ICCCI 2018

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The 6th International Conference on the Characterization and Control of Interfaces for High Quality Advanced Materials
and
the 54th Summer Symposium on Powder Technology

Program and Abstracts

Kurashiki, Japan
July 9–12, 2018

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Conference Information

1. Aims and Scope

Interfaces are critically important to a broad spectrum of materials and technologies. In 2003, the first International Conference on Characterization and Control of Interfaces for High Quality Advanced Materials (ICCCI2003) established an international forum for interface science and technology. Interest and participation doubled in 2006, 2009, 2012 and 2015 at the second, third, fourth and fifth International Conferences (ICCCI2006, 2009, 2012 and 2015) respectively. In 2018, the sixth International Conference (ICCCI2018) will continue the discussion on interface characterization and control to design and manufacture high quality advanced materials. Additionally, an industrial exhibition by multinational corporations will complement the technical sessions. At ICCCI2018, interface characterization and control technology for nano-scale to micro-scale materials synthesis, powder processing, composite processing, joining, and to control airborne particulates will be addressed by scientists and engineers from academia, industry, and national laboratories. Conference topics include:

Session A: Interface Characterization and Control for Nanoparticles and Powders (54th Summer Symposium on Powder Technology)

- Solid-liquid interfaces
- Composite interfaces
- Interface characterization techniques
- Interface control for processing
- Control and design of interfaces in suspensions

Session B: Smart Processing Technology

- Advanced materials: ceramics, metals, polymers, composites, porous materials etc.
- Microsystems
- Nanotechnology
- Novel manufacturing: 3D printing etc.
- Advanced joining and welding technology

Session C: International Symposium in Honor of Prof. Olivera Milosevic

Session D: Energy and Environment

- Batteries
- Fuel cells
- Solar cells
- Biomass, Coals
- Recycling
- PM2.5
- Nanorisk

Session E: Material Design and Evaluation

- Bio-materials
- Chemicals and pigments
- Electronic materials
- Pharmaceutical
- Engineering materials
- Microstructure evaluation
- Evaluation of material properties

2. Supporting Organizations and Sponsors

Organized by
The Society of Powder Technology, Japan

Co-Sponsors
Hosokawa Powder Technology Foundation
International Comminution Research Association
Japan Science and Technology Agency
Japan Welding Society
Joining and Welding Research Institute, Osaka University
Kao Corporation
Smart Processing Society for Materials, Environment & Energy
The 124th Committee on Advanced Ceramics, Japan Society for the Promotion of Science
The American Ceramic Society
The Ceramic Society of Japan
The Japan Institute of Energy
The Japan Institute of Metals and Materials
The Japan Society on Adsorption
The Society of Chemical Engineers, Japan
Yamanashi Prefecture
Material Research Society of Serbia

3. Conference Venue

Kurashiki Royal Art Hotel
3-21-19 Achi, Kurashiki, Okayama 710-0055, Japan
Tel: +81-86-423-2400, Fax: +81-86-423-2401
www.royal-art-hotel.co.jp

Room II

Session C: International Symposium in Honor of Prof. Olivera Milosevic

08:00–10:00 Chair: Kevin G. Ewsuk

08:00–08:30 1-II-C-01 INVITED

Design and processing of photoresponsive hierarchical nanomaterials using innovative synthesis routes

O. Milosevic
Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Serbia

08:30–09:00 1-II-C-02 INVITED

Interfaces in electronic packaging: metallurgical challenges in miniaturization

F. Hodaj
Grenoble Institute of Technology, France

09:00–09:30 1-II-C-03 INVITED

Synthesis and characterization of functional ceramic materials at the nano- and microscale with enhanced properties

G. Flores-Carrasco[1,2], A. Urbieta[3], P. Fernández[3], O. Milosevic[4], M.E. Rabanal[1]
[1]*Carlos III University, Spain,* [2]*Meritorious Autonomous University of Puebla, Mexico,* [3]*Complutense University of Madrid, Spain,* [4]*Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Serbia*

09:30–10:00 1-II-C-04 INVITED

Characterization of defects in ceramics

K. Uematsu
Uematsu Consulting for Ceramic Technology, Japan

10:00–10:20
Coffee break

10:20–12:00 Chair: Olivera Milosevic

10:20–10:50 1-II-C-05 INVITED

Synthesis of nanocarbons and ilmenites nanoparticles using super-high-energy ball milling

S. Ohara
Osaka University, Japan

10:50–11:10 1-II-C-06 INVITED

Photocatalytic efficiency of TiO_2/Ag nanoparticles modified cotton fabric

M. Milošević, M. Radoičić, Z. Šaponjić
University of Belgrade, Serbia

11:10–11:30 1-II-C-07 INVITED

Magnetically recoverable photocatalysts based on metal oxide nanostructures (Fe and Zn)

L. González[1,2], L. Muñoz-Fernandez[1], G. Flores-Carrasco[1,3], O. Milosevic[4], G. Salas[2], M.E. Rabanal[1]

[1]Carlos III University, Spain, [2]IMDEA Nanociencia, Spain, [3]Meritorious Autonomous University of Puebla, Mexico, [4]Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Serbia

12:00–13:20
Photo and Lunch

I-II-C-03 INVITED
09:00–09:30, July 10, Room II

Synthesis and Characterization of functional ceramic materials at the nano- and microscale with enhanced properties

G. Flores-Carrasco[1,2], A. Urbieta[3], P. Fernández[3], O. Milosevic[4], M.E. Rabanal[1]

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Semiconductor nanoparticles (NPs) and nanowires (NWs) of doped ZnO system have been synthesised at low temperature (190 °C) by a novel Polyol-Mediated Thermolysis (PMT) process and Vapour-Solid (VS) reaction. Ce/Ru doped ZnO NPs with different molar content (1–3--5–10%) have been synthesised by both experimental processes. The crystallite size, morphology, specific surface area and band gap have been evaluated. Also, the structural and functional characteristics were carried out by X-ray diffraction technique (XRD), high resolution transmission electron microscopy (HRTEM), Brunauer, Emmett and Teller (BET) method, UV-Vis diffuse reflectance spectra (DRS), UV-Vis spectroscopy and photoluminescence measurements (PL). Also, the photocatalytic activities of ZnO nanoparticles were evaluated by removal rate of methyleneblue (MB) under UV irradiation (365 nm) at RT. XRD patterns revealed a hexagonal ZnO wurtzite-type crystalline structure with a preferred orientation of (101) plane. Any secondary phases have been identified such as CeO2, Ce2O3, Ce, RuO2, Ru3O4, Ru. HRTEM showed NPs in shape from spherical/ellipsoidal to hexagonal, that does not change significantly with the increasing of precursor solution concentration and kind of dopant element in the samples obtained from PMT process. The size of NPs was observed in the range from 16 to 23 nm. Using the Kubelka-Munk treatment on the diffuse reflectance spectra, the direct band energy has been estimated at <3.0 eV in the Ru-doped samples. The PL spectra mainly consist of four emission bands: (i) a strong UV emission band, (ii) a weak blue band, (iii) a blue-green band and (iv) a green-yellow band, respectively. The reported results showed the photocatalytic efficiency of doped ZnO nanoparticles was always enhanced.