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962nd Conference

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Proceedings of

8th International Conference and Exhibition on

Materials Science and Engineering

May 29-31, 2017

Osaka, Japan

MatScience 2017

Conference Series
One Commerce Center-1201
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Scientific Program

MatScience 2017

Day 1 May 29, 2017

8:00-9:00 Registrations

Sapphire

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

Keynote Forum

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

Group Photo

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

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

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

Session Introduction

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

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

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

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

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

Session Introduction

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

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

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

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

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

Panel Discussion

Day 2 May 30, 2017

Sapphire

Keynote Forum

09:30-10:10	**Title: Fabrication and application of microlattices made by additive manufacturing** **Jun Ding,** National University of Singapore, Singapore
10:10-10:50	**Title: Crystallography of the corneal nanonipple structure on butterfly eyes** **Uwe Erb,** University of Toronto, Canada

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

11:10-11:50	**Title: Study of Mechanical behavior of cryogenic rolled pure metals** **Osvaldo Mitsuyuki Cintho,** UEPG, Brazil

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

Session Introduction

Session Chair: Jun Ding, National University of Singapore, Singapore
Session Co-Chair: Uwe Erb, University of Toronto, Canada

11:50-12:20	**Title: Applications of chalcogenide Ge-Sb-Se glass used for the molded lens of thermal camera using far infrared** **June Park,** Photonics Technology Institute, Republic of Korea
12:20-12:50	**Title: Impact of Molecular Dynamics (MD) simulations in materials research** **Xiaowang Zhou,** Sandia National Laboratories, USA

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

13:40-14:10	**Title: Enhanced 1.53 µm emission from Er/Yb fluorophosphate glasses for optical amplifiers** **Ganesh Agawane,** Photonics Technology Institute, Republic of Korea
14:10-14:40	**Title: Synthesis of novel copolymer based butylimidazolium ionic liquid and polybenzimidazole as anion exchange membrane for fuel cell application** **Amina OUADAH,** BIT, China
14:40-15:10	**Title: Diamond-like carbon thin film deposition by filtered cathodic vacuum arc source for wear resistance improvement of zirconia toughened alumina** **Ju Hyeon Choi,** Photonics Technology Institute, Republic of Korea

Young Researchers Forum

Session Chair: Uwe Erb, University of Toronto, Canada
Session Co-Chair: Sirikanjana Thongmee, Kasetsart University, Thailand

15:10-15:30	**Title: A novel ternary eRGO/NiO/α-Fe_2O_3 nanostructured photoanode with enhanced charge transfer properties for efficient solar hydrogen energy conversion in a photoelectrochemical cell** **Yi Wen Phuan,** Monash University, Malaysia
15:30-15:50	**Title: Insight into controllable synthesis of zinc oxide-based nanomaterials and their toxicity effects on biological wastewater treatment processes** **Jang Sen Chang,** Monash University, Malaysia
15:50-16:10	**Title: Enhanced catalytic activity of Ag-Ni alloyed nanoparticles immobilized in –COOH functionalized SBA-16 for the reduction of 4-nitrophenol** **Canggih Budi,** National Central University, Taiwan

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

16:30-16:50	**Title: Fabrication of a heterojunction V_2O_5/$BiVO_4$ photoanode with improved photoelectrochemical performance for water splitting reaction** **Chong Siang Yaw,** Monash University, Malaysia

16:50-17:10	**Title: Development of molybdenum trioxide-based photoanodes with charge storage capacity for photoelectrochemical water oxidation under illuminated and non-illuminated conditions** **Chun Yuan Chot**, Monash University, Malaysia

Poster Presentations 16:30-18:00

Poster Judge: Xiaowang Zhou, Sandia National Laboratories, USA

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

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

Panel Discussion

Award Ceremony

Day 3 May 31, 2017

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



Supporting Journals

Journal of Material Sciences & Engineering

https://www.omicsgroup.org/journals/editorialboard-material-science-engineering-open-access.php

Journal of Powder Metallurgy & Mining

https://www.omicsgroup.org/journals/editorialboard-powder-metallurgy-mining-open-access.php

Bioceramics Development and Applications

https://www.omicsonline.com/open-access/bioceramics-development-applications.php

Journal of Nanomedicine & Biotherapeutic Discovery

https://www.omicsonline.org/nanomedicine-biotherapeutic-discovery.php

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Upcoming Conferences



12th International Conference and Exhibition on

Materials Science and Nanotechnology

September 25-26, 2017 Dubai, UAE

Theme: "The Scientific Visualization of Materials & Nanotechnology"

Conference Series launches its Materials Science conference in Middle East region. With the overwhelming joy; we invite you to the 12th International Conference and Exhibition on Materials Science and Nanotechnology in Dubai, UAE during September 25-26, 2017.

Theme of the conference, "The Scientific Visualization of Materials & Nanotechnology" is designed in such a way to uncover the basic principles that lead to the drastic emergence and technologies in the field of MaterialsScience and Nanotechnology. We hope Materials Science and Nanotechnology 2017 is the best platform to discuss the basic principles involved in the development of Materials Science and Nanotechnology. As this conference deals with the basics concepts, students, delegates, academicians and business people can attend the conference to root up the knowledge and excel in this field.

Why to attend???

International Conference on Materials Science and Nanotechnology -2017 which is going to be the biggest conference dedicated to Materials Science and Nanotechnology professionals providing a premier technical forum for reporting and learning about the latest new generation technologies developed during the course of time along with discussing their applications. Events include hot topics presentations from all over the world and professional networking with industries, leading working groups and panels.

Meet Your Objective Business sector With individuals from and around the globe concentrated on finding out about Polymer science and Engineering, this is the best chance to achieve the biggest collection of members from everywhere throughout the World. Conduct shows, disperse data, meet with current, make a sprinkle with another product offering, and get name acknowledgment at this occasion. Widely acclaimed speakers, the latest methods, strategies, and the most up to date overhauls in Polymer science and Engineering are signs of this meeting.

Major Scientific Sessions

- Materials Science & EngineeringBiomaterials
- Nanotechnology & Nano scienceMining & Metallurgy
- Atomic Structure & Interatomic BondingMaterials for Energy, Environmental Applications
- Materials for Green TechnologyNanotechnology in communications & Information Technology
- Materials science PropertiesNanotechnology in Healthcare
- Polymer TechnologyNanotechnology in Environment
- Making of Nano MaterialsNanotechnology in Energy

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2017 Highlights

- 200+ Participation (70% Industry: 30% Academia)
- 5+ Keynote Speakers
- 50+ Plenary Speakers
- 20+ Exhibitors
- 14 Innovative Scientific Sessions
- 5+ Workshops
- B2B Meetings

For more details:
http://materialsscience.conferenceseries.com/middleeast/
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Business Registration	$799
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One Day Participation	$399
Young Researchers Forum	$399
Student Fee for Poster Presentation	$299
E-Poster	$99

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13th International Conference on

Advanced Materials and Nanotechnology

October 26-28, 2017 Osaka, Japan

Theme: "Exploring the Possibilities in the Field of Advanced Materials and Nanotechnology"

ConferenceSeries Ltd is proud to announce the 13th International Conference on Advanced Materials and Nanotechnology, which is to be held during October 26-28, 2017 at Osaka, Japan.

On this great gathering, Organizing Committee invites participants from all over the globe to take part in this annual conference with the theme "Exploring the Possibilities in the Field of Advanced Materials and Nanotechnology". Advanced Materials 2017 aims at sharing new ideas and new technologies amongst the professionals, industrialists and students from research areas of Advanced Materials and Nanotechnology to share their recent innovations and applications and indulge in interactive discussions and technical sessions at the event. The Conference will also have a space for companies and/or institutions to present their services, products, innovations and research results.

Why to attend???

13th International Conference on Advanced Materials 2017 and Nanotechnology professionals providing a premier technical forum for reporting and learning about the latest new generation technologies developed during the course of time along with discussing their applications. Events include hot topics presentations from all over the world and professional networking with industries, leading working groups and panels.

Meet Your Objective Business sector With individuals from and around the globe concentrated on finding out about Polymer science and Engineering, this is the best chance to achieve the biggest collection of members from everywhere throughout the World. Conduct shows, disperse data, meet with current, make a sprinkle with another product offering, and get name acknowledgment at this occasion. Widely acclaimed speakers, the latest methods, strategies, and the most up to date overhauls in Polymer science and Engineering are signs of this meeting.

Major Scientific Sessions

- Advanced Materials and Functional Devices
- Engineering Materials
- Composite Materials
- Magnetism & Multiferroism
- Optical Materials and Plasmonics
- Energy and Harvesting Materials
- Nanotechnology-Basics to Applications
- Nano Materials
- Nano Structures
- Properties of Nano Materials
- Carbon Nanostructures and Graphene
- Spintronics
- Nanoparticle Synthesis and Applications

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2017 Highlights

- 150+ Participation
- 6+ Keynote Speakers
- 30+ Plenary Speakers
- 5+ Workshops
- B2B Meetings

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AGRI, FOOD & AQUA

2nd International conference on **Food Security and Sustainability** Jun 26-27, 2017 San Diego, USA

2nd International Conference on **Food Chemistry and Nutrition** Jul 24-26, 2017 Vancouver, Canada

18th Global Summit on **Food & Beverages** Oct 02-04, 2017 Chicago, USA

8th International Conference on **Fisheries & Aquaculture** Oct 02-04, 2017 Toronto, Canada

9th Global Food Safety Conference Dec 04-06, 2017 Atlanta, USA

20th Global Food Processing & Technology Summit Dec 11-13 , 2017 Philadelphia, USA

3rd International Conference on **Food and Beverage Packaging** Jun 15-16, 2017 London, UK

6th International Conference on **Food Safety and Regulatory Measures** Jun 05-07, 2017 Milan, Italy

3rd Global Summit on **Plant Science** Aug 07-09, 2017 Madrid, Spain

7th European Food Safety & Standards Conference Sep 25-26, 2017 Vienna, Austria

10th International Conference on **Agriculture & Horticulture** Oct 02-04, 2017 London, UK

7th International Conference on **Aquaculture & Fisheries** Oct 19-21, 2017 Madrid, Spain

19th International Conference on **Food Processing & Technology** Oct 23-25, 2017 Paris, France

2nd International Conference on **Food Microbiology** Nov 09-11, 2017 Madrid, Spain

2nd internatioanl conference on **Plant physiology & Pathology** Jun 26-28, 2017 Thailand, Bangkok

9th Global Summit on **Agriculture & Horticulture** Aug 10-11, 2017 Beijing, China

World Aqua Congress Oct 23-24, 2017 Dubai, UAE

5th International Food Safety, Quality & Policy Conference Nov 27-28, 2017 Dubai, UAE

ALTERNATIVE HEALTHCARE

5th International Conference and Expo on **Acupuncture and Oriental Medicine** Jul 20-21, 2017 Chicago, USA

13th International Conference on **Connective Tissue Diseases, Systemic Conditions, Treatment & Therapies** Sep 27-28, 2017 Chicago, USA

8th International Conference on **Traditional & Alternative Medicine** Sep 04-06, 2017 Paris, France

Annual Meeting on **Naturopathic Physicians & Acupuncturists** Jul 24-26, 2017 Melbourne, Australia

10th World Congress on **Natural & Alternative Medicine** Sep 25-27, 2017 Dubai, UAE

23rd International Conference on **Herbal and Alternative Remedies for Diabetes and Endocrine Disorders** Nov 02-04, 2017 Thailand, Bangkok

BIOCHEMISTRY

2nd International Conference on **Nucleic Acids, Molecular biology & Biologics Conference** Aug 31-Sep 01, 2017 Philadelphia, USA

10th International Conference and Exhibition on **Virology and Mycology** Oct 16-17, 2017 Baltimore, USA

3rd International Conference on **Genetic and Protein Engineering** Nov 08-09, 2017 Las Vegas, USA

3rd Glycobiology World Congress Jun 26-28, 2017 London, UK

9th International Conference on **Structural Biology** Sep 18-19, 2017 Zurich, Switzerland

9th International Conference and Expo on **Proteomics** Oct 23-25, 2017 Paris, France

9th International Conference on **Bioinformatics** Oct 23-24, 2017 Paris, France

3rd International Conference on **Lipid Science & Technology** Dec 11-12, 2017 Madrid, Spain

2nd International Conference on **Biochemistry** Aug 07-08, 2017 Beijing, China

3rd International Conference on **Transcriptomics** Oct 30- Nov 01, 2017 Thailand, Bangkok

CARDIOLOGY

19th Annual Cardiology Conference Aug 31-Sep 01, 2017 Philadelphia, USA

21st International Conference on **Clinical & Experimental Cardiology** Nov 06-07, 2017 Las Vegas, USA

18th Annual Cardiologists Conference Jun 19-21, 2017 Paris, France

2nd International Conference on **Hypertension & Healthcare** Sep 11-13, 2017 Amsterdam, Netherlands

2nd International Conference on **Echocardiography** Sep 11-12, 2017 Amsterdam, Netherlands

20th European Cardiology Conference Oct 16-18, 2017 Budapest, Hungery

22nd World Cardiology Conference Dec 11-12, 2017 Madrid, Spain

16th World Cardiology Congress December 08-10, 2017 Dubai, UAE

3rd Global Summit on **Heart Diseases** Nov 02-04, 2017 Thailand, Bangkok

CHEMICAL ENGINEERING

International Conference on **Renewable Energy and Resources** Jul 24-25, 2017 Vancouver, Canada

7th International Congress and Expo on **Biofuels & Bioenergy** Oct 02-04, 2017 Toronto, Canada

3rd International Conference on **Chemical Engineering** Oct 02-04, 2017 Chicago, USA

7th International Conference and Exhibition on **Biopolymers and Bioplastics** Oct 19-21, 2017 San Francisco, USA

7th World Congress on **Petrochemistry and Chemical Engineering** Nov13-15, 2017 Atlanta, USA

2nd World Biodiesel Congress & Expo Dec 04-05, 2017 Atlanta, USA

6th International Congress and Expo on **Biofuels, Bioenergy & Bioeconomy** Dec 04-06, 2017 Sao Paulo, Brazil

2nd International Conference on **Chemical and Biochemical Engineering** Jun 07-08, 2017 Milan, Italy

5th World Bioenergy Congress and Expo Jun 29-30, 2017 Madrid, Spain

6th International Conference on **Petroleum Engineering** Jun 29-30, 2017 Madrid, Spain

3rd International Conference and Expo on **Oil and Gas** Jul 13-14, 2017 Berlin, Germany

5th International Conference on **Sustainable Bioplastics** Jul 20-21, 2017 Munich, Germany

6th World Congress on **Biofuels and Bioenergy** Sep 05-06, 2017 London, UK

6th World Congress on **Biopolymers** Sep 07-09, 2017 Paris, France

2nd Euro Global Summit and Expo on **Biomass** Sep 21-22, 2017 Madrid, Spain

13th International Conference on **Petroleum and Refinery** Jun 01-03, 2017 Osaka, Japan

International Conference on **Renewable Energy and Resources** Oct 05-07, 2017 Kuala Lumpur, Malaysia

CHEMISTRY

3rd International Conference on **Organic & Inorganic Chemsitry** Jul 17-19, 2017 Chicago, USA

3rd World Chemistry Conference Sep 11-12, 2017 Dallas, USA

5th International Conference on **Current Trends in Mass Spectrometry** Sep 25-27, 2017 Atlanta, USA

9th International Conference and Exhibition on **Analytical & Bioanalytical Techniques** Sep 28-29, 2017 Atlanta, USA

2nd International Conference on **Clinical Chemistry and Laboratory Medicine** Sep 28-29, 2017 Atlanta, USA

4th International Conference on **Past and Present Research Systems of Green Chemistry** Oct 16-18, 2017 Atlanta, USA

7th International Conference on **Medicinal Chemistry & Computer Aided Drug Designing** Nov 02-04, 2017 San Antonio, USA

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2nd International Conference on **Nuclear Chemistry**
Nov 06-07, 2017 Las Vegas, USA

2nd International Conference and Exhibition on **Polymer Chemistry**
Nov 06-08, 2017 Las Vegas, USA

6th World Congress on **Medicinal Chemistry and Drug Design**
Jun 07-08, 2017 Milan, Italy

4th World Congress on **Mass Spectrometry**
Jun 19-21, 2017 London, UK

International Conference on **Electrochemistry**
Jul 10-11, 2017 Berlin, Germany

3rd International Conference and Exhibition on **Advances in Chromatography & HPLC Techniques** Jul 13-14, 2017 Berlin, Germany

2nd International Conference and Exhibition on **Materials Chemistry**
Jul 13-14, 2017 Berlin, Germany

4th World Congress on **Chromatography**
Aug 07-09, 2017 Madrid, Spain

5th International Conference and Exhibition on **Pain Research & Management**
Sep 04-05, 2017 London, UK

5th Global Chemistry Congress
Sep 04-06, 2017 London, UK

International Conference on **Physical and Theoretical Chemistry**
Sep 18-19, 2017 Dublin, Ireland

2nd International Conference on **Pharmaceutical Chemistry**
Oct 02-04, 2017 Barcelona, Spain

5th International Conference and Expo on **Separation Techniques**
Oct 23-25, 2017 Paris, France

10th Annual Chemistry Congress
Oct 18-19, 2017 Osaka, Japan

6th Global Congress on **Mass Spectrometry**
Oct 18-19, 2017 Osaka, Japan

7th Global Mass Spectrometry Congress
Dec 14-16, 2017 Dubai, UAE

COMPUTER SCIENCE

5th International Conference on **Big Data Analysis** Sep 07-08, 2017 Toronto, Canada

DENTISTRY

17th Global Dentists and Pediatric Dentistry Annual meeting
Jul 17-18, 2017 Munich, Germany

24th World Congress on **Dentistry and Oral Health** Sep 01-02, 2017 London, UK

24th Euro Congress on **Dental & Oral Health**
Oct 19-20, 2017 Budapest, Hungery

3rd International Conference on **Sports Medicine and Fitness**
Sep 21-23, 2017 Barcelona, Spain

International Conference on **Dentistry & Dental Marketing**
Oct 05-06, 2017 Las Vegas, USA

29th Annual World Congress on **Dental Medicine & Dentistry** Oct 16-18, 2017 NewYork, USA

37th Global Summit on **Dental Surgeons & Dental Materials**
Nov 02-04, 2017 San Antonio, USA

38th Annual Congress on **World Dentistry**
Nov 06-08, 2017 San Antonio, USA

26th American Dental Congress
Dec 04-06, 2017 Atlanta, USA

39th World Dental Congress Summit
Dec 04-06, 2017 Sao Paulo, Brazil

28th Asia Pacific Dental and Oral Health Congress
Jul 10-12, 2017 Malyasia, Kuala Lumpur

30th Global Experts Meet on **Advanced Dentistry and Oral Health**
Sep 21-22, 2017 Macau, Hong Kong

31st Annual Conference on **Dental Practice Management and Marketing**
Sep 21-22, 2017 Macau, Hong Kong

37th Asia Pacific Dental and Oral Care Congress Nov 20-22, 2017 Australia, Melbourne

14th International Conference on **Clincal and Experimental Dermatology**
Jun 19-21, 2017 Philadelphia, USA

9th Clinical Dermatology Congress
Oct 16-18, 2017 NewYork, USA

2nd International Conference on **Psoriasis and Skin Specialists Meeting**
Sep 20- 21, 2017 Philadelphia, USA

16th European Dermatology Congress
Jun 07-08, 2017 Milan, Italy

12th Global Dermatologists Annual Meeting
Sep 01-02, 2017 London, UK

13th International Conference and Exhibition on **Cosmetic Dermatology and Hair care**
Oct 26-27, 2017 Paris, France

23rd Asia Pacific Dermatology Conference
Oct 26-28, 2017 Osaka, Japan

International Conference on **Pigmentary Disorders** Sep 11-12, 2017 Dubai, UAE

17th World Dermatology Conference
Sep 11-12, 2017 Dubai, UAE

DIABETES AND ENDOCRINOLOGY

10th International Conference on **Clinical diabetes, Diabetes care & Nutrition**
Jul 20-21, 2017 Chicago, USA

9th Annual Congress on **Endocrine Disorders and Therapies**
Sep 11-12, 2017 Dallas, USA

International Conference on **Diabetes**
Sep 20-22, 2017 Denever, USA

International Conference on **Diabetes, Metabolism & Obesity**
Nov15-17, 2017 Las Vegas, USA

International Conference on **Diabetes and Endocrinology**
Dec 06-08, 2017 Atlanta, USA

18th European Diabetes Congress
Jul 17-18, 2017 Lisbon, Portugal

2nd International Conference on **Metabolic Syndrome** Aug 10-11, 2017 London, UK

213h International Conference on **Diabetes**
Oct 05-06, 2017 London, UK

19th Asia Pacific Diabetes Conference
Jul 20-22, 2017 Melbourne, Australia

International Conference on **Endocrinology and Diabetes Summit**
Sep 13-14, 2017 Singapore

2nd International Conference on **Herbal and Alternative Remedies for Diabetes and Endocrine Disorders**
Nov 02-04, 2017 Thailand, Bangkok

25th Global Diabetes and Medicare Expo
Dec 11-12, 2017 Dubai, UAE

ENVIRONMENTAL SCIENCES

International Conference on **Ecology and Ecosystems**
Sep 18-20, 2017 Toronto, Canada

3rd Annual Congress on **Pollution and Global Warming**
Oct 16-18, 2017 Atlanta, USA

4th International Conference on **GreenEnergy & Expo**
Nov 06-08, 2017 Las Vegas, USA

5th International Conference on **Recycling: Reduce, Reuse and Recycle**
Nov 06-08, 2017 Las Vegas, USA

4th World Congress and Expo on **Recycling**
July 27-29, 2017 Madrid, Spain

3rd International Conference on **Green Energy and Expo**
Sep 28-29, 2017 Berlin, Germany

2nd International Conference on **Pollution Control and Sustainable Environment**
Oct 10-11, 2017 London, UK

4th World Conference on **Climate Change**
Oct 19-21, 2017 Madrid, Spain

International Conference on **Natural Hazards and Disaster Management**
Jun 01-03, 2017 Osaka, Japan

2nd International Conference on **Coastal Zones**
Jul 10-11, 2017 Jakarta, Indonesia

Annual Congress on **Environmental Pollution and Sustainable energy**
Jul 20-22, 2017 Melbourne, Australia

7th World Convention on **Recycling and Waste Management**
Aug 10-12, 2017 Beijing, China

2nd World Congress on **Climate Change and Global Warming**
Oct 16-17, 2017 Dubai, UAE

EEE & ENGINEERING

3rd World Congress on **Automation & Robotics**
Jun 28-29, 2017 San Diego, USA

International Conference on **Artificial Intelligence**
Jun 28-29, 2017 San Diego, USA

3rd International Conference on **Data Structures and Data Mining**
Aug 17-18, 2017 Toronto, Canada

International Conference on **Agricultural Engineering**
Sep 11-12, 2017 San Antonio, USA

10th World Congress on **Biosensors and Bioelectronics Biosensors & Bioelectronics** Sep 27-28, 2017 Chicago, USA

2nd World Summit on **Bioengineering**
Sep 27-28, 2017 Chicago, USA

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5th International Conference and Exhibition on **Mechanical & Aerospace Engineering** Oct 02-04, 2017 Las Vegas, USA

4th World Congress and Exhibition on **Construction and Steel Structure** Oct 16-18, 2017 Atlanta, USA

7th International Conference on **Nuclear Engineering** Oct 16-18, 2017 Atlanta, USA

International Conference on **Applied Energy** Oct 23-24, 2017 Orlando USA

6th International Conference on **Biostatistics & Bioinformatics** Nov13-14, 2017 Atlanta, USA

3rd Euro Congress on **Iron, Steel and Construction Engineering** Jun 15-16, 2017 London , UK

13th International Conference on **Wind & Renewable Energy** Jun 21-23, 2017 London, UK

International conference on **3D Printing and Technology** Jul 05-06, 2017 Frankfurt, Germany

7th Euro Biosensors and Bioelectronics Conference Jul 10-12, 2017 Berlin, Germany

3rd International Conference and Business Expo on **Wireless & Telecommunication** Jul 20-21, 2017 Munich, Germany

3rd Global Summit and Expo on **Multimedia & Artificial Intelligence** Jul 20-21, 2017 Lisbon, Portugal

2nd International Conference on **Power and Energy Engineering** Jul 20-21, 2017 Munich, Germany

2nd International Conference on **Battery and Fuel Cell Technology** Jul 27-28, 2017 Madrid, Spain

2nd International Conference on **Design and Production Engineering** Aug 21-22, 2017 Birmingham, UK

4th International Conference on **BigData Analysis and Data Mining** Sep 07-08, 2017 Paris, France

4th International conference and Expo on **Computer Graphics & Animation** Sep 25-26, 2017 Berlin, Germany

3rd International Conference and Exhibition on **Automobile Engineering** Sep 28-29, 2017 Berlin, Germany

2nd Global Summit on **Fluid Dynamics & Aerodynamics** Oct 19-20, 2017 Madrid, Spain

International Conference on **Mechatronics, Automation and Intelligent Materials** Oct 23-25, 2017 Paris, France

International Conference on **Steel Structures** Sep 11-12, 2017 Singapore

International Conference on **Smart Grid Technologies** Sep 11-12, 2017 Singapore

Geotechnical and Water Resource Engineering Summit Sep 18-19, 2017 Macau, Hong Kong

3rd World Congress on **Robotics and Artificial Intelligence** Oct 23-24, 2017 Osaka, Japan

GASTROENTEROLOGY

International Conference on **Pancreatic Disorders and Treatment** Sep 13-14, 2017 Dallas, USA

2nd International Conference on **Hepatology & Gastroenterology** Nov 13-14, 2017 Las Vegas, USA

11th Global Gastroenterologists Meeting Jun 12-13, 2017 Madrid, Spain

5th World Congress on **Hepatitis & Liver Diseases** Aug 10-12, 2017 London, UK

12th Euro-Global Gastroenterology Conference Sep 11-12, 2017 Paris, France

2nd International Conference on **Digestive Diseases** Oct 16-17, 2017 London, UK

10th International Conference on **Gastroenterology** Oct 30- Nov 01, 2017 Bangkok, Thailand

GENETICS & MOLECULAR BIOLOGY

6th International Conference on **Tissue Science & Regenerative Medicine** Aug 23-24 , 2017 San Francisco, USA

3rd International Conference & Exhibition on **Tissue Preservation and Biobanking** Aug 23-24 , 2017 San Francisco, USA

3rd Annual Genomics and Toxicogenomics Conference Sep 27-28, 2017 Chicago, USA

Annual Summit on **Cell Signaling and Cancer Therapy** Sep 27-28, 2017 Chicago, USA

Annual Summit on **Cell Therapy** Sep 27-28, 2017 Chicago, USA

13th World Biotechnology Congress Oct 19-20, 2017 NewYork, USA

2nd World Biotechnology Congress Dec 04-05, 2017 Sao Paulo, Brazil

9th International Conference on **Genomics and Pharmacogenomics** Jun 15-16, 2017 London, UK

5th International Conference on **Integrative Biology** Jun 19-21, 2017 London, UK

3rd International Conference on **Bioscience** Jun 19-20, 2017 London, UK

3rd International Conference on **Synthetic Biology** Jul 20-21, 2017 Munich, Germany

13th International Conference on **Human Genetics** Sep 14-15, 2017 Edinburgh, Scotland

9th Annual Conference on **Stem Cell and Regenerative Medicine** Sep 25-26, 2017 Berlin, Germany

17th EuroBiotechnology Congress Sep 25-27, 2017 Berlin, Germany

7th International Conference on **Tissue Engineering and Regenerative Medicine** Oct 02-04, 2017 Barcelona, Spain

5th International Conference on **Plant Genomics** Jul 03-05, 2017 Thailand, Bangkok

World Congress on **Molecular Genetics and Gene Therapy** Jul 03-05, 2017 Thailand, Bangkok

World Congress on **Nano Science and Nano Technology** Jul 10-11, 2017 Jakarta, Indonesia

14th Asia-Pacific Biotech Congress Jul 20-22, 2017 Melbourne, Australia

3rd Annual Congress and Expo on **Bioscience** Aug 10-12, 2017 Beijing, China

8th International Conference on **Tissue Science and Regenarative Medicine** Sep 11-12, 2017 Singapore

10th International Convention on **Stem Cell and Biobanking** Oct 23-24, 2017 Osaka, Japan

GEOLOGY & EARTH SCIENCE

3rd World Congress on **GIS and Remote Sensing** Sept 20-21, 2017 Charlotte, USA

2nd International Convention on **Geophysics and Geo technics** Nov 08-09, 2017 Las Vegas, USA

2nd International Convention on **Geosciences and Remote Sensing** Nov 08-09, 2017 Las Vegas, USA

13th International Conference on **GIS and Remote Sensing** Jul 20-21, 2017 Munich, Germany

Annual Congress on **Soil Sciences** Dec 04-05, 2017 Madrid, Spain

6th International Conference on **Earth Science and Climate change** Sep 18-19, 2017 Macau, Hong Kong

5th International Conference on **Oceanography and Marine Biology** Oct 16-17, 2017 Seoul, Republic of Korea

HEALTHCARE MANAGEMENT

3rd International Conference on **Wound Care, Tissue Repair & Regenerative Medicine** Sep 11-12, 2017 Dallas, USA

13th International Conference on **Health & Medical Sociology** Sep 25-26, 2017 Atlanta, USA

2nd International Conference on **Wound Care, Ostomy & Continence Nursing Practices** Jun 07-08, 2017 Milan, Italy

International Conference on **Social Sciences & Cultural Studies** Jun 21-22, 2017 London, UK

2nd Global Health Economics Summit Jun 29-30, 2017 Madrid, Spain

10th World Congress on **Healthcare & Technologies** Jul 17-18, 2017 Lisbon, Portugal

5th International Conference on **Medical Informatics & Telehealth** Aug 29-30, 2017 Prague, Czech Republic

2nd International Conference on **Environmental Health & Safety** Sep 07-08, 2017 Paris, France

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2nd International Conference on
General Practice & General Medicine
Sep 18-20, 2017 Zurich, Switzerland

6th International Conference on
Epidemiology & Public Health
Oct 23-25, 2017 Paris, France

2nd International Conference on
Health & Hospital Management
Nov 06-07, 2017 Vienna, Austria

International Conference on
Medical Education
Nov 06-08, 2017 Vienna, Austria

12th World Congress on
Healthcare and Medical Tourism
Oct 16-17, 2017 Dubai, UAE

IMMUNOLOGY

3rd Annual Global Conference on
Parasitology
Jul 31-Aug 01, 2017 Chicago, USA

2nd International Conference on
Tumor & Cancer Immunology and Immunotherapy
Jul 17-19, 2017 Chicago, USA

3rd Antibodies and Bio Therapeutics Congress
Nov 08-09, 2017 Las Vegas, USA

5th International conference on
HIV/AIDS, STDS & STIS
Nov 13-14, 2017 Las Vegas, USA

9th World Congress and Expo on
Immunology
Nov 02-03, 2017 Atlanta, USA

3rd International Conference on
Immunity, Inflammation and Immunotherapies
Nov 02-03, 2017 Atlanta, USA

8th European Immunology Conference
Jun 26-28, 2017 Madrid, Spain

11th International Conference on
Allergy, Asthma & Clinical Immunology
Aug 16-17, 2017 Edinburgh, Scotland

4th International Conference on **Parasitology**
Sep 01-02, 2017 Prague, Czech Republic

2nd International Conference on **Autoimmunity**
Nov 09-10, 2017 Madrid, Spain

International Conference on
Cancer & Tumor Immunology
Jul 03-05, 2017 Thailand, Bangkok

9th Annual Meeting on
Immunology and Immunologist
Jul 03-05, 2017 Kuala Lumpur, Malaysia

Annual Summit on **HIV/AIDS, STDs & STIs**
Aug 07-09, 2017 Beijing, China

World Immunology Congress
Dec 14-15, 2017 Dubai, UAE

INFECTIOUS DISEASES

5th World Congress on
Control and Prevention of HIV/AIDS STDs & STIs Jun 19-20, 2017 London, UK

13th International Conference on **Rare Diseases**
Jun 29-30, 2017 London, UK

3rd International Conference on
Influenza and Zoonotic Diseases
Aug 21-22, 2017 Birmingham, UK

9th Euro-Global Conference on **Infectious Diseases** Sep 07-09, 2017 Paris, France

13th World Congress on
Infection Prevention and Control
Oct 26-27, 2017 Milano, Italy

3rd International Conference on
Retroviruses, Novel Drugs and Therapies
Jul 27-28, 2017 Vancouver, Canada

3rd Annual Congress on **Infectious Diseases**
Aug 21-23 2017 San Francisco, USA

Annual Congress on
Medical Laboratory Congress & Expo
Aug 21-22, 2017 San Francisco, USA

2nd International Conference on
Infection Control
Sep 25-26, 2017 Chicago, USA

3rd Annual Congress on
Rare Diseases and Orphan Drugs
Oct 30-Nov 01, 2017 San Antonio, USA

3rd International conference on
Flu & Emerging Infectious Diseases
Nov 06-07, 2017 Las Vegas, USA

6th Annual Bacteriology and Parasitology Meeting Sep 13-14, 2017 Singapore

7th Asia Pacific STD and Infectious Diseases Congress Oct 23-25, 2017 Osaka, Japan

MATERIALS SCIENCE

International Conference on
Graphene and Semiconductors
Jul 17-18, 2017 Chicago, USA

International Conference on
Diamond and Carbon Materials
Jul 17-18, 2017 Chicago, USA

10th International Conference on
Emerging Materials & Nanotechnology
Jul 27-29, 2017 Vancouver, Canada

3rd International Conference on
Polymer Science and Engineering
Oct 02-04, 2017 Chicago, USA

2nd International Conference on
Applied Crystallography
Oct 16-18, 2017 Chicago, USA

13th International Conference and Exhibition on
Materials Science and Engineering
Nov13-15, 2017 Las Vegas, USA

14th International Conference on
Functional Energy Materials
Dec 06-07, 2017 Atlanta, USA

9th World Congress on
Materials Science & Engineering
Jun 12-14, 2017 Madrid, Spain

3rd International Conference and Expo on
Ceramics and Composite Materials
Jun 26-27, 2017 Madrid, Spain

11th International Conference on
Advanced Materials and Processing
Sep 06-07 2017 Edinburgh, Scotland

12th Annual Congress on
Materials Science and Nanotechnology
Sep 25-26, 2017 Dubai, UAE

International Conference on **Advanced Materials and Nanotechnology** Oct 26-28, 2017 Osaka, Japan

MICROBIOLOGY

2nd International conference on
Environmental & Soil Microbiology
Sep 18-20, 2017 Toronto, Canada

7th International Conference on
Clinical Microbiology
Sep 25-26, 2017 Chicago, USA

4th World Microbiologists Annual Conference
Jun 21-23, 2017 Philadelphia, USA

International Conference on
Water Microbiology & Novel Technologies
Aug 28-30, 2017 Philadelphia, USA

2nd International conference on
Human Papillomavirus
Nov13-14, 2017 Las Vegas, USA

International Conference and Expo on
Medical Virology
Aug 31-Sep 01, 2017 Philadelphia, USA

2nd International Congress on
Mycology
Sep 25-26, 2017 Chicago, USA

International Conference on
Infectious Diseases & Diagnostic Microbiology
Sep 13-14, 2017 Dallas, USA

3rd World Congress on **Beneficial Microbes: Food, Pharma, Aqua & Beverages Industry**
Sep 18-20, 2017 Houston, USA

World Summit on **Microbial & Biochemical Technologies** Sep 18-20, 2017 Houston, USA

Global Veterinary Microbiology Summit & Expo
Oct 02-04, 2017 Las Vegas, USA

11th World Summit on
Medical Microbiology
Oct 02-04, 2017 Las Vegas, USA

World Summit on **Nosocomial and Healthcare Associated Infections**
Oct 02-04, 2017 Las Vegas, USA

6th Annual Conference on **Microbiology**
Oct 16-17, 2017 Baltimore, USA

11th World Congress on **Virology**
Oct 16-17, 2017 Baltimore, USA

World Yeast Congress
Dec 06-07, 2017 Sao Paulo, Brazil

15th International Pharmaceutical Microbiology and Biotechnology Conference
Jun 21-23, 2017 London, UK

International Conference on
Microbial Pathogenesis & Host Response Mechanism Aug 24-25, 2017 Toronto, Canada

10th Annual Medical Microbiology Summit & Expo Jun 21-22, 2017 London, UK

World Host-Microbial Interactions Congress
Jul 17-18, 2017 Munich, Germany

6th International Conference on
Microbial Physiology and Genomics
Aug 31-Sep 01, 2017 Brussels, Belgium

46th World Congress on Microbiology
Sep 18-19, 2017 Dublin, Ireland

6th Clinical Microbiology Conference
Oct 26-27, 2017 Paris, France

4th World Congress and Expo on **Applied Microbiology** Nov 09-11, 2017 Madrid, Spain

International Conference on
Medical and Clinical Microbiology
Jul 03-05, 2017 Thailand, Bangkok

2nd International Conference and Summit on
Industrial and Pharmaceutical Microbiology
Oct 23-25, 2017 Osaka, Japan

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10th International Congress on **Clinical Virology**
Dec 04-05, 2017 Dubai, UAE

Annual Congress on **Microbes and Infection**
Dec 04-05, 2017 Dubai, UAE

NANOTECHNOLOGY

16th World Nano Conference
Jun 05-06, 2017 Milan, Italy

2nd world congres and expo on
Graphene 2D Materials
Aug 15-16, 2017 Edinburgh, Scotland

19th Nano Congress for Next Generation
Aug 31-Sep1, 2017 Brussels, Belgium

22th International Conference and Expo on
Nanoscience and Molecular Nanotechnology
Nov 13-14, 2017 Vienna, Austria

International conference on
Nanobiotechnology
Jul 31-Aug 01, 2017 Chicago, USA

World Congress on
Regulations of Nanotechnology
Jul 31-Aug 01, 2017 Chicago, USA

International Conference on
Nano Science and Technology
Sep 18-19, 2017 Orlando, USA

19th International Conference on
Nanotek and Expo
Nov13-15, 2017 Atlanta, USA

17th Nanotechnology products and Summit
Nov13-15, 2017 Atlanta, USA

World Congress on
NanoScience and NanoTechnology
July 10-11, 2017 Jakarta Indonesia

15th World Medical Nanotechnology Congress & Expo Oct 18-19, 2017 Osaka, Japan

3rd Biomedical Engineering and Expo
Nov 07-08, 2017 Barcelona, Spain

NEPHROLOGY

15th Annual Congress on **Nephrology & Therapeutics** Aug 28-30, 2017 Philadelphia, USA

2nd Annual Kidney Congress
Aug 28-30, 2017 Philadelphia, USA

12th Global Nephrologists Annual Meeting
Jun 26-28, 2017 London, UK

16th European Nephrology Conference
Oct 02-04, 2017 Barcelona, Spain

13th Annual Conference on
Nephrology & Urology
Jul 06-07, 2017 Kuala Lumpur, Malaysia

17th World Nephrology Conference
Oct 18-19, 2017 Dubai, UAE

NEUROSCIENCE

2nd International Conference on
Neuroimaging and Interventional Radiology
Jun 19-20, 2017 Philadelphia, USA

14th World Congress on
Neurology and Neurological disorders
Jul 17-19, 2017 Chicago, USA

3rd International Conference on
Parkinson's Disease & Movement Disorders
Sep 25-26, 2017 Chicago, USA

3rd International Conference on
Spinal Surgery
Oct 16-17, 2017 Chicago, USA

10th World Congress on
Addiction Research & Therapy
Nov 13-15, 2017 Las Vegas, USA

13th International Conference on
Neurology and Neurosurgery
Jun 19-21, 2017 Paris, France

2nd International Conference on
Spine and Spinal Disorders
Jul 24-26, 2017 Madrid, Spain

3rd International Conference on **Epilepsy & Treatment** Aug 31-Sep 01, 2017 Brussels, Belgium

15th European Neurology Congress
Aug 29-31, 2017 London, UK

7th World Congress on **Addictive Disorders and Addiction Therapy**
Aug 29-31, 2017 Prague, Czech Republic

3rd International Conference on
Central Nervous System Disorders
Sep 25-27, 2017 Vienna, Austria

16th International Conference on
Neuro Cognitive Disorders
Oct 10-11, 2017 London, UK

9th International Conference on
Alzheimer's Disease & Dementia
Oct 16-18, 2017 Madrid, Spain

6th International Conference on
Brain Disorders and Therapeutics
Nov 06-08, 2017 Madrid, Spain

18th Global Neurologists Annual Meeting on
Neurology and Neuro Surgery
Nov 16-17, 2017 Vienna, Austria

7th International Conference on
Addictive Disorders and Alcoholism
Jul 03-04, 2017 Kuala Lumpur, Malaysia

15th International Conference on **Neuroscience**
Oct 16-17, 2017 Osaka, Japan

13th Global Neurologists Annual Meeting on
Neurology and Neuro Surgery
Nov 27-28, 2017 Dubai, UAE

NURSING

23rd Cardiovascular Nursing & Nurse Practitioners Meeting
Jul 10-11, 2017 Chicago, USA

4th Annual Congress & Medicare Expo on
Primary Healthcare
Aug 21-22 , 2017 San Francisco, USA

13th International Conference on
Midwifery and Women's Health
Aug 28-30, 2017 Philadelphia, USA

30th Oncology Nursing & Nurse Practitioners Conference Aug 28-30, 2017 Philadelphia, USA

32nd International Conference on
Family Nursing and Healthcare
Sep 11-13, 2017 San Antonio, USA

34th Clinical Nursing & Nurse Education Conference Sep 20-21, 2017 charlotte, USA

3rd International Conference on **Reproductive Health** Oct 05-06, 2017 Chicago, USA

11th Global Healthcare and Fitness Summit
Oct 16-18, 2017 San Francisco, USA

46th Global Nursing and Healthcare Conference
Dec 06-07, 2017 Sao Paulo, Brazil

35th Global Nursing Care and Education Conference Sep 25-27, 2017 Atlanta, USA

40th International Conference on
Nursing & Healthcare
Oct 16-18, 2017 NewYork, USA

5th World Congress on
Women's Health and Breast Cancer
Jun 15-16, 2017 London, UK

2nd International Conferences on
Reproductive Health and Medicine
Jun 26-27, 2017 London, UK

23rd World Nursing and Healthcare Conference
Jul 10-12, 2017 Berlin, Germany

25th Cancer Nursing & Nurse Practitioners Conference Jul 17-18, 2017 Lisbon, Portugal

29th World Congress on
Advanced Nursing Practicwe
Aug 14-16, 2017 Edinburgh, Scotland

37th World Nursing Education Conference
Sept 01-03, 2017 Prague, Czech Republic

28th International Conference on
Pediatric Nursing and Healthcare
Sep 04-05, 2017 Edinburgh, Scotland

35th Critical Care nursing & Nurse Practitioners Conference
Sep 28-29, 2017 Berlin, Germany

4th International Conference on
Gynecology & Obstetrics
Oct 02-04, 2017 Barcelona, Spain

13th International Conference on
Midwifery and Women's Health
Oct 02-04, 2017 London, UK

41st Euro Nursing & Medicare Summit
Oct 26-28, 2017 Paris, France

9th Asia-Pacific Global Summit & Expo on
Healthcare
Jul 03-05, 2017 Kuala Lumpur, Malaysia

4th World Congress on
Midwifery and Women's Health
Jul 20-22, 2017 Melbourne, Australia

World Congress on **Nursing Care**
Jul 24-26, 2017 Melbourne, Australia

International Conference on
Oncology Nursing and Cancer Care
Sep 13-14, 2017 Singapore

23rd World Nurse Practitioners Conference
Sep 28-29 2017 Dubai, UAE

27th Surgical Nursing & Nurse Education Conference Oct 16-17, 2017 Dubai, UAE

Asia-Pacific Nursing and Medicare Summit
Oct 05-07, 2017 Kuala Lumpur, Malaysia

World Congress on
Nursing Pharmacology and Nursing Education
Nov 20-21, 2017 Melbourne, Australia

NUTRITION & OBESITY

16th International conference and Exhibition on
Obesity & Weight Management
Nov16-17, 2017 Atlanta, USA

12th International Conference on
Clinical Diabetes, Diabetes care & Nutrition
Jul 20-21, 2017 Chicago, USA

12th World Congress on
Obesity
Aug 24-25, 2017 Toronto, Canada

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17th World Fitness Expo
Nov 16-17, 2017 Atlanta, USA

10th International Conference on
Childhood Obesity and Nutrition
Jun 12-13, 2017 Madrid, Spain

11th European Nutrition and Dietetics Conference
Jun 29-Jul 01, 2017 Madrid, Spain

13th International Congress on
Advances in Natural Medicines, Nutraceuticals & Neurocognition
Jul 27-28, 2017 Madrid, Spain

14th International Conference on **Clinical Nutrition** Jul 27-29, 2017 Madrid, Spain

15th World Congress on **Nutrition and Food Chemistry** Sep 18-20, 2017 Zurich, Switzerland

13th Euro Obesity and Endocrinology Congress
Sep 21-23, 2017 Madrid, Spain

6th International Conference and Exhibition on
Probiotics, Functional and Baby Foods
Oct 02-03, 2017 London, UK

12th World congress on
Obesity and Endocrinology
Jul 17-19, 2017 Melbourne, Australia

15th Global Obesity Meeting
Oct 23-24, 2017 Dubai, UAE

18th Global Dieticians & Nutritionists Annual Meeting
Oct 02-03, 2017 Kuala Lumpur, Malaysia

16th Obesity Medicine Conference
Oct 30- Nov 01, 2017 Thailand, Bangkok

ONCOLOGY & CANCER

International Conference on
Cancer Biology R&D and Market
Jun 21-22, 2017 Philadelphia, USA

3rd Annual Conference on
Gynecologic Oncology
Jul 20-21, 2017 Chicago, USA

World Congress on **Preventive Oncology**
Jul 20-21, 2017 Chicago, USA

25th World Congress on **Cancer Therapy**
Oct 18-20, 2017 Baltimore, USA

10th Annual World Congress on
Biomarkers & Clinical Research
Oct 18-20, 2017 Chicago, USA

5th International Conference on
Medical Imaging and Radiology
Oct 19-20, 2017 NewYork, USA

15th World Oncologists Annual Conference
Oct 19-20, 2017 NewYork, USA

World Medical and Clinical Oncology Congress Nov13-15 , 2017 Las Vegas, USA

5th World Congress on **Breast Cancer**
Oct 16-18, 2017 San Francisco, USA

9th International Conference on
Hematology and Hematological Oncology
Nov 08-09, 2017, Las Vegas, USA

8th International Conference on **Blood Cancer & Treatment** Jun 26-27, 2017 London, UK

19th Euro Congress on **Cancer Science and Therapy** Jul 17-19, 2017 Lisbon, Portugal

7th International Conference on
Nuclear Medicine & Radiation Oncology
Jul 27-28, 2017 Madrid, Spain

20th International Conference on
Radiation Oncology & Anti- Cancer Therapy
Aug 28-29, 2017 Brussels, Belgium

9th International Conference and Expo on
Molecular & Cancer Biomarkers
Aug 24-25, 2017 Birmingham, UK

2nd International Congress on **Contemporary Issues in Women Cancers and Gynecologic Oncology** Aug 28-29, 2017 London, UK

2nd International conference on
Medical Imaging and Radiology
Sep 11-12, 2017 London, UK

11th International Conference on
Hematologic Oncology
Oct 05-06, 2017 London, UK

25th World Cancer Conference
Oct 19-21, 2017 Madrid, Spain

International Conference on
Epigenetics
Nov 06-07, 2017 Madrid, Spain

Hematology and Oncology
Jun 29-Jul 01, 2017 Thailand, Bangkok

9th International Conference on
Biomarkers
Oct 16-17, 2017 Osaka, Japan

14th Asia Pacific Oncologists Annual Meeting
Oct 26-28, 2017 Osaka, Japan

World Cancer Convention
Nov 27-28, 2017 Dubai, UAE

International Conference on
Cancer Diagnostics
Nov 27-28, 2017 Dubai, UAE

International Conference on **Epigenetic Research**
Oct 26-28, 2017 Osaka, Japan

OPHTHALMOLOGY

Global Congress & Expo on
Optometry and Vision Science
Jul 17-18, 2017 Chicago, USA

20th World Ophthalmology Summit
Dec 04-05, 2017 Sao Paulo, Brazil

2nd Global Pediatric Ophthalmology Congress
Jun 05-06, 2017 Milan, Italy

2nd International conference and Expo on
Cataract and Refractive Surgery
Jul 10-11, 2017 Berlin, Germany

15th Global Meeting and Expo on **Vision Science**
Aug 10-11, 2017 London, UK

5th International conference and Expo on
Optometry and Vision Science
Sep 11-12, 2017 Paris, France

16th International Conference on
Clinical & Experimental Ophthalmology
Sep 18-20, 2017 Zurich, Switzerland

18th European Ophthalmology Congress
Dec 07-09, 2017 Madrid, Spain

3rd International Conference on **Optometry and Vision Science** August 7-9, 2017 Beijing, China

11th Global Ophthalmologists Annual Meeting
Jun 29-Jul 01, 2017 Thailand, Bangkok

10th International Conference on
Clinical and Surgical Ophthalmology
Aug 07-09, 2017 Beijing, China

2nd World Ophthalmology Conference
Oct 23-25, 2017 Osaka, Japan

17th Global Ophthalmology and Glaucoma Conference Nov 27-28, 2017 Dubai ,UAE

PALLIATIVE CARE

3rd International Conference on
Hospice & Palliative Care
Jun 21-23, 2017 Philadelphia, USA

2nd International Conference on
Aging & Gerontology
Jun 26-28, 2017 San Diego, USA

8th International Conference on
Geriatric Medicine & Gerontological Nursing
Oct 30-Nov 01, 2017 San Antonio, USA

7th International Conference on
Geriatrics & Gerontological Nursing
Sep 04-05, 2017 Edinburgh, Scotland

PATHOLOGY

15th International Conference on **Pathology**
Jun 26-27, 2017 San Diego, USA

3rd International Conference on
Cytopathology and Histopathology
Jun 21-23, 2017 Philadelphia, USA

2nd International Conference on
Molecular Pathology
Jun 26-27, 2017 San Diego, USA

2nd International Conference on
Internal Medicine
Sep 13-14, 2017 Dallas, USA

7th International Conference on
Predictive, Preventive and Personalized Medicine & Molecular Diagnostics
Oct 5-6, 2017 Chicago, USA

6th Experts Meeting on
Medical Case Reports
Oct 16-18, 2017 San Francisco, USA

2nd International conference on
Digital Pathology
Nov 02-03, 2017 San Antonio, USA

4th World Congress on **Breast Pathology**
Aug 24-25, 2017 Toronto, Canada

14th European Pathology Congress
Aug 02-03, 2017 Milan, Italy

6th European Conference on
Predictive , Preventive and Personalized Medicine & Molecular Diagnostics
Aug 24-25, 2017 Birmingham, UK

5th European Conference on
Clinical and Medical Case Reports
Sep 07-08, 2017 Paris, France

PEDIATRICS

2nd World Congress Pediatric Oncology & Pediatric Medicine
Oct 05-06, 2017 Las Vegas, USA

3rd Annual Summit on
Pediatric Cardiology & Pulmonology
Sep 25-26, 2017 Chicago, USA

11th World Congress on
General Pediatrics & Adolosent medicine
Sep 25-26, 2017 Chicago, USA

2nd Annual Congress on
Infancy, Child Nutrition & Development (ICND)
Oct 19-21, 2017 Atlanta,USA

5th Annual Conference on
Translational Medicine
Nov15-16, 2017 Las Vegas, USA

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12th International Conference on
Clinical Pediatrics
Jun 29-Jul 01, 2017 London, UK

2nd International Conference on
Pediatric Surgery
Jun 29-30, 2017 London, UK

16th European Pediatrics Conference
Sep 01-03, 2017 Prague, Czech Republic

2nd International Conference on
Pediatric Neurology
Sep 01-02, 2017 Prague, Czech Republic

20th International Conference on
Neonatology and Perinatology
Dec 04-06, 2017 Madrid, Spain

2nd Annual Meeting on **Pediatric Nephrology**
Jun 29-30, 2017 Kuala Lumpur, Malaysia

10th World Pediatric Congress
Sep 28-29 2017 Dubai, UAE

PHARMACEUTICAL SCIENCES

3rd International Conference on
Biopharmaceutics and Biologic Drugs
Jun 19-20, 2017 Philadelphia, USA

8th World Congress on
Bioavailability & Bioequivalence: BA/BE Studies Summit
Jun 26-27, 2017 San Diego, USA

4th International Conference and Exhibition on
Pain Medicine
Aug 03-04, 2017 San Francisco, USA

Global Summit on
Emerging Orphan Drugs and Drug Abuse
Aug 23-24 , 2017 San Francisco, USA

2nd International Pharmacy Conference
Sep 01-02, 2017 Las Vegas, USA

4th International Conference on
Clinical Trials
Sep 11-13, 2017 San Antonio, USA

World Congress on
Biotherapeutics and Bioanalytical Techniques
Sep 11-12, 2017 Dallas, USA

6th International Conference on
Forensic Research & Technology
Sep 18-20, 2017 Houston, USA

6th International Summit on
GMP, GCP & Quality Control
Sep 25-26, 2017 Chicago, USA

7th International Conference and Exhibition on
Pharmaceutical Regulatory Affairs and IPR
Sep 25-26, 2017 Chicago, USA

10th Pharmacovigilanace Congress
Sep 21-22, 2017 Charlotte, USA

10th International Conference and Exhibition on
Biologics and Biosimilars
Oct 16-17, 2017 Baltimore, USA

11th World Drug Delivery Summit
Oct 16-18, 2017 NewYork, USA

5th International Conference on
Clinical Pharmacy
Oct 23-24, 2017 Orlando, USA

2nd International Conference on
Marchine Drugs & Natural Products
Jun 15-17, 2017 London, UK

9th Annual European Pharma Congress
Jul 10-12, 2017 Madrid, Spain

9th International Conference and Exhibition on
Pharmacovigilance & Drug Safety
Jul 17-18, 2017 Munich, Germany

International Conference on
Environmental Chemistry and Engineering
Jul 24-25, 2017 Madrid, Spain

13th International Conference and Exhibition on
Pharmaceutical Nanotechnology
Jul 24-25, 2017 Madrid, Spain

3rd World Congress and Exhibition on
Antibiotics and Antibiotic Resistance
Jul 31-Aug 01, 2017 Milan, Italy

7th Global Experts Meeting on
Neuropharmacology
Jul 31-Aug 02, 2017 Milan, Italy

2nd International Conference on
Generic Drugs and Biosimilars
Aug 24-25, 2017 Birmingham, UK

14th International Conference and Exhibition on
Pharmaceutical Formulations
Aug 28-29, 2017 Brussels, Belgium

9th World Congress on **Pharmacology**
Sep 04-06, 2017 Paris, France

3rd International Conference on
Advanced Clinical Research and Clinical Trials
Sep 20-21, 2017 Dublin, Ireland

8th Annual Pharmaceutical Analysis Conference
Sep 25-26, 2017 Vienna, Austria

International Conference on
Biotech Pharmaceuticals
Oct 23-25, 2017 Paris, France

3rd International Conference and Expo on
Drug Discovery & Designing
Sep 25-27, 2017 Vienna, Austria

European Biopharma Congress
Nov 16-17, 2017 Vienna, Austria

International Conference on
Pharmaceutical and Biomedical Engineering
Jun 12-13, 2017 Taipei, Taiwan

3rd Global Summits on
Herbal & Traditional Medicine
Oct 18-20, 2017 Osaka, Japan

4th World Congress on
Drug Discovery & Designing
Jul 03-05, 2017 Thailand, Bangkok

11th International Conference on
Pharmacoepidemiology and Clinical Research
Jul 06-08, 2017 Kuala Lumpur, Malaysia

8th Global Pharmacovigilance & Drug Safety Summit Jul 10-11, 2017 Jakarta, Indonesia

9th World Congress on
BA/BE Studies and Biowaivers
Jul 17-19, 2017 Melbourne, Australia

5th International Conference and Exhibition on
Pharmacognosy, Phytochemistry & Natural Products Jul 24-26, 2017 Melbourne, Australia

8th Wolrd Congress on
Pharmacology and Toxicology
Jul 24-26, 2017 Melbourne, Australia

8th Asian Biosimilars Congress
Aug 10-12, 2017 Beijing, China

12th Annual Pharma Middle East Congress
Sep 25-27, 2017 Dubai, UAE

9th Annual Congress on
Drug Formulation & Drug Design
Oct 19-21, 2017 Seoul, Republic of Korea

10th International Conference on
Neuropharmacology and Neuropharmaceuticals
Oct 23-24, 2017 Dubai, UAE

3rd World Congress on
Medicinal Plants and Natural Products Research
Oct 02-04, 2017 Kuala Lumpur, Malaysia

6th Global Congress on **Mass Spectrometry**
Oct 18-19, 2017 Osaka, Japan

16th Annual Medicinal & Pharmaceutical Sciences Congress
July 03-05, 2017 Kuala Lumpur, Malaysia

17th International Conference on
Nanomedicine and Nanotechnology in Health Care
Nov 23-24, 2017 Melbourne, Australia

10th International Conferences on
Immunopharmacology and Immunotoxicology
Nov 20-21, 2017 Melbourne, Australia

PHYSICAL THERAPY & REHABILITATION

5th International Conference and Exhibition on
Physical Medicine and Rehabilitation
Sep 11-12, 2017 Antonio, USA

4th International Conference on
Novel Physiotherapies
Aug 21-22, 2017 Birmingham, UK

World Physiotherapists & Physicians Summit
Jul 24-26, 2017 Melbourne, Australia

6th International Conference on
Physiotherapy
Nov 27-28, 2017 Dubai, UAE

PHYSICS

3rd International Conference on
Theoretical and Condensed Matter Physics
Oct 19-21, 2017 NewYork, USA

2nd International Conference on
Astrophysics and Particle Physics
Oct 30-Nov1, 2017 San Antonio, USA

10th World Congress on**Lasers, Optics & Photonics**
Nov 02-04, 2017 San Antonio, USA

2nd International Conference on
Atomic and Nuclear Physics
Nov 8-9, 2017 Las Vegas, USA

6th International Conference on
Photonics
Jul 31-Aug 1, 2017 Milan, Italy

7th International Conference on **Laser Optics**
Jul 31-Aug 2, 2017 Milan, Italy

2nd International Conference on **Physics**
Aug 28-30, 2017 Brussels, Belgium

2nd International Conference on
Quantum Physics and Quantum Technology
Sep 25-26, 2017 Berlin, Germany

International Conference on
High Energy Physics
Dec 11-12, 2017 Madrid, Spain

PSYCHIATRY

3rd International Conference on
Mental Health & Human Resilience
Jun 21-23, 2017 London, UK

Meet Inspiring Speakers and Experts at our 3000+ Global Events Every year on Medical, Pharma, Engineering, Science, Technology, Business and 40 Varient fields

3rd International Conference on
Depression, Anxiety and Stress Management
Jun 21-22, 2017 London, UK

20th Euro Congress on
Psychiatrists and Psychologists
Aug 07-08, 2017 Madrid, Spain

23rd International Conference on
Adolescent Medicine & Child Psychology
Sep 28-29, 2017 Berlin, Germany

2nd Experts Meeting on
Forensic Psychology and Criminology
Oct 02-03, 2017 London, UK

24th International Conference on
Psychiatry & Psychosomatic Medicine
Oct 02-04, 2017 London, UK

19th Global Congress on
Pediatric & Child Psychiatry
Jul 12-13, 2017 Chicago, USA

25th World Summit on
Psychology, Psychiatry & Psychotherapy
Oct 19-20, 2017 San Francisco, USA

International Conference on **Clinical Psychology**
Jun 26-27, 2017 Thailand, Bangkok

5th International Conference on
Counseling Psychology
Oct 16-17, 2017 Osaka, Japan

International Conference on
Psychiatry and Mental Health
Nov 20-21, 2017 Melbourne, Australia

10th World Psychiatrists Meet
Dec 07-08, 2017 Dubai, UAE

RESPIRATORY

5th International Conference and Exhibition on
Lung and Respiratory Care
Oct 19-20, 2017 San Francisco, USA

4th International Conference on
Respiratory and Pulmonary Medicine
Jul 17-18, 2017 Melbourne, Australia

SURGERY

5th Global Summit and Medicare Expo on
Head and Neck Surgery
Jun 19-20, 2017 Philadelphia, USA

2nd International Conference and Exhibition on
Plastic and Reconstructive Surgery
Jun 19-20, 2017 Philadelphia, USA

9th Orthopedics Expo & Surgeons Meeting
Jul 12-13 , 2017 Chicago, USA

2nd International Conference on
Plastic and Aesthetic Surgery & Medicine
Jul 27-28, 2017 Vancouver, Canada

International Conference on
Metabolic and Bariatric Surgery
Jun 12-13, 2017 Madrid, Spain

2nd International Conference on
Anesthesia and Analgesia
Sep 07-08, 2017 London, UK

6th International Conference and Exhibition on
Surgery
Sep 07-09, 2017 London, UK

2nd International Conference on
Ear, Nose and Throat Disorders
Oct 16-18, 2017 Madrid, Spain

10th Global Orthopedicians Annual Meeting
Jul 03-05, 2017 Kuala Lumpur, Malaysia

International Conference on
Ear Nose and Throat Disorders
Jul 06-08, 2017 Kuala Lumpur, Malaysia

International Conference on **Aesthetic Medicine**
Jul 06-08, 2017 Kuala Lumpur, Malaysia

4th International Conference and Exhibition on
Rhinology and Otology
Oct 18-20, 2017 Dubai, UAE

TOXICOLOGY

10th Global Summit on
Toxicology and Applied Pharmacology
Jul 20-22, 2017 Chicago, USA

3rd Annual Genomics and Toxicogenomics Conference Sep 27-28, 2017 Chicago, USA

12th International Conference on
Environmental Toxicology and Ecological Risk Assessment
Oct 19-20, 2017 Atlanta,USA

9th Euro-Global Summit on
Toxicology and Applied Pharmacology
Jun 22-24, 2017 Paris, France

11th International Congress on
Toxicology and Risk Management
Oct 10-12, 2017 London, UK

International Conference on
Occupational Toxicology and Industrial Health
Oct 16-17, 2017 Dubai, UAE

VACCINES

18th Global Summit and Expo on
Vaccines & Vaccination
Sep 18-19, 2017 Houston, USA

19th World Congress on **Vaccines, Therapeutics for Infectious and Emerging Diseases**
Oct 02-03, 2017 Chicago, USA

16th Euro Global Summit and Expo on
Vaccines & Vaccination
Jun 19-21, 2017 Paris, France

17th International Conference on
Children Vaccines
Aug 21-22, 2017 Birmingham, UK

27th Asia Pacific Vaccines & Vaccination Conference
Oct 05-07, 2017 Kuala Lumpur, Malaysia

29th Global Vaccines & Vaccination Summit And Expo
Nov 30-Dec 1, 2017 Dubai, UAE

VETERINARY

8th International Conference on
Animal Health and Veterinary Medicine
Oct 02-04, 2017 Toronto, Canada

9th Global Veterinary Summit
Nov15-16, 2017 Las Vegas, USA

7th International Veterinary Congress
Sep 04-06, 2017 Paris, France

3rd International Conference on
Livestock & Nutrition
Jun 29-30, 2017 Bangkok, Thailand

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8th International Conference and Exhibition on

Materials Science and Engineering

May 29-31, 2017 Osaka, Japan

Keynote Forum

(Day 1)



X W Zhou, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-063

8th International Conference and Exhibition on
MATERIALS SCIENCE AND ENGINEERING
May 29-31, 2017 Osaka, Japan



X W Zhou

Sandia National Laboratories, USA

Molecular dynamics analysis of thermodynamic and kinetic properties of surfaces and interfaces of PdHx

This work uses molecular dynamics simulations to study surface and interface properties of PdHx that are relevant to hydrogen storage applications. In particular, surface energies, interfacial energies, surface diffusivities, and surface segregations are all determined as a function of composition and temperature. During the course of the calculations, we demonstrated robust molecular dynamics methods that can result in highly converged finite temperature properties. Challenging examples include accurate calculations of hydrogen surface diffusivities that account for all possible atomic jump mechanisms, and constructions of surface segregation composition profiles that have negligible statistical errors. Our robust calculations reveal that the Arrhenius plots of hydrogen surface diffusion is ideally linear at low compositions, and becomes nonlinear at high compositions. The fundamental cause for this behavior has been identified. This nonlinear surface diffusion behavior is also in good agreement with available experimental data for bulk diffusion. The implication of our calculated properties on hydrogen storage application is discussed.

Biography

X W Zhou completed his PhD from Clemson University, South Carolina, USA. He has been Principal Member of technical staff, Mechanics of Materials Department, Sandia National Laboratories since 2012. He has published more than 100 papers in reputed journals and has been serving as an Editorial Board Member of Journal of Materials Science Research.

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conferenceseries.com

Chia-Jyi Liu, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-063



Chia-Jyi Liu

National Changhua University of Education, Taiwan

Energy-saving fabrication of Ag2Te-Te and $Co_{1-x-y}Ni_xFe_y$ thermoelectric materials

Thermoelectric materials can be used to generate electricity from waste heat via the Seebeck effect. High-energy input is often required to fabricate thermoelectric materials. In this talk, we present a green route to synthesize Ag_2Te-Ag nanocomposites with the reaction taking place in one pot at room temperature without any organic substance involved. Various amounts of silver in the Ag_2Te-Ag nanocomposite can be obtained depending on the reaction period of time. A possible mechanism is presented for the formaiton of Ag_2Te-Ag nanocomposite. A core-shell structure at the incipient stage of Ag_2Te growth can be observed. However, the reaction duration has a significant effect on the electrical transport behavior of the nanocomposites due to presence of various amounts of Ag, which might be beneficial for enhancing the performance of thermoelectric composites. We also present a rapid route for fabricating co-doped $Co_{1-x-y}Ni_xFe_ySb_3$ using hydrothermal methods. Hydrothermal synthesis was carried out at 170°C for a duration of 12 h, followed by evacuated-and-encapsulated heating at 580°C for a short period of 5 h. The resulting samples are characterized using powder X-ray diffraction, density, electronic and thermal transport measurements. Due to the bipolar effects on thermopower are shifted to higher temperatures as compared with the nondoped $CoSb_3$, the power factor of $Co_{1-x-y}Ni_xFe_ySb_3$ is significantly enhanced in the high temperature region due to significant enhancement of the electrical conductivity and absolute value of thermopower. The thermal conductivity of $Co_{0.76}Ni_{0.14}Fe_{0.10}Sb_3$ decreases with temperature down to 1.02 $Wm^{-1}K^{-1}$ at 600 K. As a result, the largest zT of 0.68 is attained for $Co_{0.76}Ni_{0.14}Fe_{0.10}Sb_3$ at 600 K. We also analyze the lattice thermal conductivity to gain insight into the contribution of various scattering processes that suppress the heat transfer through the phonons in $Co_{1-x-y}Ni_xFe_ySb_3$.

Biography

Chia-Jyi Liu is currently a Distinguished Professor at National Changhua University of Education, Taiwan. He received BSc from National Taiwan University in 1984. He received PhD from Johns Hopkins University in 1991 under the supervision of Prof. Dwain O Cowan who discovered the first organic metal TTF-TCNQ. He worked as a Post-doctor at the Johns Hopkins University, Southern Illinois University at Carbondale (1991-1992), as a Visiting Scientist at Superconducting Research Laboratory, International Superconductivity Technology Center, Japan (1992-1994), as a Research Fellow at Victoria University of Wellington, New Zealand (1995-1996) and as a Researcher at Industrial Research Limited, New Zealand (1996). His current interest is now developing novel materials for thermoelectrics.

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Sirikanjana Thongmee, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-063



Sirikanjana Thongmee

Kasetsart University, Thailand

Synthesis and properties of metal doped ZnO nanostructures for devices applications

The effects of substituting Ag3+ into Ag-doped ZnO NR's, $Zn_{1-x}Ag_xO$ (x=0.0, 0.1, 0.2, 0.3, 0.4 and 0.5) are investigated. X-Ray Diffraction (XRD) patterns do not indicate that the Ag ions are systematically replacing the Zn ions but instead are forming into nano Ag particles. Since the radius of the Ag^{3+} ions (0.126 nm) is much greater than that of Zn^{2+} (0.072 nm), there would be a tremendous amount of lattice distortion if at the higher level of Ag doping, the Ag ions replaced the Zn ions at the lattice sites. In the XRD patterns for the pure and x=0.1 NR's, we did not observe any peaks of the FCC crystal structure of Ag. When Ag was increased to x≥0.3, we see the reflection from the Ag (1 1 1) and Ag (2 0 0) planes. SEM shows that the morphologies of NR's are changing along with the shape of the rods as the level of Ag substitute increases. For pure ZnO, the rods are orientated perpendicular to the plane and appear to be hexagonal. The SEM images of the 1% Ag doped ZnO NR's still show the presence of rod shaped particles. The morphologies of the 2% Ag doped ZnO NR's are quite different. Some of them appear in star shape with a few arms emanating from a central point. SEM image of 5% Ag doped NR's showed ZnO NR's appear to be "broccoli" shaped. The results from PL spectrum revealed that the visible light emission of the undoped ZnO NR's are somewhat suppressed but becomes strongly enhanced (in the region between 450–600 nm) as the level of Ag doping is increased to 1%, then to 2%. This could be taken as evidence that more defects were being created as the Ag ions were replacing the Zn in their sites in the wurtzite structure.

Biography

Sirikanjana Thongmee is an Assistant Professor of Physics. She was in Physics Department, Faculty of Science, Kasetsart University. She got her BSc in Physics at Prince of Songkla University, MSc in Chemical Physics at Mahidol University and PhD (Materials Science) at National University of Singapore. She got the Thesis Presentation Award, Mahidol University, Thailand in 1999 and Outstanding Research of the Year - 2nd Class Award, Office of the National Research Council of Thailand in 2003. Currently her research focuses on the metal doped ZnO for spintronics and gas sensors applications, magnetic nanomaterials, graphene oxide for different applications and activated carbon from agricultural waste.

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Materials Science and Engineering

May 29-31, 2017 Osaka, Japan

Scientific Tracks & Abstracts

(Day 1)



Session

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

Session Chair
Xiaowang Zhou
Sandia National Laboratories, USA

Session Co-chair
Chia-Jyi Liu
National Changhua University of Education, Taiwan

Session Introduction

Title: **Ceramic structures made by additive manufacturing**
Jun Ding, National University of Singapore, Singapore

Title: **The mechanism of Mn, Si, Al, O segregation in FSW of DH36 steel**
Montadhar Almoussawi, Sheffield Hallam University, UK

Title: **Dynamic decellularization and recellularization of vascular grafts**
Jana Zarubova, Institute of Physiology of the Czech Academy of Sciences, Czech Republic

Title: **Prospects of nanostructured semiconductor thin films and composites for solar hydrogen energy conversion and storage**
Meng Nan Chong, Monash University, Malaysia

Jun Ding, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

Ceramic structures made by additive manufacturing

Jun Ding
National University of Singapore, Singapore

Additive manufacturing has been widely used in fabrication of structural and functional devices. Additive manufacturing has a great potential in producing novel products with geometry and functionality which cannot be or very difficultly obtained using conventional manufacturing techniques. Polymeric materials have been widely used in additive manufacturing because of their low melting temperatures. Some metals have been used in additive manufacturing after the successful development of novel technologies such as selective laser melting. High-quality ceramic structures are still challenging because of high melting temperature and brittleness. We have paid a great attention on additive manufacturing of ceramic structures. In our recent research, we have used extrusion free-forming in fabrication of high-quality ceramic structures including YBCO high-Tc superconductor, hard and soft magnetic ferrites and ZrO2. In addition, digital light projection has been used in fabrication of ceramic structures.

Biography

Jun Ding is Professor at Department of Materials Science & Engineering, National University of Singapore. He has been working on Functional Materials (particularly Magnetic Materials) over 25 years. His current research is focusing on Additive Manufacturing (3D Printing) with the emphasis of advanced functional and multi-functional devices.

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Notes:

Al-moussawi M, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

The Mechanism of Mn, Si, Al, O Segregation in FSW of DH36 Steel

Al-moussawi M
Sheffield Hallam University, UK

The recants findings in unpublished work on friction stir welding of DH36 steel carried out at TWI company shows elements segregation of Mn, Si, O, Al when the welding speeds exceeds 500RPM-400 mm/min. The mechanism of this segregation is not fully understood and the presence of Oxygen within this segregated elements is also needs investigation. This work investigate for the first time the elements segregation of DH36 steel by carrying out many heat treatments in within ranges of temperatures 1200-1500 and different cooling rates. Two welding speeds were also used during the welding process, low welding speeds (100mm/min, 200RPM) and high welding speeds (400mm/min, 550RPM). The results showed that segregation is only starting when the temperature exceeds 1400 and the complete segregation of Mn, Si, O, Al is occur at 1450C and also is associated with acicular ferrite formation. It is found also high rotational speeds exceeds 500RPM are causing a local melting at advancing-trailing side. The study is aim to estimate peaks temperatures limits that is not causing segregation by choosing the suitable tool rotational and traverse speeds.

Biography

Montadhar Almoussawi is a PhD student working on a project about friction stir welding of steel alloys, he is doing modelling and simulation for the process, tool optimisation and many experimental including SEM_EDS, XRD residual stress analysis and heat treatments. The project aim is to control the welding parameters in order to produce sound welds.

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Notes:

Jana Zarubova, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

Dynamic decellularization and recellularization of vascular grafts

Jana Zarubova
Institute of Physiology of the Czech Academy of Sciences,Czech Republic

Cardiovascular diseases are one of the leading causes of death worldwide [1]. A common treatment option to replace the diseased blood vessels is vascular grafting using patient's own blood vessels. The availability of such grafts is however limited by the patient's age or pathology. Artificial alternatives to the autologous grafts are currently made of relatively inert non-degradable materials such as expanded polytetrafluoroethylene and polyethylene terephthalate [2]. These polymers have been successfully used for the replacements of blood vessels with a high blood flow and an internal diameter larger than 6 mm. However, smaller-diameter grafts show very poor long-term patency, largely due to the thrombogenicity of the artificial surface under low flow conditions and intimal hyperplasia [3, 4]. Recently, decellularized tissues have emerged as promising scaffolds for constructing replacements of various tissues and organs. In this study, decellularization of porcine vessels in a perfusion dynamic system was examined and compared with the manual decellularization procedure. The composition of extracellular matrix proteins [5], structure and mechanical properties of decellularized vessels were tested and compared with native blood vessels. Decellularized scaffolds were then seeded with endothelial cells and adipose-derived stem cells and cultured in a bioreactor with defined shear stress in order to simulate physiological conditions in the body. It was shown that dynamic decellularization dramatically shortens the time needed for decellularization. It also enables standardization of the decellularization process resulting in a consistent scaffold material. Cultivation of recellularized vessels under dynamic conditions induces anti-thrombogenic phenotype in endothelial cells and improves cell adhesion and ingrowth into the scaffold.

Biography

Jana Zarubova gained her Ph.D. in Biochemistry from the Charles University in Prague. Her research focuses mainly on the design and biological evaluation of materials for vascular and bone tissue engineering. Jana Zarubova participates in the development of bioreactors for dynamic cell culture. She has long-term experience with mesenchymal stem cell culture, differentiation and their co-culture with different cell types. Jana Zarubova is also interested in the extracellular matrix and its influence on cell behavior.

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Notes:

Meng Nan Chong, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

Prospects of nanostructured semiconductor thin films and composites for solar hydrogen energy conversion and storage

Meng Nan Chong
Monash University, Malaysia

Solar energy being the largest renewable energy source on earth is an attractive energy source option that could be harnessed to electrify the cities of future. Among the various available solar-based technologies, the conversion of solar into storable form of hydrogen (H2) energy via the photoelectrochemical (PEC) technology is a promising way to harness the great benefits from the Sun. This is achieved through the application of nanostructured semiconductor photoelectrodes in an electrochemical cell, whereby water molecules are dissociated into H_2 and oxygen through the sequential PEC reactions occurring on the semiconductor surfaces. To date, however, almost all the singular semiconductor photoelectrodes used exhibited poor performance and low efficiency during the solar H_2 fuel conversion. The effective separation of photogenerated charge carriers in photoelectrodes is a key to alleviate this technical issue. This presentation outlines the photogenerated charge transfer properties and PEC water splitting ability in various nanostructured semiconductor thin films and composites. Specifically, singular and composite semiconductor materials of α-Fe_2O_3, $BiVO_4$, and MoO_3 synthesized on fluorine-doped tin oxide as active photoelectrodes used for solar energy conversion and storage are discussed. Additionally, the role and mechanism of metal and non-metal dopants on the photogenerated charge transfer properties of semiconductor thin films and composites are elucidated. These are further interpreted using the outcomes from an advanced suite of characterisation methods, including FE-SEM, EDX, XPS, XRD and FTIR, and EIS. It is believed that the fundamental understanding gained through our studies is essential and helpful to design high-performance photoelectrodes for the application in PEC water splitting.

Biography

Chong is an Associate Professor at Monash University Malaysia. He is also holding several adjunct positions and a prestigious fellowship, including a Visiting Professor at the University of Ulsan, Republic of Korea; a Senior Research Fellow at the University of South Australia; a Visiting Scientist at the Max Planck Institute for Chemical Energy Conversion, Germany; and being awarded the prestigious Royal Society Newton Advanced Fellowship (UK) in collaboration with University College London. To date, he has published close to 130 publications in journals, conference proceedings, book and book chapters, and technical reports.

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Notes:

Session

Day 1 May 29, 2017

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

Session Chair
Sirikanjana Thongmee
Kasetsart University, Thailand

Session Co-chair
Meng Nan Chong
Monash University, Malaysia

Session Introduction

Title: **Magnetic properties of titanium dioxide – reduce graphene oxide composite**
Dusadee Khamboonrueang, Kasetsart University, Thailand

Title: **A Feasibility study of raak kaew energy plant as fuel on the sustainable electricity biomass generation**
Somkiat kruaysawat, Sripatum University, Thailand

Title: **Magnetic properties in multi-layer ferrite thin films via spin-spray deposition**
Hyoung Woo Yang, Korea Electronics Technology Institute, Republic of Korea

Title: **Synthesis and magnetic behavior of Fe-Co nanoparticles**
Pimsiri Potpattanapol, Kasetsart University, Thailand

Title: **3,4 -dihydro-1,3-2h-benzoxazine: Novel reducing agent for ag(i) ion toward nano metallic silver and its applications**
Attaphon Kaewvilai, Kasetsart University, Thailand

Title: **Preparation of grapheme aerogel for absorption radionuclide form Iodine in water**
Tanate Suksompong, Kasetsart University, Thailand

Dusadee Khamboonrueang, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

Magnetic properties of titanium dioxide – reduce graphene oxide composite

Dusadee Khamboonrueang
Kasetsart University, Thailand

Titanium dioxide – reduce graphene oxide (TiO_2-RGO) composite having difference weight ratio up to 20 wt%were synthesisby hydrothermal method.The hydrothermal method were easier way to prepare TiO_2-RGO composites and can also change graphene oxide to reduced graphene oxide along with the particles of titanium dioxide loaded on the surface of the reduce graphene oxide sheet.The image of scanning electron microscopy (SEM) and Transmission electron microscopy (TEM)show the image of titanium dioxide particle dispersed on the surface area of reduce graphene oxide sheet. The peak from Fourier-transform infrared spectra analyzer(FT-IR) showed the peak of functional group of Ti-C-O at 1200 cm^{-1} and 1070 cm^{-1}. XRDspectra show titanium dioxide anatase phase peakand The Magnetic properties of the TiO_2-RGO were present in weight ratio 5 to 20 wt% as measured by SQUID magnetometer increased 25.14x10-4 emu/g.

Biography

DusadeeKhamboonrueangis a PhD student in Physics, Department of Physics. Faculty of Science Kasetsart University, Bankok and a lecturer in major Physics,Department of Science, Faculty of Science and Technology NakhonSawanRajabhat University, NakhonSawan, Thailand. Her research interest is the research on how to synthesize the composite of titanium dioxide – grapheme, the properties of composite and it'sapplications.She has expertise in materials science and renewable energy.

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Notes:

Somkiat Kruaysawat, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

A feasibility study of Raak Kaew Energy plant as fuel on the sustainable electricity biomass generation

Somkiat Kruaysawat
Sripatum University, Thailand

The objectives of this research were to study the yield, biogas production potential, grass pellet, and biomass produced from Napier Raak Kaew grass (*Pennisetum purpureum* Schumach). All of main points need to produce energy material as fuel on the sustainable electricity biomass generation. The first result gave the maximum yield of the grass at 105 tons/rai/year. The second, this experiments by analysis BMP test method were shown biogas production potential at 455 m^3/ton $_{ODS}$ or 101 m^3/ton $_{fresh\ grass}$. However, the result found that the fresh grass had the potential to produce the specific methane yield at 243 m^3 CH_4/ton $_{ODS}$ or 53.9 CH_4/ton $_{fresh\ grass}$. The third, grass pellet was produced from the grass was cutting interval at 90 days. The analysis results were found by EN 14918 standard method showed that the Gross Calorific Value as received basis and as determined basis were 4,075 and 4,127 Kcal/Kg respectively. The net calorific value as received basis was 3,749 Kcal/Kg. In addition, the total moisture was 7.48% and the bulk density was 17.14 Kg/m3. Finally, this grass was used as fuel on biomass power plant was cutting interval at 120 days. The analysis results by ASTM D5865-11a method showed that the gross calorific value and the net calorific value as dry basis were 4,406 and 4,109 Kcal/Kg or 18.44 and 17.19 Mj/Kg respectively.

Biography

Somkiat Kruaysawat has his expertise in removal of low molecular weight gases by activated carbon adsorption in air pollution and water pollution and renewable energy (wood pellet and biomass). He had got a Scholarship from Sripatum University to study PhD Program in Environmental Engineering. Till now, he has been working as a Lecturer (Assistant Professor in Chemistry) at Department of Applied Science, Institute of General Education, Sripatum University since 1997.

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Notes:

Hyoung Woo Yang, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

Magnetic properties in multi-layer ferrite thin films via spin-spray deposition

Hyoung Woo Yang
Korea Electronics Technology Institute, Republic of Korea

The progress in the electronics industry demands a number of new soft magnetic materials for inductive components in electronics. Recent developments of ferrites can fulfill the special requirements of electromagnetic interference (EMI) and near field communication (NFC) applications. Here, we have developed well-ordered multi-layer thin films with Mn-Zn ferrite and Ni-Zn ferrite on PI substrates by the spin-spray deposition method. Structure analysis indicates that the crystal structure of multi-layer ferrite thin film is spinel structure, which also has a columnar structure normal to the surface. The multi-layer ferrite thin films exhibit high permeabilities that exceed the Snoek limit for bulk Mn-Zn ferrite and Ni-Zn ferrite. Multi-layer ferrite thin films have relatively high permeability μ' ~ 500 and μ" ~ 1 up to 50 MHz, and is promising to be used as thin film devices such as a magnetic applications. The spin-spray deposited Mn-Zn ferrite/Ni-Zn ferrite multi-layer heterostructures exhibiting high magnetic properties at both low and high frequencies provide great opportunities for fundamental studies and novel magnetic devices.

Biography

Hyoung Woo Yang has research interest in designing of transition metal oxide materials and functional materials with remarkable properties, and an atomic-level understanding of fundamental principles of novel physical and mechanical phenomena under ambient or extreme conditions, by developing and utilizing strain engineering methods and other approaches.

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Notes:

Pimsiri Potpattanapol, J Material Sci Eng 2017, 6:3 (Suppl)
DOI: 10.4172/2169-0022-C1-064

Synthesis and magnetic behavior of Fe-Co nanoparticles

Pimsiri Potpattanapol
Kasetsart University, Thailand

Magnetic Behavior in FeCo nanoparticle is investigated. A series of Fe1-xCox (x = 0.3, 0.5 and 0.7) nanoparticles were fabricated using the hydrothermal method. XRD studies determined that the structures of the first two NP's were BCC while that of the third was of a disordered structure having a few small disordered BCC crystallites. SEM images of the first two showed that these nanocrystals have well structured pyramid shapes with planar surfaces on them. FC and ZFC magnetization curves showed the temperature dependences of the magnetization of the third FeCo NP's were different from those of the first two. The hysteresis loops at 300 K, 150 K and 10 K showed horizontal shifts of most of the loops seen. Most of the shifts were towards the left, meaning that in most of the NP's, it took more work to flip the spin in an increasing magnetic field than in a decreasing magnetic field.

Biography

My name is Pimsiri Potpattanapol. I come from Thailand. I'm studying for a master degree in Physics at Kasetsart University. I'm interested in material science. Since I was studying undergraduate so I have a chance to study material science seriously. For my first research, I studied the synthesis of Nanowires and chemical reaction methods. It was analyzed by the physical properties and the magnetic properties. And in my current work, I have synthesized nanoparticles by hydrothermal method. It made me discover many new things and I got the knowledge more. In the future, I hope that I will have the opportunity to fabricate nanomaterials for our nation and planet.

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Notes:

Attaphon Kaewvilai et al., J Material Sci Eng 2017, 6:3 (Suppl)
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3,4-dihydro-1,3-2h-benzoxazine: Novel reducing agent for Ag(I) ion toward nanometallic silver and its applications

Attaphon Kaewvilai[1,2], Aphichart Rodchanarowan[2] and Apirat Laobuthee[2]
[1]King Mongkut's University of Technology North Bangkok, Thailand
[2]Kasetsart University, Thailand

This work was divided into 4 research portions as follows. Firstly, the research presented to the synthesis of a mono-functional benzoxazine by Mannich reaction and its structural characterizations by various spectroscopic techniques such as UV-Vis, FTIR, 1H-NMR and MS. In the second part, a special property of mono-functional benzoxazine was studied for reducing silver nitrate to nano-metallic silver (Ag). By spectroscopic results, the speculated mechanism has been proposed to cationic radical reaction. The formation of nano silver from spherical silver to coral-like and dendrite-like structures was observed by TEM. For the third part, the nano-metallic silver was applied to coating materials for antimicrobial activity. Three types of materials, fumed silica (SiO2), titanium dioxide (TiO2) and carbon black (CB) were used as a powder substrate for Ag coating. The obtained Ag-coated products were characterized by XRD, XRF, EDX, TEM and TGA. Moreover, the Ag-coated powders were tested to antimicrobial activity by disk diffusion method. Again, the coated materials showed satisfied antibacterial results. Finally, the nano-Ag was used as an activation surface for copper electroless plating on non-conductive glass substrates. The results from SEM, XRD, XRF and TEM indicated that nano-metallic Ag was successfully prepared and could be coated on the glass substrate. According to the SEM and AFM observation, the deposited Cu film was uniformly growth as a smooth film of dense particles. In addition, the adhesion of the deposited copper was conducted by using the tape-test technique according to ASTM D3359-02, and the results exhibited a strong adhesion of the copper film on the glass substrate.

Biography

Attaphon Kaewvilai has expertise in 3,4-dihydro-1,3-2H-benzoxazines and its metals ions responsive property. He can be modifying structure of benzoxazine for improving the metal ions responsive property. Moreover, he firstly report the novel ligand based mono-functional benzoxazine for Ce(III) ions. He has applied the ions responsive property of benzoxazine as a starting material for preparation of advanced materials such as nano ceria, and metal ions sensing materials. Now, he proposed an interesting phenomena for the reduction of Ag(I) Ion to nano metallic silver and their coating applications such as antibacterial materials and electroless copper plating.

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Notes:

Tanate Suksompong, J Material Sci Eng 2017, 6:3 (Suppl)
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Preparation of grapheme aerogel for absorption radionuclide form Iodine in water

Tanate Suksompong
Kasetsart University, Thailand

Graphene Aerogels (GAs) is one of the most promising nanomaterials leading to several potential applications to capture and sequestration of radionuclides, in this work, the synthesis **Graphene Oxide** (GO) was fabricated based on the modified Hummer's method. **Graphene Oxide** gel (GO gel) prepared by centrifuged graphene solution at 5000 rpm for 20 min then it washed by DI water. In case of graphene aerogel, the dry graphene oxide gel by Freeze Drying (at -10 °C for 300 min). For absorption part we mixed GO gel 0.5 g and GAs0.5 g with Sodium iodide solution concentration 3.40% (w/v) at room temperature for 24 hours. It was revealed that the type of graphene has impacts to the adsorption iodine particles in water. The results of **Scanning Electron Microscopy** (SEM) showed iodine particles on the surface of GO aerogel more than GO gel. Moreover the results of EDX show percentage of Iodine element inside The GO aerogel have 14.97% it better than the GO gel have 4.82 % of iodine element on the surface.

Biography

Tanate Suksompong current position is a Scientist and Researcher at Department of Applied Radiation and Isotopes Faculty of Science, Kasetsart University. **Tanate Suksompong** have 4 years experience in radiation detection and nuclear instrument operation i.e. Gamma spectrometer, Liquid scintillation counter and Imaging plate system. Also, **Tanate Suksompong** have an experiences in the design and development of radiation instrument such as development of data storage system for multichannel analyzer by using SD card. **Tanate Suksompong** is also responsible for the academic services in radionuclide measurement in foods imported from Japan.

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Jun Ding, J Material Sci Eng 2017, 6:3 (Suppl)
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8th International Conference and Exhibition on
MATERIALS SCIENCE AND ENGINEERING
May 29-31, 2017 Osaka, Japan



Jun Ding

National University of Singapore, Singapore

Fabrication and application of microlattices made by additive manufacturing

In recent years, cellular structures have found wide applications such as light-weight materials, catalysts, electrodes, energy absorbers and sound absorbers and heat separators. Additive manufacturing has provided the platform for fabrication of cellular structures with geometries which are not possible to be obtained using conventional fabrication techniques. Among many unique cellular structures, micromesh and microlattice have been widely investigated by additive manufacturing. Unique mechanical properties have been reported in microlattice for applications including light-weight, energy absorption etc.In our recent studies, we have paid particular attention for other applications, such as electrochemical electrode and unique filter.The cellular structure has shown promising results for various applications, including water splitting, electrochemical separation of heavy metal ions. More recently, we have successfully developed a novel magnetic separator for high-efficiency removal of heavy metal ions. Unique magnetic mesh plus quasi-superparamagnetic nanoparticles enables removal of heavy metal ions at low magnetic field (< 1 kOe). Soft-magnetic mesh can be easily recovered for reuse, while heavy ions can be removed by suitable pH values. Compared to relatively expensive regeneration of ion-exchange, the newly developed magnetic separation is promising for practical applications.

Biography

Jun Ding is Professor at Department of Materials Science & Engineering, National University of Singapore. He has been working on functional materials (particularly magnetic materials) over 25 years. His current research is focusing on additive manufacturing (3D printing) with the emphasis of advanced functional and multi-functional devices.

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Uwe Erb, J Material Sci Eng 2017, 6:3 (Suppl)
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Uwe Erb

University of Toronto, Canada

Crystallography of the corneal nanonipple structure on butterfly eyes

One specific type of corneal nano-nipple arrays found on many insect compound eyes are hexagonally arranged protrusions in the shape of inverted paraboloids. Prior studies have focused on the anti-reflection properties of the eyes due to the nano-nipple structure, which depends mainly on the shape of individual nipples. However, in the past, little attention was given to the details of the arrangement of nano-nipples, which was qualitatively described as consisting of multiple domains. In the current study, remarkable defect structures were found through structural analysis using crystallographic principles. The investigated species is the Mourning Cloak butterfly (Nymphalis antiopa), which is common in North America as well as Europe and Asia. On its corneas, nano-nipples are predominantly in 2-D hexagonal arrangement with an average diameter of 170 nm and an average lattice parameter of 205 nm. An eye with 2 mm in diameter has approximately 10,000 ommatidia and 140 million nipples. However, within the hexagonal structure, there are nipples that deviate from the regular arrangement by having different numbers of Nearest Neighbours (NN); instead of 6 NN required by hexagonal symmetry, about 10% of nano-nipples have 5 or 7 NN and are described as 5- and 7-fold coordination defects (disclinations), respectively. Since the 5- and 7-fold disclinations usually occur adjacent to each other, they are collectively referred to as 5-7 defects. An individual 5-7 defect pair affects the nipple structure in a similar fashion as a dislocation in 2-D crystals. Furthermore, the 5-7 defects are not arranged randomly; instead, they show a strong preference to align in rows to divide the domains of nano-nipples like grain boundaries between crystals. The distribution of the domain sizes is log-normal, and analysis of the orientations of nipple domains indicate no preferred orientation. This intriguing structure will be discussed in reference to protrusion formation theories by i) microvilli secretion and ii) reaction-diffusion controlled coating development, respectively. Finally, a comparison will be presented with similar structural defects found in man-made 2-D materials such as self-assembled monolayers or graphene.

Biography

Uwe Erb received his PhD in Materials Science in 1980 from the University of Saarland (Germany). He currently is a Professor in Materials Science and Engineering at the University of Toronto. He is an Inventor on 18 patents related to the synthesis of nanostructured materials by electrochemical methods, and has authored about 250 scientific publications in the field of nanomaterials. He and his research team were the first to synthesize fully dense nanostructured materials in 1985, and developed numerous industrial applications for these materials with various companies. More recently, his research has been broadened to include bio-inspired nanostructures.

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Notes:

Osvaldo Mitsuyuki Cintho, J Material Sci Eng 2017, 6:3 (Suppl)
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Osvaldo Mitsuyuki Cintho

UEPG, Brazil

Study of mechanical behavior of cryogenic rolled pure metals

Deformation of metals at cryogenic temperatures (CT), or at temperatures close to liquid nitrogen (LN) temperature can suppress partly the dynamic recovery during deformation, allowing a higher final density of defects in the material than on a deformation at room temperature (RT). In another way, unusual deformation mechanisms can take place on cryogenic conditions. The dynamic recovery and recrystallization has a great dependence on stacking fault energy and on annealing characteristics due the dislocations distributions are a function of this energy. Annealing uses part of the stored energy in the material to the formation of new grains with low density of defects. In the present work pure metals with different stacking fault energy; aluminum (high), copper (medium) and silver (low); were rolled on room and cryogenic temperature and the products evaluate by tensile tests and hardness measurements just after rolling and after aging on room temperature. The results right after rolling show no great difference on tensile test curves but after aging, a very greater recovering of silver than other evaluated metals was detected. As showed on figure, both the rolled silver at room temperature and cryogenic temperature exibihit a great recovering level. In other side, the cryogenic rolling on silver promotes a higher tensile resistance and higher elongation after aging than the silver rolled at room temperature. This phenomenon can be due the unrecoverable defects at room temperature generated by deformations mechanism, which occurs at very low temperature (twinning).

Biography

Osvaldo Mitsuyuki Cintho has his expertise in high energy ball milling, cryogenic highenergy ball milling and cryogenic deformation processes. For analysis of these processes products, he developed devices and techniques like cryogenic x-ray diffraction system, cryogenic samples preparation methods for TEM-Transmission Electron Microscopy, Cryogenic system for the XTMS: x-ray diffraction and thermo mechanical system on Synchrotron line. Currently, he is researching about mechanical behavior and characterization of metals and steels on cryogenic conditions in order to propose a deformation mechanisms and recovering processes on this condition.

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Scientific Tracks & Abstracts

(Day 2)



Session

Catalytic Materials | Materials Science and Engineering | Nanomaterials | Materials in Research | Materials for Energy Applications

Session Chair
Jun Ding
National University of Singapore, Singapore

Session Co-chair
Uwe Erb
University of Toronto, Canada

Session Introduction

Title: **Applications of chalcogenide Ge-Sb-Se glass used for the molded lens of thermal camera using far infrared**
June Park, Photonics Technology Institute, Republic of Korea

Title: **Impact of Molecular Dynamics (MD) simulations in materials research**
Xiaowang Zhou, Sandia National Laboratories, USA

Title: **Enhanced 1.53 µm emission from Er/Yb fluorophosphate glasses for optical amplifiers**
Ganesh Agawane, Photonics Technology Institute, Republic of Korea

Title: **Synthesis of novel copolymer based butylimidazolium ionic liquid and polybenzimidazole as anion exchange membrane for fuel cell application**
Amina OUADAH, BIT, China

Title: **Diamond-like carbon thin film deposition by filtered cathodic vacuum arc source for wear resistance improvement of zirconia toughened alumina**
Ju Hyeon Choi, Photonics Technology Institute, Republic of Korea

June Park, J Material Sci Eng 2017, 6:3 (Suppl)
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Applications of chalcogenide Ge-Sb-Se glass used for the molded lens of thermal camera using far infrared

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Chalcogenide glasses including chalcogen elements sulfur, selenium and tellurium, have been studied in optics systemfor their unique properties including high refractive index and non-linearlity. Among various chalcogenide glasses, Ge-Sb-Se glasses show a good transmittance in the NIR and midIR spectrum from 2 μm ~ 16 μm and have excellent moldability for making molded lens. In order to find optimal lens molding conditions,we investigated thermal properties of Ge-Sb-Se glasses by varying different composition ratio.All of glass samples were synthesizedby using melt-quenching method in rocking furnace.The samples are categorized with two kind of chemical formula; $Ge_{(30-x)}Sb_{(10+x)}Se_{60}$ and $Ge_{(32.5-x)}Sb_{10}Se_{(57.5+x)}$. To confirm amorphous phase of samples, X-ray diffraction measurement was performed. The thermal and thermomechanical properties of Ge-Sb-Se glass sample were investigated using Differential Scanning Calorimetry (DSC) and thermo mechanical analyzer (TMA), respectively. According to increase of Ge element, Mean Coordination Number (MCN) is increased. We found that the glass transition temperature (Tg) of $Ge_{(30-x)}Sb_{(10+x)}Se_{60}$ decreased as the increase of MCN of $Ge_{(30-x)}Sb_{(10+x)}Se_{60}$. It is concluded that the thermal behavior of Ge-Sb-Se glass system is related to the mean bond energies of the elements. Finally, we optimized molding condition of chalcogenide glass system with their thermal properties.

Biography

June Park earned his Ph. D in Physics at Chung-Ang University, Republic of Korea, in Feb. 2011. He had studied optical properties of nanomaterials including carbon nanotubes, graphene and carbon related materials in his thesis. He worked as a PostDoc. with experience in synthesizing 2 dimensional materials for use in sensor, optical fiber laser and electronic devices using CVD mainly. Now, he is working for optical lens system at Korea Photonics Technology Institute.

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Notes:

X W Zhou et al., J Material Sci Eng 2017, 6:3 (Suppl)
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Impact of molecular dynamics (MD) simulations in materials research

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To improve awareness of impacts of Molecular Dynamics (MD) simulations on the advancement of materials science and technology, I will give an overview of our molecular dynamics studies of various material problems over the past 10 years. My topics will cover graphene, Giant Magnetoresistive (GMR) multilayers, CdTe/CdS solar cells, $In_xGa_{1-x}N$/GaN solid state lighting films, misfit dislocation theory, Al-Cu bond order potential, simulation of chemical reaction involving molecular H_2 gas, and radiation detecting $Cd_{1-x}Zn_{1-x}Te$. In particular, I will show that MD simulations have led to the development of a new million-dollar technology that significantly improved properties of GMR multilayers, and have led to the correction of two parameters in a widely used misfit dislocation theory.

Biography

X W Zhou completed his PhD from Clemson University, South Carolina, USA. He has been Principal Member of technical staff, Mechanics of Materials Department, Sandia National Laboratories since 2012. He has published more than 100 papers in reputed journals and has been serving as an Editorial Board Member of Journal of Materials Science Research.

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Notes:

G L Agawane, J Material Sci Eng 2017, 6:3 (Suppl)
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Enhanced 1.53 μm emission from Er/Yb fluorophosphate glasses for optical amplifiers

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Statement of the Problem: Erbium Doped Fiber Amplifiers (EDFAs) have been studied extensively to convert the NIR radiation into the visible light. The EDFAs can be applied in numerous optical applications like; optical fiber communication, data storage, biomedical diagnostic, color display, sensor,eye-safe laser and undersea optical communication. The host glass matrix noticeably affects the emission properties of the rare earth ions and, therefore, a broad study is obligatory for the exploration of the paramount apt host matrix. Fluorophosphate (FP) provides an excellent way to obtain the best matrix for doping of rare earths. The FP matrixes endure fracture toughness effortlessly making stable solid state lasers over extensive physical qualities. These matrixes are perfect for large inhomogeneous augmentation, superior broadband and flatness due to low phonon energy.Methodology & Theoretical Orientation:In this study, we report preparation of Er^{3+}/Yb^{3+} co-doped Fluorophosphate (FP) glasses containing aluminium-metaphosphate by melt quenching technique. The UV-Vis-NIR absorption measurements were carried out and analyzed through Judd–Ofelt model. Various spectroscopic properties like radiative lifetime, transition probability, intensity parameters Ωλ, emission cross-sections and stimulated absorption cross-sections at 1.53 μm have been evaluated.Findings: In this study, we report preparation of Er^{3+}/Yb^{3+} co-doped Fluorophosphate (FP) glasses containing aluminium-metaphosphate by melt quenching technique. The UV-Vis-NIR absorption measurements were carried out and analyzed through Judd–Ofelt model. Various spectroscopic properties like radiative lifetime, transition probability, intensity parameters Ωλ, emission cross-sections and stimulated absorption cross-sections at 1.53 μm have been evaluated.The fluorescence lifetime was measured and calculated by non-exponential least square fit technique. The lifetime of the glasses first increased and then decreased with increased Yb^{3+} mol%. Conclusion & Significance: Near infrared absorption and absorption cross-section were increased withan increase in YbF_3content. Emission elucidations showed that the glass matrix and concentration of $Er^{3+}$and Yb^{3+}ions significantly impact the emission characteristics and radiative lifetimes. The longest lifetime of 12 ms proved the better host matrix and 2 mol% YbF_3 is the best condition for Er co-doped glasses.

Biography

Ganesh Agawane obtained his PhD in 2015 from Chonnam National University, Gwangju, S. Korea. His PhD thesis title is Fabrication of CZTS thin film solar cells by sol-gel spin-coating and PLD method. Presently he is working as a post–doctoral researcher at Korea Photonics Technology Institute (KOPTI), Korea. His present research interest includes preparation of Er3+ doped Yb3+ sensitized fluorophosphate glasses for 1.53 um LiDAR applications.

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Notes:

Amina OUADAH, J Material Sci Eng 2017, 6:3 (Suppl)
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Synthesis of novel copolymer based butylimidazolium ionic liquid and polybenzimidazole as anion exchange membrane for fuel cell application

Amina OUADAH
Beijing Institute of Technology, China

Electrolyte membranes are very important component in fuel cells and influence significantly their performance. Polymers such as poly(olefin)s, poly(styrene)s, poly(phenyleneoxide)s, poly(phenylene)s and poly(aryleneether)s have been studied for their use as electrolyte membranes for fuel cells. In this work, a series of electrolyte membranes have been synthesized by copolymerization of polybenzimidazole, polystyrene and polyvinylimidazolium. Various ratios were studied in order to realize a good compromise between high conductivity, swelling ratio and water uptake. The conductivity test reveals that the percentage of each component in the copolymer influences directly the ion conductivity of the final membranes. The copolymerization of polystyrene and polyvinylimidazolium was confirmed by H NMR and FTIR. Compared to the commercial reference fuel cell membrane, A201 Tokuyuama; 6 of the synthesized membranes exhibit better conductivity at high temperatures and 3 at all temperatures. The best conductivity is observed for membrane $PBI_{0.5}$ S_1VIB_5 which reaches chloride conductivity of 26.3 $mScm^{-1}$ at 25°C and 73.7 $mScm^{-1}$ at 100°C; the membrane has an ion exchange capacity of 2.6 mmol/g and a low activation energy of 6.62 kJ/mol; membrane $PBI_{0.5}$ S_2VIB_5 is one of the 3 membranes with a 10.77% swelling ratio with a 6.66 kJ/mol as activation energy. All synthesized membranes show a linear Arrhenius behavior and exhibit low activation energy and mostly in plane swelling ratio. From TGA and DSC analyses, the membranes are thermostable up to 250°C. Morphology studies explored via TEM and AFM show a well-developed bicontinuous phase distribution of hydrophilic and hydrophobic regions that confirms facile ion transport channels.

Biography

Amina Ouadah is a PhD scholar, working on developing new materials for use as electrolyte membrane in order to improve the electrical, mechanical and alkaline behavior. The concept is based on the generation of totally new polymers or copolymers offering a good compromise for industrial utilization. The final products are normally less expensive than the actual commercial ones and present pretty good compromises proving by different analysis and measurements.

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Ju Hyeon Choi, J Material Sci Eng 2017, 6:3 (Suppl)
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Diamond-like carbon thin film deposition by filtered cathodic vacuum arc source for wear resistance improvement of zirconia toughened alumina

Ju Hyeon Choi
Korea Photonic Technology and Institute, Republic of Korea

Alumina has been used as engineering ceramic material widely due to high mechanical strength and hardness, wear and corrosion resistance. For higher strength and toughness, Zirconia Toughened Alumina (ZTA)which has zirconia grains in alumina matrix has been used. However, ZTAhas lower hardness and wear resistance than alumina. To improve the wear resistance of engineering ceramic, hard coating like Diamond-Like Carbon (DLC) coating on ceramicsurface has been used.In this study, tetrahedral amorphous carbon (ta-C) film which is the hardest DLC was deposited on ZTA by using Filtered Cathodic Vacuum Arc (FCVA) source and the wear resistance, hardness and scratch resistance was investigated according to the substrate bias conditions.The pulse bias was used for the substrate bias and the pulse frequency was 16 kHz and the rise time of the pulse was about 1 μs. Because it was known that the hardness of ta-C thin filmis related with the residual stress, the residual stress of the ta-C thin film deposited on dielectric material by FCVA source was investigated with various pulse voltages. The residual stress of ta-C thin film decreased monotonically with the substrate pulse bias. To obtain both high wear resistance and low residual stress, a bi-layer deposited with both high pulse voltage and low pulse voltage was deposited on ZTA. Through the pin-on-disk tests, the wear resistance was investigated in various thickness conditions of the ta-C bi-layer. It was found that the high residual stress layer has higher wear resistance. By using nano-scratch tester,it was found that the low residual stress layer has higher scratch resistance. The hardness and elastic modulus of ta-C thin film on ZTA was measured by usingunltranano-indenter.

Biography

JuHyeon Choi received the B.S., M.S. in Materials Science from Chonnam National University. He received Ph.D. degrees in Materials Science from University of California Irvine, USA, in 2004. His major research topics was photonic laser glass for fiber laser and fibe amplifiers. From 2005 to 2009, he joined Surface Science Lab at UCI and was engaged in development of metal nanoparticle arrays for plasmonic field enhanced bio sensor. He joined Dr. Jane Chang's group as a staff scientist at UCLA from 2010, where he has been engaged in research on nano phosphors with core-shell nanostructure, multifunctional oxide thin film by atomic layer deposition method. He is now a senior researcher working in the field of optical materials, DLC thin film deposition for ceramic material, especially infrared optical glass in Korea Photonic Technology and Institute, Korea.

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Young Research Forum

(Day 2)



Young Research Forum

Session Chair
Uwe Erb
University of Toronto, Canada

Session Co-chair
Sirikanjana Thongmee
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Session Introduction

Title: **A novel ternary eRGO/NiO/α-Fe_2O_3 nanostructured photoanode with enhanced charge transfer properties for efficient solar hydrogen energy conversion in a photoelectrochemical cell**

Yi Wen Phuan, Monash University, Malaysia

Title: **Insight into controllable synthesis of zinc oxide-based nanomaterials and their toxicity effects on biological wastewater treatment processes**

Jang Sen Chang, Monash University, Malaysia

Title: **Enhanced catalytic activity of Ag-Ni alloyed nanoparticles immobilized in –COOH functionalized SBA-16 for the reduction of 4-nitrophenol**

Canggih Budi, National Central University, Taiwan

Title: **Fabrication of a heterojunction V_2O_5/$BiVO_4$ photoanode with improved photoelectrochemical performance for water splitting reaction**

Chong Siang Yaw, Monash University, Malaysia

Title: **Development of molybdenum trioxide-based photoanodes with charge storage capacity for photoelectrochemical water oxidation under illuminated and non-illuminated conditions**

Chun Yuan Chot, Monash University, Malaysia

Yi Wen Phuan, J Material Sci Eng 2017, 6:3 (Suppl)
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A novel ternary Ergo/NiO/α-Fe_2O_3 nanostructured photoanode with enhanced charge transfer properties for efficient solar hydrogen energy conversion in a photoelectrochemical cell

Yi Wen Phuan
Monash University, Malaysia

In this study, a novel ternary hematite (α-Fe_2O_3)-based nanostructured photoanode with excellent Photoelectrochemical (PEC) performance consisting of 2D-electrochemical reduced Graphene Oxide (eRGO) and Nickel Oxide (NiO) was successfully developed through electrodeposition method. The surface morphology and structural properties of the nanostructured photoanode were characterised by using field emission-Scanning Electron Microscopy (FE-SEM), and High-Resolution Transmission Electron Microscopy (HRTEM). Results showed that the flexible eRGO sheets provide intimate and coherent interfaces between α-Fe_2O_3, NiO and eRGO, promoting charge transfer over their interfaces and thus, lowering the photogenerated electron-hole pairs recombination rate. X-Ray Diffraction (XRD) patterns, Raman spectra and X-ray photoelectron (XPS) spectra validated that both eRGO and NiO were successfully electrodeposited onto the ternary eRGO/NiO/α-Fe_2O_3 nanostructured photoanode. As evidenced from the ultraviolet-visible (UV-vis) diffuse reflectance spectra, the incorporation of eRGO and NiO has endowed α-Fe_2O_3 nanostructured photoanode with a wider spectral absorption range where the light absorption intensities in the visible light and near infared regions are improved. Electrochemical Impedance Spectroscopy (EIS) further confirmed that the ternary eRGO/NiO/α-Fe_2O_3 nanostructured photoanode possesses the lowest charge transfer resistance, indicating that the combined effects of eRGO and NiO could improve the electron mobility by impeding the recombination process of photogenerated charge carriers and resulting in superior PEC performance. This is because eRGO sheets act as surface passivation layer and electron transporting bridge that increase the electron transfer at the semiconductor/liquid junction. Whereas, NiO serves as hole acceptor that effectively hinders the recombination of photogenerated electron-hole pairs and accelerate the interfacial charge transfer. The solar hydrogen evolution rate of the ternary eRGO/NiO/α-Fe_2O_3 nanostructured photoanode was about 3-fold higher than the bare hematite. It is expected that the fundamental understanding gained through this study is helpful for the rational design and construction of highly efficient ternary nanostructured photoanodes for application in solar hydrogen energy conversion through PEC process.

Biography

Yi Wen Phuan received her BE (Hons 1A) in Chemical Engineering from Monash University, Malaysia. She continued her postgraduate studies under the supervision of Associate Professor Dr. Meng Nan Chong and Associate Professor Dr. Eng Seng Chan. Her research focuses on the electrochemical synthesis and modification of nanostructured hematite (α-Fe2O3) as an efficient semiconductor photoanode material for application in Photoelectrochemical (PEC) water splitting.

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Notes:

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Insight into controllable synthesis of zinc oxide-based nanomaterials and their toxicity effects on biological wastewater treatment processes

Jang Sen Chang
Monash University, Malaysia

In recent years, the increasing utilisation of nanomaterials has resulted in their wide prevalence reported in the environment due to sources originating from atmospheric emissions, municipal, manufacturing and industrial waste streams. Sewage systems and municipal Wastewater Treatment Plants (WWTPs) have become important intermediate hotspots for the transfer of nanomaterials into the environment. This is because municipal wastewater is found to be a great source of nanomaterials, and increasing concerns are aroused toward their potential impairment on biological WWTPs. Zinc Oxide (ZnO) is a well-known antibacterial agent that has drawn broad interdisciplinary attention for understanding on its toxicity effects over biological activities. To a lesser extent, however, there is a knowledge gap on the influence of shape and morphology of ZnO nanomaterials accompanied by a systematic comparison of toxicity effects towards bacteria found in biological sludge. In this study, four different dimensionality of ZnO nanomaterials, which are Zero-Dimensional (0D)-ZnO nanoparticles, One-Dimensional (1D)-ZnO nanorods, Two-Dimensional (2D)-ZnO nanosheets, and three-dimensional (3D)-nanoflowers were synthesized via bottom-up hydrothermal approaches. Subsequently, the toxicity effects of these ZnO nanomaterials were experimented over the biological activities of aerobic wastewater microorganisms and activated sludge. Results showed that the presence of ZnO nanomaterials significantly impacted on the treatment efficiency of biological aerobic wastewater treatment process, where both the Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD5) removal rates have been adversely hindered. Additionally, the 0D-ZnO nanoparticles with an average diameter of 209.67 ± 0.05 nm exhibited the highest toxicity effects toward the inactivation of activated sludge microbes. This was evidenced from the highest inhibition rate of 17.9% of activated sludge microbes among the synthesized ZnO nanomaterials and control experiment. By gaining an insight into the controllable synthesis of ZnO nanomaterials on aerobic microorganisms and activated sludge functions, this study helps to predict the potential detrimental impacts of ZnO as a nanopollutant, minimises the inherent ecohazard, and enables the optimum operation of biological WWTPs.

Biography

Chang Jang Sen is currently pursuing his postgraduate studies under the supervision of Assoc. Prof. Dr. Meng Nan Chong and Dr. Phaik Eong Poh at Monash University Malaysia. His research interest is focussed on the evaluation of different zinc oxide-based nanomaterials and their nanotoxicology effects on biological wastewater treatment processes.

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Canggih Setya Budi, J Material Sci Eng 2017, 6:3 (Suppl)
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Enhanced catalytic activity of Ag-Ni alloyed nanoparticles immobilized in –COOH functionalized SBA-16 for the reduction of 4-nitrophenol

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National Central University, Taiwan

Superior catalysts for the catalytic reduction of 4-nitrophenol (4-NP) based on alloyed bimetallic system of Ag-Ni nanoparticles have been successfully fabricated by facile immobilizing technique within the cage-pores of carboxylic acid –COOH functionalized mesoporous silica SBA-16 (named AgxNi1-x@S16C, where x is molar ratio), following procedure in our previous works with further modification.1,2It was greatly acknowledged that the –COOH functional groups on mesostructure silica support play a critical role in improving the interaction with target cation and confining the crystallite growth during calcination-reduction process.3,4Under wet impregnationin basic condition, the negatively charged density of S16C support (as confirmed by zeta potential measurement) endows effective sites to undergo ionic interaction withAg(I)/Ni(II) cation. The successful functionalization of the organic functional group on the silica framework were well identified with detailed 13C cross polarization magic angle spinning nuclear magnetic resonance (CPMAS NMR), 29Si MAS NMR, and Fourier transform infrared (FT-IR) spectroscopy.5It worth noting that without stabilizing or reducing agents, the highly dispersed Ag-Ni nanoparticles immobilized in cage-pores of S16C could be achieved by calcination-reduction process under inert conditions. Further characterizations, alloying bimetallic of Ag-Ni nanoparticle has been confirmed by the powder X-ray diffraction, X-ray photoelectron spectroscopy, energy-dispersive X-ray analysis and high resolution transmission electron microscopy. Interestingly, the presence of Ni in bimetallic alloy system could decrease the size of Ag-Ni NPs up to sub-3 nm, much smaller than that of only Ag NPs. As the catalyst for the reduction of 4-NP, the Ag0.4Ni0.6@S16C and Ag0.6Ni0.4@S16C perform much higher catalytic activity over monometallic counterparts. This enhanced catalytic activity might be attributed to the size, loading amount, high specific surface area, well-dispersed and unique electronic properties arising from Ag-Ni bimetallic system supported in cage-type S16C. Furthermore, their magnetic properties allowing a facile and rapid recycle technique for reuse.

Biography

As the PhD researcher in Department of Chemistry, National Central University, Taiwan, Canggih Setya Budi focuses his research interests on fabrication of nanomaterials including mesoporous materials, metal nanoparticles, bimetallic alloyed nanoparticles, nano-composites and their utilization for the energy storages and catalytic reactions. His academic and research skill are well distinguished and enabling him to publish his research in good journal and achieve academic scholarship from Taiwan government. He is actively involved as the member of High Energy Battery and Nano-catalyst Research Group which enabling him to share the current issues and ideas among the researchers.For about one and half years, he also experienced to work in Research and Development (R&D) division at Pura Barutama Ltd. Co., as the largest paper and printing company in South-East Asia.

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Fabrication of a heterojunction $V_2O_5/BiVO_4$ photoanode with improved photoelectrochemical performance for water splitting reaction

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Monash University, Malaysia

Hydrogen (H_2) has featured prominently as a potential alternative and renewable energy source. To date, one of the most feasible production routes of solar H_2 generation is through the Photoelectrochemical (PEC) water splitting. In this regard, Bismuth Vanadate ($BiVO_4$) is a promising semiconductor photoelectrode material that can be used for PEC water splitting. This is owing to its low-cost, relatively narrow bandgap of 2.4 eV and favourable positioning of valance band edge that provides sufficient overpotential for water oxidation. To date, however, the practical photocurrent yield of $BiVO_4$ photoelectrode reported in the literature is far lower than its full potential due to poor photogenerated carriers separation and high bulk and surface recombination rates. The emergence of heterojunction photoelectrode design is considered to be able to address these setbacks, while providing an internal electric field for improving the photogenerated charge carriers transfer in a PEC cell setup. Thus, the main aim of this study was to fabricate a heterojunction $V_2O_5/BiVO_4$ photoanode due to the fact that V_2O_5 is the most stable form of vanadium oxide and has received intense interest due to its inherently good electrochemical and photochemical properties. The resultant heterojunction $V_2O_5/BiVO_4$ photoanode structure was characterised by using Field Emission-Scanning Electron Microscopy (FE-SEM), X-ray Diffraction (XRD), UV-visible spectroscopy and a number of PEC measurements and analysis. Through this study, it was found that the photocurrent density of a bare $BiVO_4$ photoanode increased from 0.07 to 0.40 mA/cm^2 (at 1V vs. Ag/AgCl) after the formation of a heterojunction photoanode structure with an underneath V_2O_5 layer. This is almost a 6-fold improvement in terms of photocurrent density, and this study has demonstrated the presence and role of V_2O_5 in the heterojunction structure that extends the light absorption range as well as improving the electrons mobility and effective separation of photogenerated charge carriers.

Biography

Chong Siang Yaw graduated with a BE degree in the discipline of Chemical Engineering with Honours from Monash University Malaysia. He returned to Monash University, Malaysia for Postgraduate studies under the supervision of Associate Professor Dr. Meng Nan Chong and Professor Dr. Ai Kah Soh. His research focuses on the synthesis of BiVO4-based heterojunction-tandem photoelectrodes for solar hydrogen energy conversion from PEC water splitting.

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Development of molybdenum trioxide-based photoanodes with charge storage capacity for photoelectrochemical water oxidation under illuminated and non-illuminated conditions

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Photoelectrochemical (PEC) technology is one of the most promising methods that convert solar irradiation into storable chemical energy in the form of Hydrogen (H_2) via water splitting reaction. To date, the PEC technology has been studied extensively in terms of the synthesis of photoelectrodes such as synthesis approaches, structural modifications, and improvement of photoresponses. However, the PEC technology is still limited by one of the most challenging bottlenecks where all PEC cells can only be operated under well-illuminated condition. Generally, light source is the most crucial element in a PEC cell as it initiates the photoreactions and producing photogenerated charge carriers. When the light source used is withdrawn (i.e. non-illuminated condition), all the photoreactions will be terminated instantaneously. Therefore, there is a growing significance in enabling the operation of PEC technology under non-illuminated condition via the rational design of photoelectrodes for efficient solar energy conversion and storage. Recently, Molybdenum Trioxide (MoO_3) has attracted numerous research attentions due to its unique layered crystalline structure that leads to charge storage capacity in PEC technology application. Within the MoO_3 structure, a portion of the charges could be stored in the layered crystalline structure via intercalation ($MoO_3 + xNa^+ + xe^- \rightarrow NaxMoO_3$) during the well-illuminated condition. Whilst the stored charges will be released from the molybdenum bronze ($NaxMoO_3$) and continuously flow to the counter electrode via de-intercalation ($NaxMoO_3 \rightarrow MoO_3 + xe^- + xNa^+$) during non-illuminated condition. Thus, the main aim of this work was to synthesize thin films of MoO_3 via the Aerosol-Assisted Chemical Vapour Deposition (AA-CVD) method for application as photoanode used in PEC water splitting. This was followed by a systematic optimisation of the ultrasonication time on the precursor colloidal suspension, and annealing temperature on the eventual crystalline MoO_3 structure formed. FE-SEM images showed that the MoO_3 thin films that are synthesized from the AA-CVD method exhibited a 3D plate-like crystalline structure. Further electrochemical characterisations measured that the AA-CVD synthesized MoO3 thin films possessed a high charge storage capacity of 1.22 mC/cm^2 and a low charge transfer resistance of 87.6 Ω at the optimum ultrasonication time of 25 min and annealing temperature of 550o.

Biography

Chun Yuan Chot graduated in Chemical Engineering with Honours from UCSI University. He joined Monash University, Malaysia for postgraduate studies under the supervision of Associate Professor Dr. Meng Nan Chong, Professor Dr. Ai Kah Soh and Associate Professor Dr. Khang Wei Tan. His research focuses on the development of molybdenum trioxide-based photoanodes with charge storage capacity for PEC water splitting under illuminated and non-illuminated conditions.

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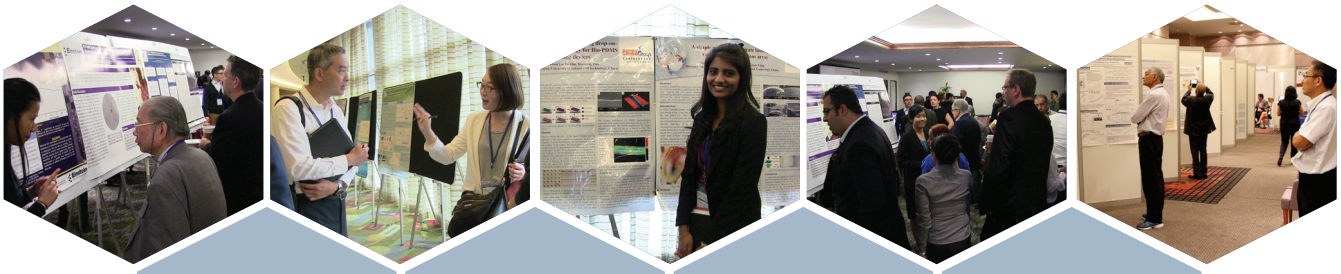
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Mu-Hsin Lee, J Material Sci Eng 2017, 6:3 (Suppl)
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Cobalt nanoparticles immobilized in 3D mesoporous silica KIT-6 for excellent catalytic hydrogen generation from ammonia borane

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Hydrogen is highly considered as the most important issue in fuel cell. Apart from this, ammonia borane is a popular reagent owing to its high hydrogen density up to ~19.6 wt%. In the field of catalytic hydrogen generation, cobalt nanoparticles (Co NPs) based materials are usually high potential candidates for hydrolysis of ammonia borane. However, the stability issue of Co NPs due to the particle aggregation resulting uncontrollable activity. Therefore, we here report the convenient way synthesis of Co NPs through one-step chemical reduction which is adsorbed in 3D mesoporous silica KIT-6 (denoted as Co@KIT-6) to keep maintain the high efficiency. Under wet impregnation process, KIT-6 support was immersed in cobalt ion precursor and the adsorbed cobalt ion into inside the pores was then chemically reduced using mixed reagent containing NaBH4 and NH3BH3 to obtain Co@KIT-6(1). It was found that the use of KIT-6 support can highly enhance the dispersion and efficiency due to its high surface area 880 m2/g and pore volume 0.9 cm3/g. In addition, KIT-6 with the internal pore size of 5 nm may separate confine the Co NPs and subsequently avoid the aggregation. Because cobalt is regulated in 3D structure, it can suffer from rapid deactivation and promote catalytic activity to reach high reuse times. According to X-ray diffraction pattern and TEM image, it can be confirmed that the particle size of Co NPs is about sub-1 nm and highly dispersed without aggregation. The turnover frequency (TOF) and activation energy (Ea) of Co@KIT-6 for the hydrolysis of ammonia borane reach almost 20 mol_{H2} mol_{Co}^{-1} min^{-1} and 26 kJ mol^{-1}. In this study, Co@KIT-6 exhibits a high promising catalyst for hydrogen generation from ammonia borane.

Biography

Mu-Hsin Lee joined the master program in Department of Chemistry, National Central University, Taiwan, in 2015. For his master study, his research focuses on the nanomaterials fabrication including mesoporous silica support, metal nanoparticles and nanostructures with the main application on catalytic process for hydrogen generation. He published his work of about hydrogen evolution inRSC Advance (2015) titled as"Silica aerogel-supported cobalt nanocomposites as efficient catalysts toward hydrogen generation from aqueous ammonia borane". His research and academic background allow him to achieve scholarship award from his school.

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Bipolar resistive switching in cobalt oxide thin film studied by I-V characterization and conductive atomic force microscopy

Jian Yang
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Developing new memories, which are high-density, high-speed, low-power-consumption and reliable, are urgent for sustained advances in information storage/processing technologies. Resistive Random Access Memories (RRAMs), which use the characteristic of resistance switching between High Resistance State (HRS) and Low Resistance State (LRS) in a Metal-Insulator-Metal (MIM) structure under applied electrical field, have attracted extensive research interest in recent few decades and have been proved to be a promising category of next-generation Non-Volatile Memories (NVMs). Binary Transition Metal Oxides (TMOs), because of their good compatibility with Complementary Metal Oxide Semiconductor (CMOS) process and simple composition and structure control, have gained considerable attention in RRAMs research. But compared to n-type oxides, studies on the resistive switching properties of p-type oxides, especially on understanding the switching mechanisms, are relatively limited. The exact resistive switching mechanism, to date, is still in debate. Conductive filaments are widely accepted to be the microscopic mechanism for most RS phenomena. However, because of the nanoscale size of conductive filaments, it is usually difficult to observe the filaments directly. In this study, the bipolar resistive switching process and mechanism in Oxygen-Plasma-Assisted Molecular Beam Epitaxy (OPA-MBE) prepared p-type CoO/Pt structures are investigated by both conventional I-V characterization and Conductive Atomic Force Microscopy (CAFM). Bipolar resistive switching behavior is exhibited in the CoO/Pt structures, showing good reproducibility and stability. The Ohmic conduction at LRS indicates the formation of metallic conductive filaments in the set process, which is well consistent to the results in CAFM experiment, in which formation and rupture of conductive filaments are observed in a writing-erasing process. This work not only demonstrates the good potential of cobalt oxide thin films for non-volatile memory application, but also provides more evidence in understanding the bipolar resistive switching mechanism.

Biography

Jian Yang is currently a Ph.D. student in the School of Materials Science and Engineering, University of New South Wales, Sydney Australia. His research interest is in fabrication of oxide thin films using oxygen-plasma-assisted molecular beam epitaxy, exploring new material systems for resistive random access memories (RRAMs), improving their resistive switching properties and investigating the underlying switching mechanism. Characterization methods include transmission electron microscopy, conductive atomic force microscopy, Kelvin probe force microscopy. etc.

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Development of Ion Adsorbent from Polybenzoxazine-based Nanoporous Materials

Chanapon Pongteeraporn
The Petroleum and Petrochemical College Chulalongkorn University, Thailand

Adsorption is a well-established technique to remove metal ions. The existence of Ca(II) and Mg(II) ions in water leads to problems in cooling and heating systems including clogging pipeline or the other industrial machines. In this work, an alkali-earth metals model solution, Ca(II) and Mg(II), was used to study the efficiency of using nano porous polybenzoxazine as an alkali-earth metal ions adsorbent. Nano porous polybenzoxazine was synthesized from bisphenol-A, formaldehyde and tetraethylenepentamine(TEPA) via a sol-gel process. The difference in solubility parameters between solvent and polymer affected the pore structure during phase separation. The benzoxazine particles dispersed in liquid (sol) agglomerate together to form a continuous three-dimensional network extending throughout the liquid (gel). The resulting nano porous polybenzoxazine provided high porosity and high surface area. In addition, the electron pairs of nitrogen atom in the main chain which can form a dipole-dipole interaction with divalent metals. Therefore, nano porous polybenzoxazine was used as an anti-fouling adsorbent for water treatment. FT-IR was used to confirm the synthesis of polybenzoxazine. The thermal properties such as degradation temperature, % weight loss and curing temperature were investigated by using TG/DTA and DSC, respectively. The adsorption experiments were studied by Atomic Adsorption Spectroscopy (AAS)to investigate the percent of metals removal. A batch equilibrium technique was carried out under the influence of pH, contact time, amounts of adsorbent, including the effect of pore characteristics. In addition, the metal adsorption efficiency of nanoporouspolybenzoxazine, carbon xerogels and commercial activated carbon were compared.

Biography

Chanapon Pongteeraporn is a second-year master's degree polymer science student at the petroleum and petrochemical college, Chulalongkorn University. He has received a bachelor's degree of engineering in a petrochemical and polymeric materials. His work related tonanoporous materials, nanotechnology and polybenzoxazine.

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

Yung-Chung Chen
National Kaohsiung University of Applied Sciences, Taiwan

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

Biography

Yung-Chung Chen received a Chemical Engineering PhD degree in 2009 from National Chung Hsing University, Taiwan (under supervision of Prof. Ru-Jong Jeng). After three years of postdoctoral fellow at the Institute of Chemistry, Academia Sinica (under supervision of Prof. Jiann T. Lin), he joined DuPont as an R&D Chemist. Currently, he was appointed as an assistant professor at National Kaohsiung University of Applied Sciences. His current research interest is focused on synthesis and characterization of organic and polymeric materials including optical materials, organic solar cells, photoresist and polyimide.

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Yi-Ting Lee, J Material Sci Eng 2017, 6:3 (Suppl)
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Direct fabrication of micro-patterned conductive polymerdevice using spray coating with metal shadow mask

Yi-Ting Lee
National Kaohsiung University of Applied Sciences, Taiwan

In recent years, micro-patterned conductive polymer device have been widely used invarious applications such as flat paneldisplay, organic solar cells, OLED lighting devices,bio-chipsystems, flexibleelectronic sensors and portable optoelectronic products. Therefore, its production method is clearly an important issue of concern. Over theyears,traditionalphotolithography and ink-jet printingare very common process to fabricate micro-patterned conductive polymer device, which generally includes spin coating, photolithography, heating, lift-off and ink-jet processes. The whole processes should be performed in a clean-room environment and depends on extremely expensive equipment. To combat this challenge, we present a simple and direct method for rapid fabricationmicro-patterned conductive polymer deviceon flexible plastic substrateby using spray coatingwith metal shadow mask. In this method, ametal shadow mask with micro-lines array pattern was fabricated by photo-lithography and wetchemical etching process. The metal shadow maskwasplaced onto the flexible plastic substrate to form the stack. The stack was then fixed on the stage of spray coating system. The conductive polymer (PEDOT:PSS) solution was pumped through the nozzle and spray coating on the stack. After proper curing process, the metal shadow mask was removed from flexible plastic substrate. The conductive polymer pattern on flexible plastic substrate was fabricated. In this study, extreme ultraviolet (EUV) radiation was used for surface modification of flexible plastic substrate. The processing condition of spray coatingwith metal shadow mask was also investigated. Finally, thesurface shape, thickness, surfaceroughness and conductivity of the fabricatedconductive polymerpattern deviceswere measured and analyzed. The experimental resultsshow that the method can be appliedforeffective fabrication of flexible electronic device withconductive polymerpattern.

Biography

Yi-Ting Lee is a graduate student at the Mold and Die Engineering Department, National Kaohsiung University of Applied Sciences, Taiwan. Her research interests include micro-fabrication technology, organic polymer processing and fabrication of conductive polymer devices for electronic applications. Dr. Chih-Yuan Chang is her advisor.He received hisPh.D. degree in mechanical engineering from National Taiwan University, Taiwan, in 2006.From 2007 to 2011, he was a Postdoctoral Fellow with the Industrial Technology Research Institute, Taiwan. Since 2012, he has been an Assistant Professor with the Mold and Die Engineering Department, National Kaohsiung University of Applied Sciences, Taiwan.

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Nattakarn Wankam, J Material Sci Eng 2017, 6:3 (Suppl)
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Novel thermo-responsive hydrogel from gellan gum and methylcellulose for use as advanced wound dressing

Nattakarn Wankam
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Cavity wound is one of the complex, clinical managements. Traditionally ribbon gauze soaked in saline solution was used to pack a cavity wound. This practice is now considered to be unsuitable due to that it is not conformable to the wound site. However, In-situ hydrogel formation that undergoes sol-gel transitions response to temperature has been widely interesting. In this study, physical blends of two materials between Gellan Gum (GG) and Methyl Cellulose (MC) in phosphate buffered saline aqueous solution (pH 7.4) were used to prepare the thermo-responsive injectable hydrogel for use as cavity wound dressing. A rotational rheometer was used to determine the rheological properties of blends. For all the samples, the G' values exceed the respective G" values in the measured frequency range at 37^0C, confirming the formation of hydrogels. Moreover, the MC solutions exhibit a board linear viscoelastic region with a stress applied to break the network of structure that is larger than 100 Pa. A degree of gelation of MC solutions slightly changes with any concentrations. Besides, FT-IR technique was used to confirm the occurrence of a specific chemical reaction and *in-vitro* cytotoxicity test on human fibroblast cells via MTT assay was evaluated to prove that it can be used in human tissue.

Biography

Nattakarn Wankama is a master's degree polymer science student at the petroleum and petrochemical college, Chulalongkorn University, Thailand. She holds the bachelor's degree of engineering in petrochemical and polymeric materials from Silpakorn University, Thailand. Shehas varied background in Biomaterials for wound dressing applications provided the perfect foundation for developing advanced wound dressing.

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Wei-Peng Goh, J Material Sci Eng 2017, 6:3 (Suppl)
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Optimal shell thickness for Al_2O_3-encapsulated Ag NPs for enhancing polaron generation in P3HT

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Surface plasmons are attractive as they have unique optical properties in the form of localized field enhancement and strong light scattering ability. As confined electromagnetic waves propagating at the metal/dielectric interface, surface plasmons can improve light absorption in a photoactive layer and hence, photogeneration of carriers. Localized electric field enhancement associated with surface plasmons can increase the optical path length of photons due to elevated scattering conditions. Introducing metallic nanoparticles in organic solar cells is known to improve charge carrier concentration. Localized field enhancement arising from surface plasmons is a possible mechanism. However, the presence of these nanoparticles in the organic layer introduces charge recombination sites. Charge recombination can be suppressed by coating a thin insulating layer around the metallic nanoparticles. Simultaneously, this insulating shell inhibits the extent that the localized field enhancement can influence charge generation in the organic layer. Hence, it is hypothesized that there is an existence of an optimal shell thickness that balances charge recombination with localized field enhancement. Different thicknesses of insulating shells in the form of Al2O3 were deposited onto 50 nm silver nanoparticles (Ag NPs) using Atomic Layer Deposition (ALD). A thin 25 nm P3HT layer was spincoated on top of the Al2O3-encapsulated Ag NPs. Using Photoinduced Absorption (PIA) spectroscopy, photogenerated P3HT+ polaron concentration as a function of Al2O3 thickness was investigated. An optimal shell thickness of 3-5 nm was obtained.

Biography

Wei Peng Goh obtained his BSc degree in Applied Science (Applied Physics) from the Royal Melbourne Institute of Technology University, Melbourne, Australia and MSc degree in Material Physics and Nanotechnology from Linköping University, Linköping, Sweden. He joined Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology and Research (A*STAR), Singapore. He is currently awaiting his PhD degree (Materials Science and Engineering) from Nanyang Technological University, Singapore.

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Siew-Lay Lim, J Material Sci Eng 2017, 6:3 (Suppl)
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Controlling crystal formation for more efficient and reproducible perovskite solar cells

Siew-Lay Lim
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Perovskite ($CH_3NH_3PbI_3$) solar cells have been fabricated by a two-step sequential deposition process whereby a PbI_2 film is first spin-coated on a mesoporous TiO_2 film, followed by immersion in CH_3NH_3I (MAI) solution for conversion to perovskite (PbI_2 + $CH_3NH_3I \rightarrow CH_3NH_3PbI_3$). Varying amounts of residual PbI_2 remain in the perovskite active layer due to incomplete conversion. The losses in photocurrent due to the residual PbI_2 result in poor and inconsistent solar cell performance. As the PbI_2 morphology is likely to have a significant effect on the formation and composition of the nanocrystalline perovskite layer, we investigate the PbI_2 film formation via three different processes (thermal drying, solvent extraction and as-deposited) and the effects of these processes on solar cell performance. It is found that the dense, multi-crystal aggregates in thermally dried PbI_2 films hinder MAI penetration and reaction, resulting in approximately 19% residual PbI_2 in the perovskite layer after the conversion process. The residual PbI_2 fraction is significantly reduced to approximately 4% when the PbI_2 film is formed by solvent extraction using dichloromethane (DCM-extraction). The loosely packed disc-like PbI_2 crystals facilitate MAI penetration and reaction. Near 100% conversion to perovskite is achieved when the as-deposited PbI2 film is immersed in MAI solution without any further drying. Perovskite solar cells fabricated from as-deposited PbI_2 films show superior and more consistent performance with an average power conversion efficiency of 14.60 ± 0.55% compared to that of 11.20 ± 3.10% when thermally dried PbI_2 films are used. By optimizing the PbI_2 and perovskite crystal formation process, we have enhanced both the performance and reproducibility of perovskite solar cells. High performance, solution-processed perovskite solar cells are promising candidates for future urban sustainability solutions.

Biography

Siew-Lay Lim received her BE and PhD in Chemical and Biomolecular Engineering from the National University of Singapore, Singapore. She is currently a Research Scientist at the Institute of Materials Research and Engineering, Agency of Science, Technology and Research (A*STAR), Singapore. Her research interests include organic and hybrid electronic materials and devices, such as transistors, photovoltaic cells and LEDs, materials systems and processes for printed electronics and large area printing of functional materials.

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Shanmugasundaram K, J Material Sci Eng 2017, 6:3 (Suppl)
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Tuning the electroluminescence of an ionic small molecules in light-emitting electrochemical cells

Shanmugasundaram K
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Light-emitting electrochemical cells have becoming attractive in thin-film applications. Compared to conventional solid state lighting device such as Organic Light-Emitting Diode (OLED), Light-Emitting Electrochemical Cell (LECs) possess simple device architecture and air stable electrodes makes LECs more impressive. Mainly LECs are two types, p-LECS and Ir-ITMCs. Polymer light-emitting electrochemical cells are tri-component blend containing emitting polymer, an ion-conducting polymer and an inorganic salt. Currently much research has been focused on cationic iridium complexes due to the phosphorescent, color tuning and an ionic nature of Ir-ITMCs. However, the source and expensive nature of iridium demands new emitters in LECs. Recently non-ionic small molecule light-emitting electrochemical cell containing the device structure as same as the p-LEC were reported by Tang et al. The molecule which is an ionic apart from Ir-ITMCs has great attentions. We designed and synthesized an ionic phenothiazine derivatives in multi-step synthetic procedure for light-emitting electrochemical cells. A complete structural, photo physical, electrochemical and electroluminescent properties were investigated. The emissions color-tuning of compounds, were covering blue and region achieved by applying the target compound in a LEC device.

Biography

Shanmugasundaram Kanagaraj was born in Tirupattur, Tamilnadu, India. He completed his B.Sc., and M.Sc., in Chemistry at Sacred Heart College Tirupattur, Tamilnadu.He worked as a Research Associate atBiocon Bristol Myers Squibb Research and Development Center (BBRC) a global biopharmaceutical company during 2011-2013 in Bengaluru, India. He joined PhD under Prof. YoungsonChoe at Pusan National University, Republic of Korea, to develop novel organic materials for light-emitting electrochemical cells.

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Evaluation of high quality steel plate plates in FCAW steel plate

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In the maritime industry, NoNox technology is moving toward significantly reducing nitrogen emission as key technologies to break down the level of regulation.To satisfy this, it uses a gas engine, or a gas engine, which is referred to as a nitrogen or a prior mention of an existing engine. In the end, the environmental regulation regulated by IMO manages to remove regulations beyond the means of acquiring additional devices and regulations. In the end, the environmental regulation defined by IMO is regarded as essential to the use of existing engines, which are not permitted by means of conventional engines, and the use of conventional fuel engines is essential for the use of conventional fuel engines, as well as the use of nitrogen in existing vessels. In this study, it seeks to examine the non-destructive testing of the welded parts of the vessel parts of the vessel using the FCAW Flux (Arc Cored) technique and also examine the results of the welding method to examine the results of the welding and the deformation of the weld zone, and to examine the results of the welding zone, which is conducted after welding, to examine the effects of the welding zone.

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The preparation and photocatalyticwater splitting of $NdVO_4$-V_2O_5 powders

Tzu Hsuan Chiang
National United University, Taiwan

The $NdVO_4$- V_2O_5 powders were synthesized by neodymium nitrate and ammonium metavanadate using the glycothermal method in ethylene glycol at 120°C for 1h.When $NdVO_4$-V_2O_5 hybrid powdersasbore light that generate electron and hole than charge spearation and migration to the surface of $NdVO_4$-V_2O_5 hybrid powders, which of the valence band are below the water oxidation potential (1.23 V versus NHE at pH 0). The resutls indicated that the holes of $NdVO_4$-V_2O_5 hybrid powders can oxidize water molecules to form oxygen as shown in Fig. 1. However, the conduction of hybrid powders was perhaps lower the water reduction potential 0V that casued electron of hybrid powdescan not reduce H+ to form hydrgen in water or sacrificial agent solution (10% methanol).Based on the stoichiometry of $NdVO_4$, the oxidation states and atomic orbitals are given by $Nd^{3+}(6s^24f^4)$, $V^{5+}(3d^0)$, and O2- (2p6). The valence band is formed by coupling Nd6s and O 2p orbitals while the conduction band is primarily controlled by V 3d orbitals, with contributions from the O 2p and Nd4f orbitals.

Biography

Deanna Mulvihill has her expertise in evaluation and passion in improving the health and wellbeing. Her open and contextual evaluation model based on responsive constructivistscreatesnewpathwaysforimprovinghealthcare.Shehasbuiltthismodelafteryearsofexperienceinresearch,evaluation,teachingandadministration both in hospital and education institutions. The foundation is based on fourth generation evaluation (Guba& Lincoln, 1989) which is a methodology that utilizes the previous generations of evaluation: measurement, description and judgment. It allows for value-pluralism. This approach is responsive to all stakeholders and has a different way offocusing.

Notes:

Mian Rong Lee, J Material Sci Eng 2017, 6:3 (Suppl)
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Shape-shifting 3D protein microstructures with programmable directionality via quantitative nanoscale stiffness modulation

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Nanyang Technological University, Singapore

The ability to shape-shift in response to a stimulus increases an organism's survivability in nature. Similarly, man-made dynamic and responsive "smart" microtechnology is crucial for the advancement of human technology. Here, 10–30 μm shape-changing 3D BSA protein hydrogel microstructures are fabricated with dynamic, quantitative, directional, and angle-resolved bending via two-photon photolithography. The controlled directional responsiveness is achieved by spatially controlling the cross-linking density of BSA at a nanometer lengthscale. Atomic force microscopy measurements of Young's moduli of structures indicate that increasing the laser writing distance at the z-axis from 100–500 nm decreases the modulus of the structure. Hence, through nanoscale modulation of the laser writing z-layer distance at the nanoscale, control over the cross-linking density is possible, allowing for the swelling extent of the microstructures to be quantified and controlled with high precision. This method of segmented moduli is applied within a single microstructure for the design of shape-shifting microstructures that exhibit stimulus-induced chirality, as well as for the fabrication of a free-standing 3D microtrap which is able to open and close in response to a pH change.

Biography

Mian Rong Lee is a final year graduate student from Nanyang Technological University, Singapore. Working with two-photon lasers, she has created protein-based shape-shifting materials, stimuli-responsive actuators and ventured into the direct metal writing of patterned SERS substrates and metamaterials.

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Notes:

Jin Ung Hwang, J Material Sci Eng 2017, 6:3 (Suppl)
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Electrochemical characteristics of PFO based pitch prepared by chemical activation for lithium ion battery

Jin Ung Hwang
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In recent years, carbon-based materials have been extensively investigated as an anode material for Li-Ion Battery (LIB). Because of their low material cost, abundance, nontoxicity and good capacity, carbon materials have been considered promising materials for LIB anodes in portable electronic devices and electric/hybrid vehicles. Despite these advantages, the practical application of carbon-based materials in many electronic device and electric/hybrid vehicles is still limited by its poor electrochemical performances. To enhance these electrochemical performances, we have performed the surface modification of PFO (Pyrolyzed Fuel Oil) based pitch by the chemical activation with KOH. PFO was heat treatment at 420 °C for 3h to prepared the pitch. The preparation method has been optimized through the analysis of diverse experimental variables such as the activating chemical agents to PFO ratio and the molarity of KOH solution. In addition, it shows that chemical activation with KOH solution can be successfully used to develop PFO with appropriate surface area and mean pore size. In this study, the effect of activating chemical agent/PFO weight ratio and Vinylene Carbonate (VC) as an electrolyte additive on electrochemical performances was investigated. The prepared modified PFO was analyzed by BET and FE-SEM. Also the electrochemical performances of modified PFO pitch as the anode were investigated by constant current charge/discharge, cyclic voltammetry and electrochemical impedance tests in the electrolyte of LiPF6 dissolved in organic solvents(EC:DMC=1:1 vol%).The coin cell using modified PFO pitch(KOH/PFO =1:5 in weight) has better initial capacity (420 mAh/g) than that of other composition coin cells. Also, modified PFO anode appeared a high capacity of 330 mAh/g on the second cycle and the retention rate capability of 2C/0.1C was 82% after 30 cycle. It is found that prepared PFO pitch anode showed improved cycling and rate capacity performance.

Biography

Jin Ung Hwang has passion and expertise in designing electrode composites of energy storage system. He pursued various researches on the anode materials of lithium ion secondary batteries, such as silicon and carbon. In this study, surface modification of PFO (Pyrolyzed Fuel Oil) based pitch was performed by the chemical activationmethod, and the physical properties and electrochemical performances of these anode materials were investigated. Theexperiment results were thoroughly analyzed to evaluate the the prepared carbon-based material's feasibility as an anode material for Li-ion battery (LIB).

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Notes:

Ting-Hsuan, J Material Sci Eng 2017, 6:3 (Suppl)
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Porous silica/polymer composite films for antireflective coatings

Ting-Hsuan
National Cheng Kung University, Taiwan

Recently, the deposition of Anti Reflective (AR) coatings to improve light transmittance for substrates such as display panels, solar cells, and eyewares have attracted intense attention. We reported a simple and facile preparation of AR silica/polymer composite films comprising vesicular nanostructures by Layer-By-Layer (LbL) vesicular assemblies and subsequent silica mineralization without any post-treatments. Continuous and intact composite coatings comprising vesicular nanostructures could be prepared by specific silica deposition onto the complex vesicles in the multilayer films by amine-catalyzed polycondensation. The vesicular cavities provided an additional parameter for adjusting their optical properties. The performance of AR property were determined by film thickness and complex vesicular size. The experimental data indicated that the AR composite films coated onto substrates exhibited maximum transmission over 97% at the visible wavelength between 570 and 800 nm. In addition, the low refractive index polymeric materials can be incorporated in the AR coatings to improve light transmission, which can achieve maximum transmission over 98% in visible wavelength. Moreover, these as-prepared AR composite films were mechanically stable to withstand both the wipe and adhesion test. This study demonstrated a simple and easy method for preparing composite films comprising vesicular nanostructure by combining LbL assembly with biomineralization.

Biography

My name is Ting-Hsuan,Lin. I got bachelor degree from National Cheng Kung University(NCKU), and major in chemical engineering. Now I manage to get the master degree in the same school. My research focuses on the antireflective coatings (ARCs).Through the synthesis of different type polymer, I get excellent AR performance on any substrates by Layer-by-Layer method .Moreover, I had one paper published on ACS Applied Materials & Interfaces. From the long period of learning , I am skillful, experienced, logical, innovative, and ambitious .I hope that I can become an good engineer to solve many problems, and that my research can benefit the world.

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Notes:

Ying Da Lai, J Material Sci Eng 2017, 6:3 (Suppl)
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Synthesis of poly(L-lysine)-based star polypeptides as potent antimicrobial agentscombating multidrug-resistant bacteria

Ying Da Lai
National Cheng Kung University, Taiwan

Antimicrobial polypeptides has received significant attention because the challenge of serious multi-drug resistance of bacteria has been considered the most important issue in the world. We report the synthesis of star homopolypeptides and copolypeptides and their evaluation as antimicrobial agents. It is known thatdendritic or star-shaped structures facilitate antimicrobial polypeptides to efficiently interact with cell membranes and consequently enhance antimicrobial potency.Polypeptides with different arms were synthesized by Ring-Opening Polymerization (ROP) of N-Carboxy Anhydrides (NCAs) using initiators with corresponded number of functional group. GPC and NMR analyses confirmed the successful synthesis of these star polypeptides. Cationic, star polypeptides comprising poly(L-lysine) (PLL) were designed and synthesized as antimicrobial agents against Escherichia coli, Klebsiellapneumoniae(KP), Pseudomonas aeruginosaand Enterohemorrhagic Escherichia coli (EHEC) which are common pathogens found in nosocomial infection.It was found that the star polypeptides exhibited the enhancement of antimicrobial efficacy as compared to linear counterparts without hemolysis and significant cytotoxicity. Unlike the synthesis of antimicrobial, peptide-based dendrimers requiring complex and tedious reaction steps, the synthesis of these star polypeptides is simple and additional functionality can be incorporated by conjugation. Furthermore, antimicrobial polypeptides can overcome antibiotic resistance owing to their unique antibacterial process. Our present results demonstrated that these star polypeptides are promising antibacterial agentsfor the treatment of bacteria induced disease.

Biography

Ying-Da, Lai, 24 years old and he graduated from National Chung Cheng University and major in chemical engineering. Now, he is a master student in department of chemical engineering, National Cheng Kung University, and my thesis objective focuses on the synthesis of polypeptides which is applied on antibacterial agents. Good knowledge in the synthesis of polymer experienced in handling reactions under the glove box and the preparation of antibacterial experiment under Laminar flow and Biological Safety Cabinet. He participated in annual meeting of the Polymer Society, Taipei in 2017 and got the championship in the poster competition. With my great skill of polymer organic synthesis, He is confident that he can do well in the field of polymeric biomaterials. He is eager to be one of the scientists who can design promising antimicrobial agents to solve the tricky issue of the rising of antimicrobial resistance.

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Notes:

Young Ju Song, J Material Sci Eng 2017, 6:3 (Suppl)
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Synthesis of miserite glass-ceramics by controlled crystallization heat treatment

Young Ju Song
Soonchunhyang University, Republic of Korea

In this study, we synthesized glass-ceramics based on miserite system. The composition and heat treatment were studied for their effect on the formation of the crystalline phases and on the resulting mechanical properties, such as transmittance over the visible spectra, hardness, fracture toughness, and bending strength. The amount and shape of the miserite crystals were examined by XRD, SEM, and DTA. The optimum processing conditions were determined from the relation between the properties and miserite phase of specimens.

Biography

Young Ju Song has completed her undergraduate degree in materials engineering Soonchunhyang University in Korea. She is currently maioring in ceramics in her masters's degree. She studies ceramic materials for various applications. Her interested field of study is the development of new materials with superior mechanical properties.

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Notes:

Si-Won Seong, J Material Sci Eng 2017, 6:3 (Suppl)
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Fabrication and characterization of SiO_2-CaO-Na_2O-K_2O-MgO-P_2O_5 based glass coatings

Si-Won Seong
Soonchunhyang University, Republic of Korea

Glasses of SiO_2-CaO-Na_2O-K_2O-MgO-P_2O_5 based system were synthesized by conventional melting process. The possibility of coating the glasses on Yttria Partially Stabilized Zirconia (Y-PSTZ) wasconsidered. In this study, various alterations were examined in the aforementioned base system, in order to optimize the variousproperties of the resulting glass coatings. The processing conditions and heat treatment were also studied for their effect on the resulting properties, such as transmittance over the visible spectra, hardness, fracture toughness, and adhesive strength.

Biography

Si-Won Seong has graduated from Soonchunhyang University in Republic of Korea. He has interest and passion in finding new materials. He has operated many measuring equipments such as XRD, SEM, and DTA to evaluate materials. Now he is pursuing a master's degree in Soonchunhyang University. His current research area is glass coating for various applications.

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Notes:

Seoyeong Kim et al., J Material Sci Eng 2017, 6:3 (Suppl)
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Casting characteristics of A356 aluminum alloy on Sn addition

Seoyeong Kim and Sugun Lim
Gyeongsang National University, Republic of Korea

Global fuel and emissions regulations are being tightened in the transport equipment industry to address global environmental and energy depletion challenges. As a countermeasure against this problem, the application of automobile parts using lightweight materials such as aluminum alloys for lightening automobiles is increasing.

Most of the aluminum alloy components are using in the automotive industry and it is manufactured by casting processes. Therefore, Al-Si based alloys excellent in casting are widely used.

The A356 alloy, which is a typical Al-Si alloy, is superior to aluminum alloys for casting, which have different flowability and filling properties, has little cracking during casting, has a low coefficient of thermal expansion, and is excellent in abrasion resistance. So the usage is increasing every year.

In addition, various studies such as process control for improving casting such as heat treatment, prevention of cracking of casting and improvement of flowability, control of cooling rate, and mechanical property strengthening by grain refinement are underway.

However, as in the study of general aluminum, the study on the relationship between the inherent physical properties of the material and the composition of the alloy has not been sufficiently studied compared to the industrial use of the A356 alloy.

In this study, the effect of Sn addition on the main composition of the alloy was investigated by adding Sn to improve the casting of the cast A356 alloy. For this purpose, casting and microstructure evaluation of A356 alloy according to the amount of Sn added was carried out.

Biography

Understanding the effects of microstructure, morphology and composition on theproperties of light materials Utilizing these knowledge to design improvement including Al- and Mg- base alloys, Development of high performance light materials via microstructure control

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Notes:

Ya-Fen Wu, J Material Sci Eng 2017, 6:3 (Suppl)
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Characterization of the structural and optical properties of ZnO nanostructures by X-ray diffraction

Ya-Fen Wu
Ming Chi University of Technology, Taiwan

Zinc Oxide (ZnO) has been extensively investigated due to its unique properties such as wide direct bandgap energy, large exciton binding energy, and thermal stability. These characteristics make ZnO nanostructures interesting for application in ultraviolet (UV) light emitters, optoelectronic devices, and chemical sensors. Various methods have been utilized to synthesize ZnO nanostructures, such as metal-organic chemical vapor deposition, sol-gel methods, and the low temperature hydrothermal method. The hydrothermal method has been widely used to grow ZnO nanostructures on ZnO-seeded substrate because of its advantages including low-cost, low-temperature, electronic compatible, and suitable for large area substrates. The properties of ZnO produced by the hydrothermal method are dependent upon preparation parameters such as growth temperature, precursor concentration, and growth time. In this work, the structural and optical properties of hydrothermally grown Zinc oxide (ZnO) nanostructures with aqueous solution molarity from 10 mM to 50 mM were studied by measurements of X-Ray Diffraction (XRD) and temperature-dependent photoluminescence (PL). The ZnO nanostructures exhibit weak emission in the Ultra Violet (UV) region and a strong and broad yellow-orange emission peak. With increasing solution molarities, the relative PL intensity ratio of the emission in the UV region to the emission in the visible region first increases and then decreases. It implies that too higher solution molarity leads to the disorder of ZnO structures. To verify the results, the measured X-ray diffraction curves are analyzed by a theoretical model and the ZnO structure size distribution were calculated. The analysis shows that the structure size uniformity of hydrothermally grown ZnO is improved with appropriately increased aqueous solution molarity, which is consistent with the experimental results from the PL spectra. Furthermore, the calculated results of the size broadening effect of the samples are verified from the Scanning Electron Microscope (SEM) images.

Biography

Ya-Fen Wu received MS degree in Department of Electrical Engineering from National Central University, Taiwan, and PhD degree in Department of Electronic Engineering from Chang Gung University, Taiwan, in 1990 and 2007, respectively. Currently, she is with the Department of Electronic Engineering of Ming Chi University of Technology, Taiwan, as Professor. Her main field of research includes compound semiconductor materials and opto-electrical devices.

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Notes:

Jae Young Kim, J Material Sci Eng 2017, 6:3 (Suppl)
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Comparison of EMI shielding effectiveness for polymer/carbon fiber composites prepared by different processing methods

Jae Young Kim
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The effects of composite preparation methods on the electrical properties such as electrical conductivities, electromagnetic parameters and EMI shielding effectiveness polymer/carbon fiber(CF)composites were investigated. The composites were prepared using injection molding machine, internal mixer and screw extruder. From the results of electrical properties, the Polymer/CF (70/30, wt%) composites prepared by injection molding showed the highest electrical conductivity and EMI shielding effectiveness. This result seemed mainly due to the increased CF length when the Polymer/CF composite were prepared by injection molding, which was advantageous in forming stable conductive network of the composite. From the results of electromagnetic parameters of the Polymer/CF composites, the increased electrical conductivity of the composite prepared by injection molding was mainly due to the increased dielectric constants (ε' and ε") of the Polymer/CF composite. This enhanced dielectric constants seemed related to the percolation at a lower concentration of the CF which was affected by the increased CF length of the composite prepared by injection molding process. From the results of dielectric loss and magnetic loss factors of the Polymer/CF composite, the major electromagnetic absorbing mechanism was dielectric loss such as dipole polarization and interface polarization between filler and matrix, resulting improved EMI absorption values. The total EMI shielding effectiveness of the Polymer/CF composite consisted of 85.1% EMI shielding effectiveness by absorption and 14.9% EMI shielding effectiveness by reflection, suggesting that the EMI shielding was predominant by the absorbing mechanism of the incident electromagnetic wave.

Biography

J.Y.Kim is attending in Master of Engineering course of Department of Chemical and Biological Engineering at Korea university since 2016. I have received B.Eng atDepartment of Chemical and Biological Engineering at Korea university in 2016.My research field is thestudyingof mechanical and electrical properties of polymer/conductive filler composites. Also I am interested in improving the compatibility of polymer blends using reactive compatibilizers. I have been studying polymer/conductive filler composites for improving the EMI SE(Electromagnetic interference effectiveness) of the composites. I have been using research equipmentssuch asuniversal testing machine (UTM), advanced rheological expansion system (ARES), scanning electron microscope (SEM) andvector network analyzer.

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Myung Geun Jang, J Material Sci Eng 2017, 6:3 (Suppl)
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EMI shielding effectiveness of polypropylene/poly(lactic acid)/carbon fiber/MWCNT composites prepared by injection molding and screw extrusion

Myung Geun Jang
Korea University, Republic of Korea

The electrical conductivity and electromagnetic interference (EMI) shielding effectiveness of the composites of polypropylene/poly(lactic acid) (PP/PLA) (70/30, wt%) with single filler of multiwall carbon nanotube (CNT) or hybrid fillers of nickel-coated carbon fiber (CF) and CNT were investigated. For the single filler composite, higher electrical conductivity was observed when the PP-g-maleic anhydride was added as a compatibilizer between the PP and PLA. For the composite of the PP/PLA (70/30)/CF (20 phr)/CNT (5 phr), the composite prepared by injection molding observed a higher EMI shielding effectiveness than the composite prepared by screw extrusion. The higher values in EMI shielding effectiveness and electrical conductivity of the PP/PLA/CF (20 phr)/CNT (5 phr) composite seemed mainly because of the increased CF length when the composites were prepared using injection molding machine, compared with the composites prepared by screw extrusion. This result suggests that the fiber length of the conductive filler is an important factor in obtaining higher values of electrical conductivity and EMI shielding effectiveness of the PP/PLA/CF/CNT composites.

Biography

Myung Geun Jang has been studying PhD course in Department of Chemical and Biological Engineering at Korea University. His expertise is focused in the field of mechanical and electrical properties of polymer/conductive filler composites. He has been using universal testing machine (UTM), advanced rheological expansion system (ARES) and scanning electron microscope (SEM) to investigate the properties of the composite. He studied the electromagnetic shielding materials and light-weight thermoplastic composite which were prepared by pultrusion, injection molding and extrusion process. He also studied the rigid polyurethane foams which are used as insulation materials.

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Huey-Er Lee et al., J Material Sci Eng 2017, 6:3 (Suppl)
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The study on correlation among electric potential of different materials of crown in different corrosion status (artificial saliva)

Huey-Er Lee[1], Ju-Hui Wu[1], Yan-Ting Pan[1], Yu-Ting Jhong[1], Kuan-Yu Chiu[1], Chih-Yeh Chao[3]
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[2]National Pingtung University of Science and Technology, Taiwan

For well corrosion and aesthetics, the common materials of dental crown are included Pt, Pd, Au and Co alloys as well as G5 Ti alloy. After implant therapy, the portion eddy current would occur between the implant and crown because their electrochemical potentials are different. However, the phenomenon will give rise to physical discomfort or implant pitting. Therefore, the present studies are focus to analyze the electrochemical potentials and surface structure of G5 Ti implant and crown made of Pd-37.7Ag (Alloy A), Au-24.90Pd-19Ag (Alloy B), Au-8.5%Pt (Alloy C) or Ni-25%Cr (Alloy D). In the artificial saliva, the electrochemical potentials of alloy A, B, C, D and G5 Ti are 0.12, 0.04, 0.02, -0.46and-0.32 eV, respectively. Meanwhile, the electrochemical potential of crown will be better if crown contains higher Pd element. The deviation of electrochemical potential between Alloy A-D crown and G5 Ti implant is 0.44, 0.36, 0.34 and -0.14, respectively. Additionally, the characteristic of surface morphology is also shown the same result. It is noted that the deviations of electrochemical potential between Alloy A-C crown and G5 implant are all positive. That means that G5 Ti implant would be anode during implant therapy resulting to corrosion. Moreover, the deviations of electrochemical potential between Alloy D crown and G5 implant is negative and smallest. It implies that G5 Ti implant would be cathode during implant therapy. And, the eddy current between G5 implant and Alloy D crown would be smallest resulting to cause lower physical discomfort or implant pitting. It also means that the Ni-25%Cr alloy is better choice to implant therapy.

Biography

Huey-Er Lee graduated from Kaohsiung Medical University, Now was working at KMU and KMU hospital as a professor and practitioner. Her expertise in prosthodontics(esp. in removable partial denture & complete denture), biomechanics and dental materials, She had been a Director, School of Dentistry (2003 ~ 2009) Dean, College of Dental Medicine(2013 ~ 2014) and Director, Department of Dentistry in KMU hospital.(2008 ~ 2013). She worked hard for improving the oral health, esthetics of people and educated the young people for improving knowledge, growing and maturity. She had made OSCE(Objective Structural Clinical Education) system for clerk and intern of dental student, and instructor of PGY(Post Graduate Year program) training system for resident.

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Notes:

Trinet Yingsamphancharoen, J Material Sci Eng 2017, 6:3 (Suppl)
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The study of pull off adhesion for aluminum wire grade 1350 on carbon steel ASTM A36 by thermal wire arc spray

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The aim of work for a coating aluminum grade 1350 on carbon steel ASTM A 36 in different roughness of 50, 75, 100 and 125 microns by thermal spray with wire arc spray technique. After that, the coated specimen was tested the mechanical property, pull off adhesion, bending as NACE No.12 and analyzed the macrostructure. From the results, the specimen with roughness of 75, 100 and 125 microns exhibited nearly thickness in averages of 370±49, 375±32, and 369±59 microns, respectively. The result indicated that the surface preparation of carbon steel ASTM A36 with highest 75 micron was suitable range caused to the nearly thickness of coated aluminum on specimen. Moreover, all specimens were agreed in criteria of bending test as NACE No.12 standard without crack. The macrostructure testing result shown the nearly thickness and pull off adhesion between coating surface of aluminum and carbon steel ASTM A36.

Biography

Trinet Yingsamphancharoen has expertise in welding Engineering and materials such as metals and plastic. He can be prepared welding procedure specification (WPS) and procedure qualification record (PQR) for controlling qualification of welding methods for their materials such as plasma arc welding for titanium, submerge arc welding for API 5L pipe and etc. Moreover, he has descripted corrosion of welded pipe based carbon steel in conditions of brine and salt spray. Now, he focused on surface welding of carbon steel for improving resistances of wear and corrosion.

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Heung Jae Chun et al., J Material Sci Eng 2017, 6:3 (Suppl)
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Collagen/poly(D,L-lactic-co-glycolic acid) composite fibrous scaffold prepared by independent nozzle control multi-electrospinning apparatus

Heung Jae Chun, Yang D H, You S J, Kim J K, Ko J H and Park Y H
The Catholic University of Korea, Republic of Korea

The objective of the present study was to evaluate non-woven collagen/poly(lactic-co-glycolic acid) fibrous scaffold (Col/PLGA FS) prepared by a co-electrospinning process using a novel multi syringe electrospinning system for tissue engineering applications, as compared to collagen and PLGA FSs. The morphological and mechanical properties of the FSs were assessed by scanning electron microscopy (SEM) and a universal testing machine (UTM). The changes in chemical composition due to the incorporation of collagen to PLGA were determined by Fourier transform infrared spectroscopy-attenuated total reflection mode (FTIR-ATR). The biocompatibility of the FSs was also evaluated in vitro in cultures of mouse fibroblasts and in vivo by subcutaneous implantation studies in rats. SEM image of the samples showed that the fiber size distribution of Col/PLGA FS became narrow compared to PLGA FS due to the incorporation of collagen of small fiber diameter. The FTIR-ATR spectrum of Col/PLGA FS revealed the characteristic bands of collagen and PLGA, indicating the co-existence of two fibrous structures. The poor mechanical properties of collagen FS was improved by co-electrospinning with PLGA. In vitro L929 cell proliferation assay revealed that the cyto-compatibility of Col/PLGA FS was increased compared to that of PLGA. In addition, Col/PLGA FS showed increased the hydrophilic property enough to absorb the exudates at the interface with mild foreign body reactions.

Biography

Heung Jae Chun had received Ph.D. degree from the Biomedical Engineering & Science Institute, Drexel University (Philadelphia, PA, USA) from 1991-1994 under the advice of Prof Richard B. Beard. For the additional 2 years (1994-1996) at BMESI, he worked on the development of the "polymeric chemoattractants for human melanoma cells" as post-doctoral position.He has published 91 SCI original research papers, including Oncogene, Biomaterials, Polymer Reviews and authored the international books including "Nanofibers-Production, Properties and Functional Applications", Three-Dimensional Nanofiber Scaffolds for Regenerative Medicine, Ch. 17, , In Tech and "Encyclopedia of Biomedical Polymers and Polymeric Biomaterials" Polymeric Scaffolds for Regenerative Medicine, Taylor & Francis Publishes, in Press, 2014. His major scientific contribution has been to appreciate and analyze the importance of natural, synthetic and hybrid scaffolds for adult stem cells on the target diseases; myocardial infarction, retinal ischemia, and osteolysis.

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Notes:

Chang-Geun Cho, J Material Sci Eng 2017, 6:3 (Suppl)
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Utilization of blast furnace by-product in application of highductile fiber-reinforced cement-free composites

Chang-Geun Cho
Chosun University, Republic of Korea

Of the building materials, cement or cement-based materials are the main binding material (Cho et al, 2012; Lee et al, 2012). However the carbon dioxide (CO_2) produced in the cement manufacturing process represents up to about 7% of global manmade CO2, and cement also has a high level of toxicity. The purpose of this research is to develop a sustainable and eco-friendly building material, which is called a high-performance ductile Fiber-Reinforced Cement-Free Composite (FRCFC). FRCFC is manufactured using Ground Granulated Blast-Furnace Slag (GGBS) based alkali-activated cement-free fiber composites. Two mixture proportions, both of which had proper flowability and viscosity of mortar in order to easily mix and uniformly disperse fibers, were determined according to alkali activators and the slump flow. Compression, direct-tension, and bending tests on the developed cement-free composites were conducted in order to evaluate the mechanical properties of composites. The developed cement-free composites showed an average of 465mm slump flow and about 2% of the tensile strain capacity based on multiple micro-cracks. The test results demonstrate the feasibility of high ductile fiber-reinforced cement-free composites as sustainable building materials.

Biography

Chang-Geun Cho has his expertise in development and applications of high performance fiber-reinforced cement and concrete composite in architectural building structures. He received PhD in the field of concrete and structures in the department of architectural engineering, Tokyo Institute of Technology, Japan, 2000. From 2009, he is working and educating at school of architecture, Chosun University, Republic of Korea. He had initially attempted to develop a strain-hardening fiber-reinforced cementless composite (Lee & Cho et al., 2012). Currently he is serving as a managing editor in International Journal of Concrete Structures and Materials, Springer.

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The effect of argon ion bombardment on multilayer graphene

Amir Hoshang Ramezani and A Jafari
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Multilayer graphene films were synthesized on copper foil by means of Low-Pressure Chemical Vapor Deposition (LPCVD) and characterized using Raman spectroscopy. Low energy argon bombardment with different doses is performed to form defective graphene. In order to investigate the effect of Argon bombardment on graphene, Raman spectroscopy, scanning electron microscopy and atomic force microscopy were used. Analysis before and after the bombardment revealed that the interaction of argon ions with graphene surface had a strong effect on the structure, morphology and roughness of graphene. Upon ion bombardment in the energy of 30 keV, formation of a damaged surface and a significant difference in the intensity of D band in Raman spectroscopy after ion bombardment was observed.

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Deactivation of nickel-based catalysts during steam reforming of naphthalene in the presence of hydrogen chloride

Andrei Veksha
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Gasification of municipal solid waste (MSW) is one of the measures to minimize landfilling and generate electricity. Gasification converts the waste into gaseous fuel (syngas), which can be usedto generate electricity in gas turbinesor gas enginesat high net electrical efficiencies. However, the removal of tar compounds, which cause equipment fouling and pipe plugging, is required prior to syngas utilization. Among available technologies for the reduction of tar levels in syngas, catalytic tar reforming is considered the most promising. Unlike the syngas from traditional biomass sources, the syngas from MSW contains high levels of hydrogen chloride. The objective of this study was to investigate the influence of HCl on the activity of nickel-based catalysts during catalytic reforming of naphthalene, one of the most stable tar compounds in syngas. Two commercial alumina catalystscontaining nickel (Cat. 1 and Cat. 2)and a catalyst prepared by impregnation of limestone with a nickel salt (Cat. 3) were tested at 790 °C in the absence and presence of HCl (2000 ppmv).

Regardless of HCl presence, commercial alumina catalysts converted ~90-100% of naphthalene into a mixture of H2, CO and CO2. Limestone catalyst hadthe lower conversion efficiency in the absence of HCl (~80%), which remained stable during the testing period. However, in the presence of HCl, the catalyst rapidly deactivated due to the reaction of support with HCl as revealed by SEM/EDX.Although the conversion of naphthalene over alumina catalystswas stable for 6 hin the presence of HCl, the composition of product gas has changed during this period. Specifically, the production of CO increased while the concentration of CO2 decreased due to the loss of water-gas shift activity of nickel in the presence of HCl. The decrease in activity was attributed to the enlargement of nickel nanoparticles.

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Biomaterials as a tool for teaching and learning training programs on surgery

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Statement of the Problem: Developing surgical skills is essential in the training of all surgical specialties. However ethical, legal and economic issues have limited surgical training. As surgical educators, we are always trying to identify new ways to provide skills training. We have developed training programs to teach surgical skills to junior surgeons from human and veterinary medicine based on laboratory animals using preserved tissues and organs as surgical training biomaterials. The goal is to help the trainees acquire the abilities and dexterity necessary to perform surgery on patients.

Methodology: We created a small bank of cryopreserved tracheas and stomachs harvested from Wistar rats as well as cryopreserved tracheas and lyophilized esophagus that were harvested from dogs. All animals were previously used in research studies. Stomachs, tracheas and esophagus were cleansed with saline solution, after which, tracheas and esophagus were mounted on polypropylene tubes. In the stomachs the pyloric antrum was tied with silk 1-0, stomachs were filled with hyaluronic acid solution and the distal esophagus was tied too. Tracheas and esophagus were trimmed in segments of 5 cm. Cryopreservation of tracheas and stomachs was made with a controlled-rate freezer (-1°C/min) and stored at -30°C for 30 to 60 days. The entire esophagus was lyophilized at -55°C and 10 mBar of vacuum pressure during 24 hours and sterilized with low temperature hydrogen peroxide gas plasma process. On the day of the surgical skills practice the cryopreserved organs were thawed at room temperature and the all the esophagus were rehydrated with saline solution at 4°C. Each preserved organ was used to perform end-to-end anastomosis with 4-0 running polypropilene or single stitches. Preserved organs are high-fidelity, inexpensive, practical, portable bench models that improve the tactile perception and facilitate surgical skills learning by improving how trainees handle tissue and surgical instruments.

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Study of corrosion inhibitors effect on the corrosion behavior of nanopolymer crystalline W-42Cr-5Ni alloy in 0.5 m NaCl solution

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A corrosion inhibitor is a chemical substance, which when added in a small concentration to a corrosive environment, effectively decreases the corrosion rate of a metallic substance that is exposed to the environment (1) The corrosion control method of metals and alloys using the inhibitors is a fundamental academic and industrial concern that has received a considerable attention nowadays, (2) Effects of three eco-friendly green corrosion inhibitors of sodium salts of nitrite, molybdate and tungstate in different concentrations (i.e., 200-2400 ppm) on the corrosion behavior of the sputter-deposited ternary nanocrystalline W-42Cr-5Ni alloy were studied using corrosion tests and electrochemical measurements in 0.5 M NaCl solution open to air at 25°C. The use of these corrosion inhibitors was enhanced to increase the corrosion resistance properties of the alloys, and as a result the corrosion rate of the W-42Cr-5Ni alloy was decreased with increasing the concentrations of sodium nitrite from 200 to 2400 ppm as shown in Fig. 1(a). The inhibition action of the tested inhibitors was found to obey the Langmuir isotherm model and the inhibition efficiency was found to increase with increasing the inhibitors concentration.

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Biologically templated assembly of hybrid semiconducting nanomesh for high performance field effect transistors and sensors

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One-dimensional semiconducting nanomaterials have been extensively investigated for active devices on flexible substrates or sensing devices to amplify weak chemical or biological signals.Network structures produce collective properties out of heterogeneous nanomaterials. Moreover, its percolated electronic paths with a large surface-area allows for efficient interactions with ionic or chemical systems. However, although various approaches have been developed, fabricating well-controlled network structures onto relevant substrates with desired location and dimension still remains a significant challenge. Here we report a highly controllable and non-destructive approach for producing a free-standing large-area semiconducting networkin solution that is readily suitable for semiconducting network-based device integration onto arbitrary substrates. In our approach, semiconducting single-walled carbon nanotubes (SWNTs) were assembled into a network-structured semiconducting layer in solution using a biological template, an M13 phage with strong binding affinity toward SWNTs, to yield a free-standing hybrid semiconducting nanomesh layer in solution.We used the semiconducting nanomesh to successfully fabricate a field-effect transistor (FET) with an Ion/Ioff ratio of ~ 104by employing a simple stencil mask. We further demonstrated that the intact biological functionality resulting from the non-destructive and room-temperature process, the intimate contact between the biological template and the SWNT, and the well-controlled nanostructureof thehybrid semiconducting nanomesh enabled a highly sensitive electrochemical modulation of the FETs. Thehybrid semiconducting nanomesh-based FETs detected a sub-ppb concentration ofthe smallneurotransmitter molecule dopamine in a biologically relevant solution. Our work provides a potentially promising route to realizing a network-structured active layer for high-performance flexible electronics and sensors.

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Electrochemical co-deposition of PPy-MnO_2 nanocomposite thin film electrodes for supercapacitors: Effects of different deposition parameters on the specific capacitance of the electrode materials

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Supercapacitors are one of the most promising energy storage devices due to their higher power density, fast charging and discharging rate, long cycle life, low manufacturing cost and intrinsic safety. These properties are dependent on the electrode materials used. Transition metal oxide has been used as electrode materials due to their higher capacitance however they have poor electrical conductivity and poor structural properties. To compensate these drawbacks, conducting polymers were embedded to metal oxide to form composite nanostructured electrodes. In this paper, electrodes were prepared based on polypyrrole (PPy) and manganese dioxide (MnO2) by electrochemical do-deposition process. The effects of the different electrochemical deposition parameters on the morphological and electrochemical properties of the electrode materials were determined using Scanning Electron Microscopy (SEM), Cyclic Voltammetry (CV) and Electrochemical Impedance Spectroscopy (EIS). The structural properties were determined using X-ray Diffraction Analysis (XRD) and Fourier Transform Infrared Spectroscopy (FTIR) and the relative surface roughness was obtained using Atomic Force Microscopy (AFM). PPy-MnO2 nanocomposite thin films were electrochemically co-deposited using potentiodynamic, potentiostatic, and galvanostatic deposition techniques. Galvanostatic deposition method of about 1 mA/cm2 current density for 5-minute deposition time has allowed the deposition of electrode with the highest capacitance value of about 190 F/g with γ-MnO2 crystal polymorph on the electrochemically co-deposited PPy-MnO2 nanocomposite thin films. At the same time, the presence of PPy and MnO2 components on the nanocomposite thin films were confirmed also through FTIR analysis. The granular and porous structure was observed using SEM images. The morphological properties correspond to the obtained specific capacitance of the individual electrodes were confirmed using CV measurement. Figure 1 shows the CV of the nanocomposite electrodes at various scan rates.

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Diamond-like carbon thin film deposition by filtered cathodic vacuum arc source for wear resistance improvement of zirconia toughened alumina

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Alumina has been used as engineering ceramic material widely due to high mechanical strength and hardness, wear and corrosion resistance. For higher strength and toughness, zirconia toughened alumina (ZTA)which has zirconia grains in alumina matrix has been used. However, ZTAhas lower hardness and wear resistance than alumina. To improve the wear resistance of engineering ceramic, hard coating like diamond-like carbon (DLC) coating on ceramicsurface has been used.In this study, tetrahedral amorphous carbon (ta-C) film which is the hardest DLC was deposited on ZTA by using filtered cathodic vacuum arc (FCVA) source and the wear resistance, hardness and scratch resistance was investigated according to the substrate bias conditions.The pulse bias was used for the substrate bias and the pulse frequency was 16 kHz and the rise time of the pulse was about 1 μs. Because it was known that the hardness of ta-C thin filmis related with the residual stress, the residual stress of the ta-C thin film deposited on dielectric material by FCVA source was investigated with various pulse voltages. The residual stress of ta-C thin film decreased monotonically with the substrate pulse bias. To obtain both high wear resistance and low residual stress, a bi-layer deposited with both high pulse voltage and low pulse voltage was deposited on ZTA. Through the pin-on-disk tests, the wear resistance was investigated in various thickness conditions of the ta-C bi-layer. It was found that the high residual stress layer has higher wear resistance. By using nano-scratch tester,it was found that the low residual stress layer has higher scratch resistance. The hardness and elastic modulus of ta-C thin film on ZTA was measured by usingunltranano-indenter.

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Spectroscopic properties of magnesium metaphosphate based fluorophosphate glasses co-doped with Er/Yb

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Statement of the Problem: In recent years, a high-speed data transmission demand has been increased tremendously due to the internet traffic. Although Erbium Doped Fiber Amplifier (EDFA) is a mature technology and is the workhorse for Wavelength Division Multiplexing (WDM) and all optical networks, its relatively large size requires further research and development to achieve the ever-wanted small, compact, and efficient fiber amplifiers. Among different host matrices, Fluorophosphate (FP) glasses have been received great attention for optical amplifier applications because of their promising properties such high rare earth solubility, good thermal and chemical stability, and so on. In particular, Er3+/Yb3+ co-doped FP glasses can enlarge the emission cross-section and improve luminous efficiency than the trivalent erbium (Er3+)-doped FP glass materials, because Yb3+ has significantly higher absorption cross-section at around 980 nm than Er3+ [3-5]. Hence, the present study reports the spectroscopic properties of co-doped FP glasses with varying Yb3+ concentration.

Methodology: Er3+/Yb3+ co-doped magnesium metaphosphate based fluorophosphate glasses were prepared by a conventional melt quenching technique and they were characterized through spectroscopic techniques.

Findings: From spectral measurements, the important spectroscopic properties such as emission cross-sections and lifetime have been evaluated for the emission band at 1.53μm in order to the see the potentiality of the material as gain media. It was found that the larger emission cross-section of the order of 2.38 x 10-20 cm^2 and longer lifetime of the order of 16 ms have been obtained for 1.53μm emission band.

Conclusion & Significance: It was demonstrated that larger concentration of Yb ions improves the signal emitted, partly because it helps in reducing quenching of Er and partly because energy transfer was enhanced. The optimum Er/Yb ratio was found to be 3:4. The results indicate that this glass composition has strong possibilities of being used in lasers and amplifiers.

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Stacking sequence and curing temperature effect on natural frequency of hybrid fiber reinforced composite laminate

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In this work, a multi lamina hybrid fiber reinforced structure was statically and harmonically analyzed for the purpose of studying of effect of stacking sequence, curing limit upon induced stresses and natural frequency of free longitudinal in-plane vibrations. The effect of boundary conditions of the structure on the natural frequency under free longitudinal vibration due to tension was also studied. The laminate was suggested to be composed of 4 layers and subjected to a tensile force with thermal load represented by curing the structure at a temperature of 240°C, then it is cooled to a temperature of 23°C. Two stacking layouts are suggested ($0^o/90^o/0^o/90^o$ and $0^o/90^o/90^o/0^o$) in order to investigate their effects on the natural frequency. The software of FEA ANSYS v.14 is taken to manipulate the project data. A comparison between numerical results obtained from the software and theoretical ones obtained from the analytical solution based on Generalized Hooke's Law and classical lamination theory was made for the purpose of results verification. Good convergence was found between the two sets of results.

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Chemical and mineralogical investigations on clay minerals deposited in Sanothimi area of Kathmandu valley

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Clay mineral is one of the important groups of natural minerals which are formed by chemical weathering & hydrothermal activities on different types of rocks. Clay minerals are being used for various purposes from pre-historic times to modern age. They are naturally occurring fine-grained hydrated aluminosilicates of mostly monocline or triclinic symmetry which may contain sodium, calcium, potassium, magnesium, iron, titanium and other ions. Clay minerals show a large variety of uses depending on their basic properties like physical properties, chemical-mineralogical composition, structure & their small grain size. Clay minerals deposit in Nepal has been studied by a few researchers in the past. Most of the research works was concerned with physical properties, chemical as well as mineralogical studies & geological studies. As far as the author knows, the first comprehensive study of ceramic properties of porcelain raw materials of Nepal was carried out in detail. However, there is no research work carried out yet on the clay minerals deposited in Sanothimi area of Kathmandu valley. In this context, the main objective of this research is to characterize the clay minerals (locally known as Kamero Mato) deposited in Sanothimi area using chemical & mineralogical analyses, X-ray diffraction (XRD), infrared (IR) spectroscopy and differential thermal analysis (DTA) techniques. Major clay minerals identified in the clays were mica (mostly of muscovite), vermiculites, feldspars and quartz based on the chemical, mineralogical, XRD (Fig. 1), IR & DTA analyses. The detail about the characterizations will be discussed during the presentation in the conference.

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Electrochemical study of unmodified and inhibitor doped silane films for corrosion protection of 2024 aluminum alloy

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Statement of the Problem: Excellent adhesion and self-healing properties conferred by chromate conversion coatings (CCC) made them the pretreatment method of choice for metals like aluminum and steels. However, due to the carcinogenic and mutagenic nature of hexavalent chromate species research to find adequate alternatives is on-going. Silanes, capable of forming a dense barrier layer as well as allowing formation of bonds with the metallic substrate and organic top coat, have been investigated as alternatives. However, the effect of number of hydrolysable groups per silane molecule and inhibitor ions have not been studied together. The purpose of this study is to compare the performance of gamma-(aminopropyl)triethoxysilane and bis-trimethoxysilane and effect of cerium ions on corrosion resistance. Methodology & Orientation: The coatings were prepared using immersion method and then cured. The focus of study was the interaction between AA2024 substrate, silane and inhibitor ionic species. Morphology of the films was studied by scanning electron microscopy. Corrosion performance was investigated via DC polarization, electrochemical impedance spectroscopy and energy dispersive x-ray spectroscopy. Findings: The number of hydrolysable groups have a significant impact on film uniformity and barrier properties. Additional hydrolysable groups in bis-trimethoxysilane allow for a marked improvement in corrosion protection over the gamma-(aminopropyl)triethoxysilane. The addition of cerium ions further enhances the performance of the bis-trimethoxysilane by imparting a self-healing effect to the silane layer. Conclusion & Significance: An increased number of hydrolysable groups in a silane molecule allow for the formation of a denser metal-silane interface along with a more uniform coating. A functional group can have a positive or negative impact on the silane layer performance. Cerium ions can provide short-term self-healing effect. Areas of future improvement are identified.

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An experimental investigation of combustionsynthesis of Sio_2 nanoparticles using theinward typepremixed flame burner

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Silica (SiO_2) nanoparticles are used as additives in plastics and rubbers to improve mechanical properties of elastomers, and in liquid system to improve the suspension behavior. In these applications, the particle morphology, average size, size distribution, and phase composition are considered as the key characteristics of powders that must be controlled.

Flame synthesis is widely used for the production of nanoparticles, as it readily offers the high temperature and oxidizing environment necessary for the growth of such particles. The combustion synthesis is an attractive technique, where particle size, and phase purity can be precisely controlled, along with the potential scale up for high throughput production, giving it an advantage over other methods such as wet chemical and chemical vapor deposition.

The objective of this experimental research was to investigate the synthesis of silicon dioxide nanoparticles using the inward type premixed burner effective to mass production of nanoparticles. In this study, the inward surface premixed flame was examined using a porous baffle plate and alloy metal foam. The results show that the surface and stable premixed flame can be generated by implementing the proper baffle plate and alloy metal foam. The inward surface premixed flame mode is changed into radiation flame, blue flame and lift off flame with decreasing equivalence ratio. The blue flame has a wide stability region and showed the lowest CO and NOx emission at low equivalence ratio. Through preliminary study usingflat premixed flame burnerit is found for silicon dioxide(SiO_2) nanoparticlesto be generated using silane(SiH_4) as precursor. And surface premixed blue flame was retained to be very stable under precursor inlet velocity and silane concentration for synthesis of silicon dioxide nanoparticles.

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Current voltage characteristic of planar langmuir probe in ionospheric maxwellian plasma

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PlanarLangmuir Probes have been installed on satellites and sounding rockets to observe the general characteristics of thermal plasma in the ionosphere for more than five decades. Because of its simplicity and convenience, the Langmuir probe is one of the most frequently installed scientific instruments on spacecraft. The Langmuir Probe is the key plasma diagnostic used by scientists interested in plasma characterization to measure the internal parameters of the bulk of the plasma.This research explores the theoretical study of Planar Langmuir Probe I-V Characteristics. The relationship between first derivatives of current verses applied probe voltage is also computed. With the help of the (volt–ampere curves) of Planar Langmuir probes, the different parameters of plasma can be determined such as plasma potential, floating potential, probe currents in different probe voltage and so on. Planar Langmuir probe geometry is easy to construct and equally suitable for plasma characterization.

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Mechanical properties of gas metal arc welding (GMAW) welded ductile cast iron with microalloyed steel

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One of the best metal joining methods using gas metal arc welding (GMAW) is already used in the agricultural machinery industry to assemble any body parts of dissimilar ductile cast iron with microalloyed steel. Capacity of some loading i.e., bearing of the machinery components depends on mechanical properties on the quality of weldments. In this research for GMAW, with the use of a microalloyed steel filler, of a new microalloyed sheet steel and a ductile cast iron cylindrical bar steel is investigated. Examined quality butt weld beads as microstructure and mechanical properties were taken by applying different mean ferrite grain size according to Hall-Petch relationship. As well as phase volumetric fraction, mechanical properties changes and ferrite grain coarsening as in the heat affected zone (HAZ) at the welding steels joints were also determined. Considering the experimental results, maximum errors of 4.4% and 2.1% were found in the evaluation of mean ferrite grain size and yield stress, respectively.

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Application of response surface methodology for optimizing adsorption performance of magnetic graphene oxide nanocomposites for removal of methadone

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Magnetic Graphene Oxide (MGO) nanocomposites have been synthesized by the co-precipitation route. The surface structure of MGO nanocomposites was analyzed by XRD, TEM, SEM, VSM and nitrogen adsorption-desorption instrumental techniques. Response surface methodology was applied to optimize the removal of methadone by MGO nanocomposites in an aqueous solution. Experiments were conducted based on a Box-Behnken Design (BBD). The influence of three parameters on the removal of methadone was examined using a response surface methodological approach. The significance of the independent variables and their interactions were tested by the Analysis of Variance (ANOVA). The optimum pH, adsorbent dose and temperature were found to be 6.2, 0.0098 g and 295.7 K, respectively. Under these conditions, removal efficiency of methadone was found to be 87.20 mg/g.

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