

Symposium 2B: Novel Chemical Processing; Molecular Routes to Ceramics and Ceramics-based Materials

Main Organizers

- Takamasa Ishigaki, Hosei University, Japan
- Yoshiyuki Sugahara, Waseda University, Japan
- Ya-li Li, Tianjin University, China

Co-Organizers

- Jun-ichi Hojo, Kyushu University, Japan
- Yuji Iwamoto, Nagoya Institute of Technology, Japan
- Younghee Kim, Korea Institute of Ceramic Engineering and Technology, Korea
- Philippe Miele, Université Claude Bernard Lyon 1, France
- Ralf Riedel, Technische Universität Darmstadt, Germany

This symposium is supported by Committee of the Functional Composite Materials in Japan Society of Powder and Powder Metallurgy.

Oral Session

Wednesday, November 17

Room: 802

9:00 - 10:30

Chairs: Richard Laine (University of Michigan, USA) and
Younghee Kim (Korea Institute of Ceramic Engineering and Technology, Korea)

9:00 - 9:30

S2B-001 Laser Ablation in Liquid: From Nanocrystals Synthesis to Nanostructures Fabrication (Invited)
P. Liu, X. Z. Lin, J. M. Yu, G. W. Yang; Sun Yat-sen University, China

9:30 - 10:00

S2B-002 Chemical Approaches to Functional Nanostructures: Growth, Applications and Devices (Invited)
S. Mathur; University of Cologne, Germany

10:00 - 10:30

S2B-003 Design and Construction of Complex Nanostructured Coatings by Bottom-up Approaches (Invited)
D. Grosso; Collège de France, France

10:30 - 10:45 Break

10:45 - 12:30

Chairs: David Grosso (Université Pierre et Marie Curie, France) and Takamasa Ishigaki (Hosei University, Japan)

10:45 - 11:15

S2B-004 Advances in Liquid-Feed Flame Spray Pyrolysis: Innovative Approaches to Nano-scale Oxide Materials (Invited)
R. M. Laine, M. Kim, T. Shyu, N. Taylor, B. Glesner; University of Michigan, USA

11:15 - 11:30

S2B-005 Influence of High-Concentration Niobium (V) Doping into Plasma-Synthesized TiO₂ Nano-Size Powders
C.-N. Zhang^{1,2}, M. Ikeda^{1,3}, T. Uchikoshi¹, J.-G. Li¹, T. Watanabe², T. Ishigaki^{1,3}; ¹National Institute for Materials Science, Japan, ²Tokyo Institute of Technology, Japan, ³Hosei University, Japan

11:30 - 11:45

S2B-006 Color Switching in Si-based Nitride Nanocomposites Prepared by Molecular Route
M. Bechelany, S. Bernard, J. Li, P. Miele; Université Lyon 1, France

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11:45 - 12:00

S2B-007 Generalized Wet-Chemical Processing of Phosphor Monospheres and the Compositional Impacts on Photoluminescence

J.-G. Li¹, X. Sun², T. Ishigaki¹; ¹National Institute for Materials Science, Japan, ²Northeastern University, China

12:00 - 12:15

S2B-008 Organic-to-Inorganic Conversion in High Pressure and Temperature for C-N Inorganic Compounds

M. Hasegawa¹, K. Niwa¹, Y. Jin, T. Tanaka, K. Kusaba¹, T. Yagi²; ¹Nagoya Univ., Japan, ²Univ. of Tokyo, Japan

12:15 - 12:30

S2B-009 Large Amount of Centimeters Long SiC Nanowires Synthesized by a Polymer Pyrolysis Chemical Vapor Deposition Route

G. Li, X. Li, Y. Li; National University of Defense Technology, China

13:15 - 15:00

Chairs: Dong-pyo Kim (National Creative Research Center of Applied Microfluidic Chemistry, Korea) and Sanjay Mathur (University of Cologne, Germany)

13:15 - 13:45

S2B-010 Nanoscaled Ceramics by Molecular Design: New Materials for Advanced Technologies (Invited)

E. Lonescu; Technische Universitaet Darmstadt, Germany

13:45 - 14:15

S2B-011 Molecular Routes to Si and B-based Ceramic (Nano)Fibers: Polymer Synthesis, Melt-/ ElectroSpinning and Polymer-to-ceramic Conversion (Invited)

S. Bernard¹, L. Gottardo¹, T. Ouyang^{1,2}, V. Salles¹, C. Balan², P. Miele¹; ¹Université Lyon 1, France, ²University of Bucharest, Romania

14:15 - 14:30

S2B-012 The Visualization of Atomic Scale Structure of Polymer-derived Si-C-O Amorphous Fibers by High-energy X-ray Diffraction and Reverse Monte Carlo Modelling

K. Suzuya¹, S. Kohara², K. Okamura³, H. Ichikawa⁴, K. Suzuki⁵; ¹Japan Atomic Energy Agency, Japan, ²Japan Synchrotron Radiation Research Institute, Japan, ³Japan Ultra-High Temperature Research Institute, Japan, ⁴Nippon Carbon Co., Ltd., Japan, ⁵Advanced Institute of Materials Science, Japan

14:30 - 15:00

S2B-013 Nano Structured SiOC Low K Thin Film Derived from Polycarbosilane (Invited)

Y. Kim, S.-R. Kim, J.-J. Kim, J.-H. Lee, Y.-J. Lee; Korea Institute of Ceramic Engineering and Technology, Korea

15:00 - 15:15 Break

15:15 - 17:30

Chairs: Emanuel Lonescu (TU Darmstadt, Germany) and Ya-li Li (Tianjin University, China)

15:15 - 15:45

S2B-014 Novel Metal@SiCN Ceramics Via Molecular Approach for Catalytic Applications (Invited)

G. Motz; University of Bayreuth, Germany

15:45 - 16:15

S2B-015 Silicon Polymer Derived Lab-on-a-Chip Systems for Microchemical Synthetic Applications (Invited)

D.-P. Kim; Chungnam National University, Korea

16:15 - 16:30

S2B-016 Templated Silicon Oxycarbide Spherical Particles and Thin Films with Controlled Porosity

L. Malfatti, A. Pauletti, C. Boissière, C. Gervais, F. Babonneau; Collège de France, France

16:30 - 16:45

S2B-017 Synthesis and Characterization of Novel Materials Based on Si-Hf-C-(N)-O through Molecular Precursors

R. Kumar, R. Sujith, A. B. Kousaalya; Indian Institute of Technology-Madras, India

16:45 - 17:15

S2B-018 Fabrication of PDCs with Tailored Structures from Liquid Precursors via Forming and Pyrolysis (Invited)

F. Hou, Y. Li, X. Liu, H. An, T. Liang, J. Xie, Y. Zhang; Tianjin University, China

17:15 - 17:30

S2B-019 Phase-separation at Nano-scale in Amorphous Si-(B-)C-N Structures Derived from Polymer-precursors: an AEM Study

H. Gu; Chinese Academy of Sciences, China

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9:00 - 10:30

Chairs: Hubert Mutin (Institut Charles Gerhardt Montpellier, France) and Yoshiyuki Sugahara (Waseda University, Japan)

9:00 - 9:30

S2B-020 Polysilsesquioxane-type Gate Insulating Materials for Organic-TFT (Invited)

K. Matsukawa¹, T. Hamada², M. Watanabe¹, S. Watase¹, T. Nagase³, T. Kobayashi³, H. Naito³; ¹Osaka Municipal Technical Research Institute, Japan, ²Japan Science and Technology Agency, Japan, ³Osaka Prefecture University, Japan

9:30 - 10:00

S2B-021 Photo-Curable Organo-Oligosioxane Derived Optical Hybrid Materials and Their Applications (Invited)

B.-S. Bae, S. C. Yang, J.-S. Kim; Korea Advanced Institute of Science and Technology, Korea

10:00 - 10:30

S2B-022 Perhydropolysilazane-Derived Silica and Organic-Inorganic Hybrid Thin Films (Invited)

H. Kozuka, A. Yamano, H. Uchiyama, T. Kawamura, M. Fujita; Kansai University, Japan

10:30 - 10:45 **Break**

10:45 - 12:00

Chairs: Hiromitsu Kozuka (Kansai University, Japan) and Byeong-Soo Bae (KAIST, Korea)

10:45 - 11:15

S2B-023 Nonhydrolytic Processing of Oxides: From Nanoparticles to Films, Mesoporous Xerogels and Foams (Invited)

P. H. Mutin, B. Boury, A. Vioux; Université Montpellier 2, France

11:15 - 11:30

S2B-024 Synthesis of Discrete Alkoxysiloxane Oligomers by Non-hydrolytic Hetero-condensation

R. Wakabayashi, K. Kawahara, K. Kuroda; Waseda University, Japan

11:30 - 11:45

S2B-025 Inorganic Molten-Salts Synthesis of Organic-Inorganic Intercalation Compounds and their Conversion Into Oxide and Non-Oxide Ceramics

F. Goettmann, P. Makowski, A. Grandjean, A. Laplace; Centre de Marcoule, France

11:45 - 12:00

S2B-026 Solid State NMR Characterization of Ceramics from Molecular Routes : Combined Experimental and *Ab-initio* Investigations

C. Gervais, F. Babonneau, F. Mauri; UPMC Univ Paris 06, France

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Chairs: Masaki Narisawa (Osaka Prefecture University, Japan) and
Philippe Miele (Institut Européen des Membrances de Montpellier, France)

13:15 - 13:45

S2B-027 Spherical Oxide Particles with Various Porous Structures by Microwave-Emulsion Processes (Invited)

J. Hojo, L. Li, M. Inada, N. Enomoto; Kyushu University, Japan

13:45 - 14:00

S2B-028 Synthesis of Plate-like Zinc Oxide Particles by the Transcription of Precursor's Shape

S. Yin¹, F. Gobo¹, T. Goto^{1,2}, T. Long^{1,3}, T. Sato¹; ¹Tohoku University, Japan, ²Daito Kasei Kogyo Co.,Ltd, Japan, ³Guangxi Normal University, China

14:00 - 14:15

S2B-029 Formation Mechanism of ZnO Nanoscrew via Homogeneous Precipitation

N. Enomoto, J. Kimura, M. Inada, J. Hojo; Kyushu University, Japan

14:15 - 14:45

S2B-030 Advanced Ceramics from Pre ceramic Polymers and Nano-sized Fillers (Invited)

P. Colombo, E. Bernardo; University of Padova, Italy

14:45 - 15:00

S2B-031 Mechanical Properties and Chemical Vapor Infiltration Fabrication of SiC Whisker Reinforced SiC Ceramic Layered Composites

Y. Xie, L. Cheng, L. Li, H. Mei, L. Zhang; Northwestern Polytechnical University, China

15:00 - 15:15 Break

15:15 - 16:45

Chairs: Junichi Hojo (Kyushu University, Japan) and Feng Hou (Tianjin University, China)

15:15 - 15:45

S2B-032 Microstructure of SiC-Si-Al₂O₃ Composites Derived from Silicone Resin - Metal Aluminum Filler Compounds by Low Temperature Reduction Process (Invited)

M. Narisawa, Y. Abe, W. Isihara, H. Kado; Osaka Prefecture University, Japan

15:45 - 16:15

S2B-033 Metal-organic Precursors-derived Ceramic Membranes for Gas Separation (Invited)

Y. Iwamoto; Nagoya Institute of Technology, Japan

16:30 - 16:45

S2B-034 Surface Strengthen And Oxidation Resistance Improvement of SiC-graphite Composites by SiC Coating

W. Yang, Z. Jin, G. Qiao, Z. Shi, H. Li; Xi'an Jiaotong University, China

Poster Session

Tuesday, November 16

Room: Event Hall

12:00 -14:00

- S2B-P001 Metal Oxide Films Deposited by Combined Process of the Acetylene Thermal Spray and Metal Organic CVD**
M. Ohoto¹, Y. Hasebe¹, A. Nakamura^{1,2}, S. Ohshio¹, H. Akasaka¹, H. Saitoh¹; ¹Nagaoka Univ. Tech., Japan, ²Chubu Chelest Co., Ltd, Japan
- S2B-P002 High Pressure Synthesis of Cubic Silicon Nitride from a Silazane Precursor**
Y. Yamamoto¹, H. Yokota¹, T. Kobayashi², T. Taniguchi², T. Sekine², Y. Sugahara¹; ¹Waseda University, Japan, ²National Institute for Materials Science, Japan
- S2B-P003 The SH – Synthesis of Ceramics Based on Titanium Carbide and Silicon Carbide Composite Materials**
Z. A. Mansurov, I. M. Vongay, O. V. Chervyakova, T. A. Zavalishina, S. H. Aknazarov; RSE Institute of Combustion Problem, Kazakhstan
- S2B-P004 Smart Colloids of Exfoliated Layered Crystals: Photochemical Reactions in Colloidal Mixtures of Clay and Semiconductor Nanosheets**
T. Nakato, Y. Nono, A. Takahashi, M. Nakamura; Tokyo University of Agriculture and Technology, Japan
- S2B-P005 Development of High Density MoO₃ Pellets for Production of ⁹⁹Mo Medical Isotope**
A. Kimura¹, Y. Sato², M. Tanase², K. Tuchiya¹; ¹Japan Atomic Energy Agency, Japan, ²Chiyoda Technol Corporation, Japan
- S2B-P006 Synthesis and Photocatalytic Activity of Brookite Particles by Self-Hydrolysis Solution Method**
M. Inada, K. Iwamoto, N. Enomoto, J. Hojo; Kyushu University, Japan
- S2B-P007 Formation Mechanism and Characteristics of BaTiO₃ Powders Prepared by Thermal Decomposition of Barium Titanyl Oxalate Precursors**
A. Ianculescu¹, S. Guillemet-Fritsch², B. Durand², P. Alphonse², G. Voicu¹, P. Budrugaec³; ¹Polytechnics University of Bucharest, Romania, ²Université Paul Sabatier, France, ³INCDIE ICPE-CA, Romania
- S2B-P008 The Effect of Crystal Structure on Photoluminescence Property of Y₃Al₅O₁₂ Prepared by Glycothermal Reaction**
K. Uegaito, S. Hosokawa, M. Inoue; Kyoto University, Japan
- S2B-P009 Microwave Hydrothermal Synthesis of Activated Carbon from Rice Chaff**
T. Koga, M. Inada, N. Enomoto, J. Hojo; Kyushu University, Japan