-P09****Effects of adding various Te compounds on thermoelectric properties of Higher Manganese Silicides**Jhi-Jhong Lin¹, Yu-Chen Cheng¹, Chien-Hsuan Yeh¹, Yu-Li Lin¹¹Green Energy and Environment Research Laboratories, Industrial Technology Research Institute, Hsinchu city, Taiwan, R.O.C..**B3-P10****Effects of Europium and Yttrium Doping on the Electric and Thermoelectric Properties of LaNiO₃**Wei-Yang Huang¹, Shih-Zong Lu¹¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan City 70101, Taiwan.**B3-P11****Performance and Durability Evaluation of the Anode-Supported Solid Oxide Fuel Cell after Thermal Cycling Operations**Jing-Kai Lin¹, Tai-Nan Lin¹, Hong-Yi Kuo¹, Chun-Yen Yeh¹, Wei-Xin Kao¹, Szu-Han Wu¹, Wei-Hong Shiu¹, Yu-Ming Chen¹, Ming-Wei Liao¹, Hung-Hsiang Lin¹, Min-Fang Han¹, Huan-Chan Ting¹, Yung-Neng Cheng¹, Ruey-Yi Lee¹¹Institute of Nuclear Energy Research.**B3-P12****High Efficiency of CO₂-activated Graphite Felt as Electrode for Vanadium Redox Flow Battery Application**Guan-Yi Lin¹, Jian-Yu Chen¹, Yu-Chung Chang¹, Daniel Manaye Kabtamu¹, Ning-Yih Hsu², Yi-Hsin Chou², Hwa-Jou Wei², Chen-Hao Wang¹¹Department of Materials Science and Engineering,

National Taiwan University of Science and Technology, ²Institute of Nuclear Energy Research, Atomic Energy Council, Executive Yuan.

B3-P13

SURFACE MODIFICATIONS OF CARBON MATERIALS FOR THE FABRICATION OF LEAD-CARBON OHMIC CONTACTS

Shu-huei Hsieh¹, Yi-Ren Tzeng², Ya-Wun Jan³, Yi-Cheng Su¹, Hao-Wei Huang¹

¹National Formosa University, ²Division of Nuclear Fuels and Materials, Institute of Nuclear Energy Research, Taiwan, ³Innolux Corporation, Taiwan.

B3-P14

The N-doped graphene for supercapacitor electrode material

W.C. Hung¹, C.L.Chang¹, Y.C.Hung¹, N.T.Wen¹

¹Chemical System Research Division, National Chung-Shan Institute of Science and Technology, Taiwan.

B3-P15

Enhancement of thermoelectric properties of mechanically alloyed Bi_{0.4}Sb_{1.6}Te₃ nanocomposites by addition of γ -Al₂O₃ particles

Pei-Hao Lin¹, Pee-Yew Lee¹

¹Nation Taiwan Ocean University.

B3-P16

Study of Conductive Carbon Dispersions on Lithium Ion Battery's mixing process and discharge performance

Tsai Ching Lung¹, Jiunn-Nan Lin¹, Li-Duan Tsai¹

¹Industrial Technology Research Institute.

B3-P17

Application of atmospheric-pressure-plasma-jet processed carbon cloth to polyaniline/reduce-graphene-oxide quasi-solid-state gel-electrolyte supercapacitor

Hung-Hua Chien¹, I-Chun Cheng¹, Cheng-Che Hsu¹, Jian-Zhang Chen¹

¹National Taiwan University.

B3-P18

The effect of different NiO ratios on the hydrogen electrode properties of proton-conducting solid oxide electrolyzer cells (P-SOECs)

Sin-Mao Song¹, Kai-Ti Hsu¹, Jason Shian-Ching Jang¹, Sheng-Wei Lee¹

¹Institute of Materials Science and Engineering, National Central University, Taoyuan 32001, Taiwan, ROC.

B3-P19

Electrospun Fe-N/C composite electrodes for Li-O₂ batteries

Yung-Hao Tsou, Tzu-Ching Hsieh, Yung-Hsiang Yen, Jia-Hao Kang, Wan-Jung Tu, Jenn-Shing Chen
Department of Applied Chemistry, National University of Kaohsiung, Kaohsiung City, Taiwan, R.O.C..

B3-P20

Iron phthalocyanine supported by N-doped graphene aerogels as cathode materials for Li-O₂ batteries

Tzu-Ching Hsieh, Yung-Hao Tsou, Yung-Hsiang Yen, Jia-Hao Kang¹, Wan-Jung Tu, Jenn-Shing Chen
Department of Applied Chemistry, National University of Kaohsiung, Kaohsiung City, Taiwan, R.O.C..

B3-P21

Formation of pitch-based carbon microspheres and nanospheres by electrospray technique for anode materials of lithium-ion battery

C.Y. Chen¹, C. Chirapornchai¹, A.H. Liang¹, C.S. Liu¹, Y.Y. Li¹

¹National Chung Cheng University.

B3-P22

Characteristics of Mn-Co and Ni-Co Metal Powders Mixed with Oxides as Cathode Contact Materials in SOFC

Wei-Ja Shong¹, Chien-Kuo Liu¹, Ruey-Yi Lee¹

¹Institute of Nuclear Energy Research.

B3-P23

Anode cermet composition modification to enhance the solid oxide fuel cell substrate strength and output power density

Hong-Yi Kuo¹, Tai-Nan Lin¹, Ming-Wei Liao¹, Yu-Ming Chen¹, Chun-Yen Yeh¹, Wei-Xin Kao¹

¹institute of nuclear research.

B3-P24

Synthesis of Ruddlesden-Popper (Sr_{1-x}La_x)₃(Mg_{1/3+x/2}Nb_{2/3-x/2})₂O₇ Powder via Glycine Nitrate Combustion Process

Yu-Ming Chen¹, Tai-Nan Lin¹, Ming-Wei Liao¹, Hong-Yi Kuo¹, Chun-Yen Yeh¹, Wei-Xin Kao¹

¹institute of nuclear energy research.

B3-P25

Porous Ni_xCo_{1-x}(OH)₂ Nanosheets Coated on ZnO Nanowires Grown on Carbon Fiber for Supercapacitor Applications

Chieh-Li Yu¹, Jin-Hua Huang

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

B3-P26

Effect of annealing temperature on the piezoelectric properties of ZnO thin films prepared by sol-gel hydrothermal method

Hong-Zong Tsai, Kun-Mao Huang, Kun-Dar Li

Department of Materials Science, National University of Tainan, Tainan, Taiwan.

B3-P27

Synthesis of manganese dioxide nanowires as cathode materials for zinc air battery

Y.C. Luo¹, H.S. Shiu¹, B.Y. Chen¹, C.Y. Chiu¹, Y.Y. Li¹

¹National Chung Cheng University.

B3-P28

Double Positive Temperature Coefficient Effects of a Composite Thermal-Sensitive Layer for the Application of a Safer Lithium Battery

T.C.CHOU¹, G.L.LAI¹, M.Y.LU¹, D.J.LIU¹, T.Y.LIU¹, K.C.CHIU¹

¹Industrial Technology Research Institute,.

Taiwan, ²Chinese Petroleum Corporation, Taipei, Taiwan.

B3-P29

Lithium ion behavior in NASICON-type $\text{Li}_{1.3}\text{Al}_{0.3}\text{Ti}_{1.7}(\text{PO}_4)_3$ solid electrolyte

Bing-Han Wu¹, Kung-Ting Chen¹, Bernard Haochih Liu¹, Yi-Hung Liu²

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan, ²Department of Greenergy, National University of Tainan, Tainan, Taiwan.

B3-P30

Effects of Temperature and Pressure on De-/Re-hydrogenation Behavior of Lithium Alanate mixed with Magnesium Hydride.

I-Chun Lin¹, Wen-Ta Tsai¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

B3-P31

A Novel Method for Generating Hydrogen by Aluminum

Cheng-Chuan Wang¹, Ya-Ching Chou¹, Chia-Ying Yen¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute.

B3-P32

Investigation of Vanadium-based Polyoxometalates as Anode Materials for Sodium-ion Batteries

Chia-Chin Lin¹, Wei-Hsiang Lin¹, Shao-Chu Huang¹, Chi-Ting Hsu¹

¹National Tsing Hua University Department of Materials Science and Engineering.

B3-P33

Amorphous Carbon for High Power Lithium Ion Battery Application

Hung-Chun Wu¹, Li-Lun Liu², Ching-Yi Su³, Yu-Hun Lin³, Kao-Hung Yeh², Sheng-Wei Kuo², Yu-Cjim Shieh²

¹Research Supervisor, ²Research Associate Engineer, ³Associate Researcher.

B3-P34

Anisotropy of Seebeck Coefficient in Si/Ge Composite Quantum Dots

Cheng-Lun Hsin¹, Sheng-Wei Lee²

¹Department of Electrical Engineering, National Central University, Taoyuan, Taiwan, ²Institute of Materials Science and Engineering, National Central University, Taoyuan, Taiwan 32001.

B3-P35

High-voltage Lithium Titanate Batteries

Chia-Ming Chang¹, Shih-Chieh Liao¹, Cheng-Zhang Lu¹, Guan-Yu Ko¹, Ting-Ju Yeh¹, Chia-Erh Liu¹, Jin-Ming Chen¹, Jui-Hsiung Huang²

¹Industrial Technology Research Institute, Hsinchu,

B3-P36

Electrical Performance of Hydrothermal Synthesized VO_x and V_2O_5 for Magnesium Ion Battery

W. X. Lin¹, S. Y. Guo¹, J. K. Chen¹

¹Institute of Materials Science and Engineering, National Taipei University of Technology.

B3-P37

Studying on the High Conductivity of Organic Solid State Electrolyte in LNMO/LTO Lithium ion battery

S.C.Liao¹, J.M.Chen¹, C.Z.Lu¹

¹Industrial Technology Research Institute.

B3-P38

Development of Ionic Conductor network with Continuous Phase Applied in Lithium Ion Batteries

Yu-Han Li¹, Guan-Lin Lai¹, Chen-Chung Chen¹,

Jung-Mu Hsu¹, Chang-Rung, Yang¹

¹Industrial Technology Research Institute.

B3-P39

Hybrid solid state battery

Chih-Ching Chang¹, Chung-Hsiang Chao¹, Chun-Lung Li¹, Chia-Chen Fang¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute.

B3-P40

The study on dehydrogenation of metal-organic framework with amine-borane group

Chi-Wei Liao¹, Jing-Yang Chung¹, Yi-Wei Chang², Bor Kae Chang², Cheng-Yu Wang³

¹Feng Chia University, ²National Central University, ³National Chiao Tung University.

B3-P41

The effect of metal-organic framework porosity to hydrogen generation of ammonia borane via nanoconfinement

Jing-Yang Chung¹, Chi-Wei Liao¹, Jing Li², Bor Kae Chang³, Cheng-Yu Wang⁴

¹Feng Chia University, ²Rutgers University, ³National Central University, ⁴National Chiao Tung University.

B3-P42

Looking into the effect of secondary phases in the thermoelectric properties of skutterudite Co-Ge-Te thin films

Deniz Wong¹, Tzu-Hsien Shen¹, Yi-Ren Liu²,

Kuei-Kuan Wu¹, Li-Chyong Chen², Kuei-Hsien Chen¹

¹Academia Sinica, ²National Taiwan University.

B3-P43

Preparation of Cr-doped lithium-rich layered oxides with enhanced electrochemical performances

Chih-Chieh Wang¹, Kuo-Feng Chiu², Yi-Chen Lin³

¹chihcwang@fcu.edu.tw, ²kfchiu@fcu.edu.tw, ³kiwistor79@gmail.com.

B3-P44

High Performance Supercapacitor Electrode Material Based on Homogeneous Ni(OH)₂ on Reduced Graphene Decorated with Ag Nanoparticles

Jui-Hsiung Huang¹, Chiu-Ping Li¹

¹Green Technology Research Institute, CPC Corporation.

B3-P45

Transesterification of Glycerol and Dimethyl Carbonate into Glycerol Carbonate over KNO₃/CaO Catalyst

C.Y. Tang, C.L. Chiang, S.H. Yu, K.S. Lin
Dept of Chemical Engineering and Materials
Science/Environmental Technology Research Center,
Yuan Ze University, Taoyuan, Taiwan.

B3-P46

Development of rock-salt structured for high energy density lithium-ion batteries

Soonhyun Hong¹, dojin Kim¹, Chunjoong Kim¹

¹Chungnam national university.

B3-P47

Thermoelectric Cu/Sb₂Se₃ nanocomposites

Yi-Syuan Chen¹, Po-Hung Chen¹, Tsung-Han Chen¹,
Chun-Hua Chen¹

¹Department of Materials Science and Engineering,
National Chiao Tung University, Hsinchu, Taiwan.

B3-P48

Power Generating Prototype Systems by Integration of Hydrogen Storage Mg-based Canisters with Fuel Cells

Chia-Chieh Shen¹, Nian-Shun Zhuang¹, Syuan-Yi Liao¹

¹Yuan Ze University.

B3-P49

Magnetocaloric effects of Gd-Co-based amorphous and nanocrystalline alloys

Yeabin Moon¹, Sung Hwan Hong¹, Young Seok Kim¹,
Hae Jin Park¹, Sang Chul Mun¹, Ki Buem Kim¹

¹Department of Nanotechnology and Advanced
materials Engineering, Sejong University.

B3-P50

Study of 30% CaO-70% B₂O₃ as simulant material for Nuclear Reactor Severe Accidents

R. K. Duchaniya¹, Shrikant¹, S. K. Jata¹, U. Pandel¹,
Parimal P. Kulkarni², A.K. Nayak²

¹Department of Metallurgical & Materials Engineering,
Malaviya National Institute of Technology Jaipur,
Rajasthan 302017, India, ²Reactor Engineering Division,
Bhabha Atomic Research Centre, Trombay, Mumbai
400085, India.

B3-P51

Microwave-assisted Synthesis of Pt-Ni/Graphene Electrode Materials for Direct Methanol Fuel Cell

Kun-Yauh Shih¹, Yu-I Wu¹, Tzu-Chieh Huang¹, Yi-Xin Lin¹,
Cheng-Ling Huang¹, Chun-Rong Lin¹, Yaw-Teng Tseng¹

¹National Pingtung University.

B3-P52

Energy Storage Applications of a Core-shell Multi-walled Carbon Nanotube@Graphene Oxide Nanoribbon

Kun-Ju Tsai¹, Chia-Liang Sun², Han-Yi Chen¹

¹Department of Material Science and Engineering,
National Tsing Hua University, Hsinchu,
Taiwan, ²Department of Chemical and Materials
Engineering, Chang Gung University, Taoyuan, Taiwan.

B3-P53

Application of Activated Graphene to Organic Electrolyte Supercapacitors

Jeng-Shian Yu¹, Guan-Min Wu², Nen-Wen Pu²,
Yih-Ming Liu¹, Tsai-Yi Cheng², Liyao Wang²,
Ming-Der Ger¹

¹Department of Chemical & Materials Engineering,
Chung Cheng Institute of Technology, National Defense
University, ²Department of Photonics Engineering,
Yuan Ze University.

Symposium B4

Bio-based Fuel and Chemical

Wednesday, November 8, 2017

Organizers

Claire R. Shen	National Tsing Hua University, Taiwan
Guang-Way Jang	Industrial Technology Research Institute, Taiwan

Oral Session

Wednesday, November 8, 2017

Room 504c

Chairperson: Claire R. Shen and Guang-Way Jang

14:00 B4-01 Keynote

Development and commercialization of lignocellulose-based biorefinery technology in Asia

Guo, Gia-Luen¹, Chen, Wen-Hua¹, Yen, Fong-Yu¹, Huang, Wen-Song², National Chiao Tung University

¹Chemistry Division, Institute of Nuclear Energy Research, ²Chemistry Division, Institute of Nuclear Energy Research.

14:20 B4-02 Invited

Engineering cyanobacteria for the synthesis of n-butanol and related compounds from CO₂

Ethan I Lan¹

¹National Chiao Tung University.

14:40 B4-03 Invited

Towards low carbon emission fermentation through mixotrophic Escherichia coli

Si-Yu Li¹

¹National Chung Hsing University.

15:00 B4-04 Invited

Bioconversion of 5-hydroxymethylfurfural to furan-2,5-dicarboxylic acid by engineered Pseudomonas putida

Shen-Long Tsai¹

¹National Taiwan University of Science and Technology.

15:20 B4-05 Invited

Self-regulated 1-butanol production in Escherichia coli based on the endogenous control of fermentative reactions

Claire R. Shen¹, Rex C. Wen¹

¹National Tsing Hua University.

Poster Session

Wednesday, November 8, 2017

12:00-14:00

Room 401

B4-P01

Mobile wastewater treatment vehicle using microbial fuel cell and solar energy

C.H.Lay¹, S.R.Tsai², T.H.Jiang³

Dept of Materials Science and Engineering, Private Feng Chia University, Taichung, Taiwan.

B4-P02

Effect of different kinds of calcium alkoxide for transesterification of soybean oil

Ching-Yu Lee¹, Wen-Dung Hsu¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Taiwan.

Symposia C

Bio-Materials

Symposium C1

Biomimetic Materials: Characterization, Chemistry and Self-Assembly

November 6-7, 2017

Organizers

Po-Yu Chen	National Tsing Hua University, Taiwan
Shiao-Wei Kuo	National Sun Yat-sen University, Taiwan

Oral Session

Monday, November 6, 2017

Room 403

Chairperson: Po-Yu Chen and Shiao-Wei Kuo

16:55-17:15 C1-01 Invited

From Au- to Cu-based Bimetallic Nanocatalysts toward Energy Conversion

*Chun-Hong Kuo^{1,2}, Yu-Chun Chuang³, David A. Cullen⁴, and Brian T. Sneed⁵

¹Institute of Chemistry, Academia Sinica, Taipei, Taiwan.

²Institute of Materials Science and Engineering, National Central University, Jhongli, Taiwan.

³National Synchrotron Radiation Research Center, Hsinchu, Taiwan.

⁴Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee, United States.

⁵Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee, United States.

Oral Session

Tuesday, November 7, 2017

Room: 404

Chairperson: Po-Yu Chen and Shiao-Wei Kuo

14:00-14:30 C1-02 Keynote

Inductive study of mechanics from biomaterials and structures: Observation, interpretation and application

Haimin Yao¹

¹The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong.

14:30-14:55 C1-03 Invited

Biomimetic Engineering for Functional Surfaces

Yi-Chang Chung^{1,2}

¹Dept of Chemical and Materials Engineering, National University of Kaohsiung, Kaohsiung, Taiwan. ²Research Center of Biomimetics and Medicare Technology, National University of Kaohsiung, Kaohsiung, Taiwan.

14:55-15:10 C1-04

Synthesis of Superwetable Smart Surfaces Inspired from Nepenthes

Po-Yu Chen¹, Zheng-Jun Shih¹, Yu-Min Lin¹, Po-Yi Chen¹, Jenq-Gong Duh¹

¹National Tsing Hua University.

15:10-15:25 C1-05

The Mechanical Properties of Liquidambar Formosana Fruit Under Compression and Humidity Change

Cheng-Che Tung¹, Hsin-Juei Wang¹, Chi-Huan Tung¹, Po-Yu Chen¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room: 404

Chairperson: Po-Yu Chen and Shiao-Wei Kuo

16:30-17:00 C1-06 Keynote

Micro/nano-architecture assisted electrochemistry on electrode materials bioinspired by butterfly wings

Tongxiang Fan¹, Xingmei Guo²

¹Shanghai Jiaotong University, ²Jiangsu University of Science and Technology.

17:00-17:25 C1-07 Invited

Studies on the Self-assembled Fabrication on Water/air Interface, Functionalization and Properties of Macroscopic Carbon-based Thin Film

Peng Xiao¹, Tao Chen^{1*}

¹Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences. *1219 Zhongguan West Road, 315201 Ningbo, Zhejiang, China.

17:25-17:40 C1-08

Formation of Self-assembled Nanotubes through Conjugation of Glucosamine at C-terminus of the Aromatic Peptide Amphiphile for Skin Regeneration

Satish Kumar Talloj¹, Bill Cheng¹, Hsin-Chieh Lin¹

¹National Chiao Tung University.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

C1-P01**In vitro bioactivity of nanotube formation on TNM implant alloy**T.Y. Liu¹, W.F. Ho², S.K. Hsu³, S.C. Wu³, H.C. Hsu³

¹Graduate Institute of Biotechnology and Biomedical Engineering, Central Taiwan University of Science and Technology, ²Department of Chemical and Materials Engineering, National University of Kaohsiung, ³Department of Dental Technology and Materials Science, Central Taiwan University of Science and Technology.

C1-P02**Bioactivity of apatite coatings on pure titanium from eggshell**C.E. Shen¹, W.F. Ho², S.K. Hsu¹, S.C. Wu¹, H.C. Hsu¹

¹Department of Dental Technology and Materials Science, Central Taiwan University of Science and Technology, Taichung, Taiwan. ²Department of Chemical and Materials Engineering, National University of Kaohsiung, Kaohsiung, Taiwan.

C1-P03**Preparation and Characteristics of Nano-Size Bone-Like Hydroxyapatite from Oyster Shells**Wen-Fu Ho¹, Lin-Chieh Ou¹, Mei-Yi Liu¹,

Hsueh-Chuan Hsu², Shih-Ching Wu², Shih-Kuang Hsu²
¹Department of Chemical and Materials Engineering, National University of Kaohsiung, Kaohsiung, Taiwan, ²Department of Dental Technology and Materials Science, Central Taiwan University of Science and Technology, Taichung, Taiwan.

C1-P04**Surface morphology and bioactivity of sprayed different ratio of fluorapatite –titanium composite coatings by vacuum plasma spraying**Chi-Sheng Chien¹, Guo-Jin Huang², Tsung-Yuan Kuo^{3*}, Jia-Wei Lin⁴, Tzer-Min Lee⁵, Cheng Yang⁶, Chin-Chi Lin⁷, Jow-Lay Huang⁸

¹Department of Orthopaedics, Chimei Foundation Hospital, Tainan; 710, Taiwan. ^{2,3,4} Department of Mechanical Engineering, Southern Taiwan University of Science and Technology, Tainan; 710, Taiwan. ⁵ School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan. ⁶ Department of Materials and Electro-Optic Research Division, National Chung-Shan Institute of Science and Technology, Taoyuan 32546, Taiwan. ⁷ Hung Chun Bio-S Tech Corporation Limited. ⁸ Department of Materials Science and Engineering, National Cheng-Kung University, Tainan 701, Taiwan.

C1-P05**Determinations of Cross-linking degree and degradation lifetime in hyaluronic acid products via SEC-MS and NMR**Pei-Heng, Lin¹, Ying-Yann, Wu¹, Chin-Ping, Huang¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

C1-P06**The Study on CoCrMo Alloy Additive Manufacturing Technology of Vat Photopolymerization**Cherng-Yuh Su¹, *Deng-Ji Ke², Jyun-Min Ruan³

¹Department of Mechanical Engineering, National Taipei University of Technology, ²Institute of Manufacturing Technology, National Taipei University of Technology, ³Institute of Mechatronic Technology, National Taipei University of Technology.

C1-P07**Mechanical Properties Improvement of Mg-based Metallic Glass by ex-situ Adding Spherical Iron Particles**X. Y. Gao¹, P. K. Shih¹, S. M. Song², T. H. Li², K. T.Hsu², P. H. Tsai², J. S. C. Jang^{1,2,*}

¹Department of Mechanical Engineering, National Central University, Chung-Li, Taoyuan 320, Taiwan. ²Institute of Materials Science and Engineering, National Central University, Chung-Li, Taoyuan 320, Taiwan.

C1-P08**Wicking on Minimal Micropatterned Surfaces with Plate-shaped Pillar Arrays Inspired from Crustacean**Koji Muto¹, Daisuke Ishii¹

¹Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology.

C1-P09**Fabrication of Biomimetic Liquid Transport Devices against Gravity**Tsubasa Kashima¹, Koki Kawai¹, Daisuke Ishii¹

¹ Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Nagoya, Japan.

C1-P10**Development of the Gold Recovery Protein Electrode from Aqueous System**YIN-LUNG HAN¹, KUO-WEI HUANG^{2*}, KAI-CHUN FAN³, LI-CHING CHUNG⁴, REN-YANG HORNG⁵, TEH-MING LIANG⁶

¹Industrial Technology Research Institute, Senior researcher. ²Industrial Technology Research Institute, Associate researcher. ³Industrial Technology Research Institute, Researcher. ⁴Industrial Technology Research Institute, researcher. ⁵Industrial Technology Research Institute, Principal researcher. ⁶Industrial Technology Research Institute, Principal engineer.

Symposium C2

Biocompatible Materials for Regenerative Medicine and Tissue Engineering

November 6-7, 2017

Organizers

Tzu-Wei Wang	National Tsing Hua University, Taiwan
Chia-Ching (Josh) Wu	National Cheng Kung University, Taiwan

Oral Session

Monday, November 6, 2017

Room 403

Chairperson: Tzu-Wei Wang and Chia-Ching (Josh) Wu

09:00-09:25 C2-01 Keynote

Biologically Engineered Surfaces for Stem Cell Expansion

Koichi Kato¹

¹Department of Biomaterials, Graduate School of Biomedical & Health Sciences, Hiroshima University.

09:25-09:50 C2-02 Keynote

The Study of Porous Hydroxyapatite Particles as Drug Carrier for Anti-Glioma Treatment

Feng-Huei Lin.

Institute of Biomed Eng & Nanomed., National Health Research Institutes, Taiwan

Institute of Biomed Eng., National Taiwan University, TaiwanTaiwan.

09:50-10:10 C2-03 Invited

Improving and Exploiting "Disease-in-a-dish" with Engineered Niche

*Adam J. Engler¹

¹Depts of Bioengineering and repave alld0, UC San Diego, La Jolla, CA USA 92093.

²Sanford Consortium for Regenerative Medicine.

10:10-10:30 C2-04 Invited

Over-1000 nm Near-Infrared (OTN-NIR) (NIR-II/III) Fluorescence in vivo Imaging

Masao Kamimura^{1,2}, Kohei Soga^{1,2}

¹Department of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan.

²Imaging Frontier Center (IFC), Tokyo University of Science, Tokyo, Japan.

Oral Session

Monday, November 6, 2017

Room 403

Chairperson: Tzu-Wei Wang and Chia-Ching (Josh) Wu

14:00-14:25 C2-05 Keynote

Proliferation and Differentiation of Human Embryonic Stem Cells Cultured on Hydrogels Grafted with ECM-derived Nanosegments

Akon Higuchi¹

¹Department of Chemical and Materials Engineering,

National Central University, Zhong-li, Taiwan.

14:25-14:45 C2-06 Invited

The influence of matrix stiffness on directed cell migration in aligned fibrous microenvironments

William Y Wang¹, Brendon M Baker¹

¹Department of Biomedical Engineering, University of Michigan, Ann Arbor, Michigan, USA.

14:45-15:05 C2-07 Invited

Dynamic regulation of the structural formation of the glandular organs by chitosan biomaterials

Tsung-Lin Yang MD. PhD.^{1,2,*}

¹Department of Otolaryngology, National Taiwan University Hospital and College of Medicine, Taipei, Taiwan.

²Research Center for Developmental Biology and Regenerative Medicine, National Taiwan University, Taipei, Taiwan.

15:05-15:20 C2-08

Functionalized peptide-based hydrogel with enzymatic crosslinking and sustained delivery of growth factors for rapid hemostasis and accelerative chronic wound healing

Lu-Chieh Huang¹, Tzu-Wei Wang¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsin-Chu, Taiwan, ROC.

15:20-15:35 C2-09

Probing cell behaviors during wound healing using bio-engineered ECM mimics

W. Chen¹, and E. Fong¹

¹School of Material Science and Engineering, Nanyang Technological University, Singapore.

Oral Session

Monday, November 6, 2017

Room 403

Chairperson: Tzu-Wei Wang and Chia-Ching (Josh) Wu

16:30-16:55 C2-10 Keynote

Fluorescent Nanomaterials Design for Over 1000 nm Near Infrared (OTN-NIR) Biophotonics

Kohei SOGA^{1,2}

¹Dept of Materials Science and Technology, Tokyo University of Science, Tokyo, Japan.

²Imaging Frontier Center, Tokyo University of Japan, Chiba, Japan.

16:55-17:15 C2-11 Invited

From Au- to Cu-based Bimetallic Nanocatalysts toward Energy Conversion

*Chun-Hong Kuo^{1,2}, Yu-Chun Chuang³, David A. Cullen⁴, and Brian T. Sneed⁵

¹Institute of Chemistry, Academia Sinica, Taipei, Taiwan.

²Institute of Materials Science and Engineering, National Central University, Zhongli, Taiwan.

³National Synchrotron Radiation Research Center, Hsinchu, Taiwan.

⁴ Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee, United States.

⁵ Materials Science and Technology Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee, United States.

17:15-17:30 C2-12

Pneumatically Actuated Soft Micro-mold (PASMO) device for tissue engineering

Jun Kameoka^{1,2,3,4}, Pojung Huang

¹Department of Material Science and Engineering, Texas A&M University, College Station, Texas, USA.

²Department of Molecular and Cellular Oncology, University of Texas MD Anderson Cancer Center, Houston, Texas, USA. ³Department of Electrical Engineering, Texas A&M University, College Station, Texas, USA. ⁴School of medicine The Jikei University, Tokyo, Japan.

17:30-17:45 C2-13

Dual-responsive Polypeptide Nanoparticles to Enhance Drug Penetration through Attenuating Tumor Stroma for Targeted and Sequential Anticancer Therapy

Pei-Hsuan Hsieh¹, Tzu-Wei Wang¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, R.O.C.

17:45-18:00 C2-14

Characterization of UV-Cured Co-Polymer of Poly(Glycerol Sebacate), Poly(Ethylene Glycol) and Poly(Caprolactone)

Yu-An Chien¹, June-Yo Chen¹, Ming-You Hsieh², Yi-Wen Chen², Jane Wang¹

¹Dept of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²3D Printing Medical Research Center, China Medical University Hospital, Taichung City 40447, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 504b

Chairperson: Tzu-Wei Wang and Chia-Ching (Josh) Wu

09:00-09:20 C2-15 Invited

Hair Keratin as the next Biomaterial Platform for TERM

Kee Woei Ng¹

¹School of Materials Science and Engineering, Nanyang Technological University, Singapore.

09:20-09:40 C2-16 Invited

Development of Chitosan-Gelatin Composites for Delivery of Adipose-Derived Stem Cells to Promote Tissue Regeneration

Nai-Chen Cheng¹, Tai-Horng Young²

¹Department of Surgery, National Taiwan University Hospital and College of Medicine, Taipei, Taiwan.

²Institute of Biomedical Engineering, College of Medicine and College of Engineering, National Taiwan University, Taipei.

09:40-10:00 C2-17 Invited

Dissolving microneedles for vaccine in combination with adjuvant CpG DNA in transdermal delivery

*Min-Hua Chen^{1,2}, Takashi Minowa², Xianglan Li², and Nobutaka Hanagata^{2,3}

¹Department of Biomedical Engineering, Chung Yuan Christian University, Taoyuan City, Taiwan. ²

Nanotechnology Innovation Station, National Institute for Materials Science, Tsukuba, Ibaraki, Japan. ³

Graduate School of Life Science, Hokkaido University, Kita-ku, Sapporo, Japan.

10:00-10:15 C2-18

Novel preparation of bioactive glass using spray drying

C.J.Y. Lin¹, C.W. Hsiao¹, B. J. Hong¹, S.J. Shih^{1*}

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

10:15-10:30 C2-19

Compositional Effects of Irradiation on Human Bone after Extracorporeal Therapy for Bone Sarcoma

SAKSHI CHAUHAN¹, Dr. S.A. Khan², Dr. A. Prasad³

¹Department of Mechanical Engineering, GBPUAT, Pant Nagar, India, ²Orthopedics, All India Institute of Medical Sciences, New Delhi, India, ³Mechanical Engineering, South Dakota State University, USA.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

C2-P01

Transmission Synchrotron X-ray Tomography and Nano-indentation Measurements to Investigate the Dinosaurs' Teeth

Tzu-Hsuan Huang^{1*}, E-Wen Huang^{1,2}, Chun-Chieh Wang^{3*}, and Shou-Yi Chang⁴

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

²Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan. ³National Synchrotron Radiation Research Center, Hsinchu, Taiwan. ⁴Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

C2-P02

Apply of Multi Stages Power Control Method on Plasma Electrolytic Oxidation Processes for High Biocompatible Coatings on Ti Alloy

Kuan-Yu Huang¹, Chen-Jui Liang¹

¹Department of Materials Science and Engineering, Feng Chia University, Taichung City, Taiwan.

C2-P03

Improved new formed cancellous bone surrounding 3D printing/additive manufacturing porous titanium dental implant

Tzu-Hung Lin¹, San-Yuan Chen², Jui-Sheng Sun³, Hsin-Ming Cheng¹, Hsiang-Yun Chen¹, Pei-Hua Yeh¹, Hsin-Yi Huang⁴, Pei-I Tsai^{2,4*}

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu 31040, Taiwan. ²Department of Materials Science and Engineering, National Chiao-Tung University, Hsinchu 30010, Taiwan. ³National Taiwan University Hospital, Taipei 10002, Taiwan. ⁴Biomedical Technology and Device Research Laboratories, Industrial Technology Research Institute, Hsinchu 31040, Taiwan.

C2-P04

Self-healable Supramolecular Nanogel through Self-assembly of Specific Nucleobase Pairing as Drug Delivery System

Kuan-Yu Chen¹, Tzu-Wei Wang¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

C2-P05

Endogenous Stimuli-responsive Shape Memory Polymer Stent with Spatial-, Temporal- and Dosage-controlled Fashions for Colorectal Cancer Therapy

Shun-Yu Hsieh¹, Tzu-Wei Wang¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

C2-P06

Fabrication of antibacterial ceramic coatings on ZK60 magnesium alloys

Jeou-Long Lee¹, Kwan-Nin Kuo¹, Yu-Hui Lin²,

Wei-Cheng Li¹, Xiao-Rong Zhang¹

¹Department of chemical and materials engineering, Lunghwa University of Science and Technology, ²Department of materials engineering, Tatung University.

C2-P07

Synthesis and Antibacterial Properties of Graphene Oxide-Doped Bioactive Glass

Ting-An Lin¹, Jia-Yu Lin¹, Henni Setia Ningsih¹, Meng-Huang Wu², Shao-Ju Shih¹

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan 10607, ²Department of Orthopedic Surgery, Taipei Medical University Hospital, Taipei, Taiwan 11031.

C2-P08

Ultrasonic-assisted micro-arc oxidation to fabricate the antibacterial ceramic coatings on ZK60 magnesium

Jeou-Long Lee^{1*}, Kwan-Nin Kuo¹, Yu-Hui Lin²,

Wei-Cheng Li¹, Xiao-Rong Zhang¹
¹Department of chemical and materials engineering, Lunghwa University of Science and Technology, ²Department of materials engineering, Tatung University.

C2-P09

Gradient aligned magnetic carriers in gelatin-silk nerve conduit

Chun-Chang Lin¹, Wei-Chen Huang², San-Yuan Chen¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan. ²Graduate Institute of Biomedical Materials and Tissue Engineering, Taipei Medical University, Taipei, Taiwan.

C2-P10

The comparison of 3D porous titanium, nonporous titanium, and tantalum interbody cages: in vitro and in vivo study

Meng-Huang Wu^{1,2}, Yen-Yao Li^{3*}, Ming-Hsueh Li⁴, Pei-I Tsai⁵, Tsung-Jen Huang^{1,2}, Ching-Yu Lee^{1,2}, Mel S. Lee⁶

¹Department of Orthopedics, Taipei Medical University Hospital, Taipei, Taiwan, ROC. ²Department of Orthopedics, Taipei Medical University Hospital, Taipei, Taiwan, ROC. ³Department of Orthopaedic Surgery, Chang Gung Memorial Hospital, Chiayi, Taiwan, ROC. ⁴Division of Neurosurgery, Department of Surgery, Chang Gung Memorial Hospital, Chiayi, Taiwan, ROC. ⁵Biomedical Technology and Device Research Laboratories, Industrial Technology Research Institute ⁶Department of Orthopaedic Surgery, Chang Gung Memorial Hospital, Kaohsiung, Taiwan, ROC.

C2-P11

Dynamic Freeze Casting of Titanium/Camphene Slurry for Producing Porous Titanium Scaffolds

Hyun-Do Jung^{1*}

¹Liquid Processing & Casting Technology R&D Group, Korea Institute of Industrial Technology, Incheon, 406-840, Korea.

Symposium C3

Biomaterials for Device Biointerface with Anti-infective and Antibacterial Applications

Monday, November 6, 2017

Organizers

Jinn P. Chu	National Taiwan University of Science and Technology, Taiwan.
Jason S. C. Jang	National Central University, Taiwan.
Chih-Hwa Chen	Taipei Medical University, Taiwan.
Her-Hsiung Huang	National Yang Ming University, Taiwan.
Ming-Jen Chen	Mackay Medical College, Taiwan.
Chun-Pin Lin	National Taiwan University, Taiwan.
Hyungil Jung	Yonsei University, Korea.

Oral Session

Monday, November 6, 2017

Room 502

Chairperson: Jinn P. Chu, Jason S. C. Jang, Chih-Hwa Chen, Her-Hsiung Huang, Ming-Jen Chen, Chun-Pin Lin and Hyungil Jung

09:00-09:20 C3-01 Invited

Novel Hollow Microneedle (NHM) for Innocuous and Efficient Subcutaneous Insulin Delivery

Yonghao Ma¹, Hyungil Jung¹

¹Dept of Biotechnology, Yonsei University, Seoul, Republic of Korea.

09:20-09:40 C3-02 Invited

Reduced Adhesion of Mammalian Cells and Bacteria by Thin Film Metallic Glass Coating

Ming-Jen Chen¹, Jinn P. Chu²

¹Dept. of Surgery, Mackay Memorial Hospital & Dept. of Medicine, Mackay Medical College, New Taipei, Taiwan, ²Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

09:40-10:00 C3-03 Invited

The Development of Mg-Zn-Ca Bulk Metallic Glass Fabricated Fixation Implant-From Translational Perspective

Chin-Chean Wong^{1,2}, Pei-Chun Wong^{3,4}, Yang-Hwei Tsuang^{1,2}, Pei-Hua Tsai⁵, J. S. C. Jang⁵, Cheng-Kung Cheng⁴, Hsiang-Ho Chen³

¹Department of Orthopaedics, Shuang Ho Hospital, Taipei Medical University, Taipei, Taiwan, ²Department of Orthopaedics, School of Medicine, College of Medicine, Taipei Medical University, Taipei, Taiwan, ³School of Biomedical Engineering, College of Biomedical Engineering, Taipei Medical University, Taipei, Taiwan, ⁴Department of Biomedical Engineering, National Yang-Ming University, Taipei, Taiwan,

⁵Institute of Materials Science and Engineering, National Central University, Taoyuan, Taiwan

10:00-10:15 C3-04

Octopus-Inspired Assembly of Nanosucker Arrays for Adhesion

Hongta Yang¹

¹National Chung Hsing University, Taiwan.

Oral Session

Monday, November 6, 2017

Room 502

Chairperson: Jinn P. Chu, Jason S. C. Jang, Chih-Hwa Chen, Her-Hsiung Huang, Ming-Jen Chen, Chun-Pin Lin and Hyungil Jung

14:00-14:20 C3-05 Invited

Antibacterial hydroxyapatite coating on titanium via a simple chemical treatment process using calcium phosphate slurry

Naofumi Ohtsu¹, Yuko Kakuchi¹, Yutaka Yoshida²

¹Kitami Institute of Technology, Kitami, Japan. ²School of Regional Innovation and Social Design Engineering, Kitami Institute of Technology, Kitami, Japan

14:20-14:40 C3-06 Invited

Evaluation of a series of silk fibroin protein-based nonwoven mats for use as an anti-adhesion or anti-bacterial patch in wound management

Meng-Yi Bai^{*,1,2} Wan-Yuan Hsu¹, Jie-Chang Tsai¹

¹Graduate Institute of Biomedical Engineering, National Taiwan University of Science and Technology, Taipei 10607, Taiwan (Republic of China) ²Adjunct appointment to the Department of Biomedical Engineering, National Defense Medical Center, Taipei 114, Taiwan (Republic of China).

14:40-14:55 C3-07

Thin Film Metallic Glass: Low Friction Coating for Performance Enhancement of Medical Syringe Needle

Jinn P. Chu¹, Chia-Chi Yu¹, Yusuke Tanatsugu¹, Mikito Yasuzawa², Yu-Lin Shen³

¹Dept of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan, ²Department of Chemical Science and Technology, The University of Tokushima, Tokushima, Japan, ³Department of Mechanical Engineering, University of New Mexico, Albuquerque, New Mexico, USA.

14:55-15:10 C3-08

Effect of HNO₃ concentration on the surface morphology and layer thickness of the anodic oxide layer on NiTi alloy

Yuma Hirano¹, Naofumi Ohtsu¹

¹School of Earth, Energy and Environmental Engineering, Kitami Institute of Technology, Kitami, Japan.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

C3-P01

Composite Coating Made of Polyelectrolyte Multilayers and Bioactive Glass on 316L Stainless Steel for Antibiotics Control Release

Ren-Jei Chung¹, W.C. Liu¹, W.C.Wang¹, Y.H.Chen¹

¹Department of Chemical Engineering and Biotechnology, National Taipei University of Technology (Taipei Tech).

C3-P02

Surfactant-free synthesis of mesoporous bioactive glass

Shao-Ju Shih¹, Chih-Wei, Hsiao¹, Jung-Ting Sun¹, Meng-Huang Wu²

¹National Taiwan University of Science and Technology, ²Taipei Medical University Hospital.

C3-P03

Development of two-layer silk sponge for medical application

Ding-Teng Wang¹, Wan-yuan Hsu², Joey Sin², Meng-Yi Bai³

Graduate Institute of Biomedical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan

C3-P04

Antibacterial efficacy of silver incorporated mesoporous bioactive glasses using simulated Enterococcus faecalis infected root canals

Y.T. Yang-Wang¹, Y.C. Chiang¹, J. C. Kung², C.J. Shih¹, C.J. Shih³

¹Department of Fragrance and Cosmetic Science, Kaohsiung Medical University, Kaohsiung, Taiwan, ²Department of Family Dentistry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan, ³Department of Medical Research, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan.

C3-P05

Preservative efficacy evaluation of a hierarchically silver incorporated meso-macroporous silica material (Ag-SiO₂) applied in the cosmetics

C.L.Lee¹, C.J.Shih¹, C.J.Shih²

¹Department of Fragrance and Cosmetic Science, Kaohsiung Medical University, Kaohsiung, Taiwan, ²Department of Medical Research, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan.

Symposium C4

Functional Nanomaterials for Therapeutic Delivery, Diagnosis and Detection

November 7-8, 2017

Organizers

Hsin-Chieh Lin	National Chiao Tung University, Taiwan
Shang-Hsiu Hu	National Tsing Hua University, Taiwan
Xinming Li	Soochow University, China
Yue Pan	Soochow University, China

Sponsor

Biomaterial and Controlled Release Society & Controlled Release Society Taiwan Local Chapter
中華民國生醫材料及藥物釋放學會



Oral Session

Tuesday, November 7, 2017

Room 403

Chairperson: Zhongwei Gu and Hsin-Cheng Chiu

09:00-09:25 C4-01 Keynote

Molecular & Supramolecular Engineering of Dendritic Peptide for Bioinspired Nanoplatform
Zhongwei Gu¹

¹Nanjing Tech University, Nanjing, China.

09:25-09:45 C4-02 Invited

Surface Charge-Switchable Theranostic Nanoparticles with Deep Tumor Tissue Penetration for Photothermal/Chemo Combinational Therapy

Hsin-Cheng Chiu¹, Wen-Hsuan Chiang¹
¹Biomedical Engineering and Environmental Sciences, National Tsing Hua University, Hsinchu, Taiwan.

09:45-10:10 C4-03 Keynote

3D-Printing of multifunctional scaffolds for bone therapy and regeneration

Chengtie Wu¹
¹Shanghai Institute of Ceramics, Chinese Academy of Sciences, Shanghai, China.

10:10-10:30 C4-04 Invited

Reactive Oxygen Species-Responsive Nanomedicine for Cancer Imaging and Therapy

Jae Hyung Park¹
¹Sungkyunkwan University, Suwon, South Korea.

10:30-10:45 C4-05

Development of Pilocarpine-Loaded Polycaprolactone Nanocarriers for Glaucoma Treatment

Jui-Yang Lai¹
¹Institute of Biochemical and Biomedical Engineering, Chang Gung University, Taiwan.

10:45-11:00 C4-06

The Investigation of the Releasing Profile of Gold Nanoparticles Embedded in Biodegradable Polymeric Scaffolds

Chia-Teng Chang¹, Yi-Kong Hsieh¹, I-Hsin Jen², Fan-Chih Pu¹, Dehui Wan², Jane Wang¹
¹Dept of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan. ²Institute of Biomedical Engineering, National Tsing Huan University, Hsinchu, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 403

Chairperson: Ki Dong Park and Li Fang Wang

14:00-14:25 C4-07 Keynote

Dual enzyme-triggered in situ forming hydrogel for therapeutic applications

Ki Dong Park¹
¹Department of Molecular Science and Technology/Applied Chemistry and Biological Engineering, Ajou University, Suwon, Republic of Korea.

14:25-14:45 C4-08 Invited

Rattle type IONP@shell-in-shell for magnetically targeted and second near-infrared light-responsive nano-platform

L. F. Wang¹, M. F. Tsai¹, C. H. Su²
¹Department of Medicinal and Applied Chemistry, College of Life Sciences, Kaohsiung Medical University, Kaohsiung 807, Taiwan, ²Institute for Translational Research in Biomedicine, Kaohsiung Chang Gung Memorial Hospital, Kaohsiung 833, Taiwan.

14:45-15:05 C4-09 Invited

Rationally Design and Synthesis of Advanced Injectable Hydrogels for Various Biomedical Applications

Xiaojun Cai¹, Zhongwei Gu¹
¹College of Materials Science and Engineering, Nanjing Tech University, Nanjing, China.

15:05-15:25 C4-10 Invited

Stimuli-responsive polymeric biomaterials-based nanoscale vehicles for cancer treatment

Kui Luo¹
¹West China Hospital and National Engineering Research Center for Biomaterials, Sichuan University, China.

15:25-15:40 C4-11

Preparation of self-functional carbon nanomaterials for biosensing, antimicrobial and anti-angiogenic applications

Chih-Ching Huang¹
¹Department of Bioscience and Biotechnology, National Taiwan Ocean University, Keelung 20224, Taiwan.

15:40-15:55 C4-12
Integrating Synthetic Protein Chemistry and Combinatorial Lipid Nanoparticles for Intracellular Delivery

Ming Wang¹
¹CAS Key Laboratory of Analytical Chemistry for Living Biosystems Institute of Chemistry, Chinese Academy of Sciences, Beijing, China.

Oral Session

Tuesday, November 7, 2017

Room 403

Chairperson: Cheng-Sheng Yeh and Jun Yang

16:10-16:30 C4-13 Invited
Nano-formulation designed in nanomedicine: malignant tumor, vessel dilation, and wound healing

Wei-Peng Li¹, Po-Tsung Kao¹, Sheng-Jung Wang¹, Chia-Hao Su², Tak-Wah Wong³, Ian Liao⁴, Chen-Sheng Yeh¹
¹Chemistry, NCKU, ²Kaohsiung Chang Gung Memorial Hospital, ³Dermatology, NCKU, ⁴Chemistry, NCTU.

16:30-16:50 C4-14 Invited
Cadherin-Matrix Regulating Extracellular Microenvironment Reconstruction

Yan Zhang¹, Ke Xu¹, Chao Gao¹, Lei Cao¹, Xiaoning Li¹, Jun Yang¹
¹The Key Lab of Bioactive Materials, Ministry of Education, College of Life Science, Nankai University, Tianjin, China;

16:50-17:10 C4-15 Invited
Multilayer PLGA Based Nanoparticles as Controlled-Release System for Vascular Targeting Therapy

Pei-Chi Lee¹, Li-Ting Chen¹, Bo-Shen Zan¹, Tze-Wen Chung¹
¹Department of Biomedical Engineering, National Yang Ming University, Taipei, Taiwan.

17:10-17:25 C4-16
Evaluation of mesenchymal stem cell delivery efficiency using in situ forming gelatin hydrogels

Seung Bae Ryu¹, Yunki Lee¹, Eun-Hye Park², Kiyuk Jang², Ki Dong Park¹
¹Department of Molecular Science and Technology/Applied Chemistry and Biological Engineering, Ajou University, Suwon, Republic of Korea. ²Cardiology Division, Seoul St. Mary's Hospital, College of Medicine, The catholic University of Korea, Seoul, Republic of Korea.

17:25-17:40 C4-17
Enhancement of Antigen-specific Immune Responses through Prime-Boost Vaccination Strategies using Chitosan/gamma-Polyglutamic Acid Microneedles

Mei-Chin Chen¹, Yi-Ying Chen¹
¹National Cheng Kung University, Taiwan.

17:40-17:55 C4-18
Rabies Virus-Inspired Dendrimers/Graphene Quantum Dot Nanohybrids for Deep Glioblastoma Penetrated Theranostics

Yu-Lin Su¹, Ling-Yi Huang¹, Pei-Fan Hu¹, Wei Cheng¹, Chih-Yi Chang¹, Shang-Hsiu Hu¹
¹Department of Biomedical Engineering and Environmental Sciences National Tsing Hua University, Hsinchu, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 403

Chairperson: Yeu Chun Kim and Chien-Wen Jeff Chang

09:00-09:05 Session Opening Remarks
09:05-09:30 C4-19 Invited
Conformation-switchable helical polypeptide eliciting selective pro-apoptotic activity for cancer therapy

DaeYong Lee¹, Yeu-Chun Kim

¹Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea.

09:30-09:55 C4-20 Invited
Selenium nanomedicine, from functional design to cancer theranosis

Tianfeng Chen¹
¹ Department of Chemistry, Jinan University, Guangzhou, China.

09:55-10:20 C4-21 Invited
Polymer/Metal Nanocomplexes for Nucleic Acids Delivery and Applications on Stem Cell Engineering

Chien-Wen Jeff Chang¹, Chun-Chiao Chuang¹, Rih-Yang Huang¹, Yee-Hsien Lin¹
¹Department of Biomedical Engineering & Environmental Sciences, College of Nuclear Science, National Tsing Hua University, Hsinchu, Taiwan.

10:20-10:45 C4-22 Invited
ROS-Responsive Drug Delivery toward Anti-Cancer/Anti-Inflammation Therapy

Lichen Yin¹, Hua He¹, Qiurong Deng¹
¹Institute of Functional Nano and Soft Materials (FUNSOM), Soochow University, Suzhou 215123, P.R. China.

Oral Session

Wednesday, November 8, 2017

Room 403

Chairperson: Tae-il Kim and Shang-Hsiu Hu

11:00-11:25 C4-23 Invited
Drug/gene delivery carriers based on bioreducible polymers and polysaccharides

Kitae Ryu¹, Gyeong Jin Lee¹, Jae Hong Park¹, Tae-il Kim¹
¹Seoul National University, Seoul, South Korea.

11:25-11:50 C4-24 Invited
The Penetrated Delivery of Drug/Energy to Tumors by Functional Nano-Materials

S.H.Hu, Y.L.Su, K.T.Chen, S.Y.Sung, C.T.Lin
Department of Biomedical Engineering and

Environmental Sciences, National Tsing Hua University,
Hsinchu, Taiwan.

11:50-12:15 C4-25 Invited

Inorganic Biomaterials

Yu Chen¹

¹ State Key Lab of High Performance and Superfine
Microstructure, Shanghai Institute of Ceramics, Chinese
Academy of Sciences.

12:15-12:40 C4-26 Invited

**Nano-drug delivery system for mitochondrial gene
therapy**

Yuma Yamada¹, Hideyoshi Harashima¹

¹Faculty of Pharmaceutical Sciences, Hokkaido
University, Sapporo, Japan.

Oral Session

Wednesday, November 8, 2017

Room 403

Chairperson: Yunching Chen and Xin Zhang

14:00-14:25 C4-27 Keynote

**Polymer-based Nitric Oxide Delivery System for
Bioapplication**

Won Jong Kim¹

¹Pohang University of Science and Technology
(POSTECH), Korea.

14:25-14:50 C4-28 Invited

**Multifunctional Nanocarriers for Efficient
Treatment against Hepatocellular Carcinoma with
Desmoplasia**

Yunching Chen¹

¹ Institute of Biomedical Engineering, National Tsing
Hua University, Hsinchu, Taiwan.

14:50-15:15 C4-29 Invited

**Small Interfering RNA Delivery: Challenges and
Our Strategies**

Xin Zhang¹, Ran Zhang¹, Bingbing Hu¹, Yan Li¹, Jun
Yang¹, Xin Zhang¹

¹National Key Laboratory of Biochemical Engineering,
Institute of Process Engineering, Chinese Academy of
Sciences, Beijing, PR China.

15:15-15:40 C4-30 Invited

**Molecular Recognition-Based Controlled Release of
Drug Molecules and Antibodies from Hydrogels**

Toshiki Sawada¹

¹Tokyo Institute of Technology, Tokyo, Japan.

15:40-16:05 C4-31 Invited

**Nucleic Acid Nanotechnology for Gene Therapy and
Molecular Diagnostics**

Hyukjin Lee¹

¹College of Pharmacy, Graduate School of
Pharmaceutical Sciences, Ewha Womans University,
Korea.

Oral Session

Wednesday, November 8, 2017

Room 403

Chairperson: Takashi Hoshiba and Chieh-Cheng Huang

16:30-16:55 C4-32 Invited

**Cultured cell-derived decellularized matrices for
tissue engineering**

Takashi Hoshiba¹

¹ Frontier Center for Organic Materials, Yamagata
University, Yonezawa, Japan.

16:55-17:20 C4-33 Invited

**Amphiphilic DNA nanoparticles for biomedical
delivery**

Minseok Kwak¹

¹ Department of Chemistry, Pukyong National
University, Busan, Republic of Korea.

17:20-17:45 C4-34 Invited

**Construction of siRNA-polymer conjugate and its
biological application**

Hiroyasu Takemoto¹, Nobuhiro Nishiyama¹

¹Laboratory for Chemistry and Life Science, Institute of
Innovative Research, Tokyo Institute of Technology
R1-11, 4259 Nagatsuta, Midori-ku, Yokohama, Japan.

17:45-18:10 C4-35 Invited

**Injectable Cell Delivery Constructs for Myocardial
Tissue Engineering**

Chieh-Cheng Huang¹, Yen Chang², Hsing-Wen Sung³

¹Institute of Biomedical Engineering, National Tsing
Hua University, Hsinchu, Taiwan, ²Department of
Cardiovascular Surgery, Taipei Tzu Chi Hospital, Taipei,
Taiwan, ³Department of Chemical Engineering,
National Tsing Hua University, Hsinchu, Taiwan.

18:10-18:15 Session Closing Remarks

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

C4-P01

Effect of Packing Density of Hollow Fiber Membrane Modules on the Performance of Hemodialysis

Jeng-Liang Kuo, Pei-Yi Tsai, Chih-Chieh Huang, Yi-Hung Wen, Wei-Lun Fan

¹Biomaterials Research & Development Department, Regeneration Medicine Technology Division, BDL, ITRI.

C4-P02

Novel polymeric functional excipient for enhancing poorly water-soluble drugs (MRS-T 2016)

Hui-Ling Cheng¹, Hung-Jui Huang², Shu-Feng Chen³, Chia-Chen Tsai⁴, Jui-Hsiang Chen⁵, Jenn-line Sheu⁶, Ting-Ting Hung⁷

¹Pharmaceutical Engineering Technology Department, Targeted Drug and Delivery Technology Department, Biomedical Technology and Device Research Laboratories, Industrial Technology Research Institute. ²Department of Healthcare Materials, Division of Fiber and Textile Chemistry, Material and Chemical Research Laboratories, Industrial Technology Research Institute.

C4-P03

Magnetic nanoparticles hyperthermia enhance the treatment efficacy of peri-implant osteomyelitis

Ming-Chun Lin¹, Chia-Ni Chang², Mei-Ru Jhang³, Shin-I Huang⁴, Chun-Chung Wang⁵, Min-Da Yang⁶, Mean-Jue Tung⁷, Mu-Jen Young⁸, Jui-Sheng Sun⁹

¹ Industrial Technology Research Institute, Biomedical Technology and Device Research Laboratories, Hsinchu, Taiwan. ²Industrial Technology Research Institute, Material and Chemical Research Laboratories, Hsinchu, Taiwan. ³Department of Orthopedic Surgery, College of Medicine, National Taiwan University, Taipei, Taiwan.

C4-P04

HA-based nanocomplexes for metastatic head and neck cancer

Chih-Peng Liu¹, Yuan-Chia Chang¹, Shih-Ta Chen¹, Chia-Mu Tu¹, Hsiang-Ching Wang¹, Yi-Chang Chen¹, Shuen-Hsiang Chou¹, Ming-Chun Lin¹, Hui-Ling Cheng¹, Yu-Hua Chen², Chia-Chun Wang², Maggie Lu

¹Biomedical Technology and Device Research Laboratories, Industrial Technology Research Institute ²Material and Chemical Research Laboratories, Industrial Technology Research Institute.

C4-P05

Extrapolating Host-Guest Relationships in Hydrogels for 3D Cell Culture

Jen-Po Weng, Hsin-Chieh Lin
Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

C4-P06

Synthesis and Characterization of Nitric Oxide Releasing Injectable Gelatin Hydrogels

Thai Thanh Hoang Thi¹, Hyo Jin Lee¹, Yunki Lee¹, Ki Dong Park¹

¹Department of Molecular Science and Technology/Applied Chemistry and Biological Engineering, Ajou University, Suwon, Republic of Korea.

C4-P07

Quantitative Tracking of Human Mesenchymal Stem Cells in animal models by Fluorescent Nanodiamonds

Long-Jyun Su^{1,2}, Yuen Yung Hui¹, Huan-Cheng Chang^{1,3}

¹Institute of Atomic and Molecular Sciences, Academia Sinica, ²Department of Chemistry, National Taiwan University, ³Department of Chemical Engineering, National Taiwan University of Science and Technology.

C4-P08

Protein-protected Au nanocluster to enhance the singlet oxygen yields of photosensitizer: the mechanism investigation and application in photodynamic therapy

Yu-Chi Wang¹, Chih-Chia Huang¹

¹Department of photonics, National Cheng Kung University, Taiwan.

C4-P09

New optical insight on ITO nanoparticles: near-infrared absorption, SERS, and photothermal conversion

Yia-Shin Huang¹, Chih-Chia Huang¹

¹Department of photonics, National Cheng Kung University, Taiwan.

C4-P10

Preparation of Salivary Electrochemical Cortisol Biosensor Based on Tin Disulfide Nanoflakes

R.J. Chung¹, W.C. Liu¹, C.S. Lo¹, N. Chang¹

¹Department of Chemical Engineering and Biotechnology, National Taipei University of Technology (Taipei Tech), Taipei, Taiwan.

Symposium C5

Biomedical Sensing Materials, Electrodes, and Devices

November 6-8, 2017

Organizers

Fu-Hsiang Ko	National Chiao Tung University, Taiwan
Lung-Ming Fu	National Pingtung University of Science and Technology, Taiwan
Gwo-Bin Lee	National Tsing Hua University, Taiwan

Oral Session

Monday, November 6, 2017

Room 402a

Chairperson: Yasuro Niidome, Jem-Kun Chen and Chii-Wann Lin

09:00-09:30 C5-01 Keynote

Current status of Biomaterials Research Program in ITRI

Chii-Wann Lin¹
¹Biomedical Technology and Device Research Laboratories, Industrial Technology Research Institute.

09:30-09:50 C5-02 Invited

Imaging Mass Spectrometry of Gold Nanoparticles Incorporated in a Living Body

Daiki Muko¹, Yuki Inoue¹, Kento Iwaisako¹, Tomoki Nishi¹, Yasuro Niidome¹
¹Department of Chemistry and Bioscience, Kagoshima University, Kagoshima, Japan.

09:50-10:10 C5-03 Invited

A Gelation and Colorimetric Chemosensor for Alkaline Phosphatase Activity based on Combination of Peptide Supramolecular Biomaterial and Gold Nanoparticles

C. Cheng¹, C. P. Chen², F. H. Ko²
¹Department of Electronics Engineering, National Chiao Tung University,, ²Department of Materials Science and Engineering, National Chiao Tung University.

10:10-10:30 C5-04 Invited

Label-Free Detection of Rheumatoid Factor Using YbYxOy Electrolyte-Insulator-Semiconductor Devices

Tung-Ming Pan^{1,2}, Ching-Yi Chen¹
¹Department of Electronics Engineering, Chang Gung University, Taoyuan 333, Taiwan. ²Division of Urology, Chang Gung Memorial Hospital, Taoyuan 333, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room: 534

Chairperson: Po-Chun Chen, Wen-Ya Lee and Gwo-Bin Lee

16:30-17:00 C5-05 Keynote

Detection of pathogens on microfluidic devices

Gwo-Bin "Vincent" Lee¹, Tsing Hua Chair Professor
¹Department of Power Mechanical Engineering Institute of Biomedical Engineering Institute of NanoEngineering and Microsystems National Tsing Hua University, Hsinchu, Taiwan.

17:00-17:20 C5-06 Invited

Sophisticated Microelectrodes for Neural Stimulation in Retinal Prosthesis by Using Built-in CMOS Microchips and High Performance Electrode Material

Toshihiko Noda¹, Makito Haruta¹, Kiyotaka Sasagawa¹, Takashi Tokuda¹, Jun Ohta¹
¹Nara Institute of Science and Technology, Ikoma, Japan.

17:20-17:40 C5-07 Invited

Albumin-Gold Nanorod Nanoplatfor for Cancer Theranostics

Yu-Fen Huang¹, Hsien-Ting Chiu¹, Cheng-Kuan Su², Yuh-Chang Sun¹, C.C.Chiang¹
¹National Tsing Hua University, Taiwan ²National Taiwan Ocean University, Taiwan.

17:40-18:00 C5-08

Annealing effect on graphene oxide/graphene layered structure for bioelectrical sensor applications

Tzu-Ting Huang¹, Chia-Heng Chiang¹, Chi-Hsien Huang^{1,2}, Ying Li²
¹Department of Material Engineering, Ming Chi University of Technology, New Taipei City, Taiwan. ²Center for Thin Film Technologies and Applications, Ming Chi University of Technology, New Taipei City, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 402a

Chairperson: Yu-Sheng Lai and Chih-Feng Wang

14:00-14:20 C5-09 Invited

Superwetting Materials for Water Droplets Transportation and Oil-Water Separation

Chih-Feng Wang¹
¹Department of Materials Science and Engineering, I-Shou University, Kaohsiung, Taiwan.

14:20-14:40 C5-10 Invited

Stretchable polymer dielectrics for pressure sensing applications

Wen-Ya Lee¹, Min-Yu Wen¹, Shihhan Wei¹, Guanting Chen¹
¹National Taipei University of Technology, Taiwan.

14:40-15:00 C5-11 Invited

Anisotropic Optical Behavior of Nanoparticle Chains

Yu-Sheng Lai¹, M.Y. Lin², H.L. Chen³, Y.S Yang²
¹National Nano Device Laboratories, National Applied Research Laboratories, Hsinchu, Taiwan. ²Institute of molecular Medicine and Bioengineering, National Chiao Tung University, Hsinchu, Taiwan. ³Department of Material Science and Engineering, National Taiwan University, Taiwan.

15:00-15:20 C5-12 Invited
A MSM Photosensor for Hydrogen Peroxide and Biomolecular Sensing with Chemiluminescence

Ching-Chang Lin¹, Fu-Hsiang Ko¹, Da-Shiuan Sun¹,
Tsung-Tso Tsai¹, Wen-Hsien Sun², Jing-Wen Tang²

¹Dept of Materials Science and Engineering, National
Chiao Tung University, Hsinchu, Taiwan. ²Material
and Chemical Research Laboratories, Industrial
Technology Research Institute, Hsinchu, Taiwan.

Oral Session

Wednesday, November 8, 2017

Room 402a

Chairperson: Dehui Wan and Po-Yu Chen

16:30-16:50 C5-13 Invited
From Carbon Ionic Liquid Electrode to Electrografted Carbon Electrode: Detection of H₂O₂, S²⁻, and Membrane Protein

Y.-H.Tang¹, Y.-H.Chen¹, C.-H.Lai¹, P.-Y.Chen^{1,2}

¹Department of Medicinal and Applied Chemistry,
Kaohsiung Medical University, Kaohsiung, Taiwan.

²Department of Medical Research, Kaohsiung Medical
University Hospital, Kaohsiung, Taiwan.

16:50-17:10 C5-14 Invited
Label-free DNA detection using two-dimensional periodic relief grating as a visualized platform for diagnosis of breast cancer recurrence after surgery

Jem-kun Chen¹

¹National Taiwan University of Science and Technology,
Taiwan.

17:10-17:30 C5-15 Invited
Fabrication of Metal Nanoparticle Array for Cost-effective, Easy-to-use, Sensitive Plasmonic Sensors

Dehui Wan¹

¹Institute of Biomedical Engineering, National Tsing
Hua University, Hsinchu, Taiwan.

17:30-17:50 C5-16
Real-Time Packing Behavior of Core-Shell Silica@Poly(N-isopropylacrylamide) Microspheres as Photonic Crystals for Visualizing in Thermal Sensing

Karthikeyan Manivannan¹, Yi-Shen Huang², Bohr-Ran
Huang³, Jem-Kun Chen¹, Chih-Feng Huang²

¹Department of Materials Science and Engineering,
National Taiwan University of Science and Technology,
Taipei, Taiwan, ²Department of Chemical Engineering,
National Chung Hsing University, Taichung,
Taiwan, ³Graduate Institute of Electro-Optical
Engineering and Department of Electronic Engineering,
National Taiwan University of Science and Technology,
Taipei, Taiwan.

Poster Session

Wednesday, November 8, 2017

12:00-14:00

Room 401

C5-P01
Integrated Organic Bioelectronics: Self-Assembled Coronene Nanofiber Arrays for Efficient Isolation, Detection, and Recovery of Cancer Cells

Rou-Zhen Liu¹, Yu-Sheng Hsiao¹

¹Department of Materials Engineering, Ming Chi
University of Technology, New Taipei City, Taiwan.

C5-P02
Facile synthesis of poly (N-isopropylacrylamide) coated SiO₂ core-shell microspheres via surface-initiated atom transfer radical polymerization for H₂O₂ biosensor applications

Karthikeyan Manivannan¹, Jem-Kun Chen¹, C.C.
Cheng²

¹Department of Materials Science and Engineering,
National Taiwan University of Science and Technology,
Taipei, Taiwan, ²Graduate Institute of Applied Science
and Technology, National Taiwan University of Science
and Technology, Taipei, Taiwan.

C5-P03
Synthesis of IrOx for Implantable Electronic Devices

Kuang-Chih Tso¹, Yi-Chieh Hsieh², Hang-Yi Wang¹,
Po-Chun Chen³, Pu-Wei Wu²

^{1,3}Graduate Program for Science and Technology of
Accelerator Light Source, ^{2,5}Department of Materials
Science and Engineering National Chiao Tung
University, Hsinchu, Taiwan, R.O.C, ⁴Department of
Materials and Mineral Resources Engineering National
Taipei University of Technology, Taipei, Taiwan,
R.O.C..

C5-P04
Development of back-end processes for implantable neurostimulation devices

PO-CHUN CHEN^{1,2}, Pin-Cheng Lin¹, Yu-Chuan Pai¹

¹Institute of Materials Science and Engineering,
National Taipei University of Technology, Taipei,
Taiwan. ²Dept of Materials and Mineral Resources
Engineering, National Taipei University of Technology,
Taipei, Taiwan

C5-P05
Ionization Process of Gold Nanorod Dimers using LDI-MS

Yo Tsutamoto¹, Daiki Muko¹, Hironobu Tahara²,
Yasuro Niidome¹

¹Department of Chemistry and Bioscience, Kagoshima
University, Kagoshima, Japan, ²Division of Chemistry
and Materials Science, Nagasaki University, Nagasaki,
Japan.

C5-P06
Development of gold nanoparticles decorated capillary biosensor for the detection of the biomolecules

Sudha Kumari¹, Saswat Mohapatra¹, Rakesh S.
Moirangthem

¹ Nanophotonics Lab, Department of Applied Physics,
Indian Institute of Technology (Indian School of Mines),
Dhanbad-826004, JH, India.

Symposia D

Advanced Functional Materials

Symposium D1

Advanced Carbon Materials

November 7-8, 2017

Organizers

Ju-Liang He Feng Chia University, Taiwan
Jarrn-Horng Lin National University of Tainan, Taiwan

Oral Session

Tuesday, November 7, 2017

Room 402b

Chairperson: Ju-Liang He

10:30-11:00 coffee break

11:00-12:30 plenary talk

15:30-16:30 coffee break & poster

14:35-15:05 D1-01 Keynote

HIPIMS Deposition of DLC Coatings

Ralf Bandorf¹

¹Fraunhofer Institute for Surface Engineering and Thin Films IST, Braunschweig, Germany.

Oral Session

Wednesday, November 8, 2017

Room 404

Chairperson: Jarrn-Horng Lin

09:00-09:30 D1-02 Keynote

Graphene-based Composites for the Applications on Thermal Management and Supercapacitor

Yhui-Ching Yuan¹, Li-Hsin, Tseng¹, Chi-Young Lee¹, Nyan-Hwa Tai¹

¹Dept of Materials Science and Engineering, National Tsing-Hua University, Taiwan.

09:30-09:45 D1-03

Low temperature synthesis of high-quality graphene on various metals by carbon ion implantation

Janghyuk Kim¹, Gwangseok Yang¹, Sooyeoun Oh¹, Jihyun Kim¹

¹Dept of Chemical and Biological Engineering, Korea university, Seoul, Korea.

09:45-10:00 D1-04

Scalable approach to highly efficient and rapid capacitive deionization with CNT-thread as electrodes

Maku Moronshing¹, C Subramaniam¹

¹Department of Chemistry, Indian institute of technology Bombay, Mumbai.

10:00-10:15 D1-05

Excellent electromagnetic interference shielding effectiveness of activated carbon-NiZnFe₂O₄ composites

Shivam Gupta¹, Nyan-Hwa Tai¹

¹Department of Materials Science and Engineering,

National Tsing Hua University, Hsinchu, Taiwan.

10:15-10:30 D1-06

Core-Shell Co₃O₄@Pt on Functionalized Graphene Sheets for Oxygen Electro-Reduction in Alkaline Electrolytes

Shih-Cheng Chou¹, Yi-Chieh Hsieh¹, Pu-Wei Wu¹

¹National Chiao Tung University.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

14:00-14:30 D1-07 Keynote

Preparation and properties of novel porous carbons and their porous polymer precursors

Dingcai Wu¹

¹Materials Science Institute, PCFM Lab, School of Chemistry, Sun Yat-sen University, Guangzhou, P. R. China.

14:30-14:50 D1-08 Invited

High efficiency oil-water separation by full carbon hybrid nanoarchitecture

Chien-Kuo Hsieh¹, Kai-Chen Huang¹, I-Ching Chen¹

¹Dept of Materials Science and Engineering, Ming Chi University of Technology, Taiwan.

14:50-15:10 D1-09 Invited

Preparation, Characterization, and CO₂ Capture/Separation Efficiencies of Metal Organic Frameworks (MOFs), Metal Azolate Frameworks (MAFs), and Zeolitic Imidazolate Frameworks (ZIFs)

Kuen-Song Lin¹, Chao-Lung Chiang¹, Abhijit Krishna Adhikari¹, Chieh-Hung Wang¹

¹Department of Chemical Engineering and Materials Science/Environmental Technology Research Center, Yuan Ze University.

15:10-15:25 D1-10

Free-standing, and Flexible Carbon Nanotubes-Graphene Hybrid Structures for Broadband Photodetecting

An T. Nguyen¹, Ching-Fu Su¹, Ya-Ping Hsieh², Mario Hoffman³, Hung-Chih Kan¹, Chia-Chen Hsu¹

¹Department of Physics, National Chung Cheng University, Ming-Hsiung, Taiwan. ²Graduate Institute of Opto-Mechatronics, National Chung Cheng University, Ming-Hsiung, Taiwan. ³Department of Physics, National Taiwan University, Taiwan.

16:30-17:00 D1-11 Keynote

Soft Processing (= Green Processing) for Nano Carbons: Direct Fabrication of Functionalized Graphenes and Their Hybrids Inks via Submerged Liquid Plasma [SLP] and Electrochemical Exfoliation [ECE] under Ambient Conditions

Masahiro Yoshimura, Jaganathan Senthilnathan, Kodepelly SanjeevaRao, Elumalai Satheeskumar

¹Promotion Centre for Global Materials Research (PCGMR), Dept of Materials Science and Engineering, National Cheng Kung University, Taiwan.

17:00-17:20 D1-12 Invited**Charge Carrier Dynamics of Graphitic Carbon Nitride Nanocomposite**Ying-Chih Pu¹, Hsiao-Chuan Fan¹, Tzu-Wei Liu¹, Jie-Wen Chen¹¹Department of Materials Science, National University of Tainan.**17:20-17:35 D1-13****Growth of Graphene Layer by Using Synchronized HIPIMS at Different Temperature**Chen-Ming Tseng¹, Tai-Ting Ho¹, Ju-Liang He¹¹Department of Materials Science and Engineering, Feng Chia University.

Poster Session

Wednesday, November 8, 2017

12:00-14:00

Room 401

D1-P01**The optical and electrical properties of carbon-nickel nanocomposite thin films prepared by reactive sputtering with different radio-frequency powers**Zih-Chen Hong¹, Sham-Tsong Shiue¹¹Department of Materials Science and Engineering, National Chung Hsing University, Taiwan.**D1-P02****Feasibility of Polydopamine/Graphene Oxide Thin-Film Composite Membrane for Forward Osmosis Application**Ju-Yun Chiang¹, Nyan-Hwa Tai¹, Chi-Young Lee¹¹Dept of Materials Science and Engineering, National Tsing-Hua University, Hsinchu, Taiwan.**D1-P03****Investigation on the Optical and Mechanical Properties of Diamond films for screen coating in cellular phone**Lun-Hui Hung¹, Nyan-Hwa Tai¹, Chi-Young Lee¹¹Dept of Materials Science and Engineering, National Tsing-Hua University, Hsinchu, Taiwan.**D1-P04****Control of Hydrophilicity on Carbon Cloth by Atmospheric Pressure Plasma Jet Treatments**K.-F. Chiu¹, H.-J. Leu², Y.-C. Yao²¹Department of Materials Science and Engineering, Feng Chia University. ²Master's Program of Green Energy Science and Technology, Feng Chia University.**D1-P05****Lipid-Encapsulated Fluorescent Nanodiamonds for Correlative Light Electron Microscopy of Cell Surface Antigens**Feng Jen Hsieh^{1,3}, Yen-Wei Chen¹, Yao-Kuan Huang⁴, Hsien-Ming Lee^{2,5}, Chun-Hung Lin^{2,3,6}, Huan-Cheng Chang^{1,7}¹Institute of Atomic and Molecular Sciences, Academia Sinica. ²Taiwan International Graduate program-Chemical Biology and Molecular Biophysics, Academia Sinica, Taipei, Taiwan. ³Department of Biochemical Sciences, National Taiwan University, Taipei, Taiwan. ⁴Institute of Cellular and Organismic Biology,Academia Sinica, Taipei, Taiwan. ⁵Institute of Chemistry, Academia Sinica, Taipei, Taiwan. ⁶Institute of Biological Chemistry, Academia Sinica, Taipei, Taiwan. ⁷Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.**D1-P06****Surface Coating on Fluorescent Nanodiamonds for Versatile Bioapplication**Shingo Sotoma¹, Feng-Jen Hsieh¹, Yen-Wei Chen¹, Jerson Chen¹, Kartika Wardhani¹, Pei-Chang Tsai¹, Huan-Cheng Chang^{1,2}¹Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei, Taiwan. ²Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.**D1-P07****Microwave assisted synthesis of reduced graphene oxide/CoFe₂O₄ composites**Kun-Yauh Shih¹, Yi-Shu Wang¹¹Department of Applied Chemistry, National Pingtung University, Pingtung, Taiwan.**D1-P08****Improvement the characteristics of graphene by pretreatment of copper foil and chemical doping method**Yu-Lin Jheng¹, Horng-Show Koo², Mi Chen³¹Department of Chemical and materials Engineering, Minghsin University of Science and Technology, Hsinchu, Taiwan. ²Department of electronic Engineering, Minghsin University of Science and Technology, Hsinchu, Taiwan.**D1-P09****Fluorescent Nanodiamond-Superparamagnetic Iron Oxide Nanohybrids for dual-Modality Imaging of Human Glioblastoma in Mice**Be-Ming Chang^{1,2,3}, Chao-Hsiung Hsu^{4,5}, Fang-Chu Lin⁵, Yuen Yung Hui¹, Long-Jyun Su¹, Chih-Che Wu⁶, Tsyr-Yan Yu^{1,2}, Yung-Ya Lin⁵, Huan-Cheng Chang^{1,2,7}¹Institute of Atomic and Molecular Sciences, Academia Sinica, ²Taiwan International Graduate Program – Molecular Science and Technology, Academia Sinica, Taipei, Taiwan. ³Department of Chemistry, National Tsing Hua University, Hsinchu, Taiwan. ⁴Department of Chemistry, National Taiwan University, Taipei, Taiwan. ⁵Department of Chemistry & Biochemistry, UCLA, Los Angeles, CA 90095, USA. ⁶Department of Applied Chemistry, National Chi Nan University, Puli, Nantou 545, Taiwan. ⁷Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei 106, Taiwan.

D1-P10

Novel Composite Electrode for the Selective Electrosorption of Gold Ion

Tzu-Yu Cheng¹, Li-Ching Chung¹, Po-I Liu¹, Yin-Lung Han¹, Kai-Chun Fan¹, Hsin Shao¹, Min-Chao Chang¹, Meng-Shun Huang¹, Ren-Yang Horng¹, Teh-Ming Liang²

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan. ²Green Energy and Environment Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

D1-P11

Application Research of Vibration Suppressing Carbon Fiber Reinforced Plastics

S. J. Liou¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

D1-P12

Synthesis and characterization of nickel-iron oxide/graphene composite

Kun-Yauh Shih¹, Shou-Shiun Yang¹, Chun-Rong Lin², Yaw-Teng Tseng²

¹Department of Applied Chemistry, National Pingtung University, Pingtung, Taiwan. ²Department of Applied Physics National Pingtung University, Pingtung, Taiwan.

D1-P13

Sealing test of graphite foil-incorporated C/C in molten fluoride salt

H.Y. Lin¹, C.W.Chuang¹, K.J. Lee², J.H. Chern Lin¹, C.P. Ju¹

¹Dept of Materials Science and Engineering, National Cheng-Kung University, Taiwan. ²Dept of Materials Science and Engineering, I-Shou University, Taiwan.

D1-P14

Effect of layered-structural friction modifiers on tribological behavior of semi-carbonized copper/phenolic resin-derived semi-metallic friction material

H.Y.Huang¹, H.Y.Lin¹, C.W.Chuang¹, K.J.Lee², J.H.Chern Lin¹, C.P.Ju¹

¹Dept of Materials Science and Engineering, National Cheng Kung University, Taiwan. ²Dept of Materials Science and Engineering, I Shou University, Taiwan.

D1-P15

An effective route to transform scrap tire carbons and coffee grounds into activated carbons with high adsorption capacity of dye

Shun-Bo Wang¹, Jhih-Hao Jiang¹, Jarrn-Horng Lin¹

¹Department of Materials Science, National University of Tainan, Taiwan.

D1-P16

Selectively non-oxidative dehydrogenation of ethanol to acetaldehyde and hydrogen on copper catalysts

Po-Tse Tseng¹, Ching-Hsiang Chang², and Jarrn-Horng Lin³

¹Department of Materials Science, National University of Tainan, Taiwan.

D1-P17

A simple impregnation to prepare CuO/XC72 composites and their performances in non-enzymatic glucose sensing

Pei-Lun Wang¹, Chia-Min Jhang², and Jarrn-Horng Lin³

¹Department of Materials Science, National University of Tainan, Tainan, Taiwan.

D1-P18

A facile one-step process for high capacitive deionization performance of reduced graphene oxide/activated carbon composite electrodes

Y.T.Lai¹, and N.H.Tai¹

¹Dept of Materials Science and Engineering, National Tsing-Hua University, Hsinchu, Taiwan.

D1-P19

High Power Impulse Magnetron Sputter Deposited Nitrogen doped DLC on Polyethylene Terephthalate

Jonathan Ho¹, Chia-Wei Liu¹, Ju-Liang He¹

¹Dept of Materials Science and Engineering, Feng Chia University.

Symposium D2

Advanced Ceramic Materials

Monday, November 6, 2017

Organizers

Ying-Hao Chu	National Chiao Tung University, Taiwan
Kuan-Zong Fung	National Cheng Kung University, Taiwan

Oral Session

Monday, November 6, 2017

Room 504b

Chairperson: Ying-Hao Chu, Kuan-Zong Fung

09:00-09:30 D2-01 Keynote

Development of RF Front-end Devices for Wireless Communication

JH Jean¹

¹National Tsing Hua University.
Hsinchu, Taiwan.

09:30-09:55 D2-02 Invited

Photocatalytic activity and surface structure of rutile TiO₂

Yasuro Ikuma¹, Koichi Niwa¹

¹Kanagawa Inst. of Tech.

09:55-10:20 D2-03 Invited

Solution-processed metal oxide thin film nanostructures for water splitting photoelectrodes

Ho Won Jang¹

¹Department of Materials Science and Engineering,
Seoul National University, Seoul, Republic of Korea.

10:20-10:35 D2-04

Frequency switchable multi-layered paraelectric-BST/ferroelectric-BaTiO₃ stack epitaxial film resonator

Ryuta Noda¹, Takahiro Shimidzu¹, Kiyotaka Wasa²,
Takahiko Yanagitani³

¹Waseda University, ²Yokohama City University, ³Waseda University, JST PRESTO, ZAIKEN.

14:00-14:30 D2-05 Keynote

Nonvolatile Ferroelectric Domain Wall Memory

V.Nagarajan¹, P.Sharma¹, Q.Zhang¹, D.Sando¹,
C.H.Lei², Y.Liu³, J.Li^{4,5}, and J.Seidel¹

¹School of Materials Science and Engineering, The University of New South Wales Australia, 2052, Australia.

²Dept of Aerospace & Mechanical Engineering, Saint Louis University, St. Louis, Missouri 63103, USA.

³School of Materials Science and Engineering, and Key Laboratory of Low Dimensional Materials & application Technology of Ministry of Education, Xiangtan University, Xiangtan, Hunan 411105, China.

⁴Dept of Mechanical Engineering, University of Washington, Seattle, Washington 98195-2600, USA.

⁵Shenzhen Key Laboratory of Nanobiomechanics, Shenzhen Institutes of Advanced Technology, Chinese

Academy of Sciences, Shenzhen, Guangdong, 518055, China.

14:30-14:55 D2-06 Invited

When Multiferroics Meets Valleytronics

Chun-gang Duan¹

¹East China Normal University.

14:55-15:20 D2-07 Invited

Optical control of multiferroicity at room temperature

Y. Y. Chiu¹, Y. D. Liou¹, Y. Cao², S. V. Kalinin², Y. H. Chu³, Y. C. Chen¹, J. C. Yang¹

¹Department of Physics, National Cheng Kung University, Tainan, 701, Taiwan, ²Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA, ³Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, 300, Taiwan.

15:20-15:45 D2-08 Invited

Reversible Low Voltage Writing of Magnetic Domains at Room Temperature in BaTiO₃/Fe₃O₄ Heterostructure

Gaokuo Zhong¹, Shuhong Xie¹, Jiangyu Li²

¹Xiangtan University, ²University of Washington.

16:30-17:00 D2-09 Keynote

Toroidal order, phase coexistence, electric-field control, and emergent phenomena in oxide superlattices

Lane W. Martin¹

¹University of California, Berkeley.

17:00-17:25 D2-10 Invited

Light-driven Functionalities in Novel SrRuO₃ thin film Heterostructures

Heng-Jui Liu¹, Tzu-Chiao Wei², Jr-Hau He², Qian Zhan³, Qing He⁴, Deok-Yong Cho⁵, Chih-Wei Luo⁶, Ya-Ping Chiu⁷, Ying-Hao Chu⁸

¹National Chung Hsing University, ²King Abdullah University of Science and Technology, ³University of Science and Technology Beijing, ⁴Durham University, ⁵Chonbuk National University, ⁶National Chiao Tung University, ⁷National Taiwan University, ⁸National Chiao Tung University.

17:25-17:50 D2-11 Invited

Tunable Light Absorption and Photoelectric Interaction in Self-Assembled Nanomaterials

Chang Wei Sea

Monash University Malaysia.

17:50-18:05 D2-12

DC field-induced piezoelectricity of cubic perovskite 0.95Pb(Mg_{1/3}Nb_{2/3})O₃-0.05PbTiO₃ epitaxial film for RF switchable resonators

Takahiro Shimidzu¹, Kiyotaka Wasa², Takahiko Yanagitani³

¹Waseda University, ²Yokohama City University, ³Waseda University, JST PRESTO, ZAIKEN.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

D2-P01

Reduction Kinetics of Fe₂O₃/Al₂O₃ Oxygen Carrier System using Syngas for Chemical-Looping Combustion Process

Wei-Chen Huang¹, Fan Hsu¹, Pei-Chen Su², Yu-Lin Kuo¹

¹Department of Mechanical Engineering, National Taiwan University of Science and Technology, ²School of Mechanical and Aerospace Engineering, Nanyang Technological University.

D2-P02

Atomic Layer Deposited Nano-Film on the NiTi Shape Memory Alloys for Biomedical Applications

H. Y. Hong¹, K. C. Yang², M. J. Chen¹, Yin-Yi Han³, H. C. Lin¹

¹Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan, ²School of Dental Technology, Taipei Medical University, Taipei, Taiwan, ³Department of Traumatology, National Taiwan University Hospital, Taipei, Taiwan.

D2-P03

Material Characterization and Hydrogen Flux of Sr(Ce_{0.6}Zr_{0.4})1-xYxO_{3-δ} Proton Conductor

Kuan-Chi Fu¹, Hsin-Che Huang¹, I-Ming Hung¹

¹Department of Chemical Engineering and Materials Science, Yuan Ze University.

D2-P04

Crystal Growth and Magnetotransport Properties of ZrTe₅

Masaki Onishi¹, Takao Sasagawa¹

¹Laboratory for Materials and Structures, Tokyo Institute of Technology.

D2-P05

Constrained sintering of Bi₂O₃-doped ZnO

Cheng-Feng Wu¹, Jau-Ho Jean¹

¹National Tsing Hua University, Hsinchu, Taiwan.

D2-P06

Extremely Large Magnetoresistance in Single Crystals of Nonmagnetic Grey Arsenic with Topological Electronic States

Takao Sasagawa¹, Takuya Nakano¹

¹Tokyo Institute of Technology.

D2-P07

Growth of Yttria Stabilized Zirconia on Flexible Muscovite Substrate by van der Waals Epitaxy

Y.H.Juan¹, P.C.Wu¹, Y.P.Lin¹, Y.H.Chu¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

D2-P08

Mechanically Tunable Flexible Ferroelectric System

Pao-Wen Shao¹, Deng-Li Ko¹, Ying-Hao Chu²

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu,

Taiwan, ²Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan, Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

D2-P09

Ferroelectric Properties of Epitaxial Bismuth Ferrite Thin Film on Flexible Muscovite Substrate

Yu-Hao Tu¹, Jie Jiang², Ying-Hao Chu¹

¹Department of Materials Science and Engineering, National Chiao Tung University, ²Key Laboratory of Low Dimensional Materials and Application Technology of Ministry of Education, Xiangtan, Hunan, China.

D2-P10

Transparent Heteroepitaxy (Ba, La)SnO₃/Muscovite for Flexible Optoelectronics

C.Y.Yang¹, M.Yen¹, Y.H.Chu¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

D2-P11

Revolutionary Thin Film with Transitional Composition

Yu-Hong Lai¹, Min Yen², Pei-Chun Wang³

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan

²Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan

³Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan

D2-P12

Heteroepitaxy of ZnO/PZT thin films on Muscovite for Flexible Ferroelectric Field-Effect Transistor Meng-Fu Tsai¹

¹frank547frank547@gmail.com.

D2-P13

Mechanically Tunable Nonlinear Dielectrics

Deng-Li Ko¹, Jie Jiang², Huang Jun Wei¹, Ying-Hao Chu³

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu,

Taiwan, ²Key Laboratory of Low Dimensional

Materials and Application Technology of Ministry of Education, Xiangtan, Hunan, China, ³Department of

Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan

Department of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan

Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

D2-P14

Mullite-bonded Porous SiC Fabricated by Oxidation of Ti₃AlC₂ and SiC

Septiadi Arifin¹, Yoon Dang-Hyok¹

School of Materials Science and Engineering,

Yeungnam University, Gyeongsan, Republic of Korea

D2-P15

Elastomagneto-resistance of

$\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{Muscovite}$ Heteroepitaxy

Min Yen¹, Ying-Hao Chu¹, Ying-Hao Chu²

¹Department of Materials Science and Engineering, National Chiao Tung University, ²Department of Material and Chemical Research Laboratories, Industrial Technology Research Institute.

D2-P16

Characteristics of MgAl_2O_4 polycrystalline Ceramics with LiF sintering aid through high temperature sintering

Yan Wei Chen¹, Cheng Hsiung Peng², Pang Shiu Chen³, Yang Kuo Kuo⁴, Cheng Hung Shih⁵, Hong Cheng Huang⁶, Chuan wei Lai⁷

¹Department of Chemical and Materials Engineering, Minghsin University of Science and Technology, Hsin-Feng, HsinChu, Taiwan. ²Chemical Defense Section Chemical Systems Research Division, Chung-Shan, Chung-Shan Institute of Science Technology, Lung-Tang, Tao-Yuan, Taiwan.

D2-P17

Synthesis of Hierarchically Porous Structured Zeolite Materials by Freeze Casting for CO_2 Adsorption

Hsin-Juei Wang¹, Haw-Kai Chang¹, Yueh-Ying Chou¹, Po-Yu Chen¹

Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan.

D2-P18

Organic Liquid based-Polymeric Silazane Precursor for the research of Silicon Oxy carbonitride composite in 3D Inkjet printing application

Chang-Yu Lin.

D2-P19

The processing parameters for high pressure synthesis of $\text{Li}_x\text{Fe}_{1-x}\text{OHFeSe}$

Po-Hsuan Lee¹, Xiaoding Qi¹, An-Hung Cheng¹

¹National Cheng Kung University.

D2-P20

Synthesis and characteristics of AlN nanowires

CHEN YI XUAN¹, Wu, Hue-Min²

¹Institute of Nanomaterials, Chinese Culture University

²Department of Optoelectrics, Chinese Culture University

D2-P21

Low-frequency dielectric properties of Li_2SnO_3 ceramics

JIAN-HAO JIANG¹, Yung-Yu Chen¹, TSAI, CHENG-LIN¹, QIU, GUO-JIN¹

Department of Electronic Engineering, Lunghua University of Science and Technology, Gueishan Shiang, Taoyuan County, Taiwan.

D2-P22

Fabrication of a multilayer 0.5PNNZT piezoelectric ceramics co-fired at low sintering temperature.

HSIAO-HSIEN HU¹, GURUMAYUM ROBERT KENEDY¹, CHEN-CHIA CHOU¹

¹ National Taiwan University of Science and Technology, Taipei, Taiwan.

D2-P23

Effect of Processing Parameters of Plasma Electrolytic Oxidation of Magnesium

Chen-Chia Chou¹, Felix Tjiang¹, Ping-Han Lu¹, Dah-Shyang Tsai²

¹ Dept of Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan

² Dept of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

D2-P24

Fabrication and characterization of Plasma Electrolytic Oxidation Coating on Hot-dip Aluminized Medium Carbon Steel

Yu-Ren Chen¹, Yan-Zhang Huang², Dah-Shyang Tsai², Chen-Chia Chou¹

¹ Dept of Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

² Dept of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

D2-P25

The Effects of Doping on the Sintering and Microwave Properties of

$\text{Ca}_4(\text{La}_4\text{Pr}_2)(\text{SiO}_4)_4(\text{PO}_4)_2\text{O}_2$

Yung-Jen Lin¹, Sea-Fue Wang², Hong-Bo Yang¹, Jia-Min Chen¹

¹Department of Materials Engineering, Tatung University, ²Department of Materials and Mineral Resources Engineering, National Taipei University of Technology.

D2-P26

Effect of Graphene on the luminescence property of BaSiO_3 : Eu3 + phosphor

Kun-Yauh Shih¹, Wei-Fang Lin¹, Cheng-Ling Huang¹

¹National Pingtung University.

D2-P27

Crystal Growth and Superconducting Properties of Ni-Bi Compounds having Strong Spin-Orbit Coupling

Keitaro Matsukawa¹, Kenjiro Okawa¹, Masayuki Murase¹, Takao Sasagawa¹

¹Tokyo Institute of Technology.

D2-P28

Effect of NaNO_3 as flux on the luminescence property of BaSiO_3 : Eu3 + phosphor

Kun-Yauh Shih¹, Wei-Fang Lin¹, Tzu-Chieh Huang¹

¹National Pingtung University.

D2-P29

Effects of HfO_2 on Properties of $\text{Ba}_{0.96}\text{Ca}_{0.03}\text{Ti}_{0.96}\text{Sn}_{0.04}\text{O}_3$ Lead-Free Ceramics for Linear Motor Applications

Cheng-Che Tsai¹, Chia-Chi Shih², Jiann-Sheng, Jiang³, Wei-Hsiang Chao⁴, Chung-Ming Weng⁴

¹Department of Digital Game and Animation Design, Tung Fang Design University, Taiwan, ²Department of Interior Design, Tung Fang Design University, Taiwan, ³Department of Arts and Crafts, Tung Fang Design University, Taiwan, ⁴Department of Electrical Engineering, National Cheng Kung University, Taiwan.

D2-P30

Effect of temperature on the luminescence properties of $\text{Zn}_2\text{SiO}_4\text{:Mn}^{2+}$ phosphors doped with graphene

Kun-Yauh Shih¹, Shen-Wen Li¹, Tzu-Chieh Huang¹

¹National Pingtung University.

D2-P31

Effects of SiO_2 on Properties of $\text{Ba}_{0.96}\text{Ca}_{0.03}\text{Ti}_{0.96}\text{Sn}_{0.06}\text{O}_3$ Lead-Free Ceramics for Energy Harvester Applications

Cheng-Che Tsai¹, Ming-Sheng, Kung¹, Hsing-Min, Hu¹, Jiann-Sheng, Jiang², Chung-Ming Weng³

¹Department of Digital Game and Animation Design, Tung Fang Design University, Taiwan, ²Department of Arts and Crafts, Tung Fang Design University, Taiwan, ³Department of Electrical Engineering, National Cheng Kung University, Taiwan.

D2-P32

Preparation of Calcium Carbonate Fine Powder from the Waste Sorbent of the Calcium Looping Process

Ming-Hui Chang¹, Wan-Hsia Liu¹, Jui-Yen Cheng¹, Heng-Wen Hsu¹

¹Industrial Technology Research Institute, Hsinchu, Taiwan.

D2-P33

Fabrication and Characterization of Thermochromic Vanadium Dioxide (VO_2) Thin Films by High Power Impulse Magnetron Sputtering

Li-Shu Tu¹, Pi-Chun Juan², Yong-Chang Chen², Chen-An Tsai², Chun-Hsi Su¹

¹Graduate Institute of Manufacturing Technology of National Taipei University of Technology, ²Department of Materials Engineering of Ming Chi University of Technology.

D2-P34

Preparation of Nano-sized Red Phosphors Coated on Platy Ceramic Materials and Their Luminescent Properties

Dae Sung Kim¹, Se Min Ban¹, Hyun Jin Lee¹, Jeong Min Park¹, Byung-Ki Choi², Kwang-Jung Kang², Kyeong Youl Jung³

¹Eco-composite Materials Center, Korea Institute of Ceramic Engineering & Tech., Gyeongnam, Republic of Korea. ²CQV Co, Chungbuk, Republic of Korea. ³Dept of Chemical Engineering, Kongju National University, Chungnam, Republic of Korea.

D2-P35

CoO thin film on muscovite substrate for flexible memorial device application

Thai Duy Ha¹, Yu-Hong Lai², Chun-Fu Chang³, Liu Hao Tjeng³, Jenh-Yi Juang¹, Ying-Hao Chu⁴

¹Department of Electrophysics, National Chiao Tung University, Taiwan, ²Department of Material Science and Engineering, National Chiao Tung University, Taiwan, ³Max-Planck Institute for Chemical Physics of Solids, Dresden, Germany, ⁴Department of Material Science and Technology, National Chiao Tung University, Taiwan.

D2-P36

Organic Liquid based-Polymeric Silazane Precursor for the research of Silicon Oxy carbonitride composite in 3D Inkjet printing application

Chang-Yu Lin

D2-P37

Self - assembled microlens array process

Guan Cheng Lin¹, Ya Xun Lin¹, Hsin I Chen¹, Mao-Kuo Wei^{1,2}, Su-Hua Chen¹

¹Dept of Materials Science and Engineering, National Dong Hwa University, Hualien, Taiwan.

²Dept of Opto-Electronic Engineering, National Dong Hwa University, Hualien, Taiwan.

D2-P38

Growth of SiC Utilizing Microwave Plasma Chemical Vapor Deposition

Y.S, Chiou¹, J.Y. Gan¹

¹Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

Symposium D3

Advanced Polymeric Materials

November 6-8, 2017

Organizers

Hong-Cheu Lin	National Chiao Tung University, Taiwan
Wen-Chang Chen	National Taiwan University, Taiwan
Chain-Shu Hsu	National Chiao Tung University
Hsin-Lung Chen	National Tsing Hua University, Taiwan
Rong-Ming Ho	National Tsing Hua University
Lien-Chung Hsu	National Cheng Kung University, Taiwan

Oral Session

Monday, November 6, 2017

Room 504a

Chairperson: Hong-Cheu Lin

09:15-09:30 D3-01

A Human-Made Gyroid-Structured Butterfly with Full-Visible-Wavelength Structural Colorations

En-Li Lin¹, Wei-Lun Hsu¹, Yeo-Wan Chiang¹¹National Sun Yat-Sen University.

09:30-09:50 D3-02 Invited

Low-Power Ultrasensitive Gas Sensor Using Porous-Electrode-Capped Organic Diodes

Hsiao-Wen Zan¹, H.F.Meng¹, C.C.Chen², C.J.Lu³, P.H.Yeh⁴, G. Madhiyan¹, H.C.Lin¹¹National Chiao Tung University, ²National Taiwan University Hospitals Hsinchu Branch, ³National Taiwan Normal University, ⁴Tamkang University.

09:50-10:10 D3-03 Invited

Flexible Organic Transistor Sensors with Specific Polymeric Sensing Layers

M. Song¹, J. Seo¹, H. Kim¹¹Kyungpook National University.

10:10-10:30 D3-04 Invited

New Conjugated Polymers for Chemical and Biological Sensors and to Study Neurological Disorders

Parameswar K. Iyer¹¹Indian Institute of Technology Guwahati.

Oral Session

Monday, November 6, 2017

Room 504a

Chairperson: Chain-Shu Hsu

14:00-14:30 D3-05 Keynote

Rational Material, Interface, and Device Engineering for High-Performance and Stable Organic and Perovskite Solar Cells

Alex K.-Y. Jen¹¹City University of Hong Kong.

14:30-14:50 D3-06 Invited

Design and Synthesis of Organic and Polymeric Conjugated Materials for Organic Photovoltaics and Transistors

Yen-Ju Cheng¹¹Department of Applied Chemistry, National Chiao Tung University, Taiwan.

14:50-15:10 D3-07 Invited

All-Polymer Solar Cells vs. Fullerene-Based Solar Cells: The Importance of Molecular Packing, Orientation and Morphology Control

Bumjoon Kim¹¹KAIST.

15:10-15:30 D3-08 Invited

Surfaces, Interfaces and Nanostructures in Organic Electronic Devices

Keisuke Tajima¹¹RIKEN CEMS.

Oral Session

Monday, November 6, 2017

Room 504a

Chairperson: Rong-Ming Ho

16:30-17:00 D3-09 Keynote

From Switchable Self-Assembly to Artificial Intracellular Machines

Myongssoo Lee

Jiling University.

17:00-17:20 D3-10 Invited

Preparation of Well-Controlled High Density Polymethyl Methacrylate Polymer Brush with Helical Structure

Tomoyasu Hirai^{1,2}, T. Kato¹, M. Sato¹, and A. Takahara^{1,2}¹ Institute for Materials Chemistry and Engineering, Kyushu University, Fukuoka, Japan.² International Institute for Carbon Neutral Energy Research, Kyushu University, Fukuoka, Japan.

17:20-17:35 D3-11

Nanoporous Crystalline Templates from Double-Crystalline Block Copolymers by Control of Interactive Confinement

Shih-Hung Huang¹, Yeo-Wan Chiang¹, Jing-Cherng Tsai²¹National Sun Yat-Sen University.

²National Chung Cheng University,

17:35-17:55 D3-12 Invited

Liquid Crystalline Polymer-Based Ion-Conductive Materials

*Zhihao Shen, Yudong Zhang, Jing Ping, Xinghe Fan, and Qifeng Zhou

Beijing National Laboratory for Molecular Sciences, Department of Polymer Science and Engineering, and Key Laboratory of Polymer Chemistry and Physics of Ministry of Education, Center for Soft Matter Science and Engineering, College of Chemistry and Molecular Engineering, Peking University, Beijing, China.

*College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China.

Oral Session

Tuesday, November 7, 2017

Room 504a

Chairperson: Wen-Chang Chen

09:05-09:20 D3-13

Order-induced Electronic Delocalization of Semiconducting Polymers

B.B.Y.Hsu¹, C.Luo², R.Jing³, M.Wang⁴, Y.Shao³, S.Patel⁵, B.H. Lee⁶, G.C.Bazon⁶, M.Chabiny⁵, D.Basov³, A.J.Heeger²

¹Dept of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan, ²Center for Polymers and Organic Solids, University of California, Santa Barbara, Santa Barbara, USA, ³Dept of Physics, Columbia University, New York, USA, ⁴Mitsubishi Chemical Center for Advanced Materials, University of California, Santa Barbara, Santa Barbara, USA, ⁵Materials Dept, University of California, Santa Barbara, Santa Barbara, USA, ⁶Center for Polymers and Organic Solids, University of California, Santa Barbara, Santa Barbara, USA

09:20-09:40 D3-14 Invited

Solution-Processed Organic Semiconductors for High Performance Organic Field Effect Transistors Application

Bo-Chin Chang¹, Guan-Yu He¹, Deng-Yi Huang¹, Chih-Yu Lin¹, Sureshraj Vegiraju¹, Ming-Chou Chen¹, Cheng-Liang Liu¹

¹National Central University.

09:40-10:00 D3-15 Invited

Efficient Polymer Solar Cells with Small Photon Energy Loss

Itaru Osaka¹

¹Hiroshima University.

10:00-10:30 D3-16 Keynote

Manipulating Charges and Light with Organic Polymers and Polymer Composites for Opto-Electronics

Antonio Facchetti¹

¹flexterra, inc..

Oral Session

Tuesday, November 7, 2017

Room 504a

Chairperson: Lien-Chung Hsu

14:00-14:30 D3-17 Keynote

Design Concept of High Refractive Index Polymers and Their Application

Mitsuru Ueda¹, Tomoya Higashihara¹

¹Department of Organic Materials Science, Graduate School of Organic Materials Science, Yamagata University.

14:30-14:50 D3-18 Invited

Orientation Correlation in Miscible Polymer Blends and Its Application of Optical Retardation Films

Masayuki Yamaguchi¹

¹Japan Advanced Institute of Science and Technology.

14:50-15:10 D3-19 Invited

n-Channel Transistors and Non-Volatile Memory Devices Based on Diimide-Based Organic Semiconductors

Felix Sunjoo Kim¹

¹Chung-Ang University.

15:10-15:30 D3-20 Invited

Design and Preparation of Functional High-Performance Polymers Towards Emergent Optoelectronic Applications

Guey-Sheng Liou¹

¹National Taiwan University.

Oral Session

Tuesday, November 7, 2017

Room 504a

Chairperson: Hsin-Lung Chen

16:30-17:00 D3-21 Keynote

Characterizing Self-Assembled Nanoparticles in Drug Delivery

kazuo sakurai¹

¹University of Kitakyushu.

17:00-17:20 D3-22 Invited

Rational Design of Conducting Polymers to Improve Charge Transportation Properties and Their Application to Photovoltaic Devices

Taiho Park¹

¹Pohang University of Science and Technology (POSTECH).

17:20-17:35 D3-23

A Discontinuous Transition from Dodecamer to Icosamer After an Induction Time in a Calix[4]arene-Derived Surfactant Monitored by Time-Resolved SAXS

Rintaro Takahashi¹, Sakiko Matsumoto¹, Shota Fujii¹,

Theyencheri Narayanan¹, Kazuo Sakurai¹

¹University of Kitakyushu, ESRF.

Oral Session
Wednesday, November 8, 2017
Room 504a
Chairperson: Cheng-Liang Liu

14:00-14:20 D3-24 Invited

Regioblock Copolythiophene

Tomoya Higashihara¹, Eisuke Goto¹
¹Yamagata University.

14:20-14:35 D3-25

Poly-Si Stop Chemical-mechanical-planarization Slurry using Core(Polystyrene)/ shell (wet ceria) Abrasive Enhancing Polishing-rate and Scratch-less

Young-Hye Son¹, Jea-Gun Park¹, Sang-Su Yun¹,
Gi-Ppeum Jung¹, Seok-Jin Yun¹
¹Hanyang University.

14:35-14:50 D3-26

Synthesis of Siloxane Modified Dianhydride Curing Agent and the Ability of the Curing Agent Using in the LED Encapsulant

Chia-Wen Hsu¹, Y.P.Wang², C.L.Ho², H.Chang²,
W.B.Chen¹, Y.H.Chan^{g1}, S.C.Hunag¹ and K.C.Chen¹
¹Industrial Technology Research Institute.
²Refining & Manufacturing Research Institute, CPC Corporation.

14:50-15:05 D3-27

Hierarchically Helical Structure of Achiral Block Copolymer Induced by Local Symmetry Breaking

I-Ming Lin¹, Yeo-Wan Chiang¹, and Wei-Tsung Chuang²
¹Department of Materials and Optoelectronic Science National Sun Yat-sen University, Kaohsiung, Taiwan.
²National Synchrotron Radiation Research Center, 101 Hsin-Ann Road, Hsinchu Science Park, Hsinchu, Taiwan.

15:05-15:20 D3-28

Study of nanofillers-filled polypropylene/poly(butylene succinate) blend-based nanocomposites

Veluri Sivanjineyulu¹, Yen-Hsiang Chang²,
Fang-Chyou Chiu^{*3}
¹Department of Chemical and Materials Engineering, Chang Gung University, Taoyuan 333, Taiwan, ²Graduate Institute of Dental and Craniofacial Science, Chang Gung University, Taoyuan 333, Taiwan, ³Department of Chemical and Materials Engineering, Chang Gung University, Taoyuan 333, Taiwan, Graduate Institute of Dental and Craniofacial Science, Chang Gung University, Taoyuan 333, Taiwan.

15:20-15:35 D3-29

Characterization of Photocurable Biodegradable Elastomer PGSA with Different Synthesis Time and Exposure Time

Lin Chen¹, Wai-Sam Ao-Ieong¹, Jane Wang¹
¹Dept of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

D3-P01

Insights into linear supramolecular polymer formation via TPE and BODIPY containing host-guest interaction

Chinmayananda Goudag¹
¹Department of Materials Sci. & Eng., National Chiao Tung University, Taiwan.

D3-P02

Synthesis of Soluble Di(2-picoly)amine Copolymer for Detection of Cu²⁺ in Aqueous Media

Pham Quoc Nhen¹, Po-Hsun Wu¹, Hong-Cheu Lin¹
¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

D3-P03

Biodegradable carbon-dioxide-based polymer for environment-friendly organic thin film transistors

Cut Rullyani¹, Chao-Feng Sung², Hong-Cheu Lin¹,
Chih-Wei Chu³
¹Department of Materials Science and Engineering, National Chiao Tung University, ²Department of Photonics and Display Institute, National Chiao Tung University, ³Research Center for Applied Science Academia Sinica.

D3-P04

Electrodeposition of Conducting Polymer PEDOT Mesoporous Films

Yi-Feng Du¹, Lu-Lin Li¹
¹Department of Energy Engineering, National United University, Miaoli, Taiwan.

D3-P05

Selective and sensitive electrochemical detection of Cu(II) ion based on ionic imprinted polymers

Chun-Chi LEE¹, Min-Shan Wu¹, Shu-Kang Hsu¹
¹Industrial Technology Research Institute.

D3-P06

Novel pentablock copolymers bearing pendant lithium sulfonates for lithium metal batteries

Chi-Yang Chao¹, Yi-Ling Liu¹
¹National Taiwan University.

D3-P07

Catalytic hydrogenation of aromatic di-amine to corresponding bis-cyclohexylamine

chaohuang chen¹, His-Yen Hsu¹, Chiou-Hwang Lee¹
¹ITRI.

D3-P08

Isoindigo-based Polymer Transistor for Ammonia Gas Sensor

Chun-Fu Lu¹, Chien-An Chen¹, Wei-Fang Su¹
¹National Taiwan University.

D3-P09

Study on the Integration of Biomimetic Hydrophilic Polymer Materials and Polyester Fabric

S.W.Lai¹, H.J.Li¹, C.L.Su¹, J.W.Tang¹, Mekuriaw Assefa, Toyoko

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

D3-P10

Femtosecond Charge Carrier Dynamics in Acidity-Controlled Conducting Polymer Films for Polymer Solar Cells

Jooyeok Seo¹, Myeonghun Song¹, Hwajeong Kim¹, Youngkyoo Kim¹

¹Kyungpook National University.

D3-P11

Realization of Multi-Mode Detection in Organic Field-Effect Transistors for Wearable Sensors

Jooyeok Seo¹, Hwajeong Kim¹, Youngkyoo Kim¹

¹Kyungpook National University.

D3-P12

Size Recognition and Selective Separation of Higher Fullerenes using Helical Poly(methyl methacrylate) Brushes

Masanao Sato¹, Tomoyasu Hirai¹, Atsushi Takahara¹

¹kyushu university.

D3-P13

Detection of Reactive Oxygen Species Using Device Platforms with Hybrid Interfaces Including Proteins

Hwajeong Kim¹, Jaehoon Jeong¹, Youngkyoo Kim¹

¹Kyungpook National University.

D3-P14

Application of polymer composite material in the field of intelligent textile

Shih-Hua Wang¹, Chiung-Hui Huang¹, Chih-Lin Su¹, Jing-Wen Tang¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute..

D3-P15

Novel Plant-based Dialkyl Hydroxylamine Antioxidant

Hung-Chin Shen¹, Chi-Lang Wu¹, Sheng-Long Zhang¹

¹Industrial Technology Research Institute.

D3-P16

Effect of The Alcoholysis Reaction on The Crystallization of Bisphenol A Diglycidyl ether/Polycarbonate Blends

Chean-Cheng Su¹, Cheng-Hsien Yu¹, Sing-Rong Wu¹, Wei-Xin Xu¹

¹Dept of Chemical and Materials Engineering, National University of Kaohsiung, Kaohsiung.

D3-P17

Exchange Reactions in Blends of Biodegradable Copolyester and Phenoxy

Chean-Cheng Su¹, Cheng-Hsien Yu¹, Xing-Rong Wu¹, Wei-Xin Xu¹

¹Dept of Chemical and Materials Engineering, National University of Kaohsiung, Kaohsiung.

D3-P18

A Replaceable Template-Synthetic Approach for Well-Defined Nanonetworks

Yen-Ting Juan

National Chung Hsing University.

D3-P19

Test method for the detection of potential-induced degradation for floating PV modules

H.C. Liu¹, C.T. Huang¹, Y.H. Yang¹, W.K. Lee¹, H.H. Chiang¹, F.M. Lin¹

¹Industrial Technology Research Institute.

D3-P20

Bio-based Polyurethane (PU) Foam with High Foaming Rate

Hong-Yuan Lian¹, Wen-Pin Chuang¹, Yun-Ya Huang¹, Su-Mei Chen Wei¹, Yi-Che Su¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute.

D3-P21

ToF-SIMS analysis on PCBM diffusion into polymer layer at room temperature

Kyohei Nakano

RIKEN.

D3-P22

Preparation of Polyol Liquefaction with Rice-husk Biomass

Jen-Hung Yuan

National Ilan University.

D3-P23

Synthesis and multi-functional responsive behaviors of diblock copolymer containing azobenzene group through controlled living RAFT polymerization

P.C. Yang

Yuan Ze University.

D3-P24

Synthesis and chemosensory properties of linear conjugated polymers containing diketopyrrolopyrrole moieties

P.C. Yang

Yuan Ze University.

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

D3-P25

Influence of Supporting Substrate in Thin Film Composite Membranes for Forward Osmosis

Min-Fei Tsai¹, Li-Han Chung¹, Yen-Cheng Li¹
¹Industrial Technology Research Institute.

D3-P26

Production of value-added materials through large molecule hydrogenation by heterogeneous catalyst

Man-Yin Lo¹, Yen-Chih Chen¹, Nai-Chia Cheng¹, Emmeline Sheu¹
¹MCL, ITRI.

D3-P27

A Comparative Study on Durability of Symmetrically and Asymmetrically Porous Polybenzimidazole Membranes for High Temperature Proton Exchange Membrane Fuel cells

Steve Lien-chung Hsu¹, Jen-Yang Chang¹, Kuan-Cing Wu¹
¹Dept of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

D3-P28

The development of Novel Anion Exchange Membrane for Electrodialysis Reversal (EDR) Application

Hsuan-Wei Lee¹, Chiu-Tung Wang¹, Jiunn-Nan Lin¹, Li-Duan Tsai¹
¹Industrial Technology Research Institute.

D3-P29

Poly(3-alkylthiophene): Precise Synthesis and Electro-optical Properties

Ning Chung¹, Po-Hsun Wu¹, Chi-Yang Chao¹
¹Department of Materials Science and Engineering, National Taiwan University.

D3-P30

Synthesis of Polyetheramine in Trickle Bed Reactor

Tz-Bang Du¹, Cheng-Han Hsieh¹, Li-Ping Ju¹, Kung-Hsun Huang¹
¹Industrial Technology Research Institute (ITRI), Hsinchu, 30011 Taiwan (R.O.C)

D3-P31

Synthesis of PVA scaffolds with aligned porous structure by freeze casting

Ching-Chun Chiu¹, Haw-Kai Chang¹, Hsin-Juei Wang¹, Po-Yu Chen¹
¹National Tsing Hua University.

D3-P32

Test method for the detection of potential-induced degradation for coast or salt-laden PV modules

H.C. Liu¹, C.T. Huang¹, Y.H. Yang¹, W.K. Lee¹, H.H. Chiang¹, F.M. Lin¹
¹Industrial Technology Research Institute.

D3-P33

Synthesis and dilute-solution properties of biocompatible HPMA polymers for drug delivery use

Taisei Miura¹, Rintaro Takahashi¹, Kazuo Sakurai¹
¹The University of Kitakyushu.

D3-P34

Antifouling LBL modified optimization for Nanofiltration Membrane

Chia-Le Wu¹, Jen-You Chu¹, Feng-Sheng Kao¹
¹Industrial Technology Research Institute.

D3-P35

Preparation of Monodisperse Hollow Molecularly Imprinted Polymers for Detection of Organotin

J.W. Wang¹, Y.C. Wang¹, C.X. Wei¹, Y.M. Kuo¹
¹Chung Hwa University of Medical Technology.

D3-P36

Synthesis of a High Performance Dispersant and Its Application in Preparing High Reflectance Solder Mask

Yu-Lin Chu¹, Meng-Wei Wang¹, Yen-Chen Lin¹, Yu-Min Han¹, Sheng-Lung Chang¹, Chih-Hao Huang¹
¹Industrial Technology Research Institute.

D3-P37

Nondestructive Examination of P(VDF-TrFE) Filter System and PM2.5 by Using Synchrotron Transmission X-ray Microscopy

Hui-Tzu Yeh¹, E-Wen Huang¹, ²Chun-Chieh Wang, ³Wei-Chieh Huang, ⁴Yu-Hsiang Hsu, ⁵Chun-Kai Chang, ⁶An-Bang Wang, ⁷Sung-Chan Li.
¹National Chiao Tung University Industrial Technology Research Institute², Industrial Technology Research Institute³, National Chiao Tung University⁴, National Taiwan University⁵, National Taiwan University⁶, National Taiwan University⁷.

D3-P38

Plasma-Polymerized Thin Films of Amphiphilic and Hydrophilic Molecules with Surface Shield Effects

Nanami Sawayama¹, Shingo Ito¹, Daisuke Ishii¹
¹Dept of Life Science and Applied Material, Nagoya Institute of Technology.

D3-P39

Additive immigration between immiscible polymer pair

Toshiki. Inomata¹, Masayuki. Yamaguchi¹
¹Japan Advanced Institute of Science and Technology.

D3-P40

The Option of Ingredients and Properties Analysis of the Epoxy- Resin-Based Thermal Insulation Coating

Hsing-Sung Chen¹, Jhu-Jyun Dai²
¹Department of Materials Science and Engineering Graduate Institute of Materials Science and Green Energy Engineering, National Formosa University, Yunlin, Taiwan. ²Department of Materials Science and Engineering Graduate Institute of Materials Science and Green Energy Engineering, National Formosa University, Yunlin, Taiwan.

D3-P41**Development of Post-Consumer Recycled Plastic Additives for Composite Materials**

Geng-Yi Lin

Industrial Technology Research Institute.

D3-P42**Study of Rheological Behavior of Ethylene Vinyl Alcohol Copolymers**

Zhi-Feng Jue

Industrial Technology Research Institute.

D3-P43**The novel transparent thermoplastic vulcanizates based on polypropylene and styrene-polyethylene-polypropylene rubber**

Jin-An Wu

Industrial Technology Research Institute.

D3-P44**Solvent induced morphology modulation of poly(3-hexylthiophene-block-isoprene)**

Chi-Yang Chao¹, Chien-Wen Huang¹

¹National Taiwan University.

D3-P45**Environmentally Friendly Poly(lactide acid) (PLA)/Carbon Fiber Composites**

Chean-Cheng Su¹, Cheng-Hsien Yu¹, Chao-Ming Tseng², Chaung-Chi Wang², Shiu-Chih Wang², Hsin-Lu Tarn², Chih-Pin Hung²

¹Dept of Chemical and Materials Engineering, National University of Kaohsiung, ²Advanced Semiconductor Engineering (ASE) Inc..

D3-P46**Optical properties of poly(methyl methacrylate) containing lithium salt**

Ryota Maeno¹, Masayuki Yamaguchi¹

¹Japan Advanced Institute of Science and Technology.

D3-P47**Reusing of Polyurethane Foam from Waste Vehicles**

Fan-Jeng Tsai

Industrial Technology Research Institute.

D3-P48**Development of Wax Injection Molds With Complex Geometrical Shapes of Cooling Channel**

C.C. Kuo

Ming Chi University of Technology.

Symposium D4

Advanced Magnetic Materials

November 6-8, 2017

Organizers

Yuan-Chieh Tseng National Chiao Tung University,
Taiwan
Chih-Huang Lai National Tsing Hua University,
Taiwan

Oral Session

Monday, November 6, 2017

Room 505

Chairperson: Yuan-Chieh Tseng

9:00-9:30 D4-01 Keynote

Advanced spintronic materials based on ordered alloys

Koki Takanashi¹

¹Institute for Materials Research, Tohoku University.

9:30-10:00 D4-02 Keynote

Spintronics phenomena arising from bulk/interface spin-orbit interaction

Kazuya Ando¹

¹Department of Applied Physics, Keio University.

14:00-14:30 D4-03 Keynote

Magnetism in the Age of Internet-of-Sensors (IoS)

Philip W. T. Pong¹

¹The University of Hong Kong.

14:30-14:50 D4-04 Invited

Study the phase transition and exchange bias of FeRh thin films

Ting-Wei Chang¹, Chih-Hao Lee¹

¹National Tsing Hua University.

14:50-15:10 D4-05 Invited

Spin dynamics in antiferromagnets and ferrimagnets

Teruo Ono¹

¹Kyoto University.

15:10-15:30 D4-06 Invited

Co coated ZnO nanowires for large magneto-absorption effect

S.L.Yeih¹, H.S.Hsu¹, K.W.Liu¹

¹National Pingtung University.

16:30-16:50 D4-07 Invited

The FePt granular films with multiple segregants

J. L. Tsai¹, Y. R. Chen¹, C. Pi¹, Y. T. Wu¹, C. W. Chang¹

¹Department of Materials Science and Engineering,
National Chung Hsing University, Taichung, Taiwan.

16:50-17:10 D4-08 Invited

Interface interactions and enhanced room temperature ferromagnetism of Ag@CeO₂ nanostructures

S. Y. Chen¹, E. Tseng¹, and A. Gloter²

¹ Department of Materials Science and Engineering,
National Taiwan University of Science and Technology

² Laboratoire de Physique des Solides, Université Paris Sud, CNRS UMR 8502, F-91405 Orsay, France.

17:10-17:25 D4-09

Ferromagnetic resonance probed post-treatment effect in iron based metallic amorphous ribbons

Y. S. Chen¹, E. A. Golygin², A. A. Gavriluk², J. G. Lin¹

¹Center for condensed matter sciences, National Taiwan University, Taipei, Taiwan, ²Department of Physics, Irkutsk State University, Irkutsk, Russia.

17:25-17:40 D4-10

Ferromagnetic CeO₂-Ag hollow sphere with distinct surface enhanced Raman scattering

Eric Nestor Tseng¹, Ying-Ting Hsiao¹, Yi-Che Chen¹, Shih-Yun Chen¹

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 505

Chairperson: Shih-Yun Chen

09:00-09:30 D4-11 Keynote

Angular dependent transmission of spin waves and the induced domain wall motions in perpendicular-magnetic-anisotropy materials

Shang-Fan Lee¹

¹Academia Sinica.

09:30-09:50 D4-12 Invited

Recent Developments of Nd-Fe-B Magnets in China

Shengzhi Dong¹, Wei Li¹

¹Central Iron & Steel Research Institute.

09:50-10:10 D4-13 Invited

Reversible hydrogenation induced spin-reorientation transition in Co₅₀Pd₅₀ alloy thin films

Po-Chun Chang¹, Yu-Chan Chen¹, Chuan-Che. Hsu¹, V. R. Mudinepalli¹, W. C. Lin¹

¹National Taiwan Normal University.

10:10-10:30 D4-14 Invited

Interfacial Hybridization at Organic-Ferromagnetic Heterojunction for Effective Spin Filtering in Organic Spintronics

Yao-Jane Hsu¹, T.-N. Lam², M.-W. Lin¹, P.-H. Chen³, Y.-L. Lai¹, D.-H. Wei¹, H.-J. Lin¹, J.-H. Wang⁴

¹National Synchrotron Radiation Research Center, ²National Chiao Tung University, ³National Tsing Hua University, ⁴National Taiwan Normal University.

Oral Session
Tuesday, November 7, 2017
Room 505
Chairperson: Yuan-Chieh Tseng

14:00-14:30 D4-15 Keynote

XMCD Studies of Magnetic Materials with High Special Resolution and High Magnetic Fields

Tetsuya Nakamura¹
Japan Synchrotron Radiation Research Institute (JASRI), Sayo, Hyogo, Japan.

14:30-14:50 D4-16 Invited

Low temperature preparation of high Ku L11-type CoPt thin films

Yu-Shen Chen¹, An-Cheng Sun¹
¹Department of Chemical Engineering and Material Science, Yuan-Ze University.

14:50-15:10 D4-17 Invited

Study of the functional materials using X-ray and Neutron Scattering

Chao-Hung Du¹
¹Tamkang University.

15:10-15:25 D4-18

Spin transfer torque, size distribution and temperature related effects in magnetic tunnel junctions with embedded nanoparticles

A. Useinov¹, H. H. Lin², C. H. Lai²
¹National Chiao Tung University, ²National Tsing Hua University.

16:30-16:50 D4-19 Invited

Roles of orbital hybridization at ferromagnet-organic heterojunctions

Der-Hsin Wei¹, Tzu-Hung Chuang¹, Kun-Ta Lu¹, Chun-I Lu¹, Yao-June Hsu¹
¹National Synchrotron Radiation Research Center.

16:50-17:05 D4-20

Microstructure and magnetocaloric effect in ball-milled Gd-Si-Ge-Sn alloy

Dongsun Seo¹, Jonghwa Lim¹, Jinkyu Lee¹
¹Kongju National University.

17:05-17:20 D4-21

Non-collinear domain wall spin-structures at ultrathin magnetic interfaces: an XPEEM study

Tzu-Hung Chuang¹, Chih-Heng Huang², Kun-Ta Lu¹, Chun-I Lu¹, Yen Huang³, Der-Hsin Wei¹
¹National Synchrotron Radiation Research Center, ²Program for Synchrotron Radiation and Neutron Beam Applications, National Sun Yat-sen University, ³Graduate Program for Science and Technology of Synchrotron Light Source, National Tsing Hua University.

Oral Session
Wednesday, November 8, 2017
Room 505
Chairperson: Yuan-Chieh Tseng

09:00-09:30 D4-22 Keynote

Magnetic proximity Effect induced transport Properties between (Bi_{1-x}Sb_x)₂Se₃ and CoFe₂O₄ and electrical field effect between (Bi_{1-x}Sb_x)₂Se₃ and SrTiO₃

Jung-Chun-Andrew Huang¹, C.W. Chong¹, S. Y. Huang¹, Y. H. Liu¹
¹Physics Department, National Cheng Kung University, Tainan, Taiwan.

09:30-09:50 D4-23 Invited

SIKA: Taiwan's Three Axis Neutron Spectrometer

Jason Gardner¹
¹NSRRC.

09:50-10:10 D4-24 Invited

Magnetic and structural properties of iron-oxide nanoparticles for biomedical applications

Yasushi Takemura¹
¹Yokohama National University.

10:10-10:30 D4-25 Invited

2D magnetic semiconductors based on Transition-Metal Dichalcogenides

Hong-Tay Jeng¹, Huei-Ru Fuh², Kiwi Chang³, Jason Hung¹
¹Department of Physics, National Tsing-Hua University, Taiwan, ²Graduate Institute of Applied Physics, National Taiwan University, Taiwan, ³Institute of Physics, Academia Sinica, Taiwan.

Oral Session
Wednesday, November 8, 2017
Room 505
Chairperson: An-Cheng Sun

14:00-14:20 D4-26 Invited

Magnetization Switching For Perpendicular Magnetic Tunnel Junctions Driven By Spin Torque From The Spin Hall Effect

Te-ho Wu¹, Ching-Ming Lee¹, Jong-Ching Wu²
¹National Yunlin Univ. of Science and Technology, Douliou, Taiwan, ²Department of physics, National Changhua University of Education, Changhua, Taiwan.

14:20-14:40 D4-27 Invited

Dynamic spin pumping with La_{0.7}Sr_{0.3}MnO₃

J. G. Lin¹, G. Y. Luo¹, Wen-Chung Chiang², Ching-Ray Chang³
¹Center for Condensed Matter Sciences, National Taiwan University, ²Department of Optoelectric Physics, Chinese Culture University, ³Department of Physics, National Taiwan University.

14:40-15:00 D4-28 Invited

Initialization-free multilevel states driven by spin-orbit torque switching

Kuo-Feng Huang¹, Ding-Shuo Wang¹, Ming-Han Tsai¹, Hsiu-Hau Lin², Chih-Huang Lai¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan, ²Department of Physics, National Tsing Hua University, Hsinchu 30013, Taiwan.

15:00-15:15 D4-29

Investigating the structural and magnetic properties of BFO in polycrystalline and thin film

J.W.Lin¹, J.S.Gardner¹, Y.H.Chu², J.G.Lin³

¹National Synchrotron Radiation Research Center (NSRRC), ²Department of Materials Science and Engineering, National Chiao Tung University, ³Center for Condensed Matter Sciences, National Taiwan University.

16:30-16:50 D4-30 Invited

Spin Torque Vortex Oscillator Using Heusler Alloy Layers

Takeshi Seki¹, Koki Takanashi¹

¹Institute for Materials Research, Tohoku University.

16:50-17:05 D4-31

Enhancement of spin-orbit torques in Pd through boron engineering

Y.M.Du¹, P.C.Chen¹, B.Y.Yang¹, P.H.Lin¹, G.Y.Guo², C.H.Lai¹

¹National Tsing Hua University, ²National Taiwan University.

17:05-17:20 D4-32

Magnetic properties of α "-Fe₁₆N₂ nanoparticles synthesised from various iron hydroxide and iron oxides

Masahiro Tobise¹, Shin Saito¹

¹Tohoku university.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

D4-P01

Accuracy Improvement in GMR Linear Position Sensor

Chia-Chang Lee¹, Chih-Huang Lai¹, Hen-Shen Hsiao², Jeng-Yuan Chang²

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²Department of Power Mechanical Engineering, National Tsing Hua University, Hsinchu, Taiwan.

D4-P02

Magnetic properties and microstructure of FePt films with MgTiON intermediate layer

Yu-Ren Chen, Chen Pi, Yu-Ting Wu, Ching Wei Chang, Hsu-Kang Li, Yuan-Shuo Chang, Zu-Yu Pan, Chang-Chun Liao, Jai-Lin Tsai*

Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan

D4-P03

Perpendicular Magnetization CoCrPt-Oxides Films with Pd Interface Modification

Chen Pi¹, Yu Ting Wu², Yu Ren Chen³, Ching Wei Chang⁴, Bo Rong Wu⁵, Jai Lin Tsai⁶

Department of Materials Science and Engineering, National Chung Hsing University, Taichung 402, Taiwan

D4-P04

Magnetic decoupling of Fe coverage across atomic step of MoS₂ flakes on SiO₂ surface

Chuan-Che Hsu¹, Zong-You Lin¹, Po-Chun Chang¹, Hsiang-Chih Chiu¹, Hsiang-Lin Liu¹, Francesco Bisio², Wen-Chin Lin¹

¹National Taiwan Normal University, ²CNR-SPIN.

D4-P05

Reversible hydrogenation induced spin-reorientation transition in Co₅₀Pd₅₀ alloy thin films

Wen-Chin Lin¹

¹Department of Physics, National Taiwan Normal University, Taipei 11677, Taiwan.

D4-P06

Enhancement of spin-orbit torques through Boron doping engineering

Bo-yuan Yang¹, Po-Hung Lin¹, Chih-Huang Lai¹

¹Department of Materials Science and Engineering, National Tsing Hua University.

D4-P07

Deposition of hydrothermally synthesized FePt Nanoparticles on Graphene for use as fuel cell electrodes

Yu-Ting Wu¹, Yu-Ren Chen², Chen Pi³, Ching Wei Chang⁴, Hsu-Kang Li⁵, Yuan-Shuo Chang⁶, Zu-Yu Pan⁷, Chang-Chun Liao⁶, Jai-Lin Tsai⁸,

Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan

D4-P08

Strong confined spin wave in three dimensional permalloy film under zero external magnetic field

Liang-Juan Chang¹, Li-Zai Tsai¹,

¹Institute of Physics, Academia Sinica, Taipei 11529, Taiwan.

D4-P09

Effect of substrate bias on magnetic properties of PrFeB thin film

Mu-Rong Kuo¹, Yu-Shen Chen¹, An-Cheng Sun¹

¹Department of Chemical Engineering and Materials Science, Yuan-Ze University.

D4-P10

Magnetic exchange coupling of Co/Ru/L11-CoPt trilayer with different thicknesses of Ru spacer

Wu-Yuan, Ting¹, Yu-Shen Chen¹, An-Cheng Sun¹

¹Department of Chemical Engineering and Material Science, Yuan-Ze University, Chung-Li, Taoyuan, Taiwan.

D4-P11**Giant Exchange Bias Properties in 314 -type
Oxygen-Vacancy Ordered Materials**

Prachi Mohanty¹, Sourav Marik¹, Deepak Singh¹, Ravi P. Singh¹

¹Indian Institute of Science Education and Research
Bhopal.

D4-P12**Enhanced Magnetic Properties in YIG Ferrites
caused by Raw Material Fe₂O₃**

Ching-Chien Huang¹, Yung-Hsiung Hung¹, Jing-Yi Huang¹, Ming-Feng Kuo¹, Wei-Zong Zuo²

¹China Steel Corporation, ²Himag Magnetic Corporation.

D4-P13**Defect Structures of Room Temperature
Ferromagnetic Ce : TiO₂ Nanoparticles**

Yi-Che Chen , Po-Chun Tseng , Eric Nestor Tseng ,
Shih-Yun Chen

Department of Materials Science and Engineering,
National Taiwan University of Science and Technology,
Taipei, Taiwan.

Symposium D5

Nanomaterials and Composites

November 6-8, 2017

Organizers

Hong-Ming Lin	Tatung University, Taiwan
Yu-Lun Chueh	National Tsing Hua University, Taiwan
Jow-Lay Huang	National Cheng Kuo University, Taiwan
Ru-Shi Liu	National Taiwan University, Taiwan
Yeukuang Hwu	Academic Sinica, Taiwan
Jiatao Zhang	Beijing Institute of Technology, China
Yi Hu	Tatung University, Taiwan
Leszek Stobinski	Warsaw University of Technology, Poland

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Oral Session

Monday, November 6, 2017
Room 504C

Chairperson: Hong-Ming Lin / Yeukuang Hwu

09:00-09:25 D5-01 Keynote

The Synthesis and Characterization of Nanoparticles with X-rays

K. S. Liang¹, C. F. Huang¹, Y. Hwu¹

¹Institute of Physics, Academia Sinica, Taipei, Taiwan.

09:25-09:45 D5-02 Invited

Inorganic-based flexible device sheets

Kuniharu Takei¹

¹Department of Physics and Electronics, Osaka Prefecture University, Sakai, Osaka, Japan.

09:45-10:00 D5-03

Multichannel Immunosensor Array Platform with 3D Hierarchical Silk Fibroin Nanoparticle-Based Interface for Early Detection of Amyloid-beta in Alzheimer's Disease

Ta-Chung Liu¹, San-Yuan Chen¹, Pu-Wei Wu¹, You-Yin Chen², Yi-Chao Lee³, Chien-Chih Ke⁴, Ren-Shyan Liu⁴

¹Chiao-Tung University, ²Yang-Ming University, ³Taipei Medical University, ⁴Taipei Veterans General Hospital.

10:00-10:15 D5-04

Fabrication of 3D Nanoporous Gold with Very Low Parting Limit Derived from Au-based Metallic Glass and Enhanced Methanol Electro-oxidation Catalytic Performance Induced by Metal Migration

Yi Xu¹, Pak Man Yiu¹, Guangcun Shan², Tamaki Shibayama³, Seiichi Watanabe³, Masato Ohnuma⁴, Wei

Huang⁵, Chan-Hung Shek¹

¹Dept of Physics and materials science, City University of Hong Kong, Kowloon Tang, Hong Kong, China.

²School of Instrumentation Science and Opto-electronics Engineering, Beihang University, Beijing, China. ³Laboratory of Quantum Energy Conversion Materials, Centre for Advanced Research of Energy and Materials, Division of Quantum Science and Engineering, Faculty of Engineering, Hokkaido University, Japan. ⁴Laboratory of Quantum Beam System Engineering, Division of Quantum Science and Engineering, Faculty of Engineering Hokkaido University, Japan. ⁵Institute of Advanced Materials (IAM), Jiangsu National Synergetic Innovation Centre for Advanced Materials (SICAM), Nanjing Tech University, Nanjing, China.

10:15-10:30 D5-05

Effect of Poly (Diallyl Dimethyl Ammonium Chloride) Concentration in 25-nm Crystal Zirconium Dioxide Abrasive on Tungsten CMP Performance for 3D NAND

Soo-bum Kim¹, Eun-Bin Seo¹, Taek-Hwan Kwon¹, Yun-Ki Kim¹, Jin-Hyung Park², Jea-Gun Park¹

¹Advanced Semiconductor Materials and Devices

Development Center, Hanyang University, Seoul, Korea.

²UB materials Inc, Yongin-si, Korea.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Oral Session

Monday, November 6, 2017
Room 504C

Chairperson: Hyunhyub Ko / Hiroki Ota

14:00-14:25 D5-06 Keynote

General and Robust Strategies for Nanocrystals with Precisely Controlled Dimensions, Compositions, and Architectures for Energy Applications

Zhiqun Lin¹

¹Georgia Institute of Technology, USA.

14:25-14:45 D5-07 Invited

Electrocatalytic Property of Nano Pd Supported on Polyaniline Modified AO-MWCNTs for Direct Formic Acid Fuel Cells

Yuh-Jing Chiou¹, Huan Yang¹, Hong-Ming Lin²,

Andrzej Borodzinski³, Leszek Stobinski³

¹Department of Chemical Engineering, Tatung University, Taipei, Taiwan, ²Department of Materials Engineering, Tatung University, Taipei, Taiwan, ³Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland.

14:45-15:00 D5-08

SnSe and SnSe₂: vapor-solid reaction phase engineering and thermal conductance characterization

Ling Lee¹, Chia-Wei Chen¹, Arumugam Manikandan¹, Shao-Hsin Lee¹, Yu-Lun Chueh¹

¹National Tsing Hua University, Taiwan.

15:00-15:15 D5-09

A Novel Two-stage CO₂ Conversion Process in Dual Fixed-bed Catalytic Reactor with Ni-Ga and Cu-based Catalysts for Methanol and Dimethyl Ether Productions

Chao-Lung Chiang¹, Cheng-Yang Tang¹, Kuen-Song Lin¹

¹Dept of Chemical Engineering and Materials Science/Environmental Technology Research Center, Yuan Ze University, Taoyuan, Taiwan.

15:15-15:30 D5-10

Influence of carbon nanotube or graphene layers on the characteristics of ZnO nanorod-based hydrogen sensors

Hsiang Chen¹, Hsin-Jie Tsai¹, Tien Chai Lin², Chien Cheng Lu¹, Yu Tzu Chen¹, Wei Ming Su¹, Chia Feng Lin³, Wen Chang Huang⁴, Yu Sheng Tsai¹

¹Department of Applied Materials and Optoelectronic Engineering, National Chi Nan University, Taiwan, ROC. ²Department of Electrical Engineering, Kun Shan University, Taiwan, ROC. ³Department of Materials Science and Engineering, National Chung Hsing University, Taiwan, ROC. ⁴Department of Electro-Optical Engineering, Kun Shan University, Taiwan, ROC.

15:30-16:30 Coffee break

Oral Session

Monday, November 6, 2017

Room 504C

Chairperson: Zhiqun Lin / Kuniharu Takei

16:30-16:55 D5-11 Keynote

Controlled Growth of Flexible SiC Field Emitters and Their Field Emission Properties

Weiyong Yang¹, Shanliang Chen

¹Institute of Materials, Ningbo University of Technology Ningbo City, China.

16:55-17:15 D5-12 Invited

Liquid-state electronics for flexible sensors

Hiroki Ota¹, Yuji Gao², Kevin Chen³, Ali Javey³

¹Yokohama National University, Yokohama, Japan. ²National University of Singapore, Singapore. ³University of California, Berkeley, Berkeley, USA.

17:15-17:30 D5-13

Robust SERS substrate of self assembly gold nanocubes, octahedra, and rhombic dodecahedra with massive nanogaps on a silver mirror

Yu-Po Wen¹, Bi-Shen Lee¹, Ta-Jen Yen¹, Michael H. Huang¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, R.O.C..

17:30-17:45 D5-14

A SERS Tattoo for Food Screening

Surojit Chattopadhyay¹, P. K. Roy¹

¹National Yang Ming University, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 504C

Chairperson: Teobald Kupka / Daisuke Kiriya

09:00-09:25 D5-15 Keynote

Fabrication of flake graphene composite materials for effective electromagnetic radiation shielding in the GHz range

Leszek Stobinski, A. Malolepszy¹, M.

Mazurkiewicz-Pawlicka¹, H.M. Lin²

¹Faculty of Chemical and Process Engineering, Warsaw University of Technology, Warsaw, Poland. ²Dept of Materials Science and Engineering, Tatung University, Taipei, Taiwan.

09:25-09:45 D5-16 Invited

Preparation of polymer composites with graphene fillers for IR shielding application

Marta Mazurkiewicz-Pawlicka¹, Artur Malolepszy¹, Yi Hu², Chung-Kwei Lin³, Leszek Stobinski¹

¹Faculty of Chemical and Process Engineering, Warsaw University of Technology, Warsaw, Poland, ²Department of Materials Engineering, Tatung University, Taipei, Taiwan, ³School of Dental Technology, College of Oral Medicine, Taipei Medical University, Taipei, Taiwan.

09:45-10:05 D5-17 Invited

From Flexible Components and Triboelectric Nanogenerators to Self-Sufficient Wearable Systems

Ying-Chih Lai¹

¹Department of Materials Science and Engineering, Nation Chung Hsing University

10:05-10:25 D5-18 Invited

Interlocked Composite Microstructures for Wearable Sensors

Hyunhyub Ko¹

¹Ulsan National Institute of Science and Technology (UNIST), South Korea.

10:25-10:40 D5-19

Low concentration NO_x gas sensing under ambient environment using ZnO nanowires modified with Cu_xO and Ag nanostructures

Heh-Nan Lin¹, Chang-Pei Chu¹

¹National Tsing Hua University, Taiwan.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Oral Session
Tuesday, November 7, 2017
Room 504C

Chairperson: Leszek Stobinski / Zhiyong Fan

14:00-14:25 D5-20 Keynote

Molecular modeling as support in bio- and nanotechnology

Teobald Kupka¹, Leszek Stobiński², Hong-Ming Lin³, Jakub Kaminsky⁴, Michał Stachów¹, Marzena Jankowska¹, Małgorzata Broda¹, Aneta Buczek¹ and Roman Szostak⁵

¹University of Opole, Faculty of Chemistry, 48, Oleska Street, 45-052 Opole, Poland. ²Faculty of Chemical and Process Engineering, Warsaw University of Technology, 1, Waryńskiego Street, 00-645 Warsaw, Poland. ³Tatung University, 40, Chungshan North Road, 3rd Section, Taipei, Taiwan. ⁴Institute of Organic Chemistry and Biochemistry AS CR, Flemingovo nám. 2, 166 10 Prague, Czech Republic. ⁵Department of Chemistry, University of Wrocław, F. Joliot Curie 14, Wrocław, Poland.

14:25-14:45 D5-21 Invited

Large-Scale Synthesis of Freestanding Layer-Structured PbI₂ and MAPbI₃ Nanosheets for High-Performance Photodetection

Changyong Lan¹, Ruoting Dong¹, Ziyao Zhou^{1,2}, Lei Shu^{1,2}, Dapan Li^{1,2}, SenPo Yip^{1,2}, Johnny C. Ho^{1,2}

¹Department of Materials Science and Engineering, City University of Hong Kong, Kowloon, Hong Kong.

²Shenzhen Research Institute, City University of Hong Kong, Shenzhen 518057, P.R. China.

14:45-15:05 D5-22 Invited

Fabrication of Stable Three-dimensional Arrays of Lead Halide Perovskite Nanowires and Optoelectronic Devices

Zhiyong Fan¹

¹Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong SAR, China.

15:05-15:20 D5-23

Time Dependent Phase Engineered (1T-2H) MoS₂/α-MoO₃ Heterostructure as Low Cost Adsorbent and Superior Catalyst for Hydrogen Evolution Reaction

Arumugam Manikandan¹, P.R. Ilango¹, Ling Lee^{1,2}, Chia-Wei Chen¹, Yi-Chung Wang¹, Yu-Chuan Shih¹, Yu-Lun Chueh^{1,2,3}

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, 30013, Taiwan, R.O.C. ²Institute of Fundamental and Frontier Sciences, University of Electronic Science and Technology of China, Chengdu 611731, P.R. China. ³School of Material Science and Engineering, State Key Laboratory of Advanced Processing and Recycling of Non-ferrous Metals, Lanzhou University of Technology, Lanzhou city 730050, Gansu, P.R. China.

15:20-15:35 D5-24

Metal-Organic Frameworks as Membrane Adsorber for Water Treatment

D.-Y. Kang¹, Hsiang Ting¹, Heng-Yu Chi¹

¹National Taiwan University, Taiwan.

15:30-16:30 Coffee break

Oral Session
Monday, November 7, 2017
Room 504C

Chairperson: Yu-Lun Chueh / Yi Hu

16:30-16:50 D5-25 Invited

Influence of preparation condition on the iron oxide/graphene composite properties

A. Malolepszy¹, M. Mazurkiewicz-Pawlicka¹, K. Ciok¹, I. Kuryliszyn-Kudelska², L. Stobinski¹

¹Faculty of Chemical and Process Engineering, Warsaw University of Technology, Poland ²Institute of Physics, Polish Academy of Sciences, Poland.

16:50-17:10 D5-26 Invited

Molecular Interaction and Assembly on 2D Materials

Daisuke Kiriya^{1,2}

¹Department of Physics and Electronics, Osaka Prefecture University, Osaka, Japan. ²Japan Science and Technology Agency (JST) PRESTO, Saitama, Japan.

17:10-17:30 D5-27 Invited

High-Performance Nanogenerators with Multifunctional Triboelectric Nanomaterials

Sang-Woo Kim¹

¹Sungkyunkwan University (SKKU), Korea.

17:30-17:45 D5-28

Effect of pH on formation of BiOI synthesized by sonochemical method and its photocatalytic activities for degradation of rhodamine B

Prakasit Intaphong¹, Anukorn Phuruangrat¹

¹Department of Materials Science and Technology, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla 90112, Thailand.

18:30-20:00 Conference banquet

Oral Session
Wednesday, November 8, 2017
Room 504C

Chairperson: Johnny Ho / Chung-Kwei Lin

09:00-09:25 D5-29 Keynote

The synergistic effects of combining MnO₂ with graphene oxide as anode material for lithium-ion batteries

Jow-Lay Huang¹, Shao-Chieh Weng¹

¹Department of Materials Science and Engineering, National Cheng Kung University.

09:25-09:45 D5-30 Invited

Preparation and Electrochromism of MnO₂ Thin films with Ag₂O nanoparticles through Electrochemical deposition

Yi Hu¹, Jiun-Shing Liu¹

¹Tatung University, Taiwan.

09:45-10:05 D5-31 Invited

Preparation and Dental Filling Application of Nanocrystalline Bismuth/Hafnium Oxide Composite Powder

May-Show Chen^{1,2}, Chin-Yi Chen³, Chung-Kwei Lin^{4,5}

¹Department of Dentistry, Taipei Medical University Hospital, Taipei 11031, Taiwan. ²School of Oral Hygiene, College of Oral Medicine, Taipei Medical University, Taipei 11031, Taiwan. ³Department of Materials Science and Engineering, Feng Chia University, Taichung 40724, Taiwan. ⁴School of Dental Technology, College of Oral Medicine, Taipei Medical University, Taipei 11031, Taiwan. ⁵Research Center of Digital Oral Science and Technology, College of Oral Medicine, Taipei Medical University, Taipei 11031, Taiwan.

10:05-10:25 D5-32

Flexible Photodetectors and Image Sensors with 1D Semiconducting Nanostructures

Guozhen Shen^{1,2}, Zheng Lou¹, Ludong Li¹

¹State Key Laboratory for Superlattices and Microstructures, Institute of Semiconductors, Chinese Academy of Sciences, Beijing 100083, China. ²College of Materials Science and Opto-electronic Technology, University of Chinese Academy of Sciences, Beijing 100029, China.

10:25-10:45 D5-33

In situ/operando synchrotron x-ray spectroscopy on energy materials

Y.R. Lu¹, H.W. Chang², Y.C. Huang³, C.L. Chen⁴, W.C. Chou³, C.L. Dong²

¹National Synchrotron Radiation Research Center, Hsinchu, Taiwan; ²Dept. of Physic, Tamkang University, Tamsui, Taiwan; ³Dept. of Electrophysics, National Chiao Tung University, Hsinchu, Taiwan; ⁴National Synchrotron Radiation Research Center, Hsinchu, Taiwan.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

D5-P01

Synthesis and characterization of visible light driven Mo-doped Bi₂WO₆ photocatalyst by hydrothermal method

Anukorn Phuruangrat¹

¹Prince of Songkla University.

D5-P02

Bismuth-aluminum oxide nanothermometer prepared by AAO (anodic aluminum oxide) template-assisted molding injection process

Shih-Hsun Chen¹, Chiu-Yen Wang²

¹Department of Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, 10607, Taiwan, ²Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, 10607.

D5-P03

Particle Size Control on the Synthesis of Graphite Encapsulated Metal Nanoparticles Using Different Liquid Organic Compounds in an Arc-Discharge System

Yu-Chieh Huang¹, Hong-Yi Lin¹, Jhih-Ying Chen¹, Tun-Hao Tsai¹, Mao-Hua Teng¹

¹National Taiwan University.

D5-P04

3D V₂O₅@Ni₃S₂ hierarchical structure for high-efficient hydrogen production

Xiongwei Zhong¹, Baomin Xu², Hui Pan¹

¹Institute of Applied Physics and Materials Engineering, University of Macau, Macao SAR, China, ²Department of Materials Science and Engineering, Southern University of Science and Technology, Shenzhen, Guangdong Province, 518055, China.

D5-P05

Molecular-doping in 2D materials toward local carrier control

H. Ichimiya¹, K. Miura¹, M. Takinoue², T. Yoshimura¹, A. Ashida¹, N. Fujimura¹, D. Kiriya³

¹Osaka Prefecture University, ²Tokyo Institute of Technology, ³Osaka Prefecture University, JST PRESTO.

D5-P06

Characteristics of Ag-Cu and Ti-Cu Bimetallic Thin Films Deposited using High Power Impulse Magnetron Sputtering

Ying-Chai Chen¹, Yi-Cheng Lin¹, Yu-Hsuan Hsu², Wan-Yu Wu²

¹Department of Mechatronics Engineering, National Changhua University of Education, Taiwan, ²Department of Materials Science and Engineering, Da-Yeh University, Taiwan.

D5-P07

Ethanol gas sensing characteristics of PdO nanoflake thin films at temperatures below 250°C

I-Kai Cheng¹, Jeng-Han Wang², Cheng-Yu Tsai¹, Yi-Sheng Chen¹, Fu-Ming Pan¹

¹National Chiao Tung University, ²National Taiwan Normal University.

D5-P08

Fabrication and Characterization of (111)-Oriented and Nanotwinned Cu by Periodic Reverse Electrodeposition

Kuan-Ju Chen¹, Chih Chen¹

¹Department of Materials Science and Engineering,

National Chiao Tung University.

D5-P09

Silicate Derived from Waste Glass of Light Bulbs/Tubes for Eco-friendly and Low-Cost Mesoporous Silica Material

Cheng-En Wu¹, Pang-Hung Liu², Huai-Kuang Fu³
¹bewizard@itri.org.tw, ²LiuPH@itri.org.tw, ³itri980106@itri.org.tw.

D5-P10

Au-Ag Nanoparticle Arrays grown on Graphene Based-Films by Thermal Evaporation for SERS Detection

Wei-Lin Syu¹, Yu-Hsuan Lin¹, Ting-Yu Liu¹, Yuh-Lin Wang²

¹Department of Materials Engineering, Ming Chi University of Technology, ²Institute of Atomic and Molecular Sciences, Academia Sinica.

D5-P11

Fabricating 10-nm Nanowire from Platinum Thin Film by Plasma Activation

Hong-Yi Lee¹
¹daikin0428@outlook.com.

D5-P12

Fabrication of Thermo-Sensitive SERS Substrate by Silver Nanoparticle Embedded on Dendritic Polymer Templates

Wen-Hao Chuang¹, Yen-Yu Lin¹, Chien-Hsin Wu¹, Ting-Yu Liu², Ru-Jong Jeng¹

¹Institute of Polymer Science and Engineering, National Taiwan University, Taipei 10617, Taiwan, ²Department of Materials Engineering, Ming Chi University of Technology, New Taipei City 24301, Taiwan.

D5-P13

Synthesis and Enhanced Electron Transfer of Supramolecular Nano-Composite Containing Dendritic Dye and Surface-Modified ZnO Nano-Rods

Chien-Min Lin¹, Hong-Cheu Lin²
¹chien_min920@yahoo.com.tw, ²linhc@mail.nctu.edu.tw.

D5-P14

Study on Preparation of h-BN/PU Elastic Composites and Properties of Thermal Conductivity

Cherng-Yuh Su¹, Yung-En Liao², Guan-Fu Zhou³, Kai-Han Su⁴, Chung-Chieh Chang⁵, Chung-Chieh Chang⁶
¹Department of Mechanical Engineering, National Taipei University of Technology, ²Institute of Mechatronic Technology, National Taipei University of Technology, ³Institute of Manufacturing Technology, National Taipei University of Technology, ⁴Graduate Institute of Mechanical and Electrical Engineering, National Taipei University of Technology, ⁵Research Center of Digital Oral Science and Technology, College of Oral Medicine, Taipei Medical University, ⁶Institute of Physics, Academia Sinica.

D5-P15

Self-deposition of Ag nanoparticles on the silicon substrates for surface-enhanced Raman scattering

Yu-Cheng Chang¹, Kai-Wei Chuang², Chien-Ming Chen³
¹ychang0127@gmail.com, ²reacion1506@gmail.com, ³s74561456@gmail.com.

D5-P16

Electromagnetic Wave Absorption Using Exfoliated Graphite Nanoplatelets and Holey Graphene

Lun-Kang Chang¹, Jeng-Shian Yu¹, Yi-Ming Liu¹, Ming-Der Ger¹, Nen-Wen Pu², Tsai-Yi Cheng², Liyao Wang², You-Yu Peng³

¹Department of Chemical & Materials Engineering, Chung Cheng Institute of Technology, National Defense University, Dasi, Taoyuan 335, Taiwan., ²Department of Photonics Engineering, Yuan Ze University, Chungli, Taoyuan 320, Taiwan., ³Chemical System Research Division, National Chung Shan Institute of Science and Technology, Longtan, Taoyuan 325, Taiwan..

D5-P17

The study of electromagnetic shielding ability of conductive colloids with different silver fillers.

WEI-TING LIU¹, Yao-Hsuan Tseng¹, Shih-Hsun Chen¹
¹National Taiwan University of Science and Technology.

D5-P18

Characterization on SiO₂-based Organic-inorganic Hydrophobic Composite Films by Ultrasonic Spray Method

Jung-Jie Huang¹, Bo-Cheng Chen², Chang-Yeh Hsu³, Yi-Hsien Wu⁴, Pei-Chun Lai⁴

¹Da-Yeh University, Department of Electrical Engineering, ²Da-Yeh University, Department of Industrial Engineering and Management, ³Asia University, Department of Computer Science and Information Engineering, ⁴Precision Machinery Research & Development Center.

D5-P19

Corrosion Resistance of Graphene-Reinforced Epoxy Coatings

Ting-Yu Chen¹, Jeng-Shian Yu¹, Chia-Hung Wu², Chun-Yu Chen³, Nen-Wen Pu⁴, Yih-Ming Liu¹, Ming-Der Ger¹

¹Department of Chemical & Materials Engineering, Chung Cheng Institute of Technology, National Defense University, ²School of Defense Science, Chung Cheng Institute of Technology, National Defense University, ³Chemical System Research Division, National Chung Shan Institute of Science and Technology, ⁴Department of Photonics Engineering, Yuan Ze University.

D5-P20

Multi-walled Carbon Nanotubes-Grafted Silica Nanoarchitectures

Chean-Cheng Su¹, Cheng-Hsien Yu¹, Yao-Wen Hsu¹
¹Dept of Chemical and Materials Engineering, National University of Kaohsiung, Kaohsiung.

D5-P21

Double-sided plasmonic silver nanoparticles decorated copper oxide/zinc oxide heterostructured nanomace arrays with high enhanced photocatalytic degradation performance

Yu-Ting Tsai¹, Jin-You Guo², Chien-Ming Chen³, Yu-Cheng Chang⁴
¹ben123louis@yahoo.com.tw, ²gd510206@gmail.com, ³s74561456@gmail.com, ⁴ychang0127@gmail.com.

D5-P22

Preparation of stretchable electrodes by using silver nanowires embedded in polyurethane

I-Zhen Yang¹, Ing-Chi Leu²
¹sally820307@yahoo.com.tw, ²icleu@mail.nutn.edu.tw.

D5-P23

Fabrication of Periodic Si Nanocone Arrays on (001)Si and Their Optical Absorption Properties
 LIN, KUN-QI¹, HUANG, YU-HSUN¹, CHENG, SHAO-LIANG²

¹Dept of Chemical and Materials Engineering, National Central University, ²Dept of Chemical and Materials Engineering, National Central University and Institute of Materials Science and Engineering, National Central University.

D5-P24

Electrochemical Deposition of Zinc Oxide Porous Nanosheet Arrays for Photoanode of Dye-Sensitized Solar Cells

P.Y.Tsai¹, W.M.Hsu¹, W.C.Yu¹
¹National Taipei University of Technology.

D5-P25

Magnetic Nanoparticle-Supported Olefin-Metathesis Catalysts for Degradation of Nitrile Butadiene Rubber

Feng-Ming Hsieh¹, Mei-Hua Wang¹
¹Industrial Technology Research Institute.

D5-P26

Synthesis of WS₂xSe₂(1-x) nanowalls with precise stoichiometry through chalcogenide diffusion and segregation using a rapid thermal annealing process
 Shin-Yi Tang¹, Henry Medina¹, Wen-Chun Yen¹, Yu-Ze Chen¹, Yi-Chung Wang¹, Arumugam Manikandan¹, Teng-Yu Su¹, Chia-Wei Chen¹, Yu-Lun Chueh¹
¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, R.O.C..

D5-P27

A study of dielectric constant of La_{1.5}Sr_{0.5}NiO₄ composites

Tzu Hsuan Chiang¹, Jhen-Kai Wong¹
¹National United University.

D5-P28

Wafer Scale aligned helix Si hierarchical nanostructures prepared by glancing angle deposition system (GLAD) as high performance anode in Secondary Lithium Ion Battery

Hsiao-Chien Wang¹, Shu-Chi Wu¹, Jian-Shiou Huang¹, Wen-Chun Yen², Stuart R. Thomas¹
¹Department of Materials Science and Engineering, National Tsing Hua University, ²Department of Physics, National Sun Yat-sen University,.

D5-P29

Plasma-Enhanced Formation of Transparent conductive Nickel Diselenide Thin Film at Low Temperature for Optical Applications

Fan-Wei Liu¹, Ling Lee¹, Yu-Lun Chueh¹
¹Department of Materials Science and Engineering, National Tsing Hua University.

D5-P30

Magnetic electrochemical exfoliated graphene on biosensing application

C.C. Huang¹, Y.L. Hsieh¹, Y.C. Tsai², Y.Y. Chen², C.Y. Su¹
¹Dep. of Mechanical Engineering, National Central University, Taiwan, ²Dep. of Bio-Industrial Mechatronics Engineering, National Chung Hsing University, Taiwan.

D5-P31

Effects of asymmetric local Joule heating on silicon nanowire-based devices and their applications

Hsiang-Hsi Ho¹, Chun-Lung Lin¹, Wei-Che Tsai¹, Liang-Jheng Hong¹, Cheng-Han Lyu¹, Hsun-Feng Hsu¹
¹Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan.

D5-P32

Synthesis of MIL-101(Cr)-SO₃H and its Catalyzed Hydrolysis of Lignin from Cornstalk

Kuo-Tong Lee¹, Yi-Lin Ciou²
¹ktlee@mail.mcut.edu.tw, ²M05138115@mail2.mcut.edu.tw.

D5-P33

Synthesis of MIL-101(Cr)-SO₃H and its Dye Adsorption from Aqueous Solution

Chia-Hang Liu¹, Kuo-Tong Lee²
¹M05138122@mail2.mcut.edu.tw, ²ktlee@mail.mcut.edu.tw.

D5-P34

Tuning Morphological Structure of Ag/QRs/PMMA Blend Fibers to Enhance the Sensitivity of Volatile Organic Compounds

Chih-Kuang Kao¹, Shun-Hsiang Chan¹, Ming-Chung Wu¹
¹Chang Gung University.

D5-P35

Amino acid-Assisted Preparation of ZnO Nanocrystallite Aggregates for Dye-Sensitized Solar Cells

C.L. Ho¹, F.Y. Jiang¹, W.C. Yu¹

¹Institute of Organic and Polymeric Materials, National Taipei University of Technology.

D5-P36

Shape Controlled Synthesis of Pd Nanocrystals On Graphene nanosheets as a high performance Electrocatalysts for Direct Ethanol Fuel Cell Application

L.KARUPPASAMY¹, C.Y.Chen¹, J.J.Wu¹

¹Feng chia university.

D5-P37

Loose hierarchical superhydrophobic structure of nanowire on micromesa

Yi-Cheng Huang¹, Jiann Shieh¹, Yi-Ci Cai¹

¹dad31423@gmail.com.

D5-P38

Fabrication of Thermo-Sensitive SERS Substrate by Silver Nanoparticle Embedded on Dendritic Polymer Templates

Wen-Hao Chuang¹, Ting-Yu Liu², Ru-Jong Jeng¹

¹Institute of Polymer Science and Engineering, National Taiwan University, Taipei 10617, Taiwan, ²Department of Materials Engineering, Ming Chi University of Technology, New Taipei City 24301, Taiwan.

D5-P39

Effect of minor elements addition on the microstructure and mechanical properties of Ti-Fe hypereutectic alloy

Sung Hwan Hong¹, Young Seok Kim¹, Hae Jin Park¹,

Sang Chul Mun¹, Yeon Beom Jeong¹

¹Sejong university.

D5-P40

Preparation of TiO₂/CNT Nanocomposite and the study of surface morphology

Bi-Hua Chiou¹, Wei-Sheng Wu¹, Lu-Lin Li¹

¹Department of Energy Engineering, National United University, Miaoli, Taiwan.

D5-P41

polyimide/ zirconium dioxide hybrid films with high dielectric constant for organic thin film transistor applications

Yang-Yen Yu¹, Chiu Chi-Ting¹, Huang Yu-Chia¹

¹Department of Materials Engineering, Ming Chi University of Technology.

D5-P42

Preparation and characterization of perovskite based solar cells using low-temperature solution-processed titanium dioxide nanoparticles as electron transport layer

Yang-Yen Yu¹, Chia-Fen Teng¹, Tseng Ching¹, Zheng-Qi Wang¹

¹Department of Materials Engineering, Ming Chi University of Technology.

D5-P43

New Process for Fabricating Intrinsic Josephson Junction using Water-treatment

Hiromi Tanaka¹, Kenta Tanaka¹, Ryo Matsumoto², Satoru Kishida³

¹National Institute of Technology, Yonago College, ²National Institute for Materials Science & Tsukuba University, ³Tottori University.

Symposium D6

Advanced Optoelectronic Materials

November 7-8, 2017

Organizers

I-Chen Chen	National Central University, Taiwan
Hsuen-Li Chen	National Taiwan University, Taiwan
Shih-Chieh Hsu	Tamkang University, Taiwan
Wei-Ren Liu	Chung Yuan Christian University, Taiwan
Wen-Cheng Ke	National Taiwan University of Science and Technology, Taiwan

Oral Session

Tuesday, November 7, 2017

Room: 535

Chairperson: Hitoshi Mizuno

09:00-09:25 D6-01 Keynote

Efficient nano-structured materials for high-performance GaN-based LEDs

Jae-Seong Park¹, Dae-Hyun Kim¹, Jun-Yong Kim¹, Tae-Yeon Seong^{1,2}

¹Dept of Materials Science and Engineering, Korea University, Seoul 02841, Korea. ²Dept of Nanophotonics, Korea University, Seoul, Korea.

09:25-09:50 D6-02 Keynote

Advanced Structural Nanoprobes for Conjugated Molecular Semiconductors and Devices

Ji-Seon Kim¹

¹Department of Physics & Centre for Plastic Electronics, Imperial College London, UK.

09:50-10:10 D6-03 Invited

CsPbX₃ perovskite quantum dots and its application in emission devices

Chih-Yueh Lin¹, Liang-Yih Chen and Chih-Yueh Lin

¹ Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

10:10-10:25 D6-04

Tuning morphology, luminescence, MRI and CT property of the Gd₂O₃:Eu³⁺ under different DI-water/toluene ratio

Sung Jun Park¹, Yu Jin Lee¹, Woo Cheol Lee¹, Woo Tae Hong¹, Hyun Kyoung Yang¹

¹Department of LED Convergence Engineering, Pukyong National University, Busan, South Korea.

10:25-10:40 D6-05

Stacked Multilayer Structure of Transparent Conducting Oxides for Opto-electronic Applications

Kanupriya Sachdev¹, Satyavir Singh², Vikas Sharma³

¹Materials Research Centre, Malaviya National Institute of Technology, JLN-Marg, Malviya Nagar, Jaipur-302017, India. ²Department of Physics, Malaviya National Institute of Technology, JLN-Marg, Malviya Nagar, Jaipur-302017, India. ³Department of Physics,

Indian Institute of Technology Delhi, Hauz Khas, New Delhi Delhi -110016, India.

Oral Session

Wednesday, November 8, 2017

Room 501

Chairperson: Ji-Seon Kim

09:00-09:25 D6-06 Keynote

New chalcogenide and halide materials for optoelectronic applications

M. Piasecki^{1,2}, O. V. Parasyuk³, V. V. Halyan², I. V. Kityk^{2,4}, O. Y. Khyzhun⁵, G. L. Myronchuk², I. E. Barchiy⁶

¹Institute of Physics, J. Dlugosz University, Armii Krajowej 13/15, Czestochowa, PL-42201, Poland.

²Department of Solid State Physics, Lesya Ukrainka Eastern European National University, 13 Voli Ave., Lutsk 43025, Ukraine. ³Department of Inorganic and Physical Chemistry, Lesya Ukrainka Eastern European National University, 13 Voli Ave., Lutsk 43025, Ukraine. ⁴Institute of Optoelectronics and Measuring Systems, Faculty of Electrical Engineering, Czestochowa University Technology, Armii Krajowej 17, Czestochowa, Poland. ⁵Frantsevych Institute for Problems of Materials Science, National Academy of Sciences of Ukraine, 3 Krzhizhanivsky St., 03142 Kyiv, Ukraine. ⁶Chemical department, Uzhgorod National University, 46 Pidgirna street, UA-88000 Uzhgorod, Ukraine.

09:25-09:45 D6-07 Invited

Opportunities in the Single and Multi-junction Solar Cells for Increasing Power Conversion Efficiency and Annual Energy Yield

Kenji Araki¹, Kan-Hua Lee¹, Nobuaki Kojima¹, Masafumi Yamaguchi¹

¹Toyota technological Institute, Nagoya, Japan.

09:45-10:05 D6-08 Invited

Antireflective nanostructure for the application of silicon solar cells

Giann Shieh¹

¹Department of Materials Science and Engineering, National United University, Miaoli, Taiwan.

10:05-10:25 D6-09 Invited

Synthesis and Modification of Na₃V₂(PO₄)₃ Cathode Materials for Sodium-Ion Batteries

Wei-Ren Liu¹, Rasu Muruganantham¹

¹Department of Chemical Engineering, Chung Yuan Christian University, Taoyuan City, Chungli 32023, Taiwan.

10:25-10:40 D6-10

Organic CMOS-image-sensor Using Top-transparent-electrode/Organic photodetector/Al-bottom-electrode and 4-silicon transistors

Hyo-Jun Kwon¹, Seung-Hyun Song¹, Joo-Hyeong Park¹, Min-Won Kim¹, Jae-Gon Kim¹, Ui-Hyeon Jung¹, Hyo-Won Baik², Jea-Gun Park^{*}

¹Advanced Semiconductor Materials and Devices Development Center, Department of Electronics and

computer Engineering, Hanyang University, Seoul 133-791, Korea. ²Department of Nanoscale Semiconductor Engineering, Hanyang University, Seoul 133-791, Korea.*222, Wangsimni-ro, Seongdong-gu, Seoul, Republic of Korea.

Oral Session
Wednesday, November 8, 2017
Room 501
Chairperson: Liang-Yih Chen

14:00-14:20 D6-11 Invited

Influence of Onion-Like Carbon Layers on the Photovoltaic Properties in Zinc Phthalocyanine-Based Solar Cells

Hitoshi Mizuno¹, Satoshi Tomita², Hisao Yanagi², Ichiro Hiromitsu¹

¹Department of Physics and Materials Science, Interdisciplinary Graduate School of Science and Engineering, Shimane University, Matsue, Japan.

²Graduate School of Materials Science, Nara Institute of Science and Technology (NAIST), Nara, Japan.

14:20-14:40 D6-12 Invited

Carrier lifetime engineering and magnetic-optical coupling of self-assembled ZnTe quantum dots

Ling Lee¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

14:40-15:00 D6-13 Invited

The electronic structures of Mn⁴⁺ activated fluorides red phosphors utilized in backlight LEDs

Yunfei Tian¹, Mi Fei¹, Liangrui He¹, Jie Chen¹, Lei Chen¹

¹School of Materials Science and Engineering, Hefei University of Technology, Hefei 230009, China.

15:00-15:15 D6-14

Electrochemical Properties of FeV₂O₄ as novel anode material for energy storage applications

Irish Valerie B. Maggay¹, Lyn Marie De Juan², Jheng-Shin Lu¹, Mai Thanh Nguyen², Tetsu Yonezawa², Wei-Ren Liu¹

¹Dep of Chemical Engineering, Chung Yuan Christian University, 200 Chung Pei Rd, Chung Li, 3023, TAIWAN. ²Division of Materials Science and Engineering, Faculty of Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo, Hokkaido 060-8628, JAPAN.

Poster Session
Wednesday, November 8, 2017
12:00-14:00
Room 401

D6-P01

Characterization of indium-tin-oxide Ohmic contact to nanohole p-GaN

Chih-Yung Chiang, Zhong-Yi Liang, Wen-Cheng Ke

¹ Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

D6-P02

TiO₂ Thin Films Deposited with Various Glancing Angle by E-Beam System

Po-Kai Chiu¹, Donyau Chiang¹, Chao-Te Lee¹, Nancy Chu¹, Chien-Nan Hsiao¹

¹Instrument Technology Research Center, National Applied Research Laboratories, Hsinchu, TAIWAN.

D6-P03

Microstructure Characterization of Fluorine Doped Few Layer MoS₂

Xiao-Mei Zhang¹

¹Department of Mechanical Engineering, School of Engineering, Tokyo Institute of Technology, Japan.

D6-P04

Enhanced optical properties of ZnO nanorod & ultra-nanocrystalline diamond- ZnO nanorod hybrid

Bohr-Ran Huang¹, Hung-Chih Lu¹

¹Graduate Institute of Electro-Optical Engineering & Department of Electronic Engineering, National Taiwan University of Science and Technology, Taipei 106, Taiwan.

D6-P05

Enhancing Raman Signals through Electromagnetic Hot Zones Induced by Magnetic Dipole Resonance of Metal-Free Nanoparticles

Yi-Chuan Tseng¹, Yang-Chun Lee¹, Sih-Wei Chang¹, Pei-Ju Tsai¹, Dai-Liang Ma², Bo-Cheng Lin², Hsuen-Li Chen¹

¹Department of Materials Science and Engineering, National Taiwan University, No. 1, Sec. 4, Roosevelt Road, Taipei, 10617, Taiwan, ²Materials and Electro-Optics Research Division, National Chung-Shan Institute of Science and Technology, Taoyuan, Taiwan.

D6-P06

Natural-Light-Style OLED with Tunable Color Temperature Feasibility

Da-Hsing Kuan¹, Wun-Yun Yang¹, Wen-Jun Lin¹, Yung-Cheng Tsai², Sheng-Hsu Shih², Jwo-Huei Jou¹

¹Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²WiseChip Semiconductor Inc. 8, Kebei Rd.2, Science Park, Chu-Nan, Taiwan.

D6-P07

Improve the double side polishing processes on sapphire substrates

Shih-Jen Lin¹, YewChung Sermon Wu^{1*}

¹Degree Program of Semiconductor Materials and Process Equipment, National Chiao Tung University, Hsinchu, Taiwan Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan. *Degree Program of Semiconductor Materials and Process Equipment, National Chiao Tung University, Hsinchu.

D6-P08

Indium-free transparent composited electrodes with ZnO:Ga and Ag multilayer

Yu Jun Yang¹, Chung Yu Chueh¹, Meng Kai Li¹, Yi Ding², Cheng Chung Jaing², Cheng Hsiung Peng¹, Pang Shiu Chen¹

¹Department of Chemical and Materials Engineering, MingHsin University of Science and Technology, Taiwan. ²Department of Optoelectronic System Engineering, Minghsin University of Science and Technology, Taiwan.

D6-P09

Enhanced transmittance in transparent TiOx/metal/TiOx stacking layer by using Ag-Cu bilayer

Hong Pang Chen¹, Fu Ping Chuang¹, Yang Kuao Kuo², Cheng Hung Shin², Pang Shiu Chen¹*

¹Department of Chemical and Materials Engineering, Ming Hsin University of Science and Technology, Hsinchu, 30401, Taiwan, R.O.C. ²Chemical Defense Section, Chemical Systems Research Division, Chung-Shan Institute of Science Technology, Lung-Tang, Tao-Yuan, Taiwan, R.O.C.

D6-P10

Characteristics of photodegradation in transparent AZO/Ag/WO₃ stacking layer

Meng Hsuan Tasi, Yao Cing Han, Pang Shiu Chen[#], Cheng-Hsiung Peng, Chao-An Jong¹

Department of Chemical and Materials Engineering, MingHsin University of Science and Technology, Taiwan, ROC. ¹NARLABs, Nano Device Laboratories, Hsinchu, Taiwan, ROC.

D6-P11

Performance study of yellow phosphorescent OLED with a novel iridium complex based emitter

Rohit Ashok Kumar Yadav¹, Yu-Chi Lo¹, Jia-Wei Wen¹, Chih-Lung Chin², Jwo-Huei Jou¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan 30013, R.O.C. ²Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan 30013, R.O.C.

D6-P12

Performance study of a novel iridium complex based green emitter for OLED

Sheng-Ching Fu¹, Wen-Jun Lin¹, Cheng-Lin Li¹, Chih-Lung Chin¹, Jwo-Huei Jou¹

¹Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

D6-P13

Doping Concentration Effect of Gold Nano Particle on Green OLED Performance

D.H.Kuan, C.C.Lo, S.H.Liu, H.F.Lin, J.R.Lee, J.H.Jou*

¹Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²Dept of Physics, National Kaohsiung Normal University, Kaohsiung, Taiwan.

D6-P14

Influence of nitrogen flow rate of Indium oxynitride nanodots on electrical characterization of ITO to P-GaN

Chia-Yu Liao, Chih-Yung Chiang, *Wen-Cheng Ke

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

D6-P15

Graphene Ohmic contact to p-GaN layer by embedded indium oxynitride nanodots interlayer

Ruo-Nong Song, Wen-Cheng Ke*

Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan. *No. 43, Keelung Road, Sec. 4, Taipei 10607, TAIWAN.

D6-P16

Upconversion Photoluminescence of Hydrothermally Synthesized Ho³⁺-doped NaYF₄ Nanocrystals under Excitation at 1160 nm

Jung-Yen Yang¹

¹National Nano Device Laboratories, National Applied Research Laboratories, Hsinchu, Taiwan.

D6-P17

The preparation and Luminescent Properties of 3.5MgO·0.5MgF₂·(1-x)GeO₂·xMnO₂ for White LEDs

Y. Chen, H. J. Lai, M. Zhang, X. He, Q. G. Zeng School of Applied Physics and Materials, Wuyi University, Jiangmen, Guangdong, P.R. China.

D6-P18

Local rear contacts for PERC silicon solar cells patterned by screen-printable polymer pastes

J. Wang¹, Y.A. Chen¹, C.Y. Chen¹, C.W. Kuo², T.M. Kuan², C.Y. Yu², I.C. Chen¹

¹Institute of Materials Science and Engineering, National Central University, Zhongli 320, Taiwan. ²TSEC Corporation, Hsinchu 303, Taiwan.

D6-P19

Optical Inhibition of Surface Plasmonic Loss by Low Index Materials in Top-emitting OLED

Yu-Tang Tsai¹, Yi-Hsiang Huang¹, Yu-Hsiang Tsai¹, Kuang-Ting Chen¹, Tien-chang Lu², Tsung-sheng Kao²

Industrial Technology Research Institute, Hsinchu, Taiwan, 31040, R.O.C. ¹Display Technology Center, Industrial Technology Research Institute. ²Department of Photonics Institute of EO Engineering, National Chiao Tung University.

Symposium D7

Smart Materials

November 7-8, 2017

Organizers

Chuan-Pu Liu	National Cheng Kung University, Taiwan
Ruey-Chi Wang	National University of Kaohsiung, Taiwan
Tzer-Shen Lin	Industry Technology Research Institute, Taiwan

Oral Session

Tuesday, November 7, 2017

Room 503

Chairperson: Chuan-Pu Liu

09:00-09:30 D7-01 Keynote

Thin Si thermoelectric material by phonon engineering

Masahiro Nomura¹

¹Institute of Industrial Science, The University of Tokyo.

09:30-09:50 D7-02 Invited

Thermoelectric device architecture for low \$/W and wearable system

Woochul Kim¹

¹Yonsei University, Seoul, Korea.

09:50-10:10 D7-03 Invited

Developing Techniques of Optical Analysis for Nanomaterials and Structured Optoelectronic Devices

Yang-Chun Lee¹, Keng-Te Lin¹, Yu-Lun Liu¹,
Chen-Chieh Yu¹, Sih-Wei Chang¹, Hsuen-Li Chen²,

¹Department of Materials Science and Engineering,
National Taiwan University, ²Department of Materials
Science and Engineering, National Taiwan University.

10:10-10:30 D7-04 Invited

In Situ Investigations of Nanowires for Energy Storage and Smart Material Applications

Steven Boles¹

¹Dept. of Electrical Engineering, The Hong Kong
Polytechnic University.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Oral Session

Tuesday, November 7, 2017

Room 503

Chairperson: Tzer-Shen Lin

14:00-14:30 D7-05 Keynote

Probing the growth and local properties of coexisting metallic-insulating domains in phase change materials

Davinder Singh¹, Pawan Kumar¹, Viswanath
Balakrishnan¹

¹School of Engineering, Indian Institute of Technology

Mandi, Kamand, Himachal Pradesh-175005, India..

14:30-14:50 D7-06 Invited

Recent Developments and Future Applications of Electrochromic Materials

Chyi-Ming Leu¹, Yu-Ruei Kung¹, Tzong-Ming Lee¹

¹Industrial Technology Research Institute.

14:50-15:10 D7-07 Invited

Bioinspired Structural Materials: Virtual Processing and Virtual Testing

Chuin-Shan Chen¹, Heng Lee¹, Shu-Wei Chang¹,
Yang-Shan Lin²

¹Dept of Civil Engineering, National Taiwan
University, ²Material and Chemical Research
Laboratories, Industrial Technology Research Institute.

15:10-15:25 D7-08

Micro-CT technology in developing a controllable modification of smart micro-pore on the surface of meso-pore materials

Tzu-Hung Lin

Industrial Technology Research Institute.

15:30-16:30 Coffee break & poster

Oral Session

Tuesday, November 7, 2017

Room 503

Chairperson: Ruey-Chi Wang

16:30-16:50 D7-09 Invited

Zwitterionic-copolymer-modified SERS Substrate Surface for Cationic Fluorescent Tag detection in Human Blood Solution

Ten-Chin Wen¹, Kundan Sivashnamugan¹

¹National Cheng Kung University.

16:50-17:05 D7-10

Preparation of Lead-free Ferroelectric (Bi_{0.5}Na_{0.5})_{0.935}Ba_{0.065}TiO₃ Thin Films on Stainless Steel Substrates with LaNiO₃ Seeding Layer

T.Y.Hsu¹, J.Shieh¹, W.J.Wu²

¹Department of Materials Science and Engineering,
National Taiwan University, Taipei,
Taiwan, ²Department of Engineering Science and Ocean
Engineering, National Taiwan University, Taipei,
Taiwan.

17:05-17:20 D7-11

Fabrication of Hydrogel-based 3D microenvironment for Wastewater Treatment

Po-Jung Huang¹, Jun Kameoka¹

¹Texas A&M University.

Oral Session

Wednesday, November 8, 2017

Room 503

Chairperson: Chuan-Pu Liu

09:00-09:30 D7-12 Keynote

Piezoelectric and Triboelectric Nanogenerators for Powering Small Electronics

Sang-Woo Kim¹

¹Sungkyunkwan University (SKKU).

09:30-9:50 D7-13 Invited

Smart Nanogenerator and Active Sensor Made from Eco-friendly Materials

C. K. Chang¹, Y. T. Chang¹, C. C. Lee¹, C. M. Leu², J. M. Wu¹

¹ Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan. 101, Section 2 Kuang Fu Road, Hsinchu 300, Taiwan. ² Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

09:50-10:10 D7-14 Invited

Flexible Pb(Zr,Ti)O₃ film based mechanical and thermal energy harvesting under harsh environments

YoungJoon Ko¹, JongHoon Jung¹

¹Department of Physics, Inha University, Incheon, Republic of Korea.

10:10-10:30 D7-15 Invited

High-Efficiency Freestanding Triboelectric-Layer Nanogenerator for Harvesting Mechanical Energy

Yannan Xie¹

¹Xiamen University.

10:30-11:00 Coffee break

11:00-12:30 Plenary talk

Oral Session

Wednesday, November 8, 2017

Room 503

Chairperson: Jyh Ming Wu

14:00-14:30 D7-16 Keynote

Demonstration of hole gas accumulation of core-shell nanowires using Si and Ge radial heterostructures

Naoki Fukata¹, Xiaolong Zhang¹, Wipakorn Jevasuwan¹, Yoshio Bando¹, Zhong Lin Wang²

¹National Institute for Materials Science (NIMS), ²Georgia Institute of Technology.

14:30-14:50 D7-17 Invited

Biocompatible Nanogenerators for Energy Harvesting and Self-Powered Applications

Zong-Hong Lin¹

¹Institute of Biomedical Engineering, National Tsing Hua University.

14:50-15:10 D7-18 Invited

Fundamental coupling between ferroelectric polarization and graphene 2D nanomaterials

Jianhua Hao

The Hong Kong Polytechnic University.

15:10-15:30 D7-19 Invited

Piezotronic and Piezo-phototronic Effect in III-Nitrides

Weiguo Hu

Beijing Institute of Nanoenergy and Nanosystems.

Oral Session

Wednesday, November 8, 2017

Room 503

Chairperson: Zong-Hong Lin

16:30-17:00 D7-20 Keynote

Enhancement in the Performance of Piezotronics and Nanogenerators Through Porous ZnO Nanowire Arrays

Yu-Lun Su¹, Chiao-Yen Wang¹, Chuan-Pu Liu¹

¹Department of Materials Science and Engineering,

17:00-17:20 D7-21 Invited

High Performance Materials for New Generation Magnetometer for Novel Application

Fu-Te Yuan¹, Meng-Huang Lai¹

¹iSentek Inc..

17:20-17:35 D7-22

Ultrahigh UV Responsivity of Single Nonpolar a-axial GaN Nanowire with Asymmetric Piezopotential via Piezo-phototronic Effect

Chen-Yu Tsai¹, Kapil Gupta¹, Chao-Hung Wang¹, Chuan-Pu Liu¹

¹National Cheng Kung University.

Poster Session

Tuesday, November 7, 2017

15:30-16:30

Room 401

D7-P01

Development of a self-powered sensor for the detection of lactate in sweat sample

Yu-Jhen Lin¹, Chuan-Hua Chen¹

¹Dept of Biomedical Engineering, National Tsing Hua University.

D7-P02

Ab initio design for biomedical Ti-Nb based shape memory alloys

Daichi Minami¹, Tokuteru Uesugi¹, Yorinobu Takigawa¹, Kenji Higashi¹

¹Department of Materials Science, Osaka Prefecture University, Osaka, Japan.

D7-P03

Martensitic transformation Characteristics of 600 °C Aged Ni-rich Ti₅₀-xNi_{50+x} (1.1 ≤ x ≤ 2) Shape Memory Alloys

Bo-Yi Li¹, Chieh Lin², Shyi-Kaan Wu³, Yi-Ching Chang⁴

¹Dept. of Materials Science and Engineering, National Taiwan University, Taipei 106, TAIWAN.

D7-P04

Study of ZnS conversion into Cu₂-xS in one-dimensional nanostructures through cation exchange

Chi-Lin Tsai¹, Liang-Ciao Yang¹, Chuan-Pu Liu¹

¹Department of Materials Science and Engineering, National Cheng Kung University.

D7-P05

Piezotronic Effect on Photoelectrochemical Water Splitting of Undoped and Sb-doped ZnO nanorods
Bo-Chang Chen¹, Zhe-Yong Gong¹, Chuan-Pu Liu¹
¹Department of Materials Science and Engineering,
National Cheng Kung University.

D7-P06

NiSi₂/Si Nanocomposites Prepared by Electroless Nickel Plating as High Performance Anode in Lithium-Ion Batteries
Chia-Chun Wu¹, Zhe-Yong Gong¹, Chuan-Pu Liu¹
¹Department of Materials Science and Engineering,
National Cheng Kung University.

D7-P07

Thermoelectric Properties of n-type Homologous Zinc Oxide Nanowire arrays and p-type Sb-doped Zinc Oxide Nanowire arrays
Nai-Yun Chang¹, Chuan-Pu Liu¹
¹National Chen Kung University.

D7-P08

Thermoelectric properties of homologous indium zinc oxide and porous zinc oxide nanowire arrays
Gung-Hao Jhou¹, Nai-Yun Chang¹, Chuan-Pu Liu¹
¹National Chen Kung University.

D7-P09

Investigation of p- and n-type doping in ZnO nanorod arrays on the triboelectric output performance
S.N.Chen¹, C.P.Liu¹, Z.H.Lin²
¹Department of Materials Science and Engineering,
National Cheng Kung University, Tainan,
Taiwan, ²Institute of Biomedical Engineering, National
Tsing Hua University, Hsinchu, Taiwan.

D7-P10

Interdigital electrode based triboelectric nanogenerator for effective energy harvesting from water
Byungkil Yun¹, Dongyeong Kim¹, Jonghoon Jung¹
¹Department of Physics, Inha University, Incheon,
Republic of Korea.

D7-P11

Enhanced performance of CuO/RGO flexible supercapacitor electrode by Li doping
Po-Hsiang Huang¹, Ping-Chang Chuang¹, Ruey-Chi Wang¹
¹Department of Material and Chemical Engineering,
National University of Kaohsiung.

D7-P12

Excellent SERS by Functional groups on GO via interaction with n- type ZnO
En-Cheng Kung¹, Yu-Hsuan Chen¹, Ruey-Chi Wang¹
¹Department of Material and Chemical Engineering,
National University of Kaohsiung.

D7-P13

Investigations on Pseudo-binary TiZrHfNiCoCu High Entropy Shape Memory Alloys
Yue-Jin Chen¹, Chih-Hsuan Chen¹
¹Dept. of Mechanical Engineering, National Taiwan
University, Taipei, Taiwan.

D7-P14

Structural-Resolved Study of Mechanical Properties of P(VDF-TrFE) Films
Ying-Jhih¹, E-Wen Huang¹, Wen-Ching Ko²,
Wen-Tsung Chuang³
¹Department of Material Sciences and Engineering,
National Chiao Tung University, Hsinchu City, 30010,
Taiwan., ²Laureate office, Industrial Technology
Research Institute, Hsinchu, Taiwan., ³National
Synchrotron Radiation Research Center, Hsinchu City,
30076, Taiwan.

D7-P15

Highly Selective Detection of Multi-Phosphorylated Peptides via Zn²⁺-IMAC enrichment and MALDI-TOF MS analysis
Se Won Bae¹, Seung-Han Shin¹
¹Korea Institute of Industrial Technology.

D7-P16

The Temperature-Sensitive Ionic Liquid with Lower Critical Solution Temperature (LCST)--Application and Development in Draw Solution
Meei-Yu Hsu¹, Yi-Chun Chen¹, Ya-Hui Ho¹
¹Materials and Chemical Laboratories, Industrial
Technology Research Institute (ITRI), Hsinchu ,
Taiwan.

D7-P17

The Study of Infrared Vacuum Brazing Ti50Ni40Cu10 and Ti50Ni30Cu20 Shape Memory Alloys
Ren-Kae Shiue¹, Shyi-Kaan Wu¹, Chuan-Yu Dai²,
Chieh Lin¹
¹Dept. of Materials Science and Engineering, National
Taiwan University, Taipei 106, TAIWAN., ²Dept. of
Mechanical Engineering, National Taiwan University,
Taipei 106, TAIWAN.

D7-P18

The Comparison on the Characteristics of B19 and R-phase Premartensitic Transformations in TiNi-based Shape Memory Alloys
Shyi-Kaan Wu¹, Yung-Chien Huang¹
¹Dept. of Materials Science and Engineering, National
Taiwan University, Taipei 106, TAIWAN.

D7-P19

Transformation Behaviors and Shape Memory Properties of Ti-rich TiNi Shape Memory Ribbons
Chih-Hsuan Chen¹, Yen-Cheng Wang², Shyi-Kaan Wu²
¹Dept. of Mechanical Engineering, National Taiwan
University, Taipei, Taiwan, ²Dept. of Materials Science
and Engineering, National Taiwan University, Taipei,
Taiwan.

Symposia E

Advanced Structure Materials

Symposium E1

High-Entropy Alloys and Metallic Glass Materials

November 6-7, 2017

Organizers

Jien-Wei Yeh	National Tsing Hua University, Taiwan
Jacob Chih-ching Huang	National Sun Yat-sen University, Taiwan
Ke-Fu Yao	Tsinghua University, China
Pinaki P. Bhattacharjee	Indian Institute of Technology Hyderabad, India
Hyoung Seop Kim	Pohang University of Science and Technology, Korea

Oral Session

Monday, November 6, 2017

Room 616

Chairperson: JW Yeh and CT Lui

09:00-09:30 E1-01 Keynote

Unprecedented combination of high strength and ductility in complex high-entropy alloys (HEAs) with nanoscale precipitates

Tao Yang¹, C. T. Liu¹

¹City University of Hong Kong.

09:30-09:45 E1-02 Invited

Site Percolations in Exact Equi-Atomic High-Entropy Alloys Demonstrated by Molecular Dynamics Simulations

Akira Takeuchi¹, Kunio Yubuta², Takeshi Wada², Kenji Amiya²

¹Graduate School of Engineering, Tohoku University, ²Institute for Materials Research, Tohoku University.

09:45-10:00 E1-03 Invited

Phase stability of high entropy alloy under dynamic forcing conditions

H.S. Oh¹, J.Y. Kim¹, C.W. Ryu¹, E.S. Park¹, H.J. Chang², K. Tsuchiya³, C.C. Tسان⁴, D. Raabe⁵

¹Seoul National University, ²Korea Institute of Science and Technology, ³National Institute for Materials Science, ⁴Massachusetts Institute of Technology, ⁵Max-Planck Institut für Eisenforschung GmbH.

10:00-10:15 E1-04 Invited

ON THE HIGH TEMPERATURE PHASE INSTABILITY OF PRECIPITATION STRENGTHENED HIGH ENTROPY ALLOYS

An-Chou Yeh¹, Te-Kang Tsao^{1,2}, Hideyuki Murakami², Yung-Ta Chen¹

¹Department of Material Science and Engineering, National Tsing-Hua University, ²National Institute for Materials Science, Japan.

10:15-10:30 E1-05 Invited

The cellular reaction of austenite -> austenite + L12 phase in an Al0.5CoCrFeNi2 high-entropy alloy after quenching and annealing

Wei-Chun Cheng¹

Oral Session

Monday, November 6, 2017

Room 616

Chairperson: JW Yeh and Hyoung Seop Kim

14:00-14:30 E1-06 Keynote

Unified Mechanical Modeling of High Entropy Alloys

H.S. Kim^{1,2}

¹Department of Materials Science and Engineering, POSTECH, Pohang, 790-784, South Korea. ²Center for High Entropy Alloys, POSTECH, Pohang, 790-784, South Korea.

14:30-14:45 E1-07 Invited

Deformation behavior of the modified CoCrFeMnNi alloys

Minku Choi¹, Nokeun Park¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Taiwan.

14:45-15:00 E1-08 Invited

Incorrect predictions of simple solid solution high entropy alloys: Cause and possible solution

Ming-Hung Tsai¹, Jian-Hong Li¹, An-Chen Fan¹, Pei-Hua Tsai¹

¹Department of Materials Science and Engineering, National Chung Hsing University, Taichung, Taiwan.

15:00-15:15 E1-09 Invited

Formation of Hard Coating Film from High Entropy Alloys

Young Seok Kim¹, Hae Jin Park¹ and Young Hoon Lee¹ and *Ki Buem Kim¹

¹Department of Nanotechnology and Advanced Materials Engineering, Sejong University, Seoul, Republic of Korea.

15:15-15:30 E1-10

Design and Development of High Entropy Alloys Containing Soft Dispersoids (Pb, Bi) for Wear Resistant Applications

Surekha Yadav¹, Arvind Kumar² and Krishanu Biswas^{1*}

¹Department of Materials Science and Engineering, Indian Institute of Technology Kanpur, 208016, India.

²Department of Mechanical Engineering, Indian Institute of Technology Kanpur, 208016, India.

Oral Session

Monday, November 6, 2017

Room 616

Chairperson: H.K. Lin and Yong Yang

16:30-16:45 E1-11 Invited**Universal secondary relaxation and unusual brittle-to-ductile transition in metallic glasses**Q. Wang¹, J.J. Liu¹, Y.F. Ye², T.T. Liu¹, S. Wang², C.T. Liu², J. Lu², Y. Yang²¹Laboratory for Microstructures, Institute of Materials, Shanghai University, China, ²Center for Advanced Structural Materials, Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Kowloon, Hong Kong SAR, China.**16:45-17:00 E1-12 Invited****Effects of Ti element additions and annealing treatment on optical and electrical properties of Cu-based films**H.K. Lin¹, S.Z. Hong¹¹NPUST.**17:00-17:15 E1-13 Invited****Significantly enhanced mechanical properties of ZrCuAlCo-based bulk amorphous alloy composite by ex-situ adding Ta particles**S. Y. Li¹, Y. L. Chiang², Y. C. Liao¹, T. H. Li², V. T. Nguyen¹, K. T. Hsu², P. H. Tsai², J. S. C. Jang²¹Department of Mechanical Engineering, National Central University, Chung-Li, Taoyuan 320, Taiwan, ²Institute of Materials Science and Engineering, National Central University, Chung-Li, Taoyuan 320, Taiwan.**17:15-17:30 E1-14****Variation of nano to bulk scale mechanical response of metallic glasses by tuning for the icosahedral order and packing density**Geunhee Yoo¹, Chaewoo Ryu¹, Jungsoo Lee¹, Jialun Gu², Kefu Yao², E.S. Park¹¹Seoul National University, ²Tsinghua University.**17:30-17:45 E1-15****A Highly Efficient and Self-stabilizing Metallic Glass Catalyst for Electrochemical Hydrogen Generation**Yuan-Chao Hu¹, Yong Yang¹¹City University of Hong Kong.**17:45-18:00 E1-16****Deformation dynamics of metallic glass composite with α -Al nanocrystals**W.Kim¹, S.Y.Kim¹, E.S Park^{1*}¹Research institute of Advanced Materials, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul 151-744 Republic of Korea.

Oral Session

Tuesday, November 7, 2017

Room 616

Chairperson: Ho Jin Ryu and Hideyuki Murakami

09:00-09:15 E1-17 Invited**PERFORMANCE OF HIGH ENTROPY ALLOYS IN HIGH TEMPERATURE ENVIRONMENTS**Hideyuki Murakami¹¹1. Surface and Interface Kinetics Group, Research Center for Structural Materials, National Institute for Materials Science.**09:15-09:30 E1-18 Invited****Effect of hydrogen absorption on the mechanical properties of CoCrFeMnNi high-entropy alloy**Jin-Yoo Suh¹, Yakai Zhao², Han-Jin Kim¹, M.P.Phaniraj¹, Jae-il Jang²¹Korea Institute of Science and Technology, ²Hanyang University.**09:30-09:45 E1-19 Invited****Configurational Entropy of Close-Packed High Entropy Alloys**C.H. HU¹, P.J. YU², K.Y. FUNG², P.K. LIAW³, J.W. YEH⁴, A. HU²¹Department of Chemistry, National Taiwan University, Taipei, Taiwan, ²Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Kowloon Tong, Hong Kong, ³Department of Materials Science and Engineering, The University of Tennessee, Tennessee, USA, ⁴Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.**09:45-10:00 E1-20 Invited****Powder Metallurgy Processing of Refractory High Entropy Alloys**Owais A. Waseem¹, Byung Chul Kang¹, Junho Lee¹, S.H.Hong¹, H.J.Ryu¹¹KAIST.**10:00-10:15 E1-21****Annealing effect on the phase stability and mechanical properties of (FeNiCrMn)(100-x)Cox high entropy alloys**Z.G. Zhu¹, K. H. Ma¹, X. Yang², C. H. Shek¹¹Department of Physics and Materials Science, City University of Hong Kong, Hong Kong, China.²State Key Laboratory for Advanced Metals and Materials, Beijing University of Science and Technology, Beijing, China.**10:15-10:30 E1-22****Statistical analysis of intermetallic phases in high-entropy alloys: Structure, prevalence, and composition dependence**Ming-Hung Tsai, Ruei-Chi Tsai, Ting Chang
Department of Materials Science and Engineering,
National Chung Hsing University, Taichung, Taiwan.

Oral Session
Tuesday, November 7, 2017
Room 616

Chairperson: Wu Kai and Pinaki Prasad Bhattacharjee

14:00-14:15 E1-23 Invited

Microstructural engineering for developing AlCoCrFeNi_{2.1} eutectic high entropy alloy with outstanding strength-ductility combination

Pinaki Prasad Bhattacharjee¹, Tilak Bhattacharjee², Irfan Samad Wani¹, Saad Sheikh³, I.T. Clark⁴, T. Okawa⁴, Sheng Guo², Nobuhiro Tsuji²
¹IIT Hyderabad, ²Kyoto University, Japan, ⁴Scienta Omicron, Inc, 6-16-4 Minami-Oi, Shinagawa-ku, Tokyo, 140-0013, Japan, ³Chalmers University of Technology.

14:15-14:30 E1-24 Invited

Study on high-temperature oxidation of FeCoNiCrAlx high-entropy alloys

W. Kai¹
¹Institute of Materials Engineering, National Taiwan Ocean University, Keelung, 20224, Taiwan, Republic of China.

14:30-14:45 E1-25 Invited

Effect of cold-rolling and annealing on AlCoCrFeNi_{2.1} eutectic high entropy alloy

Tilak Bhattacharjee¹, Irfan Wani², Pinaki Prasad Bhattacharjee², Saad Sheikh³, Sheng Guo³, Akinobu Shibata¹, Nobuhiro Tsuji¹
¹Kyoto University/ ESISM, ²IIT Hyderabad, ³Chalmers University Of Technology.

14:45-15:00 E1-26 Invited

Study on the microstructure and mechanical properties of none equal molar AlCoCrFeNiTi high-entropy alloy

Chia-Ming Kuo¹, *Che-Wei Tsai¹
¹Tsing Hua University.

15:00-15:15 E1-27

Wear resistance of non-equal molar AlCrFeMnNi high-entropy alloys with the addition of titanium and carbon

Chun-Hao Peng¹, Che-Wei Tsai¹
¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu.

15:15-15:30 E1-28

Microstructural Characterization and Mechanical Property in Non-Equal Molar AlCoCrFeNi Alloys

Li-Feng Lin¹, *Che-Wei Tsai¹
¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan, ROC.

Oral Session
Tuesday, November 7, 2017
Room 616

Chairperson: E-Wen Huang and Jinn P. Chu

16:30-16:45 E1-29 Invited

Au-based Thin Film Metallic Glasses for Plasmonic Sensor Applications

Chen Wang¹, Chun-Hway¹
¹National Taiwan University.

16:45-17:00 E1-30 Invited

Martensitic transformation behavior related with work-hardening on initial deformation stage of Ti-based metallic glass composite

Sung Hwan Hong¹, Ki Buem Kim¹
¹Sejong University.

17:00-17:15 E1-31 Invited

Thin Film Metallic Glasses: Strong and Ductile Coatings for Substrate Bending and Fatigue Property Enhancements

Jinn P. Chu¹, Chia-chi Yu¹, Chia-Lin Li¹, Chia-Hao Chang¹
¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

17:15-17:30 E1-32 Invited

Sluggish Phase Transition in CoCrFeMnNi High Entropy Alloy: Collective Structural Modulation

*EW .Huang Huang^{1,2}, A.C. Yeh³, W. C. Woo⁴, J. Jayant⁵
¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.
²Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.
³Dept of Materials Science and Engineering, Tatung University, Taipei, Taiwan.
⁴ Korea Atomic Energy Research Institute, South Korea.
⁵ Dept of Applied Mechanics, Indian Institute of Technology, India.

17:30-17:45 E1-33

Hidden Amorphous Phase and Reentrant Supercooled Liquid in Pd-Ni-P Metallic Glasses

S. Lan¹, Y. Ren², X. Y. Wei¹, B. Wang¹, E. P. Gilbert³, T. Shibayama⁴, S. Watanabe⁴, M. Ohnuma⁴, X. -L. Wang¹, City University of Hong Kong⁶, City University of Hong Kong
¹City University of Hong Kong, ²Argonne National Laboratory, ³Australian Centre for Neutron Scattering, ⁴Hokkaido University,

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

E1-P01

The dynamic signature of flow defects for plasticity initiation in Zr50Cu50 metallic glass

X.D. Liu¹, Y.F. Ye², Y. Yang¹

¹City University of Hong Kong, ²The Hong Kong Polytechnic University.

E1-P02

Delayed plasticity during nanoindentation of single phase CoCrFeMnNi high-entropy alloy

Q.F. He¹, J.F. Zeng¹, S. Wang¹, Y.F. Ye¹, C. Zhu², T.G. Nieh², Z.P. Lu³, Y. Yang¹

¹City University of Hong Kong, ²University of Tennessee, ³University of Science and Technology Beijing.

E1-P03

Size-Affected Plasticity in Eutectic Medium Entropy Alloy Nanocomposite

Z.Y. Ding¹, Q.F. He¹, Q. Wang², Y. Yang¹

¹CityU of HK, ²Shanghai University.

E1-P04

Alloying Behavior of Al-Co-Cr-Fe-Ni-Ti High Entropy Alloy Fabricated by High Energy Milling and Spark Plasma Sintering

M. Oh¹, M.C. Oh¹, H. Lee¹, B. Ahn¹

¹Dept of Materials Science and Engineering and Dept of Energy Systems Research, Ajou University, Suwon, Korea.

E1-05

Microstructural Evolution of Al-Co-Cr-Fe-Ni-X(X=Cu, Mn, Ti) High Entropy Alloy Prepared by Powder Metallurgy

M.C. Oh¹

¹Dept of Materials Science and Engineering and Dept of Energy system research, Ajou University, Suwon, Korea.

E1-P06

Phase evolution, microstructural morphology and mechanical properties of TiZrHfNiCuM high entropy alloys

Hae Jin Park¹, Young Seok Kim¹, Sung Hwan Hong¹, Ki Buem Kim¹

¹Sejong University.

E1-P07

Nano-scale Microstructural Evolution and Mechanical Properties of Equiatomic AlCoCrNi High-Entropy Alloy

Ki Buem Kim, Sung Hwan Hong, Elyorjon Jumaev
Department of Nanotechnology and Advanced Materials Engineering, Sejong University,

E1-P08

Investigation of Molecular dynamics with cooling rate effects and kauzmann temperature based on short-range order in Zr50Cu50 amorphous alloy

Sang Chul Mun¹, Sung Hwan Hong¹, Hae Jin Park¹, Young Seok Kim¹, Yea Bin Moon¹, Ho Seok Nam², Ki Buem Kim¹

¹Sejong University, ²Kookmin University.

E1-P09

Age hardening of Al0.5CoCrFe1.5NiTi0.5 high-entropy alloy

Che-Fu Lee¹, Tao-Tsung Shun¹

¹Feng Chia University.

E1-P10

Comparison of mechanical responses in amorphous and quasicrystal phase with same chemical composition

Wan Kim¹, Geon Hee Yoo¹, Eun Soo Park¹

¹Research institute of Advanced Materials, Seoul National University.

E1-P11

Microstructure and mechanical properties of Ta-Nb-V-Ti-W high entropy alloys by powder metallurgy

JongHwa Lim¹, JinKyu Lee¹, Eun Soo Park², Sang Jun Kim²

¹Kongju National University, ²Seoul National University, Republic of Korea.

E1-P12

Thermal expansion behaviors of 15-5 PH stainless steel between selective laser-melting made and wrought made

E-Wen Huang¹, Shih-min Chen¹, An Ke²

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan, ²Department of Oak Ridge National Laboratories, Oak Ridge, TN, USA.

E1-P13

Using in-situ neutron experiment study the tensile behavior of CoCrFeNi and CoCrFeMnNi equiatomic High Entropy Alloy

*Bo-Hong Lai¹, Tsung-Ruei Sui¹, E-Wen Huang, An-Chou Yeh, Ying-Jhih Wang¹, Yu-Lun Jao¹

¹Department of Materials Science and Engineering National Chiao Tung University, Hsinchu, Taiwan,

³Department of Materials Science and Engineering National Tsing Hua University, Hsinchu, Taiwan, R.O.C.

E1-P14

Pressure-induced fcc to hcp phase transition in CoCrFeMnNi high entropy alloy

Mao-Yuan Lo¹, Yi-Hung Chen¹, E-Wen Huang¹,
Jien-Wei Yeh³, Chia-En Hsu³, Chin-Ming Lin³

¹Department of Materials Science and Engineering,
National Chiao Tung University, Hsinchu,
Taiwan, ²Department of Materials Science and
Engineering, National Tsing Hua University, Hsinchu,
Taiwan, ³Department of Applied Science National
Hsinchu University of Education, Hsinchu, Taiwan.

E1-P15

Enhancements of String Tension Using Thin Film Metallic Glass Coatings

Wen-Shin Lee, Yi-Chia Liao
National Taiwan University

E1-P16

Effects of the grain refinement gradient layer on high entropy alloys

M. T. Tsai¹, T. Y. Liu¹, J. C. Huang²

¹Department of Materials and Optoelectronic Science,
National Sun Yat-Sen University, ²Center for Advanced
Study, City University of Hong Kong, Kowloon, Hong
Kong.

E1-P17

Deformation dynamics of Ti-Zr-Ni quasicrystal depending on thermal history

Geunhee Yoo¹, Chaewoo Ryu¹, Jinyeon Kim¹, Eunsoo
Park¹

¹Seoul National University.

E1-P18

Microstructures and Corrosion behaviors of FeCoNi(Nb, Mo) High-Entropy Alloys

Po-Min Chen¹, Wei-Li Wang¹, Chun-Huei Tsau¹

¹Institute of Nanomaterials, Chinese Culture University.

Symposium E2

Structural Light Alloys

Wednesday, November 8, 2017

Organizers

Jian-Yih Wang	National Dong Hwa University, Taiwan
Chun-Liang Chen	National Dong Hwa University, Taiwan
Chun Chiu	National Taiwan University of Science and Technology, Taiwan
Cheng Yu Wang	National Chiao Tung University, Taiwan

Oral Session

Wednesday, November 8, 2017

Room 402b

Chairperson: W. J. Kim, Chun-Liang Chen

09:00-09:30 E2-01 Keynote

High Performance Magnesium Alloys with LPSO structure and Millefeuille Structure

Y. Kawamura¹

¹Magnesium Research Center, Kumamoto University, Kumamoto, Japan.

09:30-09:50 E2-02 Invited

Study of microstructures and mechanical properties of Mg-Zn-RE alloy after plastic deformation processes

Cheng-Yu Wang¹, Jia-Rin Pang², Jian-Yih Wang²

¹National Chiao Tung University, ²National Dong Hwa University.

09:50-10:10 E2-03 Invited

Ongoing research for the LPSO-typed Mg alloys with multimodal microstructure

Michiaki Yamasaki^{1*}, Koji Hagihara², and Yoshihito Kawamura¹

¹Dept. Materials Science / Magnesium Research Center, Kumamoto University, Japan. ²Department of Adaptive Machine Systems, Graduate School of Engineering, Osaka University, Japan.

10:10-10:25 E2-04

Effect of friction stir processing on microstructure, texture and mechanical properties of Mg-RE alloys

Juan Chen¹, Jingyu Han¹, Liming Peng¹, Yujuan Wu¹, Feiyan Zheng¹, Wenjiang Ding¹

¹National Engineering Research Center of Light Alloy Net Forming and State Key Laboratory of Metal Matrix Composite, Shanghai Jiao Tong University, Shanghai, P. R. China.

Oral Session

Wednesday, November 8, 2017

Room 402b

Chairperson: Cheng Yu Wang, Jian-Yih Wang

14:00-14:30 E2-05 Keynote

Effect of volume fraction of icosahedral phase on the

microstructures and mechanical properties of cast, extruded and rolled Mg-Zn-Y alloys

T.Y.Kwak¹, W.J.Kim¹

¹Dept of Materials Science and Engineering, Hongik University, Seoul, Korea.

14:30-14:50 E2-06 Invited

My Perspectives on Aerospace Light Structures R&D – a Case Study of Using Integrated Computational Materials Engineering (ICME) for Titanium Alloys

Donald S. Shih¹

¹Magnesium Research Center, Kumamoto University Kumamoto, JAPAN.

14:50-15:10 E2-07 Invited

Effect of Alloying Element on Beta Phase Stability in Ti-X Alloys from First-Principles Calculations

Tokuteru Uesugi¹, Yoronobu Takigawa¹, Kenji Higashi¹

¹Department of Materials Science, Graduate School of Engineering, Osaka Prefecture University, Sakai, Japan.

15:10-15:25 E2-08

Aluminum-Based Conversion Coatings on AZ31 Magnesium Alloys

C.H.Tu¹, C.S.Lin¹

¹Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan.

15:25-15:40 E2-09

Corrosion Behavior of LZ91 Alloy and Study of Titanate Conversion Coating on LZ91

K. W. Lee^{1*}, C. S. Lin^{1*}

¹Dept. of Material Science and Engineering, National Taiwan University.

Oral Session

Wednesday, November 8, 2017

Room 402b

Chairperson: Michiaki Yamasaki, Chun Chiu

16:30-17:00 E2-10 Keynote

Design and characterization of high-strength Mg-Gd based alloys

Wenjiang Ding¹, Liming Peng¹, Yu Zhang¹, Wei Rong¹, Penghuai Fu¹, Yujuan Wu¹

¹National Engineering Research Center of Light Alloy Net Forming and State Key Laboratory of Metal Matrix Composite, Shanghai Jiao Tong University, Shanghai, P. R. China.

17:00-17:20 E2-11 Invited

Study of reinforcements on characteristics of mechanically alloyed Al6061 composites

Chun-Liang Chen^{1*}, Chen-Han Lin¹, Tai-An Chen¹

¹Department of Materials Science and Engineering, National Dong Hwa University, Hualien 97401, Taiwan.

17:20-17:35 E2-12

Role of Intermetallics Containing Modifier Elements for Refinement of Eutectic Si in Al-Si Alloys

Y. Suzuki-Yamamoto^{1*}, R. Ozaki¹, M. Yoshiya^{1,2} and H. Yasuda^{1,3}

¹Department of Adaptive Machine Systems, Osaka University, Suita, Osaka, Japan. ²Nanostructures Research Laboratory, Japan Fine Ceramics Center, Nagoya, Aichi, Japan. ³Department of Materials Science and Engineering, Kyoto University, Kyoto, Kyoto, Japan.

17:35-17:50 E2-13

The Effects of Zn, Cu and Zr on the Solution Temperature and the Quenching Sensitivity of Al-Zn-Mg-Cu Alloys

Albert Chiu¹, Sheng-Long Lee^{1,2}

¹National Central University, material science and engineering. ²Department of mechanical engineering, National central university.

Poster Session

Wednesday, November 8, 2017

12:00-14:00

Room 401

E2-P01

Sample size effects and deformation mechanisms of LPSO Mg-Zn-Y Alloy in micro- and nano-meter scales

W. S. Chuang^{1*}, P. H. Lin, J. C. Huang¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Kaohsiung, Taiwan.

E2-P02

Bioactive Surface Coatings for Improving the Corrosion of Biodegradable AZ91 Mg Alloy in Simulated Body Fluid

Chung-Wei Yang¹, Zhe-Jia Liang¹, Guan-Kai Wang¹

¹Department of Materials Science and Engineering, National Formosa University.

E2-P03

Microstructure and properties of Mg-Y-Zn alloy powder consolidated by equal channel angular extrusion

Hong-Min, Huang¹, Chun Chiu¹

¹Dept. of Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

E2-P04

Effect of SiC on microstructure and properties of Mg-Y-Zn alloy

Hsu-Chieh, Liu¹, Chun Chiu¹

¹Dept. of Mechanical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

E2-P05

Fabrication of Mg Foams with Open Cells Structure by Sintering and Dissolution Process

Y.F.Tzeng¹, C.Lam^{2*}

^{1,2}Dept of Mechanical and Automation Engineering, National Kaohsiung First University of Science and Technology, Kaohsiung, Taiwan.

E2-P06

Microstructure and mechanical properties of the as-cast and warm rolled Mg-9Li-(Al-Si)-Ti alloys and its forming process

Sung Hwan Hong¹, Jeong Tae Kim², Hyeon Taech Son³,

Jin Man Park⁴, Ki Buem Kim¹

¹Sejong University, ²Sejong University, Erich Schmid Institute of Materials Science, ³Korea Institute of Industrial Technology, ⁴Samsung Electronics Co., LTD.

E2-P07

Microstructures of Ti-8Al-1Mo-1V Hot Rolled Sheets

P.R.Chen¹, H.T.Hsu¹, C.H.Wu², J.K.Chen¹

¹Institute of Materials Science and Engineering National Taipei University of Technology, ²Department of New Materials Research and Development, China Steel Corp.

E2-P08

In-situ electrical resistivity determines the annealing parameters for the partial-annealed 3104 aluminum alloy roof

Yih-Farn Kao¹, Shi-Rong Chen¹

¹Aluminum Product Research & Development Section, China Steel Corporation, Kaohsiung, Taiwan.

E2-P09

Processing of A359/SiCp Aluminum Matrix Composites by Mechanical Stirring of a Multilayer Stirring Blades

Yuan Chan Fann¹, Chun Mu Chen¹

¹Industrial Technology Research Technology, Hsinchu, Republic of China.

E2-P10

Effect of different reinforcement on mechanical properties and microstructure of Al alloy metal matrix composites

Song-Jeng Huang¹, Chang-Wei Kang¹, Chih-Yao Lee¹, Murugan Subramani¹

¹National Taiwan University of Science and Technology.

E2-P11

Surface Modification of Titanium by Thermal Spraying of Al-12Si Alloy and Explosive Welding of Aluminum

Shih-Ying Chang¹, An-Bang Wu¹, Ji-Rong Fu¹

¹Department of Mechanical Engineering, National Yunlin University of Science & Technology.

E2-P12

Effects of pH and Chloride Concentration on the Electrochemical Behaviors of AA5052 Aluminum Alloy

C.I.Chang¹, T.Y.Tseng¹

¹Aluminum Products Research and Development Section, New Materials Research and Development Dept., China Steel Corporation.

E2-P13

The study of WS₂ inorganic nanotubes synthesis and its electrical properties

Song-Jeng Huang¹, Meng-Lin Hsieh¹, Tzu-Chun Chou¹, Aqeel Abbas¹

¹Department of Mechanical Engineering, National Taiwan University of Science and Technology.

Symposium E3

Advanced Steels

November 6-7, 2017

Organizers

Jer-Ren Yang National Taiwan University,
Taiwan

Oral Session

Monday, November 6, 2017

Room 404

Chairperson: Jer-Ren Yang

09:00-09:30 E3-01 Keynote

Nanoscale Deformation Behavior of Phase-Reversion Induced Austenitic Stainless Steels

Devesh Misra¹

¹Department of Metallurgical, Materials and Biomedical Engineering University of Texas at El Paso, El Paso, TX 79912, USA

09:30-09:50 E3-02 Invited

Hydrogen-induced embrittlement in abrasion-resistant martensitic steels

H.C. Lin¹, Y.T. Hsu¹, J.W. Liu¹, C.Y. Huang², Delphic Chen², H.W. Yen¹

¹ Department of Materials Science and Engineering, National Taiwan University, Roosevelt Road, Taipei, Taiwan, ² Iron and Steel R&D Department, China Steel Corporation, Chung Kang Road, Kaohsiung, Taiwan.

09:50-10:10 E3-03 Invited

Evaluation of Quantitative XRD technique on phase Identification

L.M.Wang¹, C.C.Chen², C.J.Tsai²

¹Department of Power Vehicle and System Engineering, Chung Cheng Institute of Technology, National Defense University, Ta-Yuan 33509, Taiwan, R.O.C, ²School of Defense Science Chung Cheng Institute of Technology, National Defense University.

10:10-10:30 E3-04 Invited

Dual Precipitation of Nano-Sized Carbide and Copper Particles in a Low Carbon HSLA steel

Chih-Yuan Chen¹, Cheng-Han Lee², Jer-Ren Yang²

¹National Taipei University of Technology, Taipei, Taiwan, ²Department of Materials Science and Engineering, National Taiwan University.

Oral Session

Monday, November 6, 2017

Room 404

Chairperson: Devesh Misra

14:00-14:30 E3-05 Keynote

Application of Laser Surface Melting for the Decayed Nickel-Based Alloys in Nuclear Industry

H. T. Lee¹, G.L. Wu², B.C. Tseng³

¹Mechanical Engineering Dept., National Cheng Kung University, Tainan, Taiwan ²Engineering Dept., Garmin Corporation, ³Project manager, ARITEX PRODUCT

Co., Ltd. Kaohsiung.

14:30-14:50 E3-06 Invited

Selective Oxidation and Hot-dip Galvanizing of Advanced High Strength Steels

C. W. Hsu¹, K.K. Wang¹, L. Chang¹, W.J.Cheng²

¹ Research Center for Microstructures and Physical Properties of Alloys, Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Kaohsiung, Taiwan, ² Steel Research and Development Department, China Steel Corporation, Kaohsiung, Taiwan.

14:50-15:10 E3-07 Invited

Application of Electron Channeling Contrast Imaging-Investigation of dislocations in deformed bcc metal

T.Y. Wu¹, J.C. Kuo¹

¹Dept of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

15:10-15:25 E3-08

Effect of isothermal holding temperatures on microstructures and corresponding mechanical properties of interphase precipitation strengthened dual-phase (ferrite + martensite) Ti and Ti-Mo-bearing steels

Shao-Pu Tsai¹, Jer-Ren Yang¹, Yuan-Tsung Wang², Ching-Yuan Huang²

¹National Taiwan University, ²Dept of R&D, China Steel Corporation, Kaohsiung, Taiwan.

Oral Session

Monday, November 6, 2017

Room 404

Chairperson: Hwa-Teng Lee

16:30-17:00 E3-09 Keynote

Establishment of a direct correlation between crystallographic structure and fracture toughness of CGHAZ through quantitative calculation and visualized characterization

Chengjia Shang¹, Xuelin Wang¹

¹Collaborative Innovation Center of Steel Technology, University of Science and Technology Beijing, China.

17:00-17:20 E3-10 Invited

Composite modification by magnesium and calcium in resulfurized steel

Jianxun Fu¹, Ping Shen¹, Jian Li¹, Delin Hu¹

¹ State Key Laboratory of Advanced Special Steel; Shanghai Key Laboratory of Advanced Ferrometallurgy; School of Materials Science and Engineering, Shanghai University, Shanghai 200072, China.

17:20-17:35 E3-11

Investigation on the Accommodation Strain due to Lenticular Martensite Formation

Yu-Ting Tsai¹, Jer-Ren Yang¹

¹ Dept of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan.

17:35-17:50 E3-12

Microstructure evolution and mechanical property of 18Mn-0.4C TWIP steels after high temperature tempering

Yu-Wen Chen¹, Yu-Ting Tsai¹, Po-Yen Tung¹, Jer-Ren Yang¹

¹ Dept of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 404

Chairperson: Chung-Shang Chiou, Shing-Hao Wang

09:00-09:20 E3-13 Invited

Microstructures related fatigue and nanomechanical behavior of duplex stainless steel weld metal under vibration-assisted welding

Shing-Hao Wang¹, Jer-Ren Yang², Chun-Hway Hsueh²

¹ Department of Mechanical Engineering, National Taiwan Ocean University Keelung 20224, Taiwan.

² Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan.

09:20-09:40 E3-14 Invited

The Annealing of A High Strength Dual Phase Steel after Induction Welding

C.S.Chiou¹, C.H.Tseng¹, T.H.Hsu¹

¹ Department of Mechanical Engineering, Yuan Ze University, Taoyuan, Taiwan.

09:40-09:45 E3-15

Warm Ductility Enhanced by Austenite Reversion in Ultrafine-Grained Duplex Steel

Guan-Ju Cheng¹, Ching-Yuan Huang², Delphic Chen², Hung-Wei Yen¹

¹ Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan, ² Iron and Steel R&D Department, China Steel Corporation, Kaohsiung, Taiwan.

09:45-10:00 E3-16

Micro-mechanisms of cooperative reactions between strain-induced transformation and recrystallization in Al-containing low-carbon steel

Shih-Che Chen¹, Cheng-Yao Huang¹, Yuan-Tsung Wang², Hung-Wei Yen¹

¹ Department of Materials Science and Engineering, National Taiwan University, ² Iron and Steel R&D Department, China Steel Corporation.

10:00-10:15 E3-17

Machinability Study of Austempered Ductile Iron (ADI) Fabricated at Intercritical Temperature Region

Po-Yao Chen¹, M.H. Tsai², C.S. Kang³, J.S. Shih⁴, S. Putatunda⁵

¹ Casting Technology Section, Metal Industries Research and Development Centre, Kaohsiung, Taiwan

² Casting Technology Section, Metal Industries Research and Development Centre, Kaohsiung, Taiwan

³ Casting Technology Section, Metal Industries Research and Development Centre, Kaohsiung, Taiwan

⁴ Casting Technology Section, Metal Industries Research and Development Centre, Kaohsiung, Taiwan

⁵ Chemical Engineering and Materials Science, Wayne State University, Detroit, Michigan, American

10:15-10:30 E3-18

Microstructure and properties of thermomechanically treated bake hardened AISI 4340 Steel

Pillanagrov Jayakumar¹, Arun Kumar¹, Vishnu Kumar Sharma¹

¹ Department of Metallurgical and Materials Engineering, Malaviya National Institute of Technology (MNIT), Jaipur-302017, India.

Poster Session

Monday, November 6, 2017

15:30-16:30

Room 401

E3-P01

Nanoindentation Induced V-Double Twin and DFZ at the DSS Weld Metal by Vibration Imposed on Welding

Min-Jen Liao¹, Shing-Hao Wang¹, Chun-Hway Hsueh², Jer-Ren Yang², Yu-Ting Tsai², Dr Rudder Wu³, Woei-Shyan Lee⁴

¹ Department of Mechanical Engineering, National Taiwan Ocean University, Keelung, Taiwan.

² Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan.

³ National Institute for Materials Science, Tsukuba, Ibaraki, Japan.

⁴ Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan.

E3-P02

Dissimilar Welding of Creep Resistant Alloys Applied in Ultra-supercritical Boilers

Hsinn-Tyng Kuo¹, Jian-Yuan Huang¹, Ren-Kae Shiue¹

¹ Dept. of Materials Science and Engineering, National Taiwan University, Taipei 106, TAIWAN.

E3-P03

The microstructure of quenched product in interstitial-free (IF) Steels

B.P.H. Liu¹, Y.C. Yu¹, J.R. Yang¹

¹ Department of Materials Science and Engineering, National Taiwan University.

E3-P04

The nucleation mechanisms of precipitates in the AA7050 aluminium alloy by in-situ HRTEM investigation

Tsai-Fu, Chung¹, Yo-Lung Yang², Ya-Chu, Yu¹, Bo-Ming Huang¹, Jer-Ren Yang¹, Zhusheng Shi², Jianguo Lin²

¹ Department of Materials Science and Engineering, National Taiwan University, ² Department of Mechanical Engineering, Imperial College London, London SW7 2AZ, UK.

E3-P05

Effects of austenite grain size on microstructure obtained by different cooling process in an interstitial free steel

Yanxin Wu^{1,2}, Pei-Heng Liu¹, Ya-Chu Yu¹, Jer-Ren Yang¹

¹Institute of Material Science and Engineering, National Taiwan University, Taipei, Taiwan. ²Dept of Materials Science and Engineering, Shanghai University, Shanghai, China

E3-P06

Effect of Mg Addition on the Grain Growth Behavior of Austenite in SS400

Chih-Ting Lai¹, Hong-Yi Wu¹, Fei-Ya Huang¹, Zheng-Wen Hsiao¹, Yen-Hao Frank Su², Jui-Chao Kuo¹,

¹Dept of Materials Science and Engineering, National Cheng Kung University, ²China Steel Corporation.

E3-P07

A Study on the Tempering Response of Si-Containing Bainite

Yu-Ting Tsai¹, Jer-Ren Yang¹, Ching-Yuan Huang²

¹ Dept of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan, ²China Steel Corporation. Iron and Steel R&D Department, China Steel Corporation, Kaohsiung, Taiwan

E3-P08

The effect of ferrite volume fraction on retained austenite in TRIP-assisted steels

C.L.Lin¹, S.P.Tsai¹, J.R.Yang¹

¹Department of Material Science and Engineering, National Taiwan University, Taipei, Taiwan, ROC.

E3-P09

Microstructure of the ultralow-carbon steels under rapid cooling process

Y.C. Yu¹, B.P.H. Liu¹, Y.X. Wu¹, J.R. Yang¹

¹Department of Material Science and Engineering, National Taiwan University, Taipei, Taiwan, ROC.

E3-P10

Static Recrystallization Behavior of X90 Grade Pipeline Steel

Xia dianxiu¹, Du hengke², Shang chengjia³, Li xiucheng³, Niu yanlong⁴

¹School of Mechanical Engineering, University of Jinan, Jinan 250022; ² School of Materials Science and Engineering, University of Shandong, ³ School of Materials Science and Engineering, University of Shandong, ⁴School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, 100083, ⁴Institute for Engineering steel, China Iron and steel research Institute Group, Beijing, 100081.

E3-P11

The Effect of Boundaries on Impact Toughness Improvement in High Strength Low Alloyed Steel

Xiucheng Li¹, Shilong Liu¹, Mi Luo², Dongsheng Liu², Chengjia Shang¹

¹Collaborative Innovation Center of Steel Technology, University of Science and Technology Beijing, ²Institute of Research of Iron and Steel, Shasteel.

E3-P12

In-situ transmission electron microscopy investigation of the deformation behavior of α -ferrite nanopillars in an interphase-precipitation strengthened dual phase steel

M.Y.Gao¹, S.P.Tsai¹, Y.L.Chang², T.F.Chung¹, J.R.Yang¹

¹Department of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan, ²National Institute for Material Science, 1-2-1 Sengen, Tsukuba, Ibaraki 305-0047, Japan.

E3-P13

Effect of Bainite Transformation Temperatures on A Low-carbon TRIP-Assisted Steel and The Application of Convergent Beam Electron Diffraction (CBED)

Shao-Pu Tsai¹, Shih-Ning Tsai¹, Jer-Ren Yang¹, Yuan-Tsung Wang², Ching-Yuan Huang²

¹National Taiwan University, ²China Steel Corporation (CSC).

E3-P14

Abrasive Steel Plate CSC PA500H Made by Direct Quench

C.F.Chen¹, Delphic Chen², J.H.Wu¹

¹Quality Control Unit-Plate, Quality Assurance Section-Plate, Bar & Rod, Metallurgical Department, China Steel Corporation, Kaohsiung, Taiwan, ²Steel Product Development Section, Iron & Steel Research & Development Department, China Steel Corporation, Kaohsiung, Taiwan.

Symposium E4

Advanced Structure Materials: Superalloys

November 8-9, 2017

Organizers

An-Chou Yeh	National Tsing Hua University, Taiwan
Hui-Yun Bor	National Chung-Shan Institute of Science and Technology, Taiwan
Chen-Ming Kuo	I-Shou University, Taiwan
Murakami	National Institute for Materials Science, Japan
Hideyuki	Tokyo Metropolitan University, Japan
Koji Kakehi	Chinese Academy of Science, China

Oral Session

Wednesday, November 8, 2017

Room 616

Chairperson: An-Chou Yeh

09:00-09:05

Introduction of Superalloys Symposium(E4)
Symposium Organizers

09:05-09:35 E4-01 Keynote

**Advanced Superalloy Development in Japan for
Next Generation Jet Engine and Gas Turbine
Applications**

Hiroshi HARADA¹

¹National Institute for Materials Science.(NIMS).

09:35-09:55 E4-02 Invited

**Effects of Cooling Rates after Solution Heat
Treatment on the Creep Behavior of Directionally
Solidified CM-247LC Superalloy**

Mau-Sheng Chiou¹, An-Chou Yeh², Sheng-Rui Jian³,
Chen-Ming Kuo⁴

¹Materials and Electro-Optics Research Division,
National Chung-Shan Institute of Science and
Technology, Taoyuan, Taiwan, ²Department of
Materials Science and Engineering, National Tsing Hua
University, Hsinchu, Taiwan, ³Department of Materials
Science and Engineering, I-Shou University, Kaohsiung,
Taiwan, ⁴Department of Mechanical and Automation
Engineering, I-Shou University, Kaohsiung, Taiwan.

09:55-10:15 E4-03 Invited

**High Temperature Creep Behavior of A Ni-based
Superalloy with High W Content**

Jun Xie¹, Jinjiang Yu¹, Guichen Hou¹, Chuanyong Cui¹,
Xiaofeng Sun¹, Tao Jin¹

¹Institute of Metal Research, Chinese Academy of
Sciences, Shenyang 110016, China.

10:15-10:30 E4-04

**Processing design to control room temperature
tensile properties for Inconel 718**

Yung-Ta Chen¹, An-Chou Yeh¹, Ming-Yen Li²,
Shih-Ming Kuo²

¹Department of Materials Science and Engineering,

National Tsing Hua University, Hsinchu, Taiwan, ²New
Materials Research & Development Department, China
Steel Corporation, Kaohsiung, Taiwan.

10:30-11:00 Coffee break

11:00-12:30 Plenary talks

12:30-14:00 Lunch break

Oral Session

Wednesday, November 8, 2017

Room 616

Chairperson: Hideyuki Murakami

14:05-14:35 E4-05 Keynote

**A rhenium-free low-cost second generation single
crystal superalloy DD98M**

Jinguo Li¹, Tao Jin¹, Jinlai Liu¹, Xiaofeng Sun¹,
Xiangbin Meng¹, Xinguang Wang¹

¹Institute of Metal Research, Chinese Academy of
Sciences.

14:35-14:55 E4-06 Invited

**On the Development of Cast High-Entropy
Superalloys with Improved Cost-Performance**

Te-Kang Tsao¹, An-Chou Yeh², Hideyuki Murakami¹,
Chen-Ming Kuo³, Koji Kakehi⁴

¹Surface and Interface Kinetics Group, National Institute
for Materials Science, Tsukuba, Japan ²Department of
Materials Science and Engineering, National Tsing Hua
University, Hsinchu, Taiwan ³Department of
Mechanical and Automation Engineering, I-Shou
University, Kaohsiung, Taiwan ⁴Department of
Mechanical Engineering, Tokyo Metropolitan
University, Minami-osawa, Japan.

14:55-15:15 E4-07 Invited

**The microstructure and properties of
 γ' -strengthened Co-base single crystal superalloy
brazing joint**

yuan sun¹, jide liu¹, xingyu hou¹, jinjiang yu¹, xinguang
wang¹, tao jin¹, yizhou zhou¹

¹ Institute of Metal Research, Chinese Academy of
Science, Shenyang, China

15:15-15:30 E4-08

**Microstructure and tensile properties of
precipitation strengthened high entropy alloys based
on AlCoCrFeNiTi**

Yao-Jen Chang

National Tsing Hua University.

15:30-16:30 Coffee break & POSTERS SESSION

Oral Session
Wednesday, November 8, 2017
Room 616
Chairperson: Koji Kakehi

16:35 - 17:05 E4-09 Keynote

Current States of the Ni-Based Alloys Development for A-USC Boilers

Keiji. Kubushiro¹, Akihiro Sato¹

¹Materials Department, Research Laboratory, IHI Corporation, Yokohama, Japan.

17:05 - 17:25 E4-10 Invited

Feasibility Study of 2nd Time Refurbishment of the Blade Coating in Siemens Gas Turbine

¹Hsien-Cheng Wu, Rong-Song Wang, Chen-Chou Chung, Jih-Hui Li

¹Taiwan Power Research Institute.

17:25 - 17:45 E4-11 Invited

Progress in Production Technology of Ni-Base Superalloy in Taiwan

Yeong-Tsuen Pan

17:45 - 18:05 E4-12 Invited

Applications of superalloy in industries

Chuan-Ming Fan¹, Yun-Kai Chang¹, Chung-Ting Fan¹, Ching-Yuan Lo¹

¹Transcrystal Alloy Industrial Corporation, Taipei, Taiwan, ROC.

Oral Session
Thursday, November 9, 2017
Room 403
Chairperson: Chen-Ming Kuo

09:00-09:05

Announcement from Symposium Organizers
Symposium Organizers

09:05-09:35 E4-13 Keynote

Design Approaches for Advanced Polycrystalline Ni-Base Superalloys

Sammy Tin¹

¹Illinois Institute of Technology, Chicago, IL/ USA.

09:35-09:55 E4-14 Invited

Low cycle fatigue behaviors of U720Li disk superalloy above 700°C: microstructure-property relationships

F.SUN¹, Y.F.GU¹, K. Kawagishi¹, H. Murakami¹, Y. Yamabe-Mitarai¹

¹Research Center for Structural Materials, National Institute for Materials Science, Japan.

09:55-10:15 E4-15 Invited

The unexpected precipitation and recrystallization in Ni-base superalloys fabricated by selective laser melting

Koji Kakehi¹, Y.L. Kuo¹

¹Dept. of Mechanical Engineering, Tokyo Metropolitan University, Tokyo, Japan.

10:15-10:30 E4-16

Microstructure, mechanical properties, and oxidation behaviors of newly designed Ni-based superalloy manufactured by selective laser melting

I Ting Ho¹, An Chou Yeh¹, Chih Peng Chen², Kuo Kuang Jen²

¹Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²Missile and Rocket System Research Division, National Chung-Shan Institute of Science & Technology, Taoyuan, Taiwan.

10:30-11:00 Coffee break

Oral Session
Thursday, November 9, 2017
Room 403
Chairperson: An-Chou Yeh

11:05-11:25 E4-17 Invited

Microstructural changes of oxidation resistant diffusion-based coatings on Ni-based single crystal superalloys

Hideyuki Murakami¹

¹Surface and Interface Kinetics Group, Research Center for Structural Materials, National Institute for Materials Science (NIMS).

11:25-11:40 E4-18

A Heat-Resistant NiCo_{0.6}Fe_{0.2}Cr_{1.5}SiAlTi_{0.2} Overlay Coating for High-Temperature Applications

Wei-Lin Hsu¹, Hideyuki Murakami², Jien-Wei Yeh¹, An-Chou Yeh¹, Kazuya Shimoda²

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan. ²Composites and Coatings Center, National Institute for Materials Science, Tsukuba, Ibaraki 305-0047, Japan.

11:40-11:55 E4-19

Microstructure and mechanical properties of Alloy718 built up by additive manufacturing processes: a comparison between EBM and SLM

Yen-Ling Kuo¹, Azusa Kamigaichi¹, Shota Horikawa¹, Koji Kakehi¹

¹Dept of Mechanical Engineering, Tokyo Metropolitan University, Tokyo, Japan.

11:55-12:10 E4-20

High Temperature Oxidation Behaviour of Novel Refractory Compositionally Complex Alloy

Kai-Chi Lo¹, An-Chou Yeh¹, Hideyuki Murakami²

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²Research Center for Structural Materials, National Institute for Materials Science, Tsukuba, Japan.

Poster Session
Wednesday, November 8, 2017
15:30-16:30
Room 401

E4-P01

Development of superalloys with increased tensile strength

Zhe-Ren Liu¹, Ching-Yuan Lo¹, An-Chou Yeh¹,
Hui-Yun Bor², Chao-Nan Wei²

¹Dept of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, ²Materials and Electro-Optics Research Division, Chung-Shan Institute of Science and Technology.

E4-P02

Development of nickel based 825 alloy plate product in CSC

Chien-Lin Lai¹, Ming-Yen Li¹, Shih-Ming Kuo¹,
Yeong-Tsuen Pan¹

¹New Materials Research & Development Department, China Steel Corporation, 1 Chung Kang Road, Hsiao Kang, Kaohsiung 81233, Taiwan, R.O.C.

E4-P03

Microstructure Modification of Continuous Casting Ti-bearing Fe-Ni-Cr Superalloy

Ming-yen Li¹, Chih-Yuan Chen¹, Shih-Ming Kuo¹,
Chien-Lin Lai¹, Yeong-Tsuen Pan¹

¹New Materials Research & Development Department, China Steel Corporation, Kaohsiung, Taiwan. ²Iron and Steel Research & Development Department, China Steel Corporation, Kaohsiung, Taiwan.

E4-P04

Liquation Cracking of Mar-M004 Weld

Yi-Hsin Cheng¹, Jyun-Ting Chen¹, Leu-Wen Tsay¹,
Ren-Kae Shiu²

¹Institute of Materials Engineering, National Taiwan Ocean University, Taiwan ²Department of Materials Engineering, National Taiwan University, Taiwan.

E4-P05

Effects of Solution Heat Treatment Temperatures on the Microstructure and High-Temperature Oxidation Behavior of Directionally Solidified CM-681LC Ni-Based Superalloy

J.M. Li¹, S.R. Jian¹, C.M. Kuo², M.S. Chiou³, J.H. Liao³,
C.N. Wei³, H.Y. Bor³

¹Dept of Materials Science and Engineering, I-Shou University, Kaohsiung, Taiwan. ²Dept of Mechanical and Automation Engineering, I-Shou University, Kaohsiung, Taiwan. ³Materials & Electro-Optics Research Division, National Chung-Shan Institute of Science & Technology, Taoyuan, Taiwan.

E4-P06

Effects of Solution Heat Treatment Temperatures on the Microstructure and High-Temperature Creep Behavior of Directionally Solidified CM-681 LC Ni-Based Superalloy

J.Y. JHANG¹, C.M. Kuo², S.R. Jian¹, M.S. Chiou³, J.H. Liao³, C.N. Wei³, H.Y. Bor³

¹ISU, ²bbmo0724@gmail.com.

E4-P07

High Temperature Mechanical Behavior of Inconel 713 LC Superalloy Based on MIM and Precision Casting Processes

Ya-Han Liang¹, Chen-Ming Kuo¹, Sheng-Rui Jian¹

¹Dept of Materials Science and Engineering, I-Shou University, Kaohsiung, Taiwan. ²Dept of Mechanical and Automation Engineering, I-Shou University, Kaohsiung, Taiwan. ³Materials & Electro-Optics Research Division, National Chung-Shan Institute of Science & Technology, Taoyuan, Taiwan.

E4-P08

Mechanical properties and fracture mechanism of diffusion bonded columnar-grained to fine-grain Ni-base superalloys joint

J.H.Liao¹, H.Y.Bor¹, C.N.Wei¹, S.H. Chen¹

¹Materials & Electro-Optics Research Division, Chung-Shan Institute of science & Technology, Tao-Yuan, Taiwan.

E4-P09

Effects of Aluminum Addition on the High Temperature Creep Properties of Directionally Solidified CM-247LC Ni-based Superalloy

M.S. Chiou¹, A.C. Yeh², J.H. Liao¹, C.N. Wei¹, H.Y. Bor¹, S.R. Jian³, C.M. Kuo⁴

¹Materials & Electro-Optics Research Division, National Chung-Shan Institute of Science & Technology, Taiwan. ²Department of Materials Science and Engineering, National Tsing Hua University, Taiwan. ³Department of Materials Science and Engineering, I-Shou University, ⁴Department of Mechanical and Automation Engineering, I-Shou University, Taiwan.

E4-P10

Interfacial Behavior between Filler Metal and Iron-Nickel-Based Superalloy during Welding Process

Shih-Ming Kuo¹, Ming-Yen Li¹, Chien-Lin Lai¹

¹New Materials Research & Development Department China Steel Corporation.

E4-P11

Porous iron-based substrates as supporting component for Metal-supported Solid Oxide Fuel Cell fabricated by additive manufacturing

Jo-Yun Chen¹, An-Chou Yeh¹, Sheng-Fu Yang²

¹Dept. of Materials science and engineering, National Tsing Hua University, Hsinchu, Taiwan, ²Physics Division, Institute of Nuclear Energy Research Atomic Energy Council, Taiwan.

E4-P12

Correlation between SLM parameters and properties of 17-4 PH stainless steel

Tzu-Hou Hsu¹, An-Chou Yeh¹, Chih-Peng Chen²,
Kuo-Kuang Jen²

¹Dept of Materials Science and Engineering, National Tsing-Hua University, Hsinchu, Taiwan, ²Missile and Rocket System Research Division, National Chung-Shan Institute of Science and Technology, Taoyuan, Taiwan.

E4-P13

**Effect of Thermal Treatment and Carbon,
Chromium and Cobalt Doping on The Thermal
Expansion Coefficient of Fe-Ni-based Alloys**

Chung-Lin Lin¹, An-Chou Yeh¹, Shih-Ming Kuo²,
Ming-Yen Li²

¹Department of Materials Science and Engineering,
National Tsing Hua University, Hsinchu, Taiwan, ²New
Materials Research & Development Department, China
Steel Corporation, Kaohsiung, Taiwan.

E4-P14

**An introduction of a new project aiming to develop
advanced high temperature alloys based on the high
entropy alloy composition space**

An-Chou Yeh¹

¹ Materials Science and Engineering Department,
National Tsing Hua University, Taiwan (R.O.C.)

Symposium E5

3D Additive Manufacturing Materials and Technology

November 6-8, 2017

Organizers

Hong-Jen Lai	Industrial Technology Research Institute, Taiwan
Jhewn-Kuang Chen	National Taipei University of Technology, Taiwan
Chung-Wei Cheng	National Chiao Tung University, Taiwan
E-Wen Huang	National Chiao Tung University, Taiwan

Oral Session

Monday, November 6, 2017

Room 502

Chairperson: Jhewn-Kuang Chen & Hong-Jen Lai

16:00-16:30 E5-01 Keynote

Selective Laser Melting of Bulk Metallic Nanocomposites

Bandar AlMangour¹, J-M Yang¹

¹Department of Materials Science and Engineering
University of California Los Angeles, CA 90095.

16:30-16:55 E5-02 Invited

Functionally graded lattice structures fabricated by powder bed fusion additive manufacturing

Chen-Nan Sun¹

¹Singapore Institute of Manufacturing Technology (SIMTech), Agency for Science, Technology and Research (A*STAR).

16:55-17:20 E5-03 Invited

3D Printing on Semiconductor Manufacturing: A New Approach for Semiconductor Packaging

Peter Chiu¹

¹CEO, DETEKT Technology Inc. Taiwan
Associate Professor, Oriental Institute of Technology, Taiwan.

17:20-17:45 E5-04 Invited

In-Situ Study of the Deformation Behavior in Additive Manufactured Stainless Steel

Soo Yeol Lee¹, Hobyung Chae¹, E-Wen Huang², Shi-Wei Chen³, Wanchuck Woo⁴, Ke An⁵

¹Chungnam National University, ²National Chiao Tung University, ³National Synchrotron Radiation Research Center, ⁴Korea Atomic Energy Research Institute, ⁵Oak Ridge National Laboratory.

17:45-18:10 E5-05 Invited

3D-printed biodegradable conduit for peripheral nerve repairs

*Yi-Wen Chen¹², Chien-Chang Chen²³, Yueh-Sheng Chen³⁴, *Ming-You Shie⁵

¹Graduate Institute of Biomedical Sciences, China Medical University, Taichung City, Taiwan.

²3D Printing Medical Research Center, China Medical University Hospital, Taichung City, Taiwan.

³Master Program for Biomedical Engineering, China Medical University, Taichung City, Taiwan .

⁴Department of Biomedical Imaging and Radiological Science, China Medical University, Taichung City, Taiwan .

⁵School of Dentistry, China Medical University, Taichung City, Taiwan.

Oral Session

Tuesday, November 7, 2017

Room 501

Chairperson: Chung-Wei Cheng & Jayant Jain

16:00-16:30 E5-06 Keynote

Toward Direct Digital Manufacturing by Hybrid Additive Manufacturing Technology

JY JENG¹

¹Department of Mechanical Engineering, National Taiwan University of Science and Technology.

16:30-16:55 E5-07 Invited

A Case Study of a Medical Prototype Implant Device by Additive Manufacturing

Fanghei Tsau¹

¹Laser & Additive Manufacturing Technology Center, ITRI.

16:55-17:20 E5-08 Invited

Effects of Porosity on Fatigue Property of Selective Laser Melted Ti-6Al-4V Porous Material

J.K.Chen¹, B.H.Lin¹, P.H.Chiang¹, M.W.Wu¹

¹National Taipei University of Technology.

17:20-17:45 E5-09 Invited

Porous Spiral Cage of biomedical Ti6Al4V alloy fabricated by electron beam melting

Meng-Hsiu Tsai¹

¹Casting Technology Section, Metal Industries Research & Development Centre.

Oral Session

Wednesday, November 8, 2017

Room 501

Chairperson: E-Wen Huang & Soo Yeol Lee

16:00-16:30 E5-10 Keynote

Biomedical research with MEMS and non-conventional 3D additive manufacturingLithography for Biomedical Research

Yong Jin YOON¹

¹Multiscale Intelligent System Laboratory School of Mechanical and Aerospace Engineering Nanyang Technological University.

16:30-16:55 E5-11 Invited

Briefing of 3D Printing Activities at NTU, Singapore

Pei-Chen Su¹

¹School of Mechanical and Aerospace Engineering Nanyang Technological University.

16:55-17:20 E5-12 Invited

Effect of build direction on mechanical properties of 3D printed 15-5 PH Stainless steel

Jayant Jain¹, E-Wen Huang², Soo Yeol Lee³, Ke An⁴
¹Department of Applied Mechanics, Indian Institute of Technology, Delhi, ²Department of Materials Science and Engineering, National Chiao Tung University, 1001 University Road, Hsinchu, Taiwan, ³Department of Materials Science and Engineering, Chungnam National University, Daejeon 305-764, South Korea, ⁴Chemical and Engineering Materials Division, the Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN 37831, United States.

17:20-17:45 E5-13 Invited

Mechanical Behavior Study of Addictive Manufacturing Ti6Al4V Implants using In-situ Synchrotron Transmission X-ray Microscopy and Self-consistent Modeling

Yuan-Wei Chang¹, Kuan Ying Tseng¹, E-Wen Huang¹, Chun Chieh Wang², Pei Yi Tsai³, Shin Yi Huang³, Nan Yow Chen⁴

¹Department of Material Sciences and Engineering, National Chiao Tung University, Hsinchu City, 30010, Taiwan, ²National Synchrotron Radiation Research Center, ³Biomedical Technology and Device research Laboratories, Industrial Technology Research Institute, ⁴National Center for High-Performance Computing, Taiwan.

17:45-18:00 E5-14

Characterization of Physical Properties and Degradation Behavior of Photocurable Biodegradable Co-Polymers Using Additive Manufacturing

Joanne Hwang¹, June-Yo Chen¹

¹Department of Chemical Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan.

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

E5-P01

Simulation of Mechanical Property of Various Scaffold Structures for Additive Manufactured Ti6Al4V

M.C. Yang¹, C.M. Yang¹, Y.T. Nien², M.H. Tsai³, C.F. Lin³, Y.C. Lu³, I.G. Chen¹

¹Department of Materials Science and Engineering, National Cheng Kung University, ²Department of Materials Science and Engineering, National Formosa University, ³Metal Industries Research & Development Centre, Kaohsiung, Taiwan.

E5-P02

Investigate the Lattice Deformation during Tensile Test by In-situ Neutron Diffraction for Additive Manufactured Stainless Steel

Wei Chang¹, Shih-Min Chen¹, Yu-Lun Jao¹, E-Wen Huang¹

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

E5-P03

Characterization of 17-4 Precipitation Hardening Stainless Steel by Laser Metal Deposition

Hong-Jen Lai¹, Tai-Sheng Chen¹, Ming-Sheng Leu¹
¹Industrial Technology Research Institute.

E5-P04

The microstructure and fracture properties of Ti-6Al-4V with high porosity fabricated by electron beam additive manufacturing

S. Y. Chen¹, C. N. Kuo², Y. L. Su², Y. C. Wu¹, Y. C. Chung¹, C. H. Ng¹, J. C. Huang¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Kaohsiung 80424, Taiwan, ²Casting Technology Section, Metal Processing R&D Department, Metal Industries Research & Development Centre, Kaohsiung, Taiwan.

E5-P05

Development of Mesoscopic Scale Simulation for Selective Laser Melting Processes

H.C.Wu¹, J.H. Yang¹

¹Department of Materials Engineering, Ming Chi University of Technology.

E5-P06

Microstructure and hardness of Al-Cu-Fe by direct laser metal deposition (LMD) on Al- Alloy

Tai-Sheng Chen¹, Hong-Jen Lai¹, Ming-Sheng Leu¹, Wu-Han Liu¹

¹Materials and Chemical Laboratory (MCL), Industrial Technology Research Institute (ITRI),.

E5-P07

Preparation and characterization of biodegradable Fe-Zn alloys by selective laser melting (SLM)

Tai-Sheng Chen, Hong-Jen Lai, Ming-Sheng Leu, Yion-Ni Liu, Wei-Chin Huang

Materials and Chemical Laboratory (MCL), AM System Innovation Dept., Industrial Technology Research Institute.

E5-P08

Hyperbranched Oligomer and Its Formulation Apply on 3D-printed Shoe Insoles

Cha-Wen Chang¹, Mei-Wen Hsu¹, Shinn-Jen Chang¹, Wan-Jung Teng¹

¹Industrial Technology Research Institute.

E5-P09

Photopolymers for 3D printing

C.K.Peng¹, Y.T.Chui¹, S.H.Hsu¹, T.H.Yang¹

¹Industrial Technology Research Institute..

E5-P10

Fabrication of bioactive glass-doped Ti6Al4V pedicle screws

Chih-Wei Hsiao¹, Jia-Yu Lin¹, Shao-Ju Shih¹

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan.

E5-P11

Influence of Scanning Strategies on the Parts Deformation in Selective Laser Melting Process

C.W. Cheng¹, H.I. Hong¹, M.C. Tsai²

¹National Chiao Tung University, ²National Cheng

Kung University.

E5-P12

Investigate the Additive-Direction-Dependent Deformation of Additive Manufactured (AM) Stainless Steel by In-situ Neutron Diffraction Measurements

Shih-Min Chen¹, Yu-Lun Jao¹, E-Wen Huang¹, Ke An²

¹Department of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan, ²Oak Ridge National Laboratories, Oak Ridge, TN, USA.

E5-P13

Preparation and characterization of Fe-based metallic glass powder and its additive manufacturing work piece

Y. C. Chi¹, Y. J. Lin¹, Y. C. Liao², V. T. Nguyen², T. H. Li¹, K. T. Hsu¹, P. H. Tsai¹, J. S. C. Jang¹

¹Institute of Materials Science and Engineering, National Central University, Chung-Li, Taoyuan 320, Taiwan, ²Department of Mechanical Engineering, National Central University, Chung-Li, Taoyuan 320, Taiwan.

Symposium E6

Metals, Ceramics and Composite Materials

Wednesday, November 8, 2017

Organizers

Wei-Hsing Tuan	National Taiwan University, Taiwan
Shou-Yi Chang	National Tsing Hua University, Taiwan
Lin Geng	Harbin Institute of Technology, China
Runhua Fan	Shanghai Maritime University, China

Oral Session

Wednesday, November 8, 2017

Room 502

Chairperson: Delu Geng, Shou-Yi Chang

09:00-09:25 E6-01 Keynote

Tunable Negative Permittivity with Fano-like Resonance and Magnetic Property in Percolative Silver/Yttrium Iron Garnet Metacomposites

Kai Sun¹, Runhua Fan², Yansheng Yin¹, Chuanbing Cheng²

¹Shanghai Maritime University, ²Shanghai Maritime University, Shandong University, China.

09:25-09:50 E6-02 Keynote

Strengthening and Toughening Metal Matrix Composites by Configuration Design

Lin Geng¹

¹School of Materials Science and Engineering, Harbin Institute of Technology, Harbin, China.

09:50-10:05 E6-03

Combined Electrochemical Methods for Ni-SiO₂ Composite Inverse Opals

Pei-Sung Hung¹, Chen-Hong Liao¹, Pu-Wei Wu¹

¹Dept of Materials Science and Engineering, National Chiao Tung University, Hsinchu, Taiwan.

10:05-10:25 E6-04 Invited

Effect of Phase Separation Time on the Solidification of Undercooled Fe₅₀Cu₅₀ Alloy

Delu Geng¹, Bingbo Wei¹

¹Northwestern Polytechnical University, China.

10:25-10:40 E6-05

Properties of the SiC_f/SiC-ZrB₂ Composites Fabricated by a Hybrid Route of Electrophoretic Deposition and Liquid Silicon Infiltration

Wahid Muhammad Furkon¹, Myong Dong Kim¹, Amis Siddharth Sharma¹, Dang Hyok Yoon¹

¹Yeungnam University, Korea.

Oral Session

Wednesday, November 8, 2017

Room 502

Chairperson: Ying Ruan, Pei-Ling Sun

14:00-14:20 E6-06 Invited

Microstructure Evolution and Rapid Eutectic Growth of High Undercooling Al-Cu-Ag Ternary Alloy of High Undercooling Al-Cu-Ag Ternary Alloy

Fuping Dai¹, Ying Ruan¹, Wei Zhai¹, Bingbo Wei¹

¹Department of Applied Physics, Northwestern Polytechnical University, Xi'an, China.

14:20-14:40 E6-07 Invited

Continuous and Discontinuous Recrystallization of Ultrafine-grained Aluminum

Pei-Ling Sun¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-sen University, Kaohsiung, Taiwan.

14:40-15:00 E6-08 Invited

Rapid Solidification and Applied Performances of Undercooled Metallic Alloys

Ying Ruan¹, Bingbo Wei¹

¹Department of Applied Physics, Northwestern Polytechnical University, Xi'an, China.

15:00-15:15 E6-09

Phase Equilibria of Al-Co-Cu Ternary Quasicrystalline System

Sinn-wen Chen¹, Pei-Chia Lo¹

¹National Tsing Hua University, Taiwan.

15:15-15:30 E6-10

The Characterization of Precipitates and PFZ in AZ80 Mg alloy

Anuz Zindal¹, Jayant Jain¹, Rajesh Prasad¹

¹Indian Institute of Technology Delhi, India.

Oral Session

Wednesday, November 8, 2017

Room 502

Chairperson: Chun-Yi Chen, Po-Yu Chen

16:30-16:55 E6-11 Keynote

Characterization of Mechanical Properties of Zr-Ti-Cu-Nd Metallic Glass Composites Using Nanoindentation

Ya-Hsuan Wu¹, Chun-Hway Hsueh¹

¹National Taiwan University, Taiwan.

16:55-17:15 E6-12 Invited

Micro-Mechanical Property Enhancement of Metals Electroplated in Electrolyte Containing Supercritical CO₂

Tso-Fu Mark Chang¹, Chun-Yi Chen¹, Haochun Tang¹, Takashi Nagoshi², Daisuke Yamane¹, Toshifumi Konishi³, Katsuyuki Machida¹, Kazuya Masu¹, Masato Sone¹

¹Institute of Innovative Research, Tokyo Institute of Technology, Kanagawa, Japan & CREST, Japan Science and Technology Agency, Kanagawa,

Japan, ²National Institute of Advanced Industrial Science and Technology, Ibaraki, Japan, ³Institute of Innovative Research, Tokyo Institute of Technology, Kanagawa, Japan & CREST, Japan Science and Technology Agency, Kanagawa, Japan & NTT Advanced Technology Corporation, Atsugi, Kanagawa, Japan.

17:15-17:35 E6-13 Invited

Polymorphism, Piezoelectricity and Sound Absorption of Electrospun Polyvinylidene Fluoride Nanofibrous Membranes

Chang-Mou Wu¹

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taiwan.

17:35-17:55 E6-14 Invited

Synthesis of Multi-functional Scaffolds and Composites from Natural Materials by Freeze Casting Techniques

Po-Yu Chen¹, H.-K. Chang¹, P.-H. Lee¹, W.-K. Liu¹, B.-S. Liaw¹, C.-W. Huang¹

¹National Tsing Hua University, Taiwan.

17:55-18:15 E6-15 Invited

Rapid Solidification of Supercooled Liquid Refractory Alloys under Electrostatic Levitation Condition

Liang Hu¹, Shangjing Yang¹, Lei Wang¹, Bingbo Wei¹

¹Department of Applied Physics, Northwestern Polytechnical University, Xi'an, China.

Poster Session

Wednesday, November 8, 2017

12:00-14:00

Room 401

E6-P01

Mechanical Evaluation and Material Selection of Thin-Film Composite Structures for Flexible Displays and Packages

Wen-Ju Chen¹, Chun-Cheng Chen¹, Kuan-Ting Chou¹, Shou-Yi Chang¹, Jui-Chang Chuang², Frank Yang², Chen-Chu Tsai²

¹National Tsing Hua University, ²Industrial Technology Research Institute, Taiwan.

E6-P02

Strategies of Mechanical Strengthening in Electroplated Au Materials

Haochun Tang¹, Chun-Yi Chen¹, Tso-Fu Mark Chang¹, Daisuke Yamane¹, Toshifumi Konishi², Katsuyuki Machida¹, Kazuya Masu¹, Masato Sone¹

¹Institute of Innovative Research, Tokyo Institute of Technology & CREST, Japan Science and Technology Agency, ²Institute of Innovative Research, Tokyo Institute of Technology & CREST, Japan Science and Technology Agency & NTT Advanced Technology Corporation, Japan.

E6-P03

Phase Equilibria in the Ternary Au – Sb – Sn system at 573 K

Wojciech Gierlotka¹, Chia-Chun Hsu¹, Ta-Chou Cheng¹, Che Chang¹

¹Dept of Materials Science and Engineering, National Dong Hwa University, Hualien, Taiwan.

E6-P04

Thick Film Metallization of AlN Substrate by Cu Screen Printing Process with Ti Intermediate Layer

Chia-Ting, Lin¹, Yang-Kuao, Kuo¹

¹National Chung-Shan Institute of Science, Taiwan.

E6-P05

Thermal Properties and Temperature Cycling Tests of Diamond/Ag-Ti Composites

Yu-Siang Jhong¹, Hsiao-Ting Tseng¹, Su-Jien Lin¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Taiwan.

E6-P06

Fabrication of High Thermal Conductive Diamond/Silver Composites and Their Joining with Substrates

Yu-Siang Jhong¹, Sian-Jyun Cian¹, Su-Jien Lin¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Taiwan.

E6-P07

Evaluation of Hollow Type Powder of Wungsten Carbide-Cobalt using Spray Drying Process

Wu-Han Liu¹

¹Industrial Technology Research Institute, Taiwan.

E6-P08

Fabrication of High Thermal Conductive Diamond/Copper Composites and Their Joining with Substrates

Yu-Siang Jhong¹, Yi-An Lai¹, Su-Jien Lin¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Taiwan.

E6-P09

Study the Influences of Adding Cr, Fe, Mo, Si and Ti on high Performance TiC/Ni-based Cermet System by Mechanical Alloying

Hung Yen¹, Yu-Siang Jhong¹, Jien-Wei Yeh¹, Su-Jien Lin¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Taiwan.

E6-P10

Study on Impact Resistance of Ceramic Armor Based on Bionic Fish Scale Structure

C.W. Yeh¹, Y.L. Chen¹, J.Z. Lu¹, D.G. Huang², W.K. Huang¹

¹Department of Power Vehicle and Systems Engineering, Chung Cheng Institute of Technology, National Defense University, Taoyuan, Taiwan, ²HOCHENG Corporation.

E6-P11

The Evolution of Recrystallization Textures in a 2.54 wt% Non-oriented Electrical Steel

R. W. Liao¹, P. L. Sun¹, W. C. Hsu¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-sen University, Taiwan.

E6-P12

Preparation of Ce-doped Yttrium Aluminum Garnet Phosphor Particles using One-step Spray Drying

Shao-Ju Shih¹, Zhi-Meng Wang¹, Dušan Galusek², Wei-Hsing Tuan³

¹Department of Materials Science and Engineering, National Taiwan University of Science and Technology, Taiwan, ² Joint Glass Centre of the IIC SAS, TnU AD and FChFT STU, Študentská 2, 911 50 Trenčín, Slovakia, ³Department of Materials Science and Engineering, National Taiwan University, Taiwan.

E6-P13

Evolution of Microtextures in the Deformed and Recrystallized Structure of a 2.54 wt.% Si Non-oriented Electrical Steel

K. H. Lin¹, P. L. Sun¹

¹Department of Materials and Optoelectronic Science, National Sun Yat-Sen University, Taiwan.

E6-P14

Comparison the Effect of Electric Furnace and Microwave Heating on Nickel Oxide Reduction

Jenn-Shing Wang¹, Chun-Chieh Huang¹, Zhi-Qi Chen¹, Fu-An Yang¹, Ming-Chiou Shen¹, Jiun-Shen Wang²

¹Department for Mechanical Engineering, Far East University, Tainan, Taiwan. ²Department of Power Mechanical Engineering, National Taitung College, Taitung, Taiwan.

E6-P15

Microstructure and Mechanical Property of Ti-6Al-4V Joint Interface with Zr-Ti-Cu-Ni Metallic Glass Filler Metal

Da Hye Song¹, Yun Ji So¹, Jong Hwa Lim¹, Dong Sun Seo¹, Jin Kyu Lee¹

¹Kongju National University, Korea.

E6-P16

Waste LCD Glass Foaming to Be Building Light Aggregate by Microwave

Jenn-Shing Wang¹, Chun-Chieh Huang¹, Zhi-Qi Chen¹, Zhi-Hong Wang¹, Fu-An Yang¹, Jiun-Shen Wang²

¹Department for Mechanical Engineering, Far East University, Tainan, Taiwan. ²Department of Power Mechanical Engineering, National Taitung College, Taitung, Taiwan.

E6-P17

Recovery Metal Layer of Electroplated Plastic by Electrolysis Process

Jenn-Shing Wang¹, Wang Guan Wei², Feng-Hao Hu¹, Ming-Chiou Shen¹, Jiun-Shen Wang³

¹Department for Mechanical Engineering, Far East University, Tainan, Taiwan. ²No.36, Ln. 149, Siwei St., Yongkang Dist., Tainan, Taiwan. ³Department of Power Mechanical Engineering, National Taitung College, Taitung, Taiwan.

E6-P18

The Effect of Wet Molding and Slurry Deposition Process on the Transparent Rate of Al₂O₃ Sheet

Jenn-Shing Wang¹, Yi-Shou Lai¹, Hung Lee¹, Zhi-Qi Chen¹, Chun-Chieh Huang¹, Guan-Wei Wang²

¹Department for Mechanical Engineering, Far East University, Tainan, Taiwan. ² Department of Pharmacy, Chia Nan University of Pharmacy & Science, Tainan, Taiwan.

E6-P19

Chemical Stability of Nanotwinned Cu Nanowires

Chun-Lung Huang¹, Chien-Neng Liao¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

E6-P20

Electrochemical Performance of Ba-doped La_{0.6}Sr_{0.4}Co_{0.8}Fe_{0.2}O₃ Air Electrode for Solid Oxide Electrolyzer Cell

Kuan-Chi Fu¹, Hsin-Che Huang¹, I-Ming Hung¹, Jing-Chie Lin², Sheng-Wei Lee³

¹Department of Chemical Engineering and Materials Science, Yuan Ze University, ²Department of Mechanical Engineering, National Central University, ³Institute of Materials Science and Engineering, National Central University, Taiwan.

E6-P21

Fabrication and Characterization of Quartz Fiber/Silicon Nitride Composite Materials

Yuan-Han Lee¹, Yu-Chun Fu¹, Yu-Hsu Chang¹

¹National Taipei University of Technology, Taiwan.

E6-P22

Synthesis of Delafossite CuFeO₂ Powders by Chemical Co-Precipitation Reaction at Low Temperature

Ting-Fong Siao¹, Shi-Yun Bai¹, Yu-Hsu Chang¹

¹National Taipei University of Technology, Taiwan.

E6-P23

Corrosion Behavior of Nanostructured Ti-based Alloys with TiO₂ Layer Prepared by Atomic Layer Deposition

Chia-Chieh Shen¹, Chi-Chung Kei², Wei-Ting Hsu¹, Chien-Wei Chen²

¹Yuan Ze University, ²National Applied Research Laboratories, Taiwan.

E6-P24

The Sintering of SiC and Properties of Al/SiC Composites

Y. Kuo¹, P.Y. Wang¹, Y.J. Lin¹, C.F. Yang¹

¹Dept of Materials Science and Engineering, Tatung University, Taipei, Taiwan.

E6-P25

Wet Wear Behavior of PTAW WC/Ni-based Coatings and Their Corrosion Characteristics in Seawater

Zhao Xuan¹, Chen Haiyan¹, Fan Li¹, Dong Lihua¹, Yin Yansheng¹

¹College of Ocean Science and Engineering, Shanghai Maritime University, China.

E6-P26

Mechanical Strengthening of Gold Micro-Cantilever by Control of Electroplating Conditions

Keisuke Asano¹, Haochun Tang¹, Chun-Yi Chen¹, Takashi Nagoshi², Tso-Fu Mark Chang¹, Daisuke Yamane¹, Toshifumi Konishi³, Katsuyuki Machida¹, Kazuya Masu¹, Masato Sone¹

¹Institute of Innovative Research, Tokyo Institute of Technology & CREST, Japan Science and Technology Agency, ²National Institute of Advanced Industrial Science and Technology, ³Institute of Innovative Research, Tokyo Institute of Technology & CREST, Japan Science and Technology Agency & NTT Advanced Technology Corporation, ⁴Institute of Innovative Research, Tokyo Institute of Technology & CREST, Japan Science and Technology Agency, Japan.

E6-P27

Effect of Hydrogen on Grain Refinement of CP-Ti

Szu Yu Hou¹, Tair-I Wu²

¹Thermo-Chemical Laboratories, Tatung University, Taipei, Taiwan. ²Dept. of Materials Engineering, Tatung University, Taipei, Taiwan.

Symposia F

Materials Modeling, Theory,
Characterization, and Processing

Symposium F1

Materials Modeling of Structure, Defect and Property

November 6-7, 2017

Organizers

Yu-Chieh Lo	National Chiao Tung University, Taiwan
Huey-Jiuan Lin	National United University, Taiwan

Oral Session

Monday, November 6, 2017

Room 503

Chairperson: Yu-Chieh Lo, Huey-Jiuan Lin

09:00-09:25 F1-01 Keynote

Predictive Multiscale Modeling of Deformation and Strength of Structural Materials

Shigenobu Ogata¹

¹Osaka University.

09:25-09:45 F1-02 Invited

The Atomistic Study on Pseudo-elastic Effect of Ni-Ti Shape Memory Alloys

I-Ling Chang¹, M.H. Tsai¹

¹National Cheng Kung University.

09:45-10:05 F1-03 Invited

Thermodynamics and kinetics of deformation units of nanocrystalline and amorphous metals via atomistic modellings

Yun-Jiang Wang¹

¹State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences, Beijing 100190, China.

10:05-10:25 F1-04 Invited

Negative stacking fault energies and nano-twin formation in face-centered cubic high entropy alloys

Y.H. Zhang¹, Y. Zhuang¹, A. HU¹, J.J. Kai¹, C.T. Liu¹

¹Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Kowloon Tong, Hong Kong.

10:25-10:45 F1-05 Invited

Reduced nonuniform shear deformation in close-packed granular packings with an ordered/disordered composition

Guo-Jie Jason Gao¹, Yun-Jiang Wang², Shigenobu Ogata³

¹Dept. of Mathematical and Systems Engineering, Shizuoka University, ²State Key Laboratory of Nonlinear Mechanics, Institute of Mechanics, Chinese Academy of Sciences, School of Engineering Science, University of Chinese Academy of Sciences, ³Dept. of Mechanical Science and Bioengineering, Osaka University, Center for Elements Strategy Initiative for Structural Materials (ESISM), Kyoto University.

14:00-14:25 F1-06 Keynote

Peculiar Size-Dependent Band Structure and Electronic Property of MS₂-Monolayer Nano-polygons

¹Xiao-Li Fan¹, Yu-Rong An¹, Zhi-Fen Luo¹,

²Woon-Ming Lau

¹State Key Laboratory of Solidification Processing, School of Material Science and Engineering, Northwestern Polytechnical University.

²School of Energy Science & Engineering, University of Electronic Science & Technology, China, Chengdu, Sichuan, China.

14:25-14:45 F1-07 Invited

Why does catalyst reduction helps in biomass conversion — Case study of TiO₂

Hsin-Yi Tiffany Chen¹, Gianfranco Pacchioni²

¹Dept of Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan, ²Dipartimento di Scienza dei Materiali, Universit di Milano-Bicocca, Milano, Italy.

14:45-15:05 F1-08 Invited

Understanding Mechanisms Leading to Self-Folding Nanostructures from Focused Ion Beam

Cheng-Lun Wu¹, Chun-Wei Pao¹, David J. Srolovitz²

¹Accademia Sinica, ²University of Pennsylvania.

15:05-15:25 F1-09 Invited

Grain Boundary Energy Distributions in Body-Centered Cubic Metals

S.Ratanaphan¹, R.Sarochawikasit²

¹Department of Tool and Materials Engineering, King Mongkut's University of Technology Thonburi, Bangkok, Thailand, ²Department of Computer Engineering, King Mongkut's University of Technology Thonburi, Bangkok, Thailand.

15:25-15:40 F1-10

Evolution of water transport and surface morphology for UV-irradiated

Poly(2-hydroxyethylmethacrylate)

Yu-Fan Chuang¹, Sanboh Lee¹

¹Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

16:30-16:50 F1-11 Invited

Mechanism of Ultrafast Resistance Switching in Resistive Random Access Memory

Yu-Li Chen¹, Mon-Shu Ho¹, Wen-Jay Lee²

¹Department of Physics, National Chung Hsing University, ²National Center for High-performance Computing.

16:50-17:10 F1-12 Invited

Nitrogen-Vacancy Diamond Sensor—Novel Diamond Surfaces from ab initio simulations

Jyh-Pin Chou

Department of Mechanical and Biomedical Engineering, College of Science and Engineering, City University of Hong Kong.

17:10-17:25 F1-13

Design of Hydrogen Production and Purification materials

Liang Chen¹

¹Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences.

17:25-17:40 F1-14

Wetting property of copper on amorphous carbon surface

Yong-Long Chen¹

¹Department of Materials Science and Engineering, National Chiao Tung University.

17:40-17:55 F1-15

Structure and Properties of Lithium-Calcium Borosilicate Glasses Studied by Molecular Dynamic Simulation

Yueh-Ting Shih¹, Jau-Ho Jean¹

¹Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan.

Poster Session
Tuesday, November 7, 2017
15:30-16:30
Room 401

F1-P01

The Stochastic Transition from Size Dependent to Size Independent Yield Strength in Metallic Glasses

F.C. Li¹, S. Wang¹, Q.F. He¹, H. Zhang¹, B.A. Sun¹, Y.Lu¹, Y. Yang¹

¹Centre for Advanced Structural Materials (CASM), College of Science and Engineering, City University of Hong Kong, Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong, China

F1-P02

Study on Mechanical Properties Anisotropy of Amorphous-Cu₅₀Zr₅₀/Crystalline-Cu Multilayers via MD Simulation

Dan Zhao¹, Bo Zhu¹, Hongwei Zhao¹

¹School of Mechanical Science and Engineering, Jilin University, Changchun, Jilin, 130022, China.

F1-P03

Study of diamond coating thickness on diamond-coated silicon in nanoindentation via molecular dynamic simulations

Bo Zhu¹, Dan Zhao¹, Hongwei Zhao¹

¹Jilin University.

F1-P04

Why does catalyst reduction helps in biomass conversion — Case study of TiO₂

Hsin-Yi Tiffany Chen¹, Gianfranco Pacchioni²

¹Dept of Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan, ²Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca, Milano, Italy.

F1-P05

Atomic-scale Modelling and Simulations of the Lithiation Behavior of the Si Anode in Li-ion Batteries using Reactive Force Field (ReaxFF)

Li-Yi Pan¹

¹Dept of Materials Science and Engineering, National

Taiwan University, Taipei, Taiwan..

F1-P06

Comprehensive formation mechanism of stacking fault and twin in FeNiCoCr(Al/Mo)_x high entropy alloys

YU Peijun¹, Dr. HU Alice¹

¹City University of Hong Kong.

F1-P07

Computer Simulation of Electromagnetic Pipeline Inspection at Bend

Ming-Hong Chiueh¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

F1-P08

The accurate elastic modulus measurement for hyperelastic materials by sub-100 nm AFM nanoindentation

Chih-Yu Huang¹, Alice Chinghsuan Chang¹, Bernard Haochih Liu¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

F1-P09

Investigation of AlCl₄ clusters intercalated in graphite for rechargeable Al-ion battery

HUNG-LUNG CHOU¹

¹Graduate Institute of Applied Science and Technology, National Taiwan University of Science and Technology, Taipei 10607 Taiwan.

F1-P10

Numerical study for the effect of experimental parameters on the profile formation by wet chemical etching

Guan-Ping Zhao, Jin-Ru Miao, Kun-Dar Li

Department of Materials Science, National University of Tainan, Tainan, Taiwan.

F1-P11

Study on the Curve Fitting of the Master Kinetics Curve Model using Different Shapes of Curves

Wen-Hui Chen¹, Ren-Hao Chuang¹, Mao-Hua Teng¹

¹National Taiwan University.

F1-P12

Study on the temperature range of phase transformation of hydroxyapatite using a dilatometer and two-step sintering technique

Yu-Shan Liu¹, Guan-Yi Li¹, Mao-Hua Teng¹

¹National Taiwan University.

F1-P13

Inherent and intrinsic internal friction of Cu-Zn-Al shape memory alloys

Shih-Hang Chang¹, Chin Kuo¹, Yuan-Chien Hsiao¹, , Bo-Yen Huang¹, Shyi-Kaan Wu²

¹Department of Chemical and Materials Engineering of the National Ilan University.

²Department of Materials Science and Engineering, National Taiwan University, Taipei 106, Taiwan.

F1-P14

**The Effect of Structure Disorder on Li Storage of
Defective Graphene – A First-Principles Study**

Yu-Jen Tsai¹, Chin-Lung Kuo¹

¹Dept of Materials Science and Engineering, National
Taiwan University, Taipei, Taiwan.

Symposium F2

Materials Design, Discovery and Optimization Based on Computation

Tuesday, November 7, 2017

Organizers

Shih-Kang Lin	National Cheng Kung University, Taiwan
Nien-Ti Tsou	National Chiao Tung University, Taiwan

Oral Session

Tuesday, November 7, 2017

Room 502

Chairperson: Shih-Kang Lin, Nien-Ti Tsou

09:00-09:30 F2-01 Keynote

Thermodynamics of High Entropy Alloys

Shuanglin Chen¹

¹CompuTherm, LLC, USA.

09:30-09:50 F2-02 Invited

The New Lead-free Solders Database

Wojciech Gierlotka¹

¹Department of Materials Science and Engineering,
National Dong Hwa University, Taiwan.

09:50-10:00 F2-03

CALPHAD Assisted Analysis, Prediction, and Elimination of Carbide Segregation in High-carbon Chromium Steels

Hizkia Alpha Dewanto¹, Y.L. Huang², Yen-Hao Frank
Su², Shih-Kang Lin¹

¹Department of Materials Science and Engineering,
National Cheng Kung University, Tainan,
Taiwan, ²Steel Making Process Development Sec. Iron
& Steel R & D Department, China Steel Corporation,
Kaohsiung, Taiwan.

10:00-10:10 F2-04

Phase Equilibria of the Cu-Zr-Ti Ternary Systems at 703 °C and Thermodynamic Assessment and Metallic Glass Region Prediction for the Cu-Zr-Ti Ternary System

G.N.Hermana¹, Y.W.Yen², C.H Lin¹, J.S. Chang¹

¹Dept of Materials Science and Engineering, National
Taiwan University of Science and Technology, Taipei,
Taiwan.

10:10-10:20 F2-05

Activity and Stability of Pt Alloys in Oxygen Reduction Reaction

Jeng-Han Wang¹ and Kuan-Wen Wang²

¹Department of Chemistry, National Taiwan Normal
University, Taipei, Taiwan ²Institute of Materials
Science and Engineering, National Central University,
Taoyuan, Taiwan

10:20-10:30 F2-06

Topological and superconductivity coexist phase in MoC

*Angus Huang¹, Guang Bian², and Horng-Tay Jeng^{1,3}

¹Department of Physics, National Tsing Hua University,
Hsinchu 30013, Taiwan.

²Department of Physics and Astronomy, University of
Missouri, Columbia, Missouri 65211, USA.

³Institute of Physics, Academia Sinica, Taipei 11529,
Taiwan.

14:00-14:20 F2-07 Invited

Strategies to Control Thermal Expansion of High Temperature Materials

Masato Yoshiya^{1,2}, Yusuke Akada¹, Susumu Fujii¹

¹Department of Adaptive Machine Systems, Osaka
University, Suita, Osaka, Japan. ²Nanostructures
Research Laboratory, Japan Fine Ceramics Center,
Nagoya, Aichi, Japan.

14:20-14:40 F2-08 Invited

Topological Dirac nodal lines in pure metal beryllium and its potential applications

Xing-Qiu Chen¹

¹Institute of Metal Research, Chinese Academy of
Sciences, China.

14:40-15:00 F2-09 Invited

Prediction of two-dimensional metal halides

Shi-Hsin Lin¹

¹Material and Chemical Research Laboratories,
Industrial Technology Research Institute, Hsinchu,
Taiwan. ²Dept of Materials and Optoelectronic Science,
National Sun Yat-Sen University, Kaohsiung, Taiwan.
³Dept of Materials Science and Engineering, Tatung
University, Taipei, Taiwan.

15:00-15:20 F2-10 Invited

The self-assembly of waterborne biodegradable polyurethane hydrogel: A molecular dynamics study

Chien-Hui Wen¹, Yu-Hsuan Kuan¹, Shan-Hui Hsu²,
Shu-Wei Chang^{1*}

¹Department of Civil Engineering, National Taiwan
University, Taipei, Taiwan, ²Institute of Polymer
Science and Engineering, National Taiwan University,
Taipei, Taiwan.

15:20-15:30 F2-11

A Design Method for Additive-manufactured Dental Implants

S.S.Chien^{1*}, N.T.Tsou¹, L.M.Jun¹

¹Dept of Materials Science and Engineering, National
Chiao Tung University.

16:30-16:50 F2-12 Invited

Combining First-principle Calculations and Artificial Neural Network for Additive Screening in Lithium-ion Battery

Wen-Dung Hsu¹

¹Department of Materials Science and Engineering,
National Cheng Kung University, Tainan, Taiwan.

16:50-17:10 F2-13 Invited

Lithiation Mechanism and Lithium Storage

Chin-Lung Kuo¹

¹Dept of Materials Science and Engineering, National Taiwan University, Taipei, Taiwan

17:10-17:30 F2-14 Invited

Examining the numerical effects of Molecular Dynamics Simulation on the Thermodynamics Properties of Polymer

Jun-Fu Zhang¹, Jia-Han Li¹, Wen-Jay Lee^{2*}

¹Department of Engineering Science and Ocean Engineering College of Engineering, National Taiwan University, ²National Center for High-performance Computing.

17:30-17:40 F2-15

Novel Synthesis of Solid Solutions CaxSr1-xO using Polymer Complex Method (PCM) for Biodiesel Application

M.L.P.Potestades¹, S.K.Lin¹, W.D.Hsu¹, M.Yoshimura¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

Poster Session

Tuesday, November 7, 2017

15:30-16:30

Room 401

F2-P01

Microstructural Analysis for Smart Materials

Yi-Chien, Lee¹, Nien-Ti, Tsou¹

¹Dept. of Materials Science and Engineering, National Chiao-Tung University.

F2-P02

The Study of Application of Response Surface Method on Spheroidization Treatment of SWRCH22A Steel Wire Rod

Wei-Chih Huang¹, Hsing-Sung Chen²

¹Dept of Materials Science and Green Energy Engineering College of engineering, National Formosa University, Yunlin, Taiwan. ²Dept of Materials Science and Green Energy Engineering College of engineering, National Formosa University, Yunlin, Taiwan.

F2-P03

Microstructural Analysis for the Indentation in Shape Memory Alloys by Using Molecular Dynamics Simulation

Ji-Ting Li¹, Nien-Ti Tsou¹

¹Dept. of Materials Science and Engineering, National Chiao-Tung University, Hsinchu, Taiwan.

F2-P04

Systematic Analysis on Thermodynamic Stability and Thermoelectric Properties of Impurities Doped TiS₂ by ab initio Calculations

K. Fujimoto^{1*}, S. Fujii¹ and M. Yoshiya^{1,2}

¹Department of Adaptive Machine Systems, Osaka University, ²Department of Adaptive Machine Systems, Osaka University / Nanostructures Research Laboratory, Japan Fine Ceramics Center, Nagoya, Aichi, Japan.

F2-P05

Process optimization of Cu-to-Cu bonding using Ga-based sub-micron particles

Hseng-ming Liao¹, Che-yu Yeh¹, Yu-chen Liu¹, Mei-jun Wang¹, Shih-kang Lin¹

¹Dept. of Material Science and Engineering, National Cheng Kung University.

F2-P06

Effects of molecular orbital energy level on the internal electric field distribution in OLED devices with different hosts

Sophiya Khan¹, Rohit Ashok Kumar Yadav², Fu-Jie Jiang², Yo Chi Lo², Sun Zen Chen³, Tzu-Wei Liang⁴, Jwo-Huei Jou²

¹Department of Textile Technology, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, Delhi 110016, India, ²Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan, R.O.C, ³Center for Nanotechnology, Materials Science and Microsystems, National Tsing Hua University, Hsinchu 30013, Taiwan, R.O.C, ⁴Global Science Instruments Co., Ltd., Taiwan, R.O.C.

F2-P07

Carrier mobility effects on the electric field in OLED under a forward bias

Minaal Dembla¹, Rohit Ashok Kumar Yadav², Tsu Hao Ou², Hsin Fa Lin², Sun Zen Chen³, Tzu-Wei Liang⁴, Jwo-Huei Jou²

¹Department of Textile Technology, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, Delhi 110016, India, ²Department of Materials Science and Engineering, National Tsing Hua University, Hsinchu 30013, Taiwan, R.O.C, ³Center for Nanotechnology, Materials Science and Microsystems, National Tsing Hua University, Hsinchu 30013, Taiwan, R.O.C, ⁴Global Science Instruments Co., Ltd., Taiwan, R.O.C.

F2-P08

Phase behavior of tetrabutylphosphonium -base ionic liquids: A COSMO-RS and experiments

C.H.Huang^{1*}, P.I.Liu¹, and Y.C.Chen¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu 31040, Taiwan.

F2-P09

First-principles study of interface between NCM cathode material and electrolyte in lithium ion batteries

Y. C. Chang¹, Y. C. Chuang¹, C. C. Liang¹, W. D. Hsu¹

¹Department of Materials Science and Engineering, National Cheng Kung University, Taiwan.

F2-P10

Modifications of Lattice Thermal Conduction in Si Grain Boundaries by Systematic Calculations

Kohei Funai¹, Susumu Fujii¹, Tatsuya Yokoi¹, Masato Yoshiya²

¹Department of Adaptive Machine Systems, Osaka University, ²Department of Adaptive Machine Systems, Osaka University / Nanostructures Research Laboratory,

Japan Fine Ceramics Center.

F2-P11

Influence of cooling rate on microstructure during rapid solidification of Ti-6Al-4V alloy

T.Y. Wang¹, M.H. Tsai², Y.C. Lu², I.G. Chen¹, S.K. Lin¹

¹Department of Materials Science and Engineering,
National Cheng Kung University, Taiwan, ²Metal
Industries Research & Development Centre.

F2-P12

Computer simulation of anisotropic surface diffusion and evolution during vapor deposition

Sheng-Jie Hong¹, Po-Yu Huang¹, Kun-Dar Li^{1*}

¹Department of Materials Science, National University
of Tainan, Tainan, Taiwan.

F2-P13

High-Accurately Prediction for Binary Metal-Oxides Properties by Machine Learning

Che-Ming Chang¹, Yu-Chieh Lin¹

¹Material and Chemical Research Laboratories,
Industrial Technology Research Institute.

F2-P14

The Study of Application of Response Surface Method on Spheroidization Treatment of SWRCH22A Steel Wire Rod

W.C.HUANG¹

¹ Dept of Materials Science and Green Energy
Engineering College of engineering, National Formosa
University, Yunlin, Taiwan.

F2-P15

High-Absorbency Cellulose-Based Material Revealed by Multiscale Simulation

Cheng-Kuang Lee¹, Yu-Ying Hsu¹

¹Material and Chemical Research Laboratories,
Industrial Technology Research Institute, Taiwan.

Symposium F3

Advanced Characterization for Materials
Genome & ICME: TEM, Synchrotron X-ray,
and Neutron

November 6-7, 2017

Organizers

Xun-Li Wang	City University of Hong Kong, China
Yandong Wang	University of Science and Technology Beijing, China
Ji-Jung Kai	City University of Hong Kong, China
Wan-Chuck Woo	Korea Atomic Energy Research Institute, Korea
Stefanus Harjo	Japan Proton Accelerator Research Complex, Japan
Jayant Jain	Indian Institute of Technology Delhi, India
Shi-Wei Chen	National Synchrotron Radiation Research Center, Taiwan
Nan-yow Chen	National Center for High-Performance Computing, Taiwan
Wen-Jay Lee	National Center for High-Performance Computing, Taiwan
E-Wen Huang	National Chiao Tung University, Taiwan

Oral Session

Monday, November 6, 2017

Room 501

Chairperson: E-Wen Huang

09:00-9:30 F3-01 Keynote

Statistics of Diffraction from Nanocrystalline Powder Samples

Hande Ozturk¹, Shangmin Xiong², IC Noyan²
¹NSLS II, Brookhaven National Laboratory, ²Columbia University.

09:30-9:50 F3-02 Invited

In Operando and Real-Time Studies on the Nanoscale with Small-Angle Neutron Scattering
Elliot Paul Gilbert¹

¹Australian Centre for Neutron Scattering, ANSTO, Locked Bag 2001, Kirrawee DC, NSW 2232, AUSTRALIA.

09:50-10:10 F3-03 Invited

Evaluation of delocalized shear banding in superelastic BMG composite

Hyun Seok Oh¹, Jin Kyu Lee², Yeon Wook Kim³, Won Seok Ko⁴, Cem Tasan⁵, Dierk Raabe⁶, Eun Soo Park¹
¹Seoul National University, ²Kongju National University, ³Keimyung University, ⁴University of Ulsan, ⁵Massachusetts Institute of Technology, ⁶Max-Planck-Institut für Eisenforschung.

10:10-10:30 F3-04 Invited

Understanding Deformation Behavior of Materials by In situ X-ray Synchrotron Tomography

Sudhanshu Shekhar Singh¹, Nikhilesh Chawla², Xianghui Xiao³

¹Materials Science and Engineering, Indian Institute of Technology Kanpur, ²Materials Science and Engineering, Arizona State University, ³Advanced Photon Source, Argonne National Laboratory.

14:00-14:30 F3-05 Keynote

Microscopic Insights on Mechanical Behaviors from in-situ Neutron Diffraction Studies

M. Naeem¹, Bing Wang¹, Haiyan He¹, and D. Ma², A. D. Stoica², S. Harjo³, and Xun-Li Wang¹,

¹Department of Physics, City University of Hong Kong 83 Tat Chee Ave., Kowloon, Hong Kong ²Division of Chemical and Engineering Science Oak Ridge National Laboratory, Oak Ridge, TN 37831-6045, USA ³Neutron Science Research Center, Japan Atomic Energy Research Institute, Tokai, Ibaraki 319-1195, Japan.

14:30-14:50 F3-06 Invited

Combined use of SAXS and SANS measured by in-house facilities

M. Ohnuma¹, T. Ishida¹, M. Furusaka¹

¹Hokkaido University.

14:50-15:10 F3-07 Keynote

Radiation-induced Defects in Advanced Nuclear Structural Materials

Ji-Jung Kai¹

¹Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Hong Kong.

15:10-15:30 F3-08 Invited

Coherent X-ray Scattering at TPS: Beamline, Commissioning, and Application.

Yu-Shan Huang, Jhih-Min Lin, Chun-Yu Chen, Hong-Yi Yan, Chao-Chih Chiu
National Synchrotron Radiation Research Center, Hsinchu, Taiwan.

Oral Session

Monday, November 6, 2017

Room 501

Chairperson: Yu-Shan Huang

16:30-17:00 F3-09 Invited

Micromechanics for investigating deformation behaviour of metallic materials

Tea-Sung (Terry) Jun¹, David E.J. Armstrong², T. Benjamin Britton³

¹Incheon National University, ²University of Oxford, ³Imperial College London.

17:00-17:20 F3-10 Invited

Magnetic characterization of Ni₈₀Fe₂₀/La_{0.7}Sr_{0.3}MnO₃/SrTiO₃(001) thin films

Ko-Wei Lin¹, Palash Manna², Ilaria Bergenti³, Chia-Hui Lin¹, Patrizio Graziosi³, Antonio Ruotolo⁴, Johan van Lierop², V. A. Dediu³, Xinzhong Liu⁵, Grace Causer⁵, Frank Klose⁵

¹NCHU, ²U of Manitoba, ³ISMN-CNR, ⁴City U of Hong

Kong, ⁵ANSTO.

17:20-17:40 F3-11 Invited

Magnetic imaging study of a grain-oriented electric steel using polarized pulsed neutrons

Kosuke Hiroi¹, Takenao Shinohara¹, Hirotoshi Hayashida², Joseph Don Parker¹, Yuhua Su¹, Kenichi Oikawa¹, Tetsuya Kai¹, Yoshiaki Kiyonagi³

¹J-PARC center, Japan Atomic Energy Agency, ²Neutron Science and Technology Center, CROSS, ³Graduate School of Engineering, Nagoya University.

17:40-18:00 F3-12 Invited

Formation of metallic cation-oxygen network for anomalous thermal expansion coefficients in ZnO-P2O5 glass

Yohei Onodera¹
¹Kyoto University.

18:00-18:15 F3-13 Invited

In situ Synchrotron Studies on the Deformation Induced Phase Transformations in β Titanium Alloys

Suresh Neelakantan¹, P.E.J. Rivera-Díaz-del-Castillo², Sybrand van der Zwaag³

¹Department of Applied Mechanics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi – 110 016, India, ²Engineering department, Lancaster University, Engineering Building, LA1 4YR, Lancaster, United Kingdom., ³Faculty of Aerospace Engineering, Delft University of Technology, Kluyverweg 1, 2629 HS, Delft, The Netherlands.

Oral Session

Tuesday, November 7, 2017

Room 501

Chairperson: Tu-Ngoc Lam

09:00-09:30 F3-14 Invited

Engineering materials studies using pulsed neutron diffraction at J-PARC

Stefanus Harjo¹, Takuro Kawasaki¹, Kazuya Aizawa¹, Wu Gong²

¹J-PARC Center, Japan Atomic Energy Agency, ²Elements Strategy Initiative for Structural Materials, Kyoto University.

09:30-09:50 F3-15 Invited

In situ observation of lattice strain evolutions around the fatigue crack in residual stress imposed compact-tension specimens

Wanchuck Woo¹, Dong-Kyu Kim¹, Huai Wang², Gyu Baek An³

¹Korea Atomic Energy Research Institute, ²Chungnam National University, ³Chosun University.

09:50-10:10 F3-16 Invited

Stress Relaxation- Does it improve formability?.Experimental and theoretical investigations using SS 316

Hariharan¹, Jayant Jain²

¹IIT Madras, India, ²IIT Delhi, India.

10:10-10:30 F3-17 Invited

Spatial Distributions of Guest Molecule and Hydration Level in Dendrimer-based Guest-host Complex Revealed by Small Angle Neutron Scattering

Hsin-Lung Chen¹, Chih-Ying Liu¹

¹National Tsing Hua University.

Oral Session

Tuesday, November 7, 2017

Room 501

Chairperson: Yuan-Wei Chang

14:00-14:20 F3-18 Invited

Understanding diffraction patterns of disordered materials

Shinji Kohara¹

¹National Institute for Materials Science.

14:20-14:40 F3-19 Invited

Revealing the atomic arrangements of compounds by using probe-corrected transmission electron microscopy

Ming-Yen Lu¹

¹Dept of Materials Science and Engineering, National Tsing Hua University.

14:40-15:00 F3-20 Invited

Defect Structure Modeling of Crystalline Oxide-Ion Conductors by the Pair Distribution Function Analysis

Naoto Kitamura¹

¹Tokyo University of Science.

15:00-15:20 F3-21 Invited

Application of High-Throughput Framework and Machine Learning on Prediction of Material Properties

Wen-Jay Lee^{1,2}, Chia-Yung Jui¹

¹National Center for High-performance Computing, No.22, Keyuan Rd., Central Taiwan Science Park, Taichung City, Taiwan

(R.O.C.). ²Department of Physics, National Chung Hsing University, 145 Xingda Rd., South Dist., Taichung City, Taiwan(R.O.C.)

15:20-15:40 F3-22

Study of Synchrotron X-ray Structure-resolved Titanium Oxide Phthalocyanine (TiOPc) & Its Matrix for Electric Effect

Tu-Ngoc Lam

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

F3-P01

Mechanical Property Evaluation in Superelastic Ni-Fe(Co)-Ga Micro-Pillar

Kengo Igawa¹, Tso-Fu Mark Chang¹, Chun-Yi Chen¹, Akira Umise², Takashi Nagoshi³, Masaki Tahara¹, Tomonari Inamura¹, Hideki Hosoda¹, Volodymyr A. Chernenko⁴, Masato Sone¹

¹Laboratory for Materials and Structures, Tokyo Institute of Technology, Yokohama, Japan & Laboratory for Future Interdisciplinary Research of Science and Technology, Tokyo Institute of Technology, Yokohama, Japan & CREST, Japan Science and Technology Agency, Yokohama, Japan, ²Laboratory for Future Interdisciplinary Research of Science and Technology, Tokyo Institute of Technology, Yokohama, Japan & Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Tokyo 101-0062, Japan, ³National Institute of Advanced Industrial Science and Technology, Ibaraki 305-8564 Japan, ⁴Laboratory for Materials and Structures, Tokyo Institute of Technology, Yokohama, Japan & BCMaterials & University of Basque Country, UPV/EHU, Bilbao, Spain & Ikerbasque, Basque Foundation for Science, Bilbao, Spain.

F3-P02

Investigation of the iron valence in ANAMMOX bacteria by EELS

Y.H.CHEN¹, C.Y.Hsieh¹, T.T.Chang¹, R.F.Cai¹, and S.C.Lo¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

F3-P03

Microstructural characterization of a Japanese sword using neutron diffraction

Stefanus Harjo¹, Takuro Kawasaki¹, Takenao Shinohara¹, Francesco Grazzi²

¹J-PARC Center, Japan Atomic Energy Agency, ²Consiglio Nazionale delle Ricerche.

F3-P04

EBSD Analyses of Transformation Kinetics in the Brazed Zircaloy-2 Joint

Chuan-Zong Lin¹, Chuan-Sheng Kao¹, Ren-Kae Shiue¹, Pawel Nowakowski², Paul E Fischione²

¹National Taiwan University, ²E.A. Fischione Instruments.

F3-P05

Preparation and application in electromagnetic wave absorption of SiC nanoparticles embedded in Polyacrylonitrile through electrospinning

Cheng-Hsiung Peng, Yi-Fan Han, Yu-Xuan Yang, Deng-Wei Zhong, Hong-Ze Zheng
Department of Chemical and Materials Engineering, MingHsin University of Science and Technology, MingHsin University of Science and Technology, 1, Xinxing Road, Hsinchu County304, TAIWAN.

F3-P06

The study of Spinodal decomposition and ordering reaction occurring in the Widmanstatten austenite of an Fe-Mn-Al steel upon air cooling

Zhi-Wei Huang¹, Wei-Chun Cheng¹, Chin-Tzu Chang¹, Chung-Tien Lin¹, Yu-Cheng Chou¹, Wei-Ting Wu²

¹Casting and welding laboratory, Department of Mechanical Engineering, National Taiwan University of Science and Technology, ²Casting Technology Section, Metal Processing R&D Department, Metal Industries Research & Development Centre.

F3-P07

Preparation and application in electromagnetic wave absorption of ZnO nanoparticles embedded in Polyacrylonitrile through electrospinning

Cheng-Hsiung Peng, Wei Hui Hung, Pin Yu Lin, Hao Ming Tseng, Chao Jan Yang
Department of Chemical and Materials Engineering, MingHsin University of Science and Technology, No.1, Xinxing Rd., Xinfeng Hsinchu 30401, TAIWAN.

F3-P08

Direct Observation of Solid State Reaction of Si1-xGex Nanowires with Ni by in-situ TEM

Yu-Chaun Lee¹, Yu-Sheng Huang¹, Ming-Yen Lu¹, Lih-Juann Chen¹

¹Dept of Materials Science and Engineering, National Tsing Hua University.

F3-P09

Scientific Highlights from the QUOKKA Small Angle Neutron Scattering Instrument

Christopher J. Garvey¹, Jitendra P. Mata¹, Kathleen Wood¹, Chun-Ming Wu¹, Elliot P. Gilbert¹

¹ANSTO.

F3-P10

SANS and SAXS analysis for nano particles of 18Mn-0.6C twinning-induced plasticity steel

Eunjoo Shin¹, Wanchuck Woo¹, Masato Ohonuma²
¹Korea Atomic Energy Research Institute, ²Hokkaido University.

Symposium F4

Manufacturing technology of thin film materials for sustainable energy, semiconductor, optical, optoelectronic, tribological, protective and biological applications

Tuesday, November 7, 2017

Organizers

Fu-Hsing Lu	National Chung Hsing University, Taiwan
Jyh-Wei Lee	Ming Chi University of Technology, Taiwan

Oral Session

Tuesday, November 7, 2017

Room 521

Chairperson: Sang Yul Paul LEE, Jia-Hong Huang

09:30-10:00 F4-01 Keynote

Measurement of Residual Stress on TiN Hard Coatings by Average X-ray Strain (AXS) Combined with Laser Curvature and Nanoindentation Methods

Jia-Hong Huang¹, An-Ni Wang¹, Ge-Ping Yu¹

¹National Tsing Hua University, Hsinchu 300, Taiwan, ROC.

10:00-10:20 F4-02 Invited

Oxide Coatings Deposited by Air Atmospheric Pressure Plasma Jet

Yu-Lin Kuo¹, Kuang-Hui Chang¹, Chi-Liang Ko¹

¹National Taiwan University of Science and Technology.

10:20-10:40 F4-03 Invited

Synthesis of various Zn-Mg Coatings and their industrial application development

Joung-Hyun LA¹, WooSung Jung², Sang-Yul Lee¹

¹ Center for Surface Technology and Applications, Department of Materials Engineering, Korea Aerospace University, Goyang-si, Gyeonggi-do 412-791, Korea.

²POSCO Technical Research Laboratories, Korea.

Oral Session

Tuesday, November 7, 2017

Room 521

Chairperson: YU-LIN KUO, Yin-Yu CHANG

14:00-14:20 F4-04 Invited

Whether or not Al and Ag ions doped in the Al: ZnO and Ag: ZnO thin films of nanorods fabricated by electrochemical process

Jing-Chie Lin¹

¹Institute of Materials Science and Engineering, National Central University, Taoyuan, Taiwan.

14:20-14:40 F4-05 Invited

The preparation of thin films by non-vacuum processing

Hong-Ying Chen¹

¹Department of Chemical and Materials Engineering, National Kaohsiung University of Applied Sciences,

Kaohsiung, Taiwan.

14:40-15:00 F4-06 Invited

Electrosynthesized Nanostructured Materials for Dye-Sensitized Solar Cells

Lu-Lin Li¹

¹Department of Energy Engineering, National United University, Miaoli, Taiwan

15:00-15:15 F4-07

Study on Interface Reaction of Ammonia Nitrogen in Electrolysis Process

Po-Yu Hu¹, Tzu-Ying Chen¹, Shing-Der Chen¹

¹Material and Chemical Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan.

15:15-15:30 F4-08

Force-pad made from contact-electrification poly (ethylene oxide) /InSb field-effect transistor

Jyh-Ming Wu¹, Ying-Hong Lin¹, Bo-Zhong Yang¹, Yu-Siou Lin¹, Shih-Hsiang Lai²

¹Department of Materials Science and Engineering, National Tsing Hua University, ²Industrial Technology Research Institute.

Oral Session

Tuesday, November 7, 2017

Room 521

Chairperson: Jing-Chie Lin, Hong-Ying Chen

16:30-16:50 F4-09 Invited

Development of p-type tin oxide based semiconductors for optoelectronic applications

Chien-Yie Tsay¹, Ming-Chien Lin¹

¹Dept of Materials Science and Engineering, Feng Chia University, Taichung, Taiwan.

16:50-17:10 F4-10 Invited

State-of-the-art of hard coatings: An example of TiVN/TiSiN multilayered hard coatings

Yin-Yu Chang¹, Hung Chang¹

¹Department of Mechanical and Computer-Aided Engineering, National Formosa University, Yunlin 632, Taiwan.

17:10-17:30 F4-11 Invited

Nickel silicide nanocrystals formation on silicon nanowires by solid state reaction and reactive deposition epitaxy

Hsun Feng Hsu¹

¹Department of materials science and engineering, National Chung Hsing University, Taichung, Taiwan.

17:30-17:45 F4-12

Solution processed high conductive Al-Doped Zinc oxide with connected nanorod structure for sensor application

P.D.Kumar¹, Z. Pei^{1,2}

¹Department of Electrical Engineering, National Chung Hsing University, Taichung, Taiwan, R.O.C, ²Graduate Institute of optoelectronic Engineering, National Chung Hsing University, Taichung, Taiwan, R.O.C.

17:45-18:00 F4-13

Polystyrene-sulfonate Surfactant Effect on Tungsten-film Chemical-mechanical-polishing Properties Improvement in Buried-tungsten-gate Formation of 1x-nm DRAM

Eun-Bin Seo¹, Soo-Bum Kim¹, Yun-Ki Kim¹, Jin-Hyung Park², Jea-Gun Park²

¹Advanced Semiconductor Materials & Device Development Center, Hanyang University, Seoul, Korea.

² UB materials Inc, #10, Hakchon-ro, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea.

Poster Session

Tuesday, November 7, 2017

15:30-16:30

Room 401

F4-P01

Reflective coating material of the dual-reflector in the marine lantern by reflectance and light efficiency

Sung Jae Lee¹, Jin Young Park¹, Hyun Kyoung Yang¹

¹Department of LED Convergence Engineering, Pukyong National University, Busan, South Korea.

F4-P02

Effect of water addition to NH₄NO₃/ethylene glycol electrolyte on the growth of anodic layer on titanium

Mingxue Bai¹, Naofumi Ohstu¹

¹Faculty of Engineering, School of Earth, Energy and Environmental Engineering, Kitami Institute of Technology, Japan.

F4-P03

Bendable candlelight OLED

Shih-Hao Liu¹, Wei-Chi Song¹, Cheng-Chieh Lo¹, Yu-Chi Lo¹, Jia-Ren Lee¹, Jwo-Huei Jou¹

¹charliehao876@hotmail.com.

F4-P04

Sputtering Deposition of TiN_xO_y Thin Films with Tunable Properties

Yu-Chen Liou¹, Fu-Hsing Lu¹

¹National Chung Hsing University, Taiwan.

F4-P05

The Improvement of ENP Process Parameter on Alumina Substrate by GR&R and FMEA Method

Wen-Hao Wang¹, Kai-Hsiang Chuang¹

¹Industrial Technology Research Institute.

F4-P06

Morphology and resistivity control of TiN films produced by unbalanced magnetron sputtering

Ming-Ting Tsai¹, Kai-Ling Chuang¹, Fu-Hsing Lu¹

¹Department of Materials Science and Engineering, National Chung Hsing University, Taiwan.

F4-P07

Enhanced Stemness and Multilineage Differentiation Capacity of Adipose-Derived Stem Cells by Multifunctional Biointerfaces

Chih-Yu Wu¹, Hsien-Yeh Chen¹

¹Department of Chemical Engineering, National Taiwan University, Taiwan.

F4-P08

Fabrication of the Transmission-type Field Emission Bulb

C.Y.Hsu¹, C.S.Lin¹, Y.M.Liu¹, M.D.Ger¹, N.W.Pu², M.J.Youh³

¹Department of Chemical and Materials Engineering, National Defense University Institute of

Technology, ²Department of Photonics Engineering,

Yuan Ze University, ³Department of Information

Technology, Hsing Wu University, New Taipei City.

F4-P09

Phase Transition in Sol-gel Derived CuGaO₂ Films by Thermal Annealing

T. Endo, ⁴K. Obara, ⁵A. Ziana, ⁶W. Ikesugi, ⁷K.

Matsuyama, ⁸K. Uesugi

¹Division of Information and Electronic Engineering, Muroran Institute of Technology, Muroran, Japan.

F4-P10

Mechanical property evaluation of CrTiBN and TiCrBN hard coatings fabricated by the superimposed high power impulse and middle frequency magnetron sputtering technique

Yu-Wen Su¹, Chi-Yu Lu¹, Wahyu Diyatmika¹,

Bih-Show Lou^{2,3}, Jyh-Wei Lee^{1,4,5}

¹Ming Chi University of Technology, ²Chang Gung University, ³Department of Nuclear Medicine and

Molecular Imaging Center, Chang Gung Memorial

Hospital, Taoyuan, Taiwan. ⁴Center for Thin Films

Technologies and Applications, Ming Chi University of

Technology, New Taipei City, Taiwan. ⁵College of

Engineering, Chang Gung University, Taoyuan, Taiwan.

F4-P11

Synthesis of TiO₂ coatings on titanium foils by plasma electrolytic oxidation for photocatalytic applications

Jia-Shuang Chen¹, Guan-Wei Lin¹, Fu-Hsing Lu¹

¹National Chung Hsing University, Taiwan.

F4-P12

A Novel Coating Technique for Developing High Performance Ultrafiltration Membranes

K.T. Lu¹, S. N. Chang¹, W. Y. Hsu¹, W.B. Chu¹

¹Dept. of Coating Processing Design, Div. of Platform

Technology for Advanced Materials, Material and

Chemical Research Laboratories, Industrial Technology

Research Institute, Hsinchu, Taiwan (ITRI).

F4-P13

Use the Low Pressure Plasma to Modified HDPE to Polymerize N-isopropylacrylamide via UV-induced Surface Grafting

Yi-Sheng Liu¹, Ko-Shao Chen^{1,2}, Kuan-Wei Tseng,

Mu-Rong Yang

¹Dept of Materials Engineering, Tatung University,

Taiwan. ²College of Environment and Resources, Ming

Chi University of Technology, Taiwan.

Symposium F5

Nanofabrication, Nanodevices, NEMS/MEMS and Sensor Technology

Monday, November 6, 2017

Organizers

Fan-Gang Tseng	National Tsing Hua University, Taiwan
Sheng-Wei Lee	National Central University, Taiwan
Pei-Wen Li	National Chiao Tung University, Taiwan
Motofumi Suzuki	Kyoto University, Japan

Oral Session

Monday, November 6, 2017

Room 402c

Chairperson: Fan-Gang Tseng, Sheng-Wei Lee, Pei-Wen Li, Motofumi Suzuki

09:20-09:50 F5-01 Keynote

Interfacial Mechanics for Micro and Nanomechanical Systems Engineered by Photothermal Heating

Motofumi Suzuki¹, Yuya Sengoku¹, Kyoko Namura¹
¹Kyoto University.

09:50-10:10 F5-02 Invited

Material Design of High Strength Electroplated Gold Alloy toward High-Sensitive MEMS Accelerometers

Masato Sone¹, Hao-chun Tang¹, Chun-yi Chen¹, Tso-Fu Mark Chang¹, Takashi Nagoshi², Daisuke Yamane¹, Toshifumi Konishi³, Katsuyuki Machida¹, Kazuya Masu¹

¹Tokyo Institute of Technology, ²National Institute of Advanced Industrial Science and Technology, ³NTT Advanced Technology Corporation.

10:10-10:30 F5-03 Invited

Nitrided and Fluorinated Graphene for the Applications on High Mobility Graphene Transistor, Memory and Chemical Sensor

Chao Sung LAI¹

¹Dean, College of Engineering Institute of Electronic Engineering, Chang Gung University Taiwan.

14:00-14:20 F5-04 Invited

The Germanium “Halo”: Visualizing invisible Ge interstitials

Tom George¹, T. L. Huang², C. Y. Hsueh², K. P. Peng², M. H. Kuo¹, H. C. Lin², Pei-Wen Li²

¹National Central University, ²National Chiao Tung University.

14:20-14:40 F5-05 Invited

Sub-1mG Inertial Sensors by Multi-layer Metal Technology

Daisuke Yamane¹, Toshifumi Konishi², Hiroshi Toshiyoshi³, Katsuyuki Machida¹, Kazuya Masu¹
¹Tokyo Institute of Technology, JST-CREST, ²Tokyo Institute of Technology, NTT Advanced Technology Corporation, JST-CREST, ³The University of Tokyo, JST-CREST.

14:40-15:00 F5-06 Invited

Two-Dimensional Nanomaterials-Based Functional Devices for Optoelectronic, Energy Conversion, and Biosensing Applications

Yit-Tsong Chen¹

¹Department of Chemistry, National Taiwan University.

15:00-15:20 F5-07 Invited

Interface and Defect Engineering: Broadband Light and Low Temperature Gas Detection Abilities by Using Nano-Heterojunction Device

Ping-Hung Yeh¹

¹Tamkang University.

16:30-16:50 F5-08 Invited

Intelligent gas Sensing System and Its Applications

Da-Jeng Yao¹

¹National Tsing Hua University, Taiwan.

16:50-17:10 F5-09 Invited

Nanostructure-Based Aluminum Sensors for Highly Sensitive Biosensors

Pei-Kuen Wei¹, Kuang-Li Lee¹, Ming-Yang Pan¹

¹Research Center for Applied Sciences, Academia Sinica.

17:10-17:30 F5-10 Invited

Printable Sensing Materials for Low-Power Consumption Applications

Chih-Ting Lin¹, Wen-Yu Chuang¹, Hsuan-Han Chen¹

¹Graduate Institute of Electronics Engineering, National Taiwan University.

17:30-17:50 F5-11 Invited

Simple, and Highly Preservable Gold-grafted Nanostructure Silicon Detection Platform

Zhi-Jie Yang¹, Zhong-Ming Gu¹, Yuan-Jing Lin¹, Chia-Wen Tsao¹

¹Department of Mechanical Engineering, National Central University.

Poster Session
Monday, November 6, 2017
15:30-16:30
Room 401

F5-P01

All solid-state micro-supercapacitors with high performance based on MoO₃/Ag multilayers

Ke Teng¹, Wei-Chih Wang¹, Ming-Xun Jiang¹, Pang-Shiu Chen², Sheng-Wei Lee¹
¹National Central University, ²MingHsin University of Science and Technology.

F5-P02

Application of supercritical carbon dioxide electrodeposition for copper filling into nano-holes

De-Wei Lin¹, Wen-Ta Tsai¹
¹Department of Materials Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

F5-P03

Purification of the field emission carbon nano-coil

Chun-Hsuan Lin¹, Yih-Ming Liu², Ming-Der Ger³
¹jimmywood1123@gmail.com, ²takululiu@gmail.com, ³mingderger@gmail.com.

F5-P04

Structural design of silicon nanowire arrays for high-performance photovoltaic applications

Cheng-Yi Li¹, Chia-Yun Chen¹
¹Department of Materials Science and Engineering, National Cheng Kung University.

F5-P05

Mechanical properties of Sn-Bi/AAO (anodic aluminum oxide) composite thin films performed by nanoindentation

Bao-Yi, Zeng¹, Shih-Hsun Chen¹
¹National Taiwan University of Science and Technology.

F5-P06

Optical application of Indium antimonide nanowires fabricated by vacuum molding injection process with AAO template

Yi-Sin Shen¹, Wei-Hao Feng¹, Shih-Hsun Chen¹
¹National Taiwan University of Science and Technology.

F5-P07

Three dimensional Ni(OH)₂ nickel foam for non-enzymatic glucose sensor

Bohr-Ran Huang¹, Che-Wei Wu¹
¹National Taiwan University of Science and Technology.

F5-P08

Temperature Structure Stability of Multi-Ti/Au-Layered Micro-Cantilever

Takuma Suzuki¹, Chun-Yi Chen¹, Tso-Fu Mark Chang¹, Daisuke Yamane¹, Toshifumi Konishi², Katsuyuki Machida¹, Kazuya Masu¹, Masato Sone¹
¹Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, 226-8503, Japan & CREST, Japan Science and Technology Agency, Yokohama, 226-8503, Japan, ²Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, 226-8503, Japan & CREST, Japan Science and Technology

Agency, Yokohama, 226-8503, Japan & NTT Advanced Technology Corporation, Atsugi, Kanagawa, 243-0124, Japan.

F5-P09

Long-Term Vibration Test and Structure Stability of Ti/Au Micro-Cantilever as MEMS Components

Koichiro Tachibana¹, Chun-Yi Chen¹, Tso-Fu Mark Chang¹, Daisuke Yamane¹, Toshifumi Konishi², Katsuyuki Machida¹, Kazuya Masu¹, Masato Sone¹
¹Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan & CREST, Japan Science and Technology Agency, Yokohama, Japan, ²Institute of Innovative Research, Tokyo Institute of Technology, Yokohama, Japan & CREST, Japan Science and Technology Agency, Yokohama, Japan & NTT Advanced Technology Corporation, Atsugi, Japan.

F5-P10

Young's Modulus Evaluation of Ti/Au Micro-Cantilevers by Au Electrodeposition

Hideaki Nakajima¹, Tso-Fu Mark Chang¹, Chun-yi Chen¹, Daisuke Yamane¹, Toshifumi Konishi¹, Hiroshi Toshiyoshi², Katsuyuki Machida¹, Kazuya Masu¹, Masato Sone³, ¹Tokyo Institute of Technology, ²The University of Tokyo, ³Tokyo Institute of Technology.

F5-P11

Local Ablations on Surface and Inside Glass Substrate Using UV Laser Pulses


K. Chao¹, S-F Tseng², W-T Hsiao², H-C Yu¹, D. Chiang²
K. Chao¹, S-F Tseng², W-T Hsiao², H-C Yu¹, D. Chiang²
National Taiwan Ocean University¹, National Applied Research Laboratories².

Abstracts

Plenary Lectures

IUMRS-ICA2017

Prof. Lih-Juann Chen

	Given Name: Lih J.	Last Name: Chen
	Nationality: Taiwan, ROC	
	Organization: National Tsing Hua University	
	Present position: Distinguished Chair Professor, National Tsing Hua University	
	Address: 101, sec. 2, Kuang-Fu Road, Hsinchu, Taiwan	
	TEL: 886-3-5731166	
	Email: ljchen@mx.nthu.edu.tw	
Education	<ul style="list-style-type: none"> ✧ Ph.D. in Physics, University of California, Berkeley, USA (1974) ✧ B.S. in Physics, National Taiwan University (1968) 	
Research Interests or Working Experience	Synthesis and applications of low-dimensional nanomaterials, atomic scale structures and dynamic processes of advanced materials, metallization in integrated circuits devices	
Biography	<p>Professional Experiences:</p> <ul style="list-style-type: none"> ✧ President, National Tsing Hua University (2010-2014) ✧ Deputy Minister, National Science Council (2008-2010) ✧ Vice Chancellor for Research and Development, University System of Taiwan (2006-2008) ✧ Dean, College of Engineering, National Tsing Hua University (1999-2005) ✧ Director and Chairman, Department of Materials Science and Engineering, National Tsing Hua University (1982-84) ✧ Associate Director, Materials Science Center, National Tsing Hua University (1984-85) ✧ Professor, Department of Materials Science and Engineering, National Tsing Hua University (1979-present) ✧ Associate Professor, Department of Materials Science and Engineering, National Tsing Hua University (1977-79) ✧ Research Associate, Materials Department, University of California, Los Angeles (1974-77) ✧ Councilor, Academia Sinica (2011-2107) ✧ President, Phi Tau Phi Honor Society (2011-2013) ✧ President, Association of East Asia Research Universities (2011-2013) ✧ Second Vice President, International Union of Materials Research Societies (1999-2001) ✧ President, Microscopy Society, Taiwan (1999-2001) ✧ President, Chinese Society for Materials Science (1995-99) ✧ Founding President, Chinese Federation of Materials Societies in Taiwan (1998-99) 	

Advanced Nanodevices with Plasmonic Enhancement

L. J. Chen

Department of Materials Science and Engineering, National Tsing Hua University
*101, Section 2 Kuang Fu Road, Hsinchu, Taiwan 30013, Republic of China.
ljchen@mx.nthu.edu.tw

Recent developments in nanotechnology and plasmonics have accelerated the exploitation of plasmonic enhancement in advanced nanodevices. It has been recognized that utilizing plasmonics may offer a route to faster, smaller, and more efficient electronics as well as new technology opportunities.

In this talk, a number of recent advances in nanodevices with plasmonic enhancement will be presented. The following topics will be highlighted:

1. Plasmonic laser using epitaxially grown silver and aluminum films,
2. Au nanocrystal array/silicon nanoantennas as wavelength-selective photoswitches,
3. Photodetectors using Au/Ga₂O₃ peapodded nanowires with plasmonic properties,
4. Plasmonic enhancement of Au nanoparticle-embedded single-crystalline ZnO nanowire dye-sensitized solar cells,
5. Ultrahigh density plasmonic hot spots with ultrahigh electromagnetic field for improved photocatalytic activities,
6. Plasmon-enhanced photocatalytic hydrogen production on Au/TiO₂ hybrid nanocrystal arrays,
7. Detectors for intermediates in chemical reactions with an in situ surface-enhanced Raman scattering method.

Prof. Atsushi Takahara

Prof. Atsushi Takahara earned his D.Eng. (1983) in the field of polymer science. He worked at Faculty of Engineering, Kyushu University as an assistant professor and then associate professor from 1983 to 1999. He was a full professor of IFOC, Kyushu University from 1999 to 2003. Since 2003, he is a full professor of Institute for Materials Chemistry and Engineering (IMCE), Kyushu University. From 2005 to 2008 and 2011- , he has been elected as a member of Science Council of Japan. He was a president of Society of Polymer Science, Japan (SPSJ) (2014-2016). At present, he is a president of Materials Research Society, Japan (2017-2019). He received several awards including Science Award (SPSJ), RSC fellow and APS fellow. He is a senior editor of *Langmuir* and was an Editor of *Polymer* (Polymer Physics, Asia except for China), an associate editor of *Polymer Journal* (SPSJ). He has published more than 500 peer reviewed papers, more than 80 review papers and more than 80 book chapters. His research interests are focused on advanced soft materials such as polymer ultrathin films, polymer nanocomposites, and novel characterization technique by quantum beam.

Design and Surface Functional Properties of Ionic Polymer Brushes

Atsushi Takahara

Kyushu University
744 Motoooka, Nishi-ku, Fukuoka 819-0395 Japan
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Soft interfaces offer fascinating opportunities for addressing numerous problems of both academic and industrial interest: high-quality functional or protective coatings, composite materials, surface engineered particles, metal-organic interfaces, biological applications, micro-patterning, etc. Polymers chemically grafted to the surface of substrates are typical soft interfaces known as polymer brushes. Surfaces covered with polyelectrolyte brushes, whose polymers composed of a polyelectrolyte, are particularly attractive because of their potential applications including adhesion, antifouling, biocompatibility and water lubrication systems. In this presentation, our recent researches on control of wettability and adhesion through precise design of soft interfaces such as a polyelectrolyte brush surface are presented. We started from fundamental science including precise polyelectrolyte synthesis and solution characterization of polyelectrolytes, characterization of polymer brush at water interfaces. On the basis of fundamental studies, we have successfully achieved 1) superhydrophilicity and antifouling properties, 2) repeatable adhesion, 3) super-lubricant behavior, and 4) cell-surface interaction control.

Prof. Samuel Stupp



Prof. Samuel Stupp is Board of Trustees Professor of Materials Science and Engineering, Chemistry, Medicine, and Biomedical Engineering at Northwestern University. He directs at Northwestern the Simpson Querrey Institute for BioNanotechnology and the Energy Frontiers Research Center for Bio-Inspired Energy Science funded by the Department of Energy. Professor Stupp is a member of the National Academy of Engineering, the American Academy of Arts and Sciences, and the Spanish Royal Academy. He is a fellow of the American Physical Society, the Materials Research Society, and the Royal Society of Chemistry. His awards include the Department of Energy Prize for Outstanding Achievement in Materials Chemistry, the Materials Research Society Medal Award, the American Chemical Society Award in Polymer Chemistry, the American Chemical Society Ronald Breslow Award for Achievement in Biomimetic Chemistry, the International Award from The Society of Polymer Science in Japan, and the Royal Society Award in Soft Matter and Biophysical Chemistry. He has received *honoris causa* doctorates from Eindhoven Technical University in the Netherlands, the University of Gothenburg in Sweden, and the National University of Costa Rica.

Bio-Inspired Self-Assembling Materials

Samuel I. Stupp

Departments of Materials Science and Engineering, Chemistry, Medicine, and Biomedical
Engineering, Simpson Querrey Institute for BioNanotechnology
Center for Bio-Inspired Energy Science

Northwestern University
2220 Campus Drive, Evanston, Illinois 60208, USA
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Bio-inspiration in the design of materials can occur at many levels and degrees of complexity. In one part of the spectrum there is the use of synthetic or naturally occurring biomolecular structures to create function or as a learning tool to discover novel structure-property relations. At a different level bio-inspiration may involve the use of synthetic materials to emulate functions we observe in living systems, for example, ability to regenerate, motility, adaptive behavior in a specific environment, and transduction of one form of energy to another, among many others. This lecture will describe examples of supramolecular biomimetic materials for regenerative medicine, photocatalysis to generate solar fuels, functions that emulate muscles, or for the construction of devices for wearable electronics. The lecture will also describe other bio-inspired materials with surprising dynamic behavior with great potential as biomaterials.

Prof. Bruce S. Dunn



Professor; Ph.D. 1974 University of California, Los Angeles: Electrical and optical properties of inorganic solids; Sol-gel derived materials; Solid electrolytes and battery electrode materials; Biomimetic materials systems.

Research Interests

Research in the Dunn group involves the synthesis of inorganic and hybrid materials and characterization of their electrical and optical properties. The various areas are described in greater detail on our lab page and representative publications are listed below. One of the principal themes which extends to most of the research activities is the use of sol-gel methods to synthesize a number of the materials studied in the group (see:

<http://www.solgel.com/educational>

for background on the sol-gel process). This synthetic approach enables us to prepare materials which incorporate a wide variety of organic and biological dopants and are capable of developing unique microstructures and properties.

Area of Thesis Guidance

Solid electrolytes, electrical properties of ceramics and glasses, ceramic-metal bonding, optical materials.

Creating Pseudocapacitive Materials for High Rate Energy Storage

Bruce Dunn

Department of Materials Science and Engineering
University of California, Los Angeles
Los Angeles, CA 90095, USA

The prospect of developing materials with the energy density of batteries and the power density and cycle life of electrical double-layer capacitors (EDLCs, also known as supercapacitors) is an exciting direction that has yet to be realized. With these materials there is the promise of achieving charging in minutes (much faster than batteries) with charge storage levels comparable to battery electrode materials (much higher than EDLCs). In recent years there has been widespread interest in pseudocapacitance, a faradaic process involving surface or near-surface redox reactions, that can lead to high energy density at high charge-discharge rates. This paper will review our work on identifying Li⁺ conducting materials which exhibit pseudocapacitive behavior. Our research on Li⁺ insertion in Nb₂O₅ has established a basis for intercalation pseudocapacitance in which the rate of charge storage is determined by surface-like kinetics rather than semi-infinite diffusion as occurs with battery materials. Another key feature with this mechanism is that the structure does not undergo a phase transformation upon Li⁺ insertion. In addition, when materials are reduced to nanoscale dimensions, they may begin to exhibit pseudocapacitive characteristics because of the large number of surface sites or because phase transitions are suppressed. In research to date, we have identified several electrode materials that retain high capacity for lithium at charging rates of 1 to 2 minutes. These results indicate our improved understanding of the electrochemical and structural characteristics that lead to materials and devices that exhibit both high energy density and high power density.

Ick Chan Kwon, PH. D

Head, Center for Theragnosis, Biomedical Research Institute, KIST

Research Field

Nano Technology, Drug development

Education

1982	B.S., Textile Engineering, college of Engineering, Seoul National University, Seoul Korea.
1984	M.S. Textile Chemistry, College of Engineering, Seoul National University, Seoul, Korea
1993	Ph. D. Pharmaceutics, School of Pharmacy, University of Utah, Salt Lake City, Utah, USA
1994	Post-doctoral Fellow, Center for Controlled Chemical Delivery, University of Utah, Salt Lake City, Utah, USA

Employment

2013 – present	Head, center for Theragnosis, Biomedical Research Institute, KIST
2013 – present	Principal Research Scientist, Center for Theragnosis, Biomedical Research Institute, KIST
2007 – 2011	Head, Biomedical Research Center, KIST
1998 – 2011	Principal Research Scientist, Biomedical Research Center, KIST
1994 – 1998	Senior Research Scientist, Biomedical Research Center, KIST
1984 – 1987	Research Scientist, Polymer Chemistry Lab, KIST

Molecular Imaging with Polymeric Nanoparticles

Ick Chan Kwon

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Recent advances in nanotechnology and biotechnology have contributed to the development of multifunctional nanoparticles that enable the targeted delivery of imaging agents and therapeutic agents for biomedical applications. Compared to small molecules (e.g., imaging agents and therapeutic agents), nanoparticles possess unique characteristics such as multi-functionality, multi-valency and long circulation time in the blood. As a result, nanoparticles hold great potential in the future biomedical field as novel molecular imaging, diagnostics, and the drug delivery system. Moreover, the combination of both imaging agents and therapeutic agents within a single nanopatform, often referred to as theragnostic nanomedicine, make it possible not only to provide useful information for monitoring drug delivery, drug release, and therapeutic efficacy of drug, but to also perform diagnosis and therapy simultaneously. Theragnostic nanoparticles containing diagnostic and therapeutic functions allow in vivo real-time imaging of the diseased site, monitoring the biodistribution of drug and determining the optimal therapeutic efficacy following treatments. These features can allow clinicians to select optimal therapeutic options for personalized medicine.

Prof. King-Ning Tu



Prof. King-Ning Tu received his PhD degree in Applied Physics from Harvard University in 1968. He spent 25 years at IBM T. J. Watson Research Center as Research Staff Member in Physical Science Department. During that period, he also served as Senior Manager of Thin Film Science Department and Materials Science Department for 10 years. In July 1993, he joined UCLA. He was Distinguished Professor in Dept. of Materials Science and Engineering and also Dept. of Electrical Engineering at UCLA until June 2016. He is now TSMC Chair Professor in National Chiao Tung University in Hsinchu, Taiwan, ROC. He is a Fellow of APS, TMS, MRS, and an Overseas Fellow of Churchill College, Cambridge University, UK. He was president of MRS in 1981. He received the 2013 John Bardeen Award of TMS EMPM Division, and 2017 IEEE Components, Packaging, and Manufacturing Technology Award. He is an academician of Academia Sinica. He has over 500 journal publications with citation over 2,100 and h-factor of 79. His textbook on “Electronic Thin Film Reliability” was published by Cambridge University Press in 2011. He co-author with Prof. Andriy M. Gusak, Ukraine, a textbook on “Kinetics in Nanoscale Materials” published by Wiley in 2014. His research interests are in metal-silicon reactions, solder joint reactions, electromigration, and kinetic theories of interfacial reactions. His website is <http://www.seas.ucla.edu/eThinFilm/>.

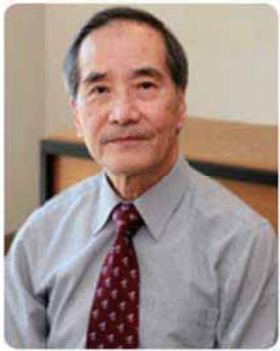
Effect of Joule heating on electromigration and thermomigration in 3D IC packaging technology

K. N. Tu

International College of Semiconductor Technology
National Chiao Tung University, Hsinchu, Taiwan
kntu@ucla.edu

In the era of big data and internet of things, mobile and wearable devices are ubiquitous. The continuing demand for smaller size, more functionality, lower power consumption, and reduced cost is challenging. A paradigm change, from 2D IC to 3D IC, is occurring in microelectronic industry. Joule heating becomes the most serious yield and reliability issue. For example, to remove heat, a temperature gradient must exist, but a difference of 1°C across a μ -bump of 10 μm in diameter has a temperature gradient of 1000 °C/cm, which can cause thermomigration. Furthermore, system level electromigration occurs in weak links. In this talk, a brief review will be given.

Prof. Burn J. Lin



Dr. Burn J. Lin holds a Distinguished Research Chair at the National Tsing Hua University. He was a Vice President and the Distinguished Fellow at TSMC, Ltd., from 2011 to 2015. He joined TSMC in 2000 as a Senior Director. Earlier he held various technical and managerial positions at IBM after joining in 1970. He has been extending the limit of optical lithography for more than four decades.

Dr. Lin is a member of the US National Academy of Engineering, an Academician of Academia Sinica, ITRI laureate, IEEE Fellow, and SPIE Fellow.

He received the IEEE Nishizawa medal in 2013, 2009 IEEE Cledo Brunetti Award, 2009 Benjamin G. Lamme Meritorious Achievement Medal, 2006 Distinguished Optical Engineering Award, 2004 1st recipient of SPIE Frits Zernike award, 2 TSMC Innovation Awards, 10 IBM Invention Awards, and an IBM Outstanding Technical Contribution Award.

Dr. Lin authored 1 book and 3 book chapters, published 133 articles, and 78 US patents

Innovations scaling 5 μm to 5 nm

Burn J. Lin

National Tsing Hua University
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The semiconductor industry follows Moore's Law to shrink from 5 μm to 5 nm in 21 generations over half a century. Many patterning innovations in optics, materials, precision engineering, processing, and metrology coupling with electrical innovations in devices, circuits, and packaging enable such scaling by 3 orders of magnitude. This presentation covers key patterning innovations to stimulate more innovations.

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最堅強師資陣容

本系教授均為國內外一流大學畢業之博士。

最前瞻高科技研究方向與發展重點

半導體材料、奈米材料、光電材料、通訊材料、能源材料及生醫材料。本系緊臨科學園區，與高科技業界密切合作。

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孕育高科技人才

依據天下雜誌報導：科學園區董事長及總經理級中，屬交大校友佔63.5%，美國矽谷華人創辦之上市公司交大校友約佔80%。交大校友無論在全球高科技產業、學術界、文化界等各產業都佔有舉足輕重的影響力，以科學園區為例，自1980年成立迄今，交大有將近七成的畢業生進入竹科工作，成為帶動竹科成長快速起飛的先導部隊，也代表著台灣踏入世界高科技產業領域的推動者。許多人認為美國有矽谷是因為有史丹佛大學，而交大之於科學園區，所扮演的領先角色也決不遺餘力。

最卓越之研究水準

根據湯森路透網站的SCI索引資料庫之統計結果，交大材料系近五年之學術研究表現輝煌，豐碩的研究成果發表在諸多頂級國際期刊中，包含Science (2008、2009、2012、2015年各1篇)、Nature Communications (2011年2篇、2012、2013、2014年各1篇、2016年5篇)、Nature Nanotechnology (2011年1篇)、Nature Physics (2012年1篇)、JACS (2015年1篇)、Angewandte Chemie (2014年1篇)與Nano Letters (2011年4篇、2012年2篇、2013年4篇、2014年4篇、2015、2016年各1篇)。

- 陳智 教授兼系主任 美國加州大學洛杉磯分校材料科學博士
覆晶錫鎢電遷移與冶金反應、三維積體電路封裝、奈米雙晶銅的製備與應用、低溫銅-銅直接接合
- 張翼 講座教授兼副校長 美國明尼蘇達州立大學材料科學博士
III-V族高速高频電子元件製程與封裝技術、氮化鎵材料及元件技術、III-V族半導體材料(GaN, GaAs, InAs)磊晶技術及高频元件、III-V族(GaN, GaAs, InAs)/鎢/矽晶元件整合技術、高频覆晶構裝技術、功率元件構裝技術。
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陶瓷複合材料、高溫氧化、玻璃陶瓷、高介電係數薄膜、金屬與陶瓷材料之界面特性分析、陶瓷複合材料之研究
- 韋光華 講座教授兼工學院院長 美國麻州大學化學工程博士
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奈米生醫材料研究、藥物載體及傳遞釋放系統設計研發、多功能性生物晶片材料開發、功能陶瓷與薄膜製程研究
- 謝宗雍 教授 美國麻省理工學院材料科學博士
光電儲存媒體、寬能隙氧化物光電元件、電子封裝技術、奈米複合材料、薄膜太陽能電池、材料界面結構及性質、微觀結構分析
- 張立 教授 英國牛津大學冶金及材料科學博士
鑽石、氧化鋅、三族氮化物半導體磊晶薄膜成長、原子級掃描穿透式電子顯微鏡分析、界面結構與晶體缺陷
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- 林宏洲 教授
美國伊利諾大學材料科學博士
智慧材料、液晶顯示(LCD)、材料有機及高分子發光二極體(OLED、PLED)材料、有機及高分子太陽能電池材料、化學及生物感測材料奈米複合材料、熱傳導高分子複合材料
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晶圓接合、圖案化藍寶石晶片、GaN磊晶技術、散熱基板、光電半導體元件
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奈米製造與元件、奈米材料與分析、軟性元件材料
- 吳捷偉 教授兼加速器學程主任 美國加州大學洛杉磯分校材料科學博士
應用電化學(電鍍和置換反應)、自組態晶體和反蛋白石、奈米結構電催化劑之燃料電池
- 呂志鵬 教授兼工學院國際事務辦公室主任 美國明尼蘇達大學化學博士
半導體製成及整合、低介電材料、奈米及薄膜材料、新穎低介電材料之研究、OLED及軟性電晶體之封裝應用
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奈米藥物傳遞系統控制釋放之研究與應用、抗血栓薄膜材料之研究與應用、生物分子感測系統之研究、生醫功能性材料之設計與研究、奈米醫藥之相關研究
- 徐雍泰 教授 國立清華大學化學工程博士
材料化學、奈米異質結構、綠色能源科技、界面電子傳輸動力學
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自旋電子學、磁感測器、磁半導體、同步輻射於材料之分析、磁性材料
- 陳軍華 副教授 日本東京工業大學材料科學與工程學博士
有序維度氧化物奈米結構及其於高效能常溫氣體感測器之應用、脈衝雷射沉積高精度能熱電轉換複合材料薄膜及厚膜、奈米結構異域性表面電漿及表面增強拉曼散射光學於分子感測之應用、團簇高分子模板合成中空及有序維度金屬奈米結構
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新穎複雜性氧化物異質結構、奈米結構與介面、功能性晶體之合成與分析、透明可撓式之電子元件開發、強關聯材料系統之拓撲缺陷成長與分析、新穎電子與功能性材料元件製程與設計
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智慧材料、材料微結構分析、生醫元件設計、奈米微粒分散模擬、計算力學
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**先進製程檢測
最佳解決方案**

應用領域:

IC產業、LED產業、面板產業、TFT-LCD產業、
太陽電池產業、奈米材料研究等。

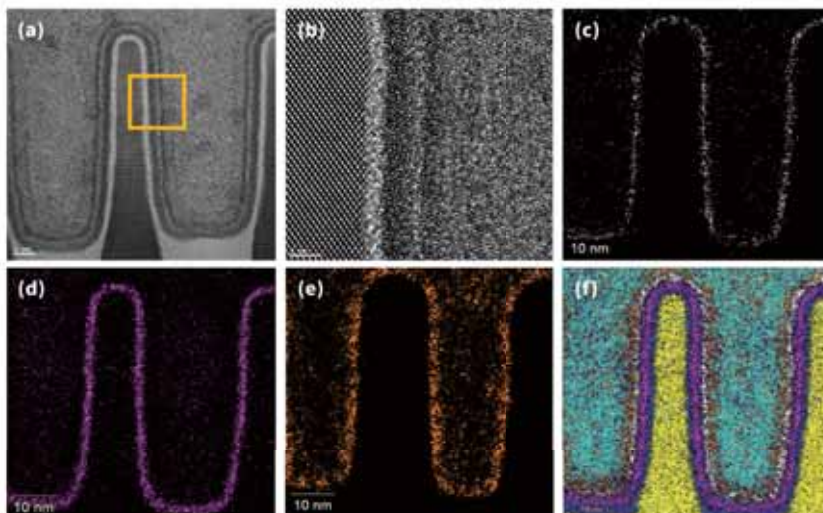
宜特材料分析三大保證:

1. 已完成知名晶圓廠、LED磊晶廠和面板廠的分析試樣，獲得客戶肯定與高度評價。
2. TEM權威鮑忠興等多位博士專家，為您提供最頂尖的服務。
3. 全天候三班制24小時運作，全面縮短交期，產能大躍進。

結構分析 OM, Optical Profiler, FIB, XRD, SEM/EDX, TEM/EDX/EELS

表面分析 FTIR, AES, AFM, SCM, XPS, SIMS, Raman

Advanced Logic Device Analysis



HRTEM image with EDX mapping results for 10 nm FinFET device.

(a) shows high resolution image for FinFET and lattice array in (b).

(c)~(e) illustrate multiwall structure of high K material and EDX mapping result in (f).

Figure(a)~(f) : High resolution TEM/EDX analysis for 10 nm FinFET devices.

Leica 全系列金相及數位顯微鏡

Leica
MICROSYSTEMS

多照明方法，專業級材料分析金相顯微鏡

Leica DM2700 M

Leica DM2700 M 靈活的正立顯微鏡系統在所有對比法中均使用了 4500° K 的恒定色溫 LED 照明：明視野 (BF)、暗視野 (DF)、微分干涉差 (DIC)、偏光 (POL) 或螢光 (FLUO) 應用。它還提供了內置式傾斜照明，能夠提高表面形貌和缺陷的可視度。Leica DM2700 M 金相顯微鏡還能夠依據情況裝配透射光軸。

可選擇三種顯微鏡物鏡轉輪，並可外加一個 0.7X 的宏觀物鏡，您能通過它一眼看見約 40mm 長的一個樣本，是進行快速定位和概覽的理想選擇。

能夠從顯微鏡載物台的完備產品線中，為大小達到 100 x 100mm 的樣本（例如箔片、晶片和 PCB）以及厚度達到 80mm 的樣本（例如機械元件）找到一種理想的載物台進行檢查或是使用標準的陶瓷耐刮載台。



明視野, 上/下光源, 工業級顯微鏡

Leica DM750 M

Leica DM750 M 是一台適用於基礎材料應用的工業實驗室或材料科學的光學設備。它的萬能載物台和反射光系統適合幾乎所有的樣本來獲取高品質圖像。

機械載物台可以同時配置穿透光和反射光的應用。它可以裝配多種樣品夾來固定不同直徑尺寸的樣品。

獨特的 4 段可控制 LED 反射光照明提供了明場、斜光照明模式，以及可選配偏光照明模組。這可以讓客戶在同一台顯微鏡上觀察多種不同的樣品。



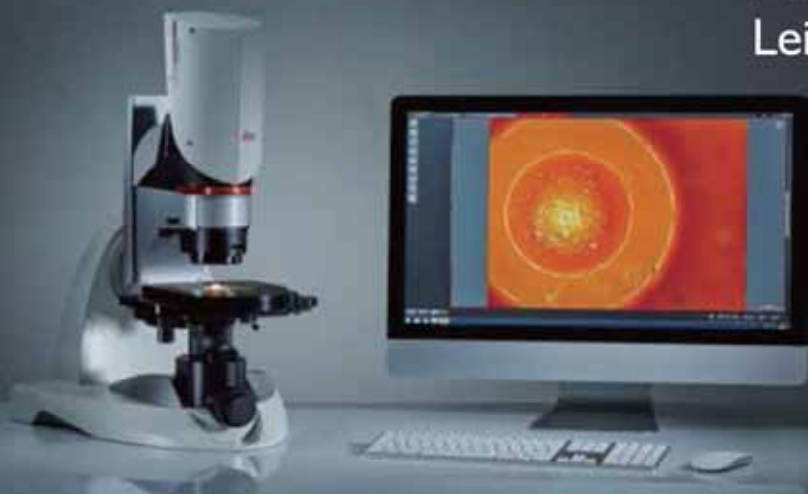
無需苦苦尋覓，結果近在眼前！

Leica DVM6 光學數位顯微鏡

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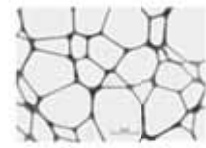
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- SEM/EDX
- TEM/EDX/EELS
- FIB, Circuit editing
- SIMS, SRP
- Auger, XPS, XRD
- Optical profiler
- SCM, AFM
- FTIR, Raman

電性分析/ESD

- X-ray radiography
- SAT
- EMMI / InGaAs, OBIRCH
- Themos-mini
- C-AFM
- Passive voltage contrast
- ESD/Latch-up testing
- Wire bonding, packaging

可靠度測試

- HAST, LTST
- THST, PCT / UB-HAST
- TCT, TST
- HTOL, BLT, ELFR
- Reflow Test
- Board Level RA

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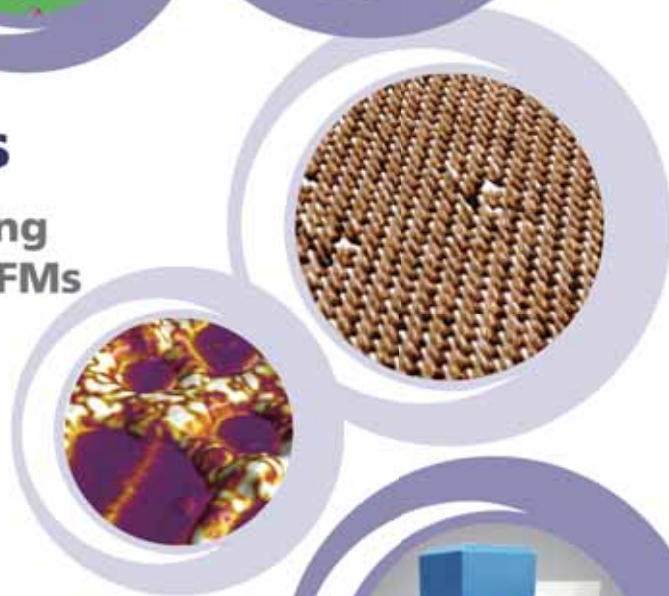
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NDL 國家奈米元件實驗室

National Nano Device Laboratories

國家奈米元件實驗室 (National Nano Device Laboratories, NDL) 位於新竹與南部科學工業園區。自1988年成立以來，透過服務型研發的帶動，將取得國際認同的一流研發成果，轉為製程技術研發服務平台，支援國內產學研究群進行「新材料」、「新結構」與「新應用」的元件技術開發；並藉由跨微電子、物理、化學、光電、微機電、機械等非傳統電子電機領域研究平台的建立，以實作訓練方式補足跨學系理論授課上的不足，協助碩博士級高階技術人力進入職場能快速應用所學，降低跨領域技術溝通整合上的障礙，以及減少產業內部訓練的時間，所培育之碩博士級人力多已成為目前業界重要的高階經理人，這亦是該實驗室對國內半導體產業最大的貢獻。

主要任務

- 建立奈米元件製造與電子系統研究之整合性與開放式實驗環境
- 支援國內奈米元件計畫之高質量研究
- 推動後矽世代積體元件技術與相關應用
- 培育台灣半導體元件製造領域尖端技術人才

核心技術

- 高遷移率 (III-V Ge) 節能電晶體製程技術
- 原子級二維材料及元件整合製程技術
- 微機電奈米感測元件製程技術
- 低成本多功能三維異質整合製程技術

核心設施

- 半導體元件彈性製程試驗線
- 半導體材料檢測分析設施
- 元件與電路高頻特性量測設施

- 建立與國際接軌之非平面 (FinFET) 服務平台、電阻式記憶體 (RRAM) 服務平台、積層式電晶體服務平台等先進元件研究環境，吸引世界各頂尖研究團隊、知名半導體設備商、國際半導體大廠進行合作研究。
- 每年平均支援80所大學、280個教授研究群，超過60,000小時以上儀器設備服務、10-15個國家型計畫及國內大型研發計畫，以及協助250位以上碩博士研究生完成論文研究工作。
- 專業的客服機制，提供國內產學研究群有效率的元件製作服務，平均每年承接50間業界廠商共1,500件委託代工、合作研究15-20案，協助國內半導體廠商、零組件耗材等公司完成產品驗證、小型量產。



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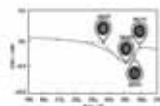
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- 高精度自動機械手臂



UV-DSC 紫外光觀察系統



Real View 即時影像觀察系統



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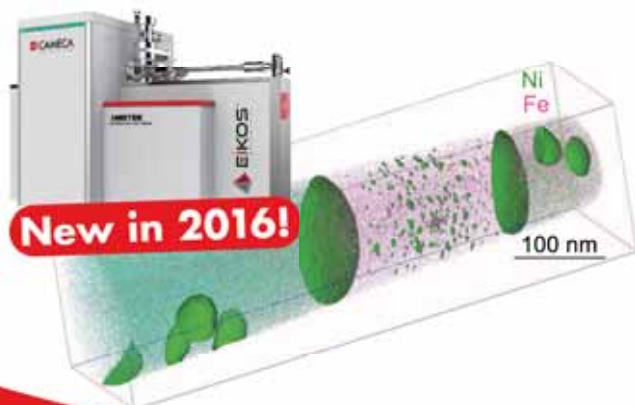
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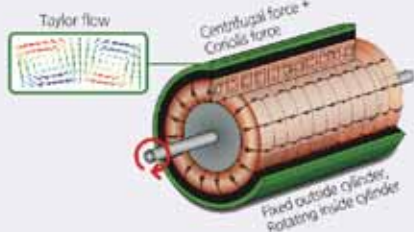


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$$T_c = \frac{\omega r d}{v} \left(\frac{v}{r} \right)^{1/2} = \frac{\omega d}{v} \left(\frac{d}{r} \right)^{1/2}$$

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 v : angular velocity of the rotor (rad/s)
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 d : width of the annular gap (m)



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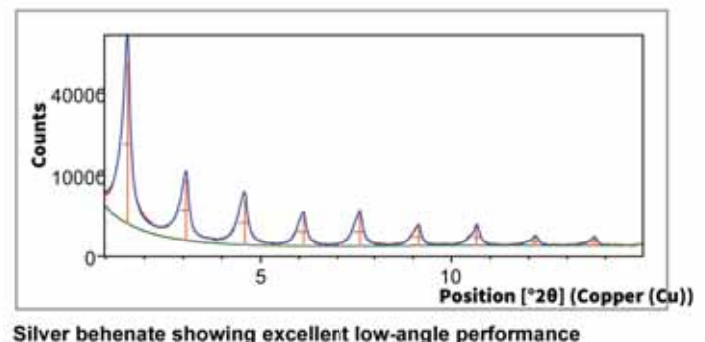
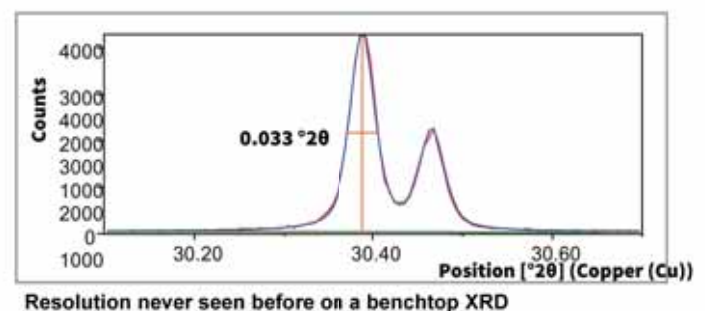


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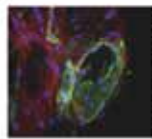
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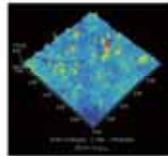
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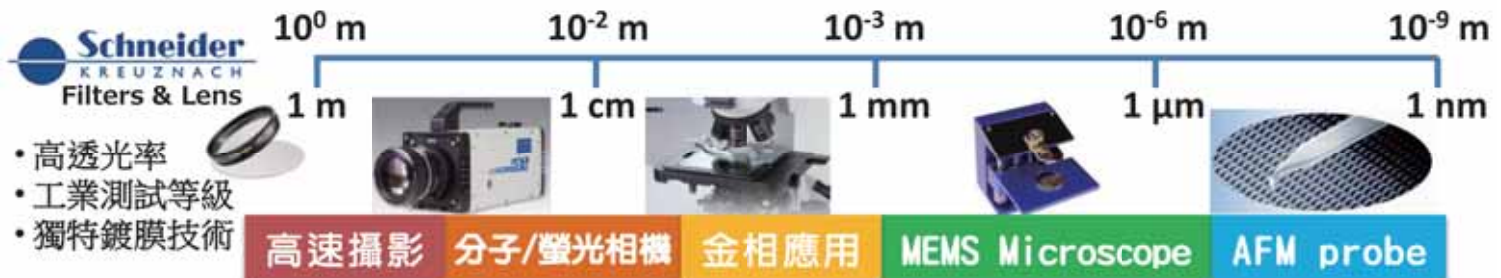


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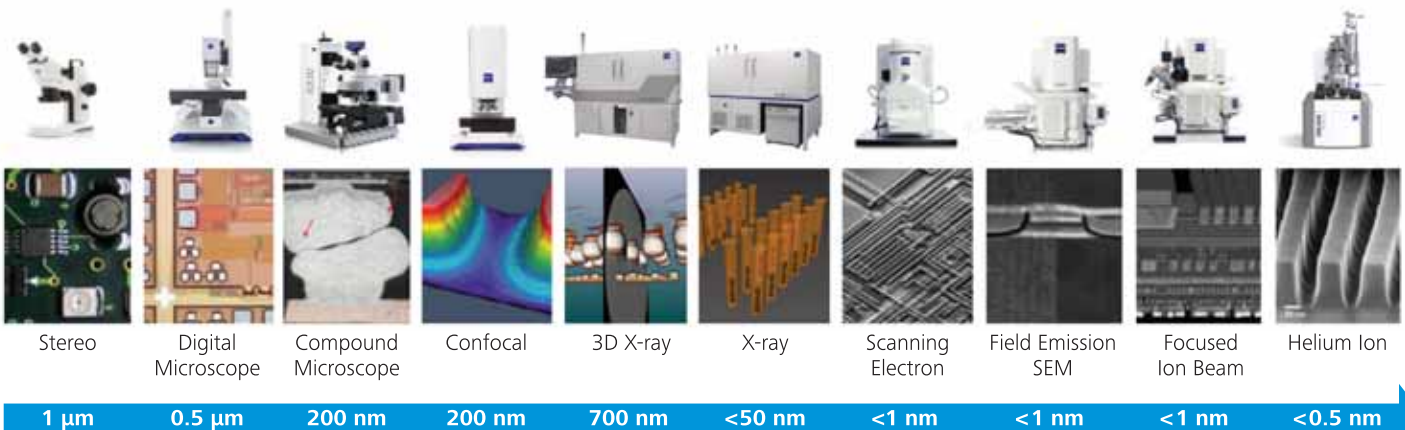


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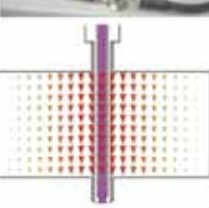
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- * 專業生產耐高溫陶瓷坩堝，可根據客戶需求生產各種規格尺寸製品，品種齊全，備有現貨。可在 1700°C 高溫下長期使用，具有耐酸、耐鹼、耐氣體侵蝕等特性。
- * 研製生產陶瓷坩堝搭配所有熱分析儀器廠家所使用陶瓷坩堝如：德國 Netzsch、法國 Setaram、美國 TA、美國 PE、日本 Seiko、瑞士 Mettler 等，產品品質得到各大學、研究機構的肯定。
- * 客製化各種複雜特殊形狀、生產週期短，數量不限。



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- ✦ 可配合『網路分析儀』
- * 非連續頻率 0.8 ~ 20 GHz; 應用如下：
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- ◆ 濾波器和誘電天線的低損失誘電材料
- ◆ 尖端材料、等離子、陶瓷材料、薄膜、半導體
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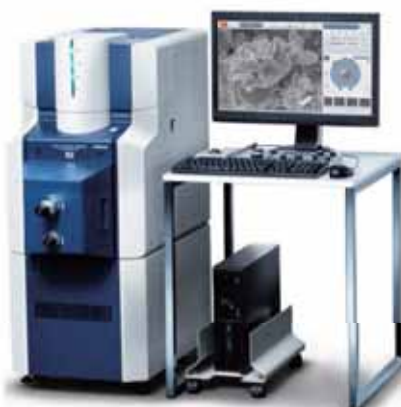


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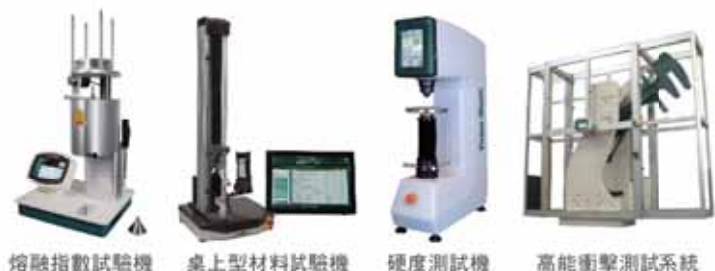
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which focuses on corrosion/coatings, anodization studies, and physical/analytical electrochemistry, includes a reference grade potentiostat, frequency response analyzer (FRA) and a 100 V high-voltage amplifier. The unit includes multiple AC techniques including single sine, harmonic analysis, and multisine.

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用途：各種粉體原料、各種二次電池材料



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爐體外形尺寸：1,580W x 1,900L x 2,200H mm
爐體有效尺寸：320W x 640L x 170H mm
熱源：SiC加熱棒

外熱間隙式回轉爐Batch-type Rotary Kiln

用途：各種粉體原料、碳化原料、鋰電池材料、其它



規格：
加熱溫度：Max.900°C
處理氛圍氣：氮氣、氬氣、氧氣、其它
內體外形尺寸：Φ300×620mm (加熱部)
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內體回轉數：0.5 ~ 3.0rpm
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氣流式分級機 Aero Fine Classifier

用途：用於輕比重、黏性強的粉體等加工，粉粒乾式分級。

Models	Cut point [μm]	Feed rate [kg/h]	Air flow rate [m³/min]	Comp.-air At 0.5MPa [m³/min]	Dimension (D×H) [mm]	Weight [kg]
AC-20	0.3~20	1~20	1.5~3.0	-0.5	Φ100×H400	50
AC-30	0.5~25	2~40	3.0~6.0	-1.0	Φ400×H600	100
AC-40	1.0~30	4~80	8~12	-1.5	Φ500×H800	200
AC-60	1.0~30	8~160	20~30	-4.0	Φ600×H1100	400
AC-80	1.5~30	16~320	32~48	-8.0	Φ1000×H1200	500
AC-Multi	0.5~20	~120	-	-	-	-



氣流式分級機 Turbo Classifier

用途：用於輕比重、黏性強的粉體等加工，粉粒乾式分級。

Models	Cut point [μm]	Feed rate [kg/hr]	Rotor speed [min⁻¹]	Air flow rate [m³/min]	Motor capacity [kW]	Body weight [kg]
TC-15	0.5~20	2~100	~5	~11,000	2.0~3.0	1.5
TC-25	0.6~30	2~100	~50	~7,000	3.0~9.0	2.2
TC-40	2~50	3~120	~200	~5,500	15~35	3.7~15
TC-60	1~50	5~120	~1000	~4,500	30~80	7.5~75
TC-100	2~50	5~120	~4000	~2,000	40~120	22~37
TC-100IV	2~50	5~120	~8000	~2,000	60~250	45~75



粉碎機 Super Jet-Mill

用途：適用於食品、樹脂、藥品等對熱敏感材料的粉碎加工。

Models	Air consumption [m³/min]	Capacity [kg/hr]	Body size D×H [mm]	Body Weight [kg]	Compressor used [kW]
SJ-100	0.2~0.3	0.05~0.3	Φ160×140	5	2.2
SJ-500	0.8~1.2	0.5~10	Φ320×180	27	7.5~11
SJ-1500	2.0~3.0	2.0~30	Φ400×180	45	15~22
SJ-2500	3.0~4.5	3.0~50	Φ500×180	65	22~37
SJ-5000	6.0~9.0	5.0~150	Φ600×350	120	45~75
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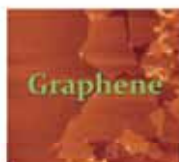
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1. **提升製程良率** ----- 精準、穩定的奈米表面量測，讓您精準量測薄膜表面型態，如厚度、高度、寬度、及粗糙度。
2. **提升量測速度** ----- 我們硬體及軟體的人性化設計，任何人都可以輕鬆、快速上手，量測速度最快可達到兩分鐘出一張圖，且不失數據精準度，可以快速判斷製程參數是否需調整。
3. **降低成本** ----- a. 您無需另外聘請高階研發人員進行設備操作 b. 我們的AFM為目前市面上性價比最高的設備，同樣規格只要市售的1/2價格，您可以自由選配所需之功能無需額外負擔不需要的複雜功能。
4. **任何時間、場地量測不受限** ----- 優異的防震設計，讓您不會因為環境因素而受到很多限制，輕鬆取得5nm以下之解析度。
5. **任何人都可以輕易上手** ----- 我們保證30 min內可以完成教育訓練，並讓任何人都可以快速、輕鬆上機操作。



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2. **完美去除奈米級氣泡** ----- 經過不斷的研發改良，產品脫泡效果極佳，已遍及各大LED大廠。
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- 熱電分析(SEEBECK)
- 耐火材料測試系統
- 高放熱量絕熱量熱系統
- 粒徑/奈米粒徑分佈量測儀
- 界面電位量測儀
- 元素分析儀(XRF/Micro-XRF)
- 油份濃度計
- 旋光光度計
- 多波長折射計
- 密度計
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- FT-IR紅外線光譜儀
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- GC氣相層析儀
- AA原子吸收光譜儀
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- 濁度計
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- 綜合水質檢測光譜儀
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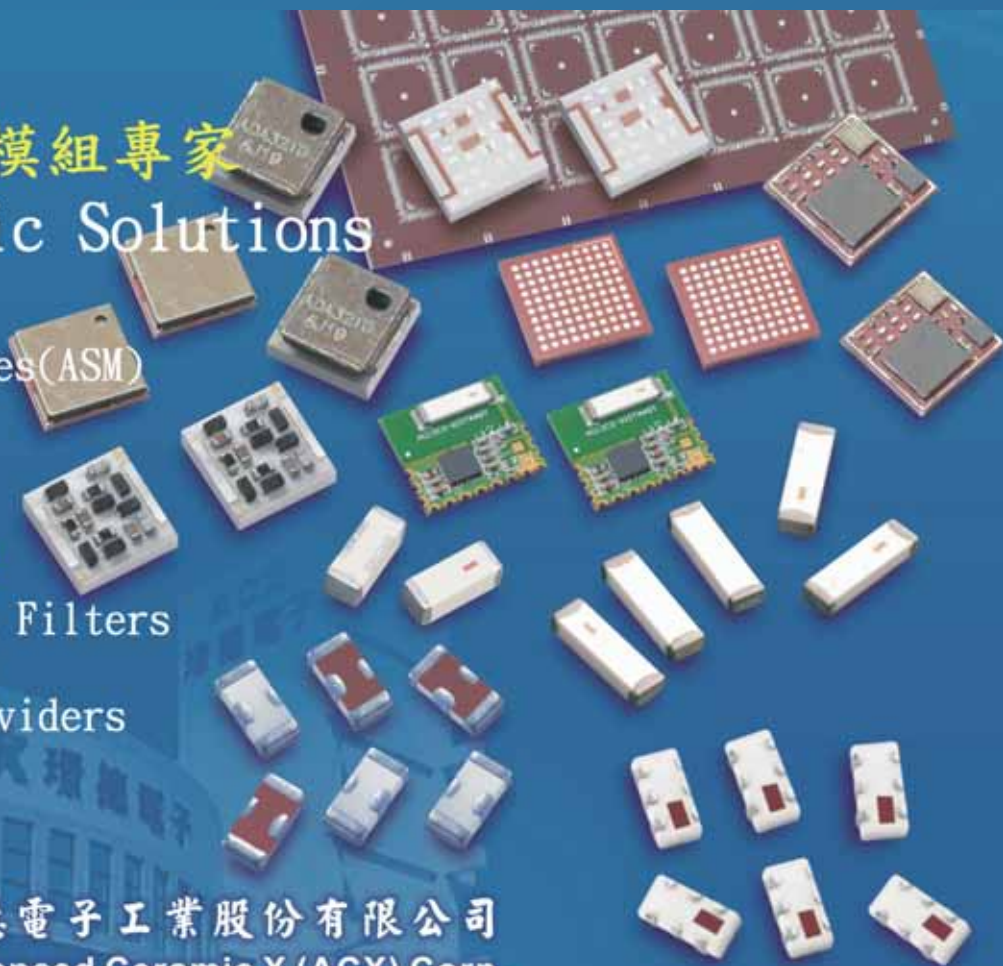
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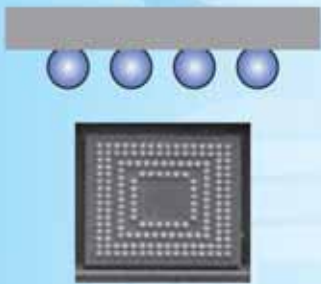
ETS-FCCSP
(Embedded Trace Substrate)



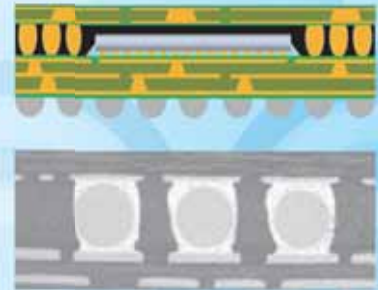
Large FCBGA



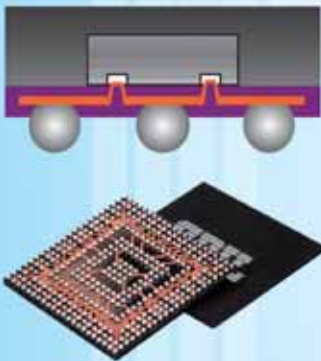
Fan-In WLCSP



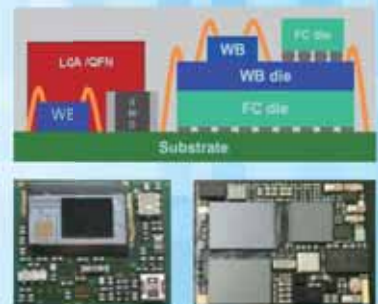
HBW PoP
(High bandwidth)



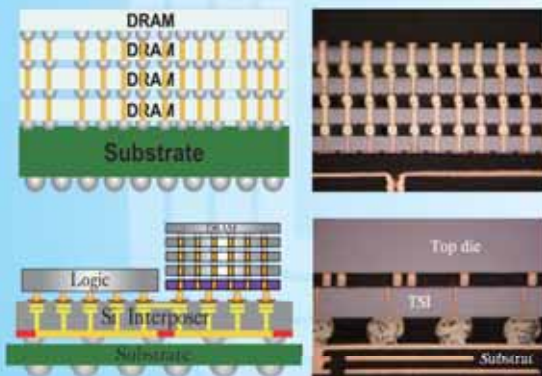
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SME-200(Rchamber)

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CS-200

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- Available for various application-specific process modules (special module for insulating materials like PZT, BST, AIN, SiNx, Al2O3)
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ei-5

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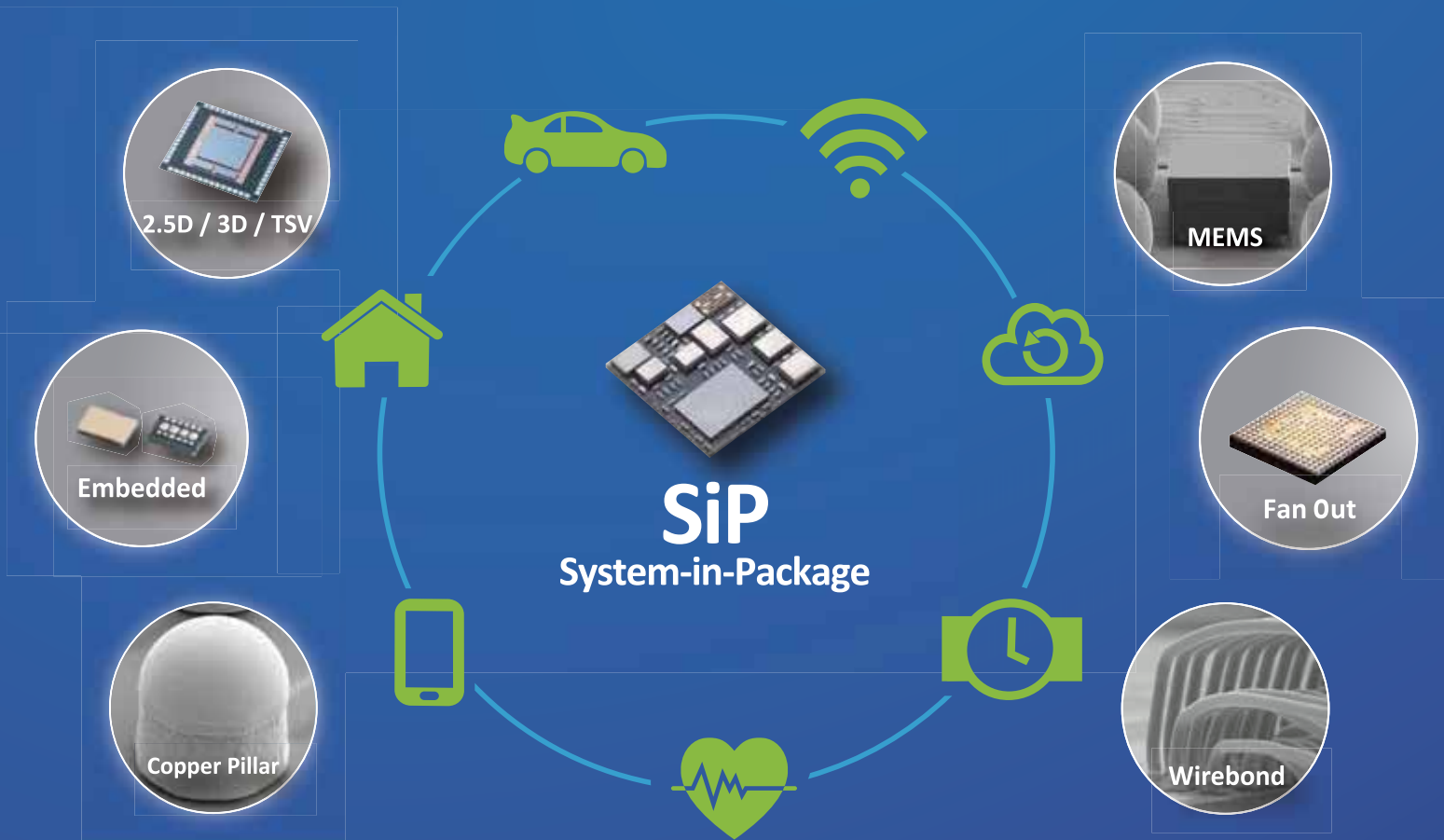
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