Symposium 14: Advanced Engineering Ceramics and Composites

Incorporating the 4th International Symposium on Advanced Ceramics (organized by JSPS 124th Committee (Advanced Ceramics)) and the 4th International Symposium on the Science of Engineering Ceramics (organized by CerSJ Engineering Ceramics Division).

4th International Symposium on Advanced Ceramics (ISAC-4)

Main Organizers
- Takashi Goto, Tohoku University, Japan
- Yi-Bing Cheng, Monash Univ., Australia
- Takashi Akatsu, Tokyo Institute of Technology, Japan

Co-Organizers
- Zhengyi Fu, Wuhan University of Technology, China
- Stuart Hampshire, Univ. of Limerick, Ireland
- Juergen G. Heinrich, Clausthal Univ. of Technology, Germany
- Michael J. Hoffmann, Karlsruhe Institute of Technology, Germany
- Dongliang Jiang, Shanghai Institute of Ceramics, China
- Yutaka Kagawa, Univ. of Tokyo, Japan
- Hai-Doo Kim, KIMS, Korea
- Do Kyung Kim, KAIST, Korea
- Tomaz Kosmac, Josef Stefan Institute, Slovenia
- Walter Krenkel, Univ. of Bayreuth, Germany
- Michael Khor, Nanyang Technological University, Singapore
- Hua-Tay Lin, Oak Ridge National Lab, USA
- Hasan Mandal, Anadolu Univ., Turkey
- Lalit Mohan Manocha, Sardar Patel University, India
- Keiji Matsuihiro, NGK Insulators, Ltd., Japan
- Hideo Takahashi, Asahi Glass Co., Ltd., Japan
- Hidehiko Tanaka, NIMS, Japan
- Junichi Tatami, Yokohama National Univ., Japan
- Jitendra P. Singh, U.S. Army International Technology Center - Pacific
- Mrityunjay Singh, OAI, NASA Glenn Research Center, USA
- Vijay K. Srivastava, Banaras Hindu University, India
- Guo-Jun Zhang, Shanghai Institute of Ceramics, China
- Yu Zhou, Harbin Institute of Technology, Harbin, China

Oral Session

Monday, November 15
Room: 1006

14:15 - 16:00: Mechanical Properties of Ceramics
Chair: Fumihiro Wakai (Tokyo Institute of Technology, Japan)

14:15 - 14:45
S14-001 Mechanical Reliability Assessment of Brittle Ceramic Components (Invited)
H.-T. Lin; Oak Ridge National Laboratory, USA

14:45 - 15:15
S14-002 Processing-green structure-microstructure-property Relationship in Ceramics (Invited)
K. Uematsu, S. Tanaka; Nagaoka University of Technology, Japan

15:15 - 15:45
S14-003 Strengthening Mechanism of High-Strength Reaction-sintered Silicon Carbide (Invited)
S. Suyama, Y. Itoh; Toshiba Corporation, Japan
15:45 - 16:00
S14-004  Proof Test of Hybrid Shrink Fits with Ceramic Hub
M. Wagner, H. Binz; University of Stuttgart, Germany

16:00 - 16:15  Break

16:15 - 18:30: Mechanical Properties of Ceramics
Chairs: Hua-Tay Lin (Oak Ridge National Laboratory, USA) and Keizo Uematsu (Nagaoka University of Technology, Japan)

16:15 - 16:45
S14-005  Impact Fracture Behavior of Ceramics and of PE-Fiber-Reinforced Mortars (Invited)
Y. Tanabe¹, M. Yamada¹, M. Kunieda¹, K. Sekine², T. Kumazawa³; ¹Nagoya University, Japan, ²Mino Ceramic Co. Ltd., Japan

16:45 - 17:00
S14-006  Nanofractography of Ceramics by Scanning Probe Microscopy (Invited)
J. Tatami, T. Wakihara, K. Komeya; Yokohama National University, Japan

17:00 - 17:15
S14-007  Effect of Nonlinear Viscoelasticity on Indentation Load Relaxation (Invited)
T. Akatsu, Y. Akimoto, Y. Shinoda, F. Wakai; Tokyo Institute of Technology, Japan

17:15 - 17:30
S14-008  Indentation Fracture (IF) Test for Silicon Nitride Bearing Balls as an International Standard Method
H. Miyazaki, Y. Yoshizawa, T. Ohji; National Institute of Advanced Industrial Science and Technology, Japan

17:30 - 17:45
S14-009  Fracto-emission during Unstable Crack Propagation in Ceramic Materials
T. Shiota, Y. Sato, K. Yasuda; Tokyo Institute of Technology, Japan

17:45 - 18:00
S14-010  Fracture Behavior of Ultra-Thin Al₂O₃ Layer Coated on Ductile Substrate
R. T. Doloksaribu, R. Kitazawa, K. Matumura, Y. Kagawa; The University of Tokyo, Japan

18:00 - 18:15
S14-011  Ballistic Property Testing and Damage Characterization of Metal-Ceramic Interpenetrating Composites for Light Armour Applications
J. Binner, C. Munnings, R. Higginson; Loughborough University, UK

18:15 - 18:30
S14-012  Wear Behavior of SiC Ceramics Sintered with Small Amount of Additives
B. V. M. Kumar¹, Y.-W. Kim², H.-T. Bae², D.-S. Lim³; ¹The University of Seoul, Korea, ²Korea University, Korea

Tuesday, November 16
Room: 1006

9:00 - 10:30: Sintering of Ceramics
Chair: Zuhair Munir (University of California, USA)

9:00 - 9:30
S14-013  Fabrication of Advanced Nanocrystalline Ceramics by Spark Plasma Sintering: Theory and Practice (Invited)
R. Chaim; Technion - Israel Institute of Technology, Israel

9:30 - 9:45
S14-014  Structure and Properties of Spark-plasma Sintered TiN-Si₃N₄ Ceramic Nanocomposites Reinforced with Si₃N₄ Nanowires
A. Ragulya¹, V. Kolesnichenko¹, M. Hermann²; ¹Frantsevich Institute for Problems in Materials Science, Ukraine, ²Fraunhofer Institute for Ceramic Technologies and Systems, Germany
9:45 - 10:00
S14-015 Microstructure Development and Creep Behavior of Alumina/SiC Micro-nanocomposites Obtained by Spark Plasma Sintering or Pressurless Sintering
M. Jaafar, G. Bonnefont, G. Fantozzi, H. Reveron; MATEIS Insa de Lyon, France

10:00 - 10:15
S14-016 Densification and Mechanical Properties of Al₂O₃-ZrO₂-CeO₂ Ceramics Prepared by Spark Plasma Sintering
E. Yilmaz, O. Ormanci, I. Akin, F. Sahin, O. Yucel, G. Goller; Istanbul Technical University, Turkey

10:15 - 10:30
S14-017 Fabrication of Alumina-Zirconia Based Laminates by Sequential Centrifugal Gel Casting
S. Maleksaeedi¹, M. H. Paydar¹, J. Ma²; ¹Shiraz University, Iran, ²Nanyang Technological University, Singapore

10:30 - 10:45 Break

10:45 - 11:45: Sintering of Ceramics
Chair: Rachman Chaim (Technion-Israel Institute of Technology, Israel)

10:45 - 11:15
Z. A. Munir¹, D. Quach¹, S. Kim¹, R. A. D. Souza², M. Martin³; ¹University of California, USA, ²RWTH Aachen University, Germany

11:15 - 11:30
S14-019 Consolidation of Turbostratic Carbon with the Graphitization by SPS and the Mechanical Property
N. Toyofuku¹, M. Nishimoto¹, Y. Kodera¹, M. Ohyanagi¹, Z. A. Munir²; ¹Ryukoku University, Japan, ²University of California, Davis, USA

11:30 - 11:45
S14-020 Multi-Stage Spark Plasma Sintering To Develop ZrB₂-18wt%SiC-xwt%TiSi₂ Composites with Better Properties
N. Gupta, K. M. Reddy, K. Pavani, B. Basu; Indian Institute of Technology, India

14:15 - 16:00: Sintering of Ceramics
Chairs: Yoshihiro Hirata (Kagoshima University, Japan) and Kiyoshi Hirao (National Institute of Advanced Industrial Science and Technology, Japan)

14:15 - 14:45
S14-021 Ultra-fast Densification of Nano- and Submicro-grain Ceramics (Invited)
Z. Fu¹, J. Zhang¹, W. Wang¹, H. Wang¹, Y. Wang¹, S. W. Lee², K. Nihara³; ¹Wuhan University of Technology, China, ²SunMoon University, Korea, ³Nagaoka University of Technology, Japan

14:45 - 15:15
S14-022 GB Phase and Chemical Composition of SiC/Si₃N₄ Nano/Micro-composites – Implications to Mechanical Properties (Invited)
P. Šajgalík¹, Š. Lojanová¹, M. Hnatko², Z. Lenčéš, Z. Chlup³; ¹Slovak Academy of Sciences, Slovak Republic, ²Academy of Sciences of the Czech Republic, Czech Republic

15:15 - 15:45
S14-023 Mechanical Principles of Sintering in Micro- and Macro-scale (Invited)
F. Wakai; Tokyo Institute of Technology, Japan

15:45 - 16:00
S14-024 Synthesis and Characterization of cBN/WCCo Composites Obtained by the Pulse Plasma Sintering (PPS) Method
A. Michalski, M. Rosiński, M. Płocińska, J. Szawłowski; Warsaw University of Technology, Poland
S14-025 Development of Highly-efficient Processes for Ceramic Materials Using Microwave Heating (Invited)
K. Hirao¹, M. Fukushima¹, N. Kondo¹, S. Ohashi², S. Hashimoto², Y. Iwamoto²; ¹National Institute of Advanced Industrial Science and Technology, Japan, ²Nagoya Institute of Technology, Japan

S14-026 Densification, Phases, Microstructures and Mechanical Properties of Liquid Phase-sintered SiC (Invited)
Y. Hirata, N. Matsunaga, S. Sameshima; Kagoshima University, Japan

S14-027 Processing and Characterization of Multi-walled Carbon Nanotube-Alumina Ceramic Matrix Nanocomposites Ceramic Matrix Composites
M. Estili, A. Kawasaki; Tohoku University, Japan

S14-028 Fabrication of Silicon Nitride-Based Nano/nano-Composites Through High Energy Mechanical Milling and Spark Plasma Sintering
X. Xu¹, J. W. Zhang¹, T. Nishimura², N. Hirosaki³; ¹University of Science and Technology of China, China, ²National Institute for Materials Science, Japan

N. Makul, B. Chatveera; Thammasat University, Thailand

S14-030 Behaviors of Inter-granular Films and Phases During Sintering Process in Liquid-phase-sintered SiC Ceramics
H. Gu; Shanghai Institute of Ceramics, China

S14-031 Relations between Microstructure and Mechanical Properties of Hot-Pressed RBSN with Sintering Additives of La₂O₃-MgO and Lu₂O₃-SiO₂

Wednesday, November 17
Room: 1006

9:00 - 10:30: Superelasticity and Superplasticity of Ceramics
Chair: Takashi Akatsu (Tokyo Institute of Technology, Japan)

9:00 - 9:30
S14-032 Grain Boundary Sliding and Non-Newtonian Flow in Superplastic Ceramics
D. Gómez-García¹², E. Zapata-Solvas, S. de Bernardi-Martín, A. Domínguez-Rodríguez¹; ¹University of Seville, Spain, ²Imperial College, UK

9:30 - 10:00
S14-033 High-Strain-Rate Superplasticity and Failure in Undoped Tetragonal Zirconia Polycrystals (Y-TZP) (Invited)
K. Hiraga, H. Yoshida, K. Morita, K. B. Nam, M. Tabuchi; National Institute for Materials Science, Japan
10:00 - 10:15
S14-034 Superelastic Deformation Behavior of Glassy Carbon
Y. Shinoda, T. Akatsu, F. Wakai; Tokyo Institute of Technology, Japan

10:15 - 10:30
S14-035 Estimation Theory for Random Force Exerted on Grains during Superplastic Deformation of Ceramics
T. Okmaoto, Y. Yasuda, T. Shiotia; Tokyo Institute of Technology, Japan

10:30 - 10:45 Break

10:45 - 12:00: Structural Ceramics
Chair: Diego Gómez-García (University of Seville, Spain)

10:45 - 11:15
S14-036 Thermal Shock Resistance and Plasma Erosion Resistance of ZrO2(3Y)/BN-SiO2 Ceramic Composites Targeted for Hall Thruster Channel Walls (Invited)
Y. Zhou, D. Jia, X. Duan; Harbin Institute of Technology, China

11:15 - 11:30
S14-037 Response of Al2O3/TiB2 Ceramic Composite Subjected to High Velocity Impact
J. Zhang, P. Zhai, Z. Fu; Wuhan University of Technology, China

11:30 - 11:45
S14-038 Laser Thermal Shock Experiments - Performance and Evaluation on the Basis of Advanced Ceramics
R. Pulz, B. Rehmer; BAM Federal Institute for Materials Research and Testing, Germany

11:45 - 12:00
S14-039 High Dense Yttria Doped Mullite without Abnormal Grain Growth
J. Rocha1, S. Sugita1, K. Uematsu2; 1Guanajuato University, Mexico, 2Nagaoka University of Technology, Japan

13:15 - 15:00 Structural Ceramics
Chairs: Yu Zhou (Institute for Advanced Ceramics, Harbin Institute of Technology, China) and Junichio Hojo (Kyusyu University, Japan)

13:15 - 13:45
S14-040 Alumina Matrix Nanocomposites for Strength and Wear Resistance by Solid State Precipitation (Invited)
R. I. Todd, A. Mukhopadhyay; University of Oxford, UK

13:45 - 14:15
S14-041 Study on Microstructure and Mechanical Properties of Cr3C2/Al2O3 Nano-Composites Prepared Via MOCVD in Fluidized Bed (Invited)
H.-T. Lin1, B.-Z. Liu2, P. K. Nayak2, S.-Q. Lu3, S.-C. Wang3, J.-L. Huang2; 1Cheng Shiu University, Taiwan, ROC, 2National Cheng-Kung University, Taiwan, ROC, 3Southern Taiwan University of Technology, Taiwan, ROC

14:15 - 14:30
S14-042 Nano-sized Tungsten Carbide Powder Prepared by a Nitride Conversion Method
S.-K. Sun1,2, Y.-M. Kan1, G.-J. Zhang1; 1Shanghai Institute of Ceramics, China, 2Chinese Academy of Sciences, China

14:30 - 14:45
S14-043 Improvement in Mechanical Properties of Al2O3/WC Composites due to Ca-PSZ Addition
J. Boonpo, W. Buggakupta, N. Chuankrerkkul; Chulalongkorn University, Thailand

14:45 - 15:00
S14-044 In-Situ Synthesis and Characterization of Alumina Matrix Composites
Z.-C. Chen1, S. Nugroho2, D. Nomoto1, T. Akao1, T. Onda1, A. Kawasaki2; 1Tottori University, Japan, 2Diponegoro University, Indonesia, 3Tohoku University, Japan
15:15 - 17:15: Structural Ceramics
Chairs: Richard Todd (University of Oxford, UK) and Jow-Lay Huang (National Cheng Kung University, Taiwan)

15:15 - 15:45
S14-045  Systematic Evaluation of Ceramics Corrosion toward New Refractory (Invited)
   J. Hojo, S. Sawano, N. Enomoto; Kyushu University, Japan

15:45 - 16:00
S14-046  Mechanical Properties of Alumina Matrix Composites due to a Combination of Strontium and Calcium Hexaluminates
   W. Buggakupta; Chulalongkorn University, Thailand

16:00 - 16:15
S14-047  Effect of Dopant Configurations on Oxygen Permeation through Alumina Ceramics under Oxygen Potential Gradients at High Temperatures
   T. Matsudaira, M. Wada, S. Kitaoka; Japan Fine Ceramics Center, Japan

16:15 - 16:30
S14-048  In-Situ Diffraction Study of Thermal Stability and Self-Recovery in Aluminium Titanate
   Z. Oo¹, I. M. Low²; ¹Curtin University of Technology, Malaysia, ²Curtin University of Technology, Australia

16:30 - 16:45
S14-049  Optimum Surface Roughness of Machinable Glass Ceramic in End-milling
   M. M. Reddy¹, A. Gorin¹, K. A. Abou-El-Hossein¹; ¹Curtin University of Technology, Malaysia, ²Nelson Mandela Metropolitan University, South Africa

16:45 - 17:00
S14-050  Damage Evolution Mechanisms in Alumina Shocked above HEL
   A. K. Mukhopadhyay¹, K. D. Joshi², A. Dey¹, R. Chakraborty¹, A. Mandal¹, J. Ghosh¹, S. Bysakh¹, A. Rav², S. K. Biswas¹, S. C. Gupta²; ¹Central Glass and Ceramic Reserach Institute, India, ²Bhabha Atomic Research Centre, India

17:00 - 17:15
S14-051  Comparative Study of Shock Deformed Alumina above HEL by Nanoindentation
   A. K. Mukhopadhyay¹, K. D. Joshi², A. Dey¹, R. Chakraborty¹, A. Rav², A. Mandal¹, J. Ghosh¹, S. Bysakh¹, S. K. Biswas¹, S. C. Gupta²; ¹Central Glass and Ceramic Reserach Institute, India, ²Bhabha Atomic Research Centre, India

Thursday, November 18
Room: 1006

9:00 - 10:30: Hard and Environmental Barrier Coatings
Chair: Hideaki Matsubara (Japan Fine Ceramics Center, Japan)

9:00 - 9:30
S14-052  Development of Hard Ceramic Coatings for Extreme Tribological Applications (Invited)
   M. Ürgen¹, A. Erdemir¹, S. Timur¹, K. Kazmanlı¹, O. L. Eryilmaz²; ¹Istanbul Technical University, Turkey, ²Argonne National Laboratories, USA

9:30 - 10:00
S14-053  Residual Stresses and Adhesion Energy Measurements in Thin Tribological Coatings (Invited)
   D. Singh¹, K. Pappacena¹, O. Eryilmaz¹, J. L. Routbort¹, G. Chen²; ¹Argonne National Laboratory, USA, ²Ohio University, USA

10:00 - 10:30
S14-054  Selection and Design of Environment Barrier Coatings (Invited)
   Y. Wang; Northwestern Polytechnical University, China
### Symposium 14

**10:45 - 12:00: Hard and Environmental Barrier Coatings**  
Chair: Mustafa Ürgen (Istanbul Technical University, Turkey)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
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</thead>
<tbody>
<tr>
<td>10:45 - 11:15</td>
<td>S14-055</td>
<td>Electron Beam-PVD of Zirconia Based Ceramic Layers for Thermal Barrier Coating (Invited)</td>
<td>H. Matsubara; Japan Fine Ceramics Center, Japan</td>
</tr>
<tr>
<td>11:30 - 11:45</td>
<td>S14-057</td>
<td>Environmental Barrier Coatings for Silicon Nitride</td>
<td>H. F. Chen, H. Klemm, A. Michaelis; Fraunhofer IKTS Dresden, Germany, Shanghai Institute of Ceramics, China</td>
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<tr>
<td>11:45 - 12:00</td>
<td>S14-058</td>
<td>Optical and Tribological Properties of Silicon Carbide Thin Films Grown by Reactive DC Magnetron Sputtering</td>
<td>T. Tavsanoglu, E. Baskurt, O. Yucel; Istanbul Technical University, Turkey</td>
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**13:15 - 14:15: Packaging Technologies for Ceramics**  
Chair: Akihiko Ito (Institute for Materials Research, Tohoku University, Japan)

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<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
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<tbody>
<tr>
<td>13:45 - 14:00</td>
<td>S14-060</td>
<td>Improving Releasability of Y$_2$O$_3$-Based Ceramics from Epoxy Molding Compounds</td>
<td>S. Kitaoka, N. Kawashima, K. Nakahira, M. Yoshiya, S. Miyagawa, Y. Noguchi, Y. Uetani; Japan Fine Ceramics Center, Japan, Osaka University, Japan, TOWA Corporation, Japan, Nitto Denko Corporation, Japan</td>
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<tr>
<td>14:00 - 14:15</td>
<td>S14-061</td>
<td>Ab-initio Study on Atomic Level Bonding on Trivalent Metal Oxide Surface with Acid/Base with H$_2$O</td>
<td>M. Yoshiya, S. Kitaoka, N. Kawashima; Osaka University, Japan, Japan Fine Ceramics Center, Japan</td>
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**14:15 - 15:00: Laser Processing of Ceramics Coatings**  
Chair: Khiam Aik Khor (Nanyang Technological University, Singapore)

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<th>Time</th>
<th>Session</th>
<th>Title</th>
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<tr>
<td>14:15 - 14:30</td>
<td>S14-062</td>
<td>Laser Chemical Vapor Deposition of Oriented Alpha-alumina Coatings (Invited)</td>
<td>A. Ito, T. Kimura, T. Goto; Tohoku University, Japan, Japan Fine Ceramics Center, Japan</td>
</tr>
<tr>
<td>14:30 - 14:45</td>
<td>S14-063</td>
<td>Microstructure of Ce$_{1-x}$Fe$_x$O$_2$ Films Prepared by Laser Chemical Vapor Deposition</td>
<td>R. Tu, J. R. V. Garcia, T. Goto; Tohoku University, Japan</td>
</tr>
<tr>
<td>14:45 - 15:00</td>
<td>S14-064</td>
<td>Surface Modification of Thermal Sprayed Thermal Barrier Coatings by Laser Treatment</td>
<td>V. Akdoğan, B. Demirel, Ö. Keleş, G. Göller, Y. Taptık; Istanbul Technical University, Turkey</td>
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<td>15:00 - 15:15</td>
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<td>Break</td>
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</table>
15:15 - 16:00: Bioceramics
Chair: Rong Tu (Institute for Materials Research, Tohoku University, Japan)

15:15 - 15:45
S14-065 Novel Processing for Bioceramics Through Thermal Spray and Spark Plasma Sintering Technologies (Invited)
K. A. Khor; Nanyang Technological University, Singapore

15:45 - 16:00
S14-066 Hydroxyapatite Nano-barium-strontium-titaniumoxide Composites
N. Demirkol1,2, E. S. Kayali3, M. Yetmez2, F. N. Oktar4,5, S. Agathopoulos6; 1Kocaeli University, Turkey, 2Istanbul Technical University, Turkey, 3Karaelmas University, Turkey, 4Marmara University, Turkey, 5Marmara University, Turkey, 6Ioannina University, Greece

Monday, November 15
Room: 1007

14:15 - 16:00: Ultra High Temperature Ceramics
Chair: Hidehiko Tanaka (National Institute for Materials Science, Japan)

14:15 - 14:45
S14-067 Synthesis of Nano Structured Carbides via Templated Sol-Gel Processes (President-Designated)
Y.-B. Cheng; Monash University, Australia

14:45 - 15:15
S14-068 High Temperature Stability of ZrB2 Based Ultra High Temperature Ceramics (Invited)
G.-J. Zhang; Shanghai Institute of Ceramics, China

15:15 - 15:30
S14-069 Processing of Ultra High Temperature Ceramic – Carbon Fibre Composites
J. Binner1, B. Vaidhyanathan1, A. Paul1, S. Venugopal1, A. Heaton2, P. Brown2; 1Loughborough University, UK, 2Defence Science and Technology Laboratory, UK

15:30 - 15:45
S14-070 Hafnium Carbide and Silicon Carbide Coatings on C Substrates
A. Allemand1,2, O. Szwedek1,2, Y. L. Petitcorps1, N. Teneze2, P. David2; 1Université de Bordeaux, France, 2CEA-Centre du Ripault-DMAT, France

15:45 - 16:00
S14-071 Processing and Properties of ZrB2-SiC Ceramics Using Polycarbosilane
S. Kim1, J.-M. Chae1,2, S.-M. Lee1, Y.-S. Oh1, H.-T. Kim1, S. Nahm1; 1Korea Institute of Ceramic Engineering and Technology, Korea, 2Korea University, Korea

16:00 - 16:15 Break
16:15 - 18:30: Ultra High Temperature Ceramics  
Chairs: Yi-Bing Cheng (Monash University, Australia) and Guo-Jun Zhang (Shanghai Institute of Ceramics, China)

16:15 - 16:30  
S14-072 Formation of Tough Interlocking Microstructure in ZrB2-SiC Based Ultra High Temperature Ceramics by Pressureless Sintering  
J. Zou1,2, G.-J. Zhang1; 1Shanghai Institute of Ceramics, China, 2Graduate School of Chinese Academy of Sciences, China

16:30 - 16:45  
S14-073 Highly Textured HfB2-SiC Based Ultra High Temperature Ceramics with Anisotropic Properties  
D.-W. Ni1,2, G.-J. Zhang1, Y. Sakka3; 1Shanghai Institute of Ceramics, China, 2Graduate School of Chinese Academy of Sciences, China, 3National Institute for Materials Science, Japan

16:45 - 17:00  
S14-074 Oxidation Behavior of ZrB2-SiC and ZrB2-ZrC Composites  
I. Akin, F. Sahin, O. Yucel, G. Goller; Istanbul Technical University, Turkey

17:00 - 17:15  
S14-075 Evaluation of the Oxidation Behaviour of ZrB2-SiC at Elevated Temperatures  
A. Momozawa1, Y. Kubota2, T. Yoshinaka2, K. Komurasaki1, T. Goto2, H. Hatta5; 1Tokyo City University, Japan, 2Tokyo University of Science, Japan, 3Japan Aerospace Exploration Agency, Japan, 4The University of Tokyo, Japan, 5Tohoku University, Japan

17:15 - 17:30  
S14-076 Accurate Quantitative Evaluation of Active Oxidation Rate of SiC under Elevated Temperatures  
Y. Kubota1, T. Yoshinaka2, H. Hatta2, T. Goto2, Y. Kogo1; 1Tokyo University of Science, Japan, 2Japan Aerospace Exploration Agency, Japan, 3Tohoku University, Japan

17:30 - 17:45  
S14-077 Passive Oxidation and Oxidation Transition of CVD-SiC under High Temperatures  
T. Yoshinaka1, Y. Kubota2, T. Goto2, H. Hatta1; 1Japan Aerospace Exploration Agency, Japan, 2Tohoku University, Japan

17:45 - 18:00  
S14-078 Joining Ti-Al-C Ceramics and Fabricating Ti-Al-C/Al2O3 Laminated Composites by Preferential Oxidation at Low Oxygen Partial Pressure  
A. Li, Y. Zhou; Institute of Metal Research, China

18:00 - 18:15  
S14-079 High-temperature Strength of Directionally Solidified Boride Eutectics  
I. Bogomol1,2, T. Nishimura2, O. Vasylykiv2, Y. Sakka2, P. Loboda1; 1National Technical University of Ukraine “KPI”, Ukraine, 2National Institute for Materials Science, Japan

18:15 - 18:30  
S14-080 Computer Models of T-x-y Diagrams with Ternary Compounds  
V. Lutsyk1,2, N. Yuri1; 1RAS, Russia, 2Buryat State University, Russia
**Tuesday, November 16**

Room: 1007

**9:00 - 10:30: Silicon Carbide Fiber**

Chairs: Lalit Manocha (Sardar Patel University, India) and Hidehiko Tanaka (National Institute for Materials Science, Japan)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>S14-081</td>
<td>High-Temperature Fiber Composites by Reactive Melt Infiltration (Invited)</td>
<td>W. Krenkel, F. Gugel, R. Voigt, H. Mucha; University of Bayreuth, Germany</td>
</tr>
<tr>
<td>9:30</td>
<td>S14-082</td>
<td>Global and Local Damage Parameters in Carbon Fiber-SiC Matrix Hybrid Ceramics</td>
<td>M. Ikegami(^1), S. Q. Guo(^2), Y. Kagawa(^{1,2}); (^1)The University of Tokyo, Japan, (^2)National Institute for Materials Science, Japan</td>
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<tr>
<td>9:45</td>
<td>S14-083</td>
<td>Experimental Investigations of Frictional Effects in C-SiC Based Ceramic Matrix Systems</td>
<td>H. Mucha(^1), N. Langhof(^{1,2}), W. Krenkel(^{1,2}); (^1)University of Bayreuth, Germany, (^2)Fraunhofer ISC, Germany</td>
</tr>
<tr>
<td>10:00</td>
<td>S14-084</td>
<td>Understand the Friction Surface Damage of Carbon-Fibre Reinforced Carbon-Silicon Carbide Composites (C/C-SiC)</td>
<td>H. Wu, Y. Wang; Loughborough University, UK</td>
</tr>
<tr>
<td>10:30</td>
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<td>Break</td>
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</tbody>
</table>

**10:45 - 11:45: Silicon Carbide Fiber**

Chair: Walter Krenkel (University of Bayreuth, Germany)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:45</td>
<td>S14-086</td>
<td>Microstructure and Properties of Three Phase Carbon and Ceramic Matrix Composites (Invited)</td>
<td>L. M. Manocha, H. Patel, R. Pande, S. Manocha; Sardar Patel University, India</td>
</tr>
<tr>
<td>11:15</td>
<td>S14-087</td>
<td>Microstructure and Mechanical Properties of Joints in Sintered SiC Fiber-Bonded Ceramics</td>
<td>T. Matsunaga(^1), H.-T. Lin(^2), R. Asthana(^3), M. Singh(^4), T. Ishikawa(^1), S. Kajii(^1); (^1)Ube Industries, Ltd., Japan, (^2)Oak Ridge National Laboratory, USA, (^3)University of Wisconsin-Stout, USA, (^4)NASA Glenn Research Center, USA</td>
</tr>
<tr>
<td>11:30</td>
<td>S14-088</td>
<td>The Machinability of 3D-C/SiC Composites</td>
<td>P. He, S. M. Dong, X. Y. Zhang, Y. S. Ding, L. Gao, Z. Wang; Shanghai Institute of Ceramics, China</td>
</tr>
</tbody>
</table>

**14:15 - 15:45: Processing for Sillicon Carbide Composites**

Chair: Junichi Tatami (Yokohama National University, Japan)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:15</td>
<td>S14-089</td>
<td>Industrialization of Advanced SiC/SiC Composites and SiC Based Composites; Intensive Activities at Muroran Institute of Technology under OASIS (Invited)</td>
<td>A. Kohyama(^1), Y. Koho(^1), H. Kishimoto(^1), J. S. Park(^{1,2}), H. C. Jung(^2); (^1)Muroran Institute of Technology, Japan, (^2)Institute of Energy Science and Technology, Co. Ltd., Japan</td>
</tr>
</tbody>
</table>

177
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:45 - 15:15</td>
<td>S14-090</td>
<td>Thermally Conductive, Tough SiC-based Ceramic Attempting to Mimic Nature with High-temperature Properties (Invited)</td>
<td>T. Ishikawa; Ube Industries, Ltd., Japan</td>
</tr>
<tr>
<td>15:15 - 15:30</td>
<td>S14-091</td>
<td>Effects of Preform Densification on Near-Net Shaping of NITE-SiC/SiC Composites</td>
<td>N. Nakazato¹, Y. Kohn⁰, H. Kishimoto¹, J.-S. Park¹², H.-C. Jung⁰, A. Kohyama¹²; ¹Muroran Institute of Technology, Japan, ²Institute of Energy Science and Technology Co. Ltd., Japan</td>
</tr>
<tr>
<td>15:30 - 15:45</td>
<td>S14-092</td>
<td>Fabrication of Environmentally Resistant NITE-SiC/SiC Composites</td>
<td>J.-S. Park¹², H.-C. Jung⁰, A. Kohyama¹²; ¹Institute of Energy Science and Technology, Co. Ltd., Japan, ²Muroran Institute of Technology, Japan</td>
</tr>
<tr>
<td>S14-093</td>
<td>Cancelled</td>
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<tr>
<td>15:45 - 16:15</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:15 - 18:45</td>
<td>Processing for Silicon Carbide Composites</td>
<td>Chairs: Toshihiro Ishikawa (Ube Industries, Ltd., Japan) and Takashi Goto (Institute for Materials Research, Tohoku University, Japan)</td>
<td></td>
</tr>
<tr>
<td>S14-094</td>
<td>Properties of Carbide Ceramics from Gelcasting and Pressureless Sintering (Invited)</td>
<td>D. Jiang; Shanghai Institute of Ceramics, China</td>
<td></td>
</tr>
<tr>
<td>S14-095</td>
<td>XAFS Analysis of Ag in the Anti-bacterial Ceramics Glaze (Invited)</td>
<td>N. Isu¹, Y. Kato¹, S. Yamazaki¹, A. Nakahira², C. Numakó²; ¹INAX Corp., Japan, ²Osaka Prefecture University, Japan, ³The University of Tokushima, Japan</td>
<td></td>
</tr>
<tr>
<td>17:15 - 17:30</td>
<td>S14-096</td>
<td>Mechanical and Corrosion Test on SiC Multilayer Containing Porous Layers</td>
<td>C. V. Bolivar¹, S. Biamino¹, M. Pavese¹, P. Fino¹, P. Hähner², C. Badini³; ¹DISMIC, Politecnico di Torino, Italy, ²JRC-Institute for Energy European Commission, Netherlands</td>
</tr>
<tr>
<td>17:30 - 18:00</td>
<td>S14-097</td>
<td>Joining of Silicon Carbide Ceramics by Using Tape Cast Interlayer</td>
<td>W. B. Tian, H. Kita, N. Kondo, H. Hyuga, T. Nagaoka; National Institute of Advanced Industrial Science and Technology, Japan</td>
</tr>
<tr>
<td>S14-098</td>
<td>The Role of Chromium Carbide and Carbon Additives in Titanium Carbide Sintering</td>
<td>P. Rutkowski, J. Lis, L. Stobierski, G. Górný; AGH University of Science and Technology, Poland</td>
<td></td>
</tr>
<tr>
<td>18:00 - 18:15</td>
<td>S14-099</td>
<td>Injection Molding of Alumina-Chromia-Yttria Nanocomposites</td>
<td>R. Gadow, F. Kern, F. Sommer; University of Stuttgart, Germany</td>
</tr>
<tr>
<td>18:15 - 18:30</td>
<td>S14-100</td>
<td>Rheological Properties of Mg-SiC Feedstock for the Powder Injection Molding</td>
<td>M. Alimadadi, S. M. Taheri, M. Alizade; Iran Materials and Energy Center, Iran</td>
</tr>
<tr>
<td>18:30 - 18:45</td>
<td>S14-101</td>
<td>Thermical and Morphological Characterization of Poly(Butylene Terephthalate)/Silica Nanocomposites</td>
<td>M. Parvinzadeh, R. Hajiraei; Islamic Azad University, Iran</td>
</tr>
</tbody>
</table>
Wednesday, November 17
Room: 1007

9:00 - 10:30: Graphite Foams and Porous Ceramics
Chair: Lennart Bergström (Stockholm University, Sweden)

9:00 - 9:30
S14-102 Bonding and Integration of Graphite Foams to Metallic Systems for Thermal Management Applications (Invited)
M. Singh1, A. L. Gyekenyesi1, R. Asthana2; 1Ohio Aerospace Institute, USA, 2University of Wisconsin-Stout, USA

9:30 - 10:00
S14-103 Mechanical Characterization of Graphite Foams (Invited)
A. L. Gyekenyesi, C. E. Smith, M. Singh; Ohio Aerospace Institute, USA

10:00 - 10:30
S14-104 The Annealing of Pyrolytic Graphite to Highly Oriented Pyrolytic Graphite (Invited)
Y. Sodha1, F. J. Buschmann2, R. J. Diefendorf2; 1ENEOS, Japan, 2Knolls Atomic Power Laboratory, USA

10:45 - 12:00: Porous and Textured Ceramics
Chair: Andrew Gyekenyesi (Ohio Aerospace Institute, USA)

10:45 - 11:15
S14-105 Tuning the Structure and Transport Properties of Macroporous Alumina (Invited)
L. Bergström1, L. Andersson1, M. A. Knackstedt2, A. C. Jones2; 1Stockholm University, Sweden, 2Australian National University, Australia

11:15 - 11:45
S14-106 Fabrication of Textured Ceramics by Colloidal Processing in a Strong Magnetic Field and Subsequent Sintering (Invited)
Y. Sakka, C. Hu, X. Zhu, T. S. Suzuki, T. Uchikoshi; National Institute for Materials Science, Japan

11:45 - 12:00
S14-107 Electrochemical Reduction of Nitrates on Pt/MWCNTs Prepared by Vapor-phase Impregnation-decomposition Method
J. R. V. Garcia1, E. T. Santillan1, A. M. Robledo1, R. Tu2, A. Ito2, T. Goto3; 1National Polytechnic Institute, Mexico, 2Tohoku University, Japan

13:15 - 15:00: Phase, Interface and Microstructure of Ceramics
Chairs: Yuichi Ikuhara (The University of Tokyo, Japan) and Ken Sugawara (TOKUYAMA Corporation, Japan)

13:15 - 13:45
S14-108 Nonstationary Grain Growth in Cemented Carbides: Theoretical Prediction and Experimental Observations (Invited)
S.-J. Kang, D.-Y. Yang; Korea Advanced Institute of Science and Technology, Korea

13:45 - 14:15
S14-109 Phase Relationships and Structures of Oxide Crystals Based on First Principles Calculations (Invited)
I. Tanaka1, A. Seko1, A. Togo1, F. Oba1; 1Kyoto University, Japan, 2Japan Fine Ceramics Center, Japan

14:15 - 14:45
S14-110 Grain-Boundary Segregation and Phase-Separation Mechanism in Yttria-Stabilized Tetragonal Zirconia Polycrystal (Invited)
K. Matsumo1, H. Yoshida1, Y. Ikuhara1; 1Tosoh Corporation, Japan, 2National Institute for Materials Science, Japan, 3The University of Tokyo, Japan
### Symposium 14

**14:45 - 15:00**  
S14-111  
**A Simple Potential for the Interaction of Al/α-Al2O3 Interface**  
X. Lai, L. Liu, H. Mei, P. Zhai; Wuhan University of Technology, China

**15:00 - 15:15**  
Break

**15:15 - 16:00: Phase, Interface and Microstructure of Ceramics**  
Chair: Suk-Joong Kang (Korea Advanced Institute of Science and Technology, Korea)

**15:15 - 15:45**  
S14-112  
**Atomic Structures, Segregation Site and Properties of Ceramic Interface (Invited)**  
Y. Ikuhara¹,²,³, Y. Sato¹,², N. Shibata⁴, T. Mizoguchi⁵, T. Yamamoto¹,²; ¹The University of Tokyo, Japan, ²Japan Fine Ceramic Center, Japan, ³Tohoku University, Japan

**15:45 - 16:00**  
S14-113  
**An Atomic-Scale Study of SiAlON Ceramics Using Aberration Corrected Scanning Transmission Electron Microscopy**  
H. Yurdakul¹,², J. C. Idrobo²,³, S. Turan⁴, S. J. Pennycook²,³; ¹Anadolu University, Turkey, ²Oak Ridge National Laboratory, USA, ³Vanderbilt University, USA

**16:00 - 17:15: Aluminium Niteride and Related Compounds**  
Chair: Hasan Mandal (Anadolu University, Turkey)

**16:00 - 16:30**  
S14-114  
**Effect of Ca-Al-O Compounds Addition on Reflectivity of AlN Ceramics (Invited)**  
K. Sugawara; Y. Kanechika; TOKUYAMA Corporation, Japan

**16:30 - 16:45**  
S14-115  
**AlN-TiN Ceramic Nanocomposite Formation by Reactive Milling and Shock Compaction Method**  
H. AminiMashhadi¹, P. Manikandan¹, G. Kennedy¹, R. Tomoshige³, K. Hokamoto¹; ¹Kumamoto University, Japan, ²Sojo University, Japan, ³Kumamoto University, Japan

**16:45 - 17:00**  
S14-116  
**Controlling of Nitriding Process on Reactive Plasma Spraying of Al Particles**  
M. Shahien, M. Yamada, T. Yasui, M. Fukumoto; Toyohashi University of Technology, Japan

**17:00 - 17:15**  
S14-117  
**Theoretical Prediction and Synthesis of Hf₃AlN and Zr₃AlN, Novel Layered Ternary Nitrides with Excellent Damage Tolerance**  
F. Li; J. Wang, J. Wang, Y. Zhou; Institute of Metal Research, China

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**Thursday, November 18**

**Room: 1007**

**9:00 - 10:30: Silion Nitride and SiAlON**  
Chair: Jorge Vargas Garcia (National Polytechnic Institute, Mexico)

**9:00 - 9:30**  
S14-118  
**Silicon Nitride Grain Boundary Glass Chemistry, Structure and Properties (Invited)**  
S. Hampshire; University of Limerick, Ireland

**9:30 - 10:00**  
S14-119  
**Effect of Fine Silicon Addition To Develop Strong SRBSN (Sintered Reaction Bonded Silicon Nitride) (Invited)**  
H.-D. Kim; Korea Institute of Materials Science, Korea
10:00 - 10:15  
**S14120**  Development of CNT-dispersed Si₃N₄ Ceramics with High Strength and Electrical Conductivity by Adding HfO₂ as a Sintering Aid  
M. Matsuoka, S. Yoshio, T. Yamakawa, J. Tatami, T. Wakihara, K. Komeya, T. Meguro; Yokohama National University, Japan

10:15 - 10:30  
**S14-121**  Microstructure and Properties of Nanocomposites in Al₂O₃-Si₃N₄ System  
L. F. He, H. D. Kim, T. Nakayama, T. Suzuki, H. Suematsu, K. Niihara; Nagaoka University of Technology, Japan

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

10:45 - 12:00: Silicon Nitride and SiAlON  
Chair: Hai-Doo Kim (Korea Institute of Materials Science, Korea)

10:45 - 11:15  
**S14-122**  Parameters Affecting Grain Boundary Chemistry of SiAlON Ceramics (Invited)  
N. C. Acikbas¹, H. Mandal², F. Kara², A. Kara², S. Turan², H. Yurdakul², B. Bitterlich³; ¹MDA Advanced Ceramics, Turkey, ²Anadolu University, Turkey, ³Ceramtec AG, Germany

11:15 - 11:45  
**S14-123**  The Development and Practical Applications of High Hardness High Toughness Si₃N₄ Ceramics (Invited)  
M. Nagano, N. Mukae, Y. Mori; Nippon Tungsten Co.Ltd., Japan

11:45 - 12:00  
**S14-124**  Electrophoretic Deposition of Ti₃Si(Al)C₂ From Aqueous Suspension  
Y. Liang¹,², Z. Sun¹, J. Chen¹, X. Liu², Y. Zhou³; ¹Institute of Metal Research, China, ²Northeastern University, China, ³Graduate School of Chinese Academy of Science, China

13:15 - 15:00: Ceramics for Automobile and Power Generator  
Chair: Toyohiko Yano (Tokyo Institute of Technology, Japan)

13:15 - 13:45  
**S14-125**  New Technology with Porous Materials; Progress in the Development of the Diesel Vehicle Emission Control (Invited)  
K. Ohno; Ibiden Co., Ltd., Japan

13:45 - 14:15  
**S14-126**  Microstructure Change of Li(Ni, Co)O₂-based Positive Materials of Li-ion Batteries During Charge and Discharge (Invited)  
Y. Ukyo, Y. Takeuchi¹, C. Okuda, Y. Ito; Toyota Central research & Developments Laboratories Inc., Japan

14:15 - 14:30  
**S14-127**  Fabrication of Silicon Nitride Nanowire Dispersed Epoxy Composites and their Properties  
T. Kusunose¹, T. Yagi¹, T. Sekino¹; ¹Kagawa University, Japan, ²NMIJ, National Institute of Advanced Industrial Science and Technology, Japan, ³Tohoku University, Japan

14:30 - 14:45  
**S14-128**  Effect of Water Vapor on Crystal Structure and Cyclic Fatigue Behavior of La₆Sr₂MnO₃ at High Temperature  
M. Tanaka, T. Matsudaira, I. Tanabe, S. Kitaoka; Japan Fine Ceramics Center, Japan

14:45 - 15:00  
**S14-129**  Innovative Materials for Automotive Industry: Current Status and Perspectives  
A. Okada; Nagaoka University of Technology, Japan
Symposium 14

Poster Session

Monday, November 15

Room: Event Hall

12:00 - 14:00

Silicon Carbide

S14-P001 Sintering of Silicon Carbide Ceramics with Co-addition of Gadolinium Oxide and Silica and Their Mechanical Properties
T. Yano, Y. Horie, M. Imai, K. Yoshida; Tokyo Institute of Technology, Japan

S14-P002 The Influence of PyC/SiC Interphase on C/SiC Composites
Y. Zhu, Z. Huang, X. Liu, M. Yuan, D. Jiang; Shanghai Institute of Ceramics, China

S14-P003 Effects of Nano-powder Slurry on Microstructure and Microchemistry of NITE SiC and SiC/SiC Composites
J. Takakura, H. Kishimoto, J.-S. Park, H.-C. Jung, T. Shibayama, A. Kohyama; Muroran Institute of Technology, Japan, Institute of Energy Science and Technology, Co. Ltd., Japan, Hokkaido University, Japan

S14-P004 Microstructure of Ceramic Phase for Ceramizable Silicone Rubber Based Composites
Z. Pędzich, D. M. Bieliński, J. Duń; AGH University of Science & Technology, Poland, Institute for Polymers & Dyes Technology, Poland, Technical University of Łódź, Poland

S14-P005 Bending Strength Property of SiC Composite Ceramics Depending on Surface Grinding Condition
K. W. Nam, E. S. Kim, S. W. Park; Pukyong National University, Korea, Kyoto National University, Japan

S14-P006 Increasing the Elastic Limit of SiC/SiC Ceramics by Growth of SiC Nano Wires in the SiC Fiber Preform
A. Bruno, P. René, H. Plaisantin, E. Philippe, P. Weisbecker, S. Jacques; LCTS, France, Snecma Propulsion Solide, France

S14-P007 A Fundamental Study for Crack Healing of SiC Ceramics and SiC/ SiC Composite Ceramics
K. W. Nam, I. S. Seo; Pukyong National University, Korea

S14-P008 Integration of UV-LIGA Process with Slip Casting for Fabricating Polycarbosilane-Derived Silicon Carbide MEMS

S14-P009 The effect of Filler (SiC, Si, Carbon Black) Addition during LSI Process for C/C-SiC Composite
K. Seyoung, I.-S. Han, K.-S. Hong, D.-W. Seo, J.-H. Yu, S.-D. Kim, S.-K. Woo, B.-K. Jang; Korea Institute of Energy Research, Korea, National Institute for Materials Science, Japan

S14-P010 Effect of Particle Size on the Dynamic Mechanical Behavior and Deformed Microstructure of SiCp/Al Composites
D. Cao, L. Liu, W. She, P. Zhai, Q. Zhang; Wuhan University of Technology, China

S14-P011 Rheological Behavior of Al-SiCp Feedstock
A. Ghanbari, M. Alizadeh, E. Ghasemi; Iran Materials and Research Center, Iran, Iran Paint Research Center, Iran

S14-P012 Rheological Behavior of Al-SiCp Feedstocks
A. Ghanbari, M. Alizadeh, E. Ghasemi; Iran Materials and Energy Research Center, Iran, Iran paint Research, Iran

S14-P013 Passive Oxidation Behavior CVD SiC at Moderate Temperatures
N. Kumatani, R. Tu, T. Goto; Tohoku University, Japan
<table>
<thead>
<tr>
<th>Paper ID</th>
<th>Title</th>
<th>Authors</th>
<th>Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>S14-P014</td>
<td>Oxidation Behavior of AlN/h-BN Nano Composites at High Temperatures</td>
<td>H. Jin, W.-Z. Li, Y. Huang, N. Gao, B. He, G. Qiao, Z. Jin</td>
<td>Xi'an Jiaotong University, China, Far East Holding Group Co. Ltd., China</td>
</tr>
<tr>
<td>S14-P015</td>
<td>Sintering of Silicon Nitride Ceramics with Magnesium Silicon Nitride and Yttrium Oxide as Sintering Additives</td>
<td>J. Guojian, X. Jiayue, P. Guihua, Z. Hanru, L. Wenlan, X. Suying, M. Yongjun</td>
<td>Shanghai Institute of Technology, China, Guangxi Normal University, China, Shanghai Institute of Ceramics, China, Shanghai University, China</td>
</tr>
<tr>
<td>S14-P016</td>
<td>The Effect of Heat-Treatment on Thermal Conductivity of Silicon Nitride Ceramics</td>
<td>K. Yoshida, Y. Sekimoto, K. Katayama, T. Wasanpiarnpong, M. Imai, T. Yano</td>
<td>Tokyo Institute of Technology, Japan, Tokai University, Japan, Chulalongkorn University, Thailand</td>
</tr>
<tr>
<td>S14-P017</td>
<td>Influence of Additives on the Nitridation of Silicon</td>
<td>Y.-C. Lee, W.-H. Tuan</td>
<td>National Taiwan University, Taiwan</td>
</tr>
<tr>
<td>S14-P018</td>
<td>Wear Characteristics of Si₃N₄ Ceramics According to the Amount of Additive SiO₂ Nano Colloidal</td>
<td>S. H. Hwang, H. I. Je, Y. K. Jeong, K. W. Nam</td>
<td>Pukyong National University, Korea</td>
</tr>
<tr>
<td>S14-P019</td>
<td>The Crack Healing Behavior of Si₃N₄ Ceramics with SiO₂ 1.3 wt.% Nano - Colloidal Additive</td>
<td>K. W. Nam, S. H. Park, K. E. Kuni, J. S. Kim</td>
<td>Pukyong National University, Korea, NGE Tech, Korea</td>
</tr>
<tr>
<td>S14-P020</td>
<td>Analyses of Microstructure and Oxygen Content Effects on Thermal Conductivity of AlN Ceramics by Using Slack's Plot</td>
<td>R. Kobayashi</td>
<td>Chuo University, Japan</td>
</tr>
<tr>
<td>S14-P021</td>
<td>Aluminium Oxynitride as Material for High-Temperature Applications</td>
<td>D. Zientara, J. Domagała, D. P. Sert, M. M. Bučko, Eż. Godlewsk, G. Górný, J. Lis</td>
<td>AGH – University of Science and Technology, Poland, Ecole Européenne d'Ingénieurs en Génie des Matériaux, France</td>
</tr>
<tr>
<td>S14-P022</td>
<td>Tribological Behaviour of SiAlON Ceramics</td>
<td>N. C. Acikbas, H. Mandaż, F. Kara, Kumar, B. Basu</td>
<td>Bilecik University, Turkey, Anadolu University, Turkey, Indian Institute of Technology, India</td>
</tr>
<tr>
<td>S14-P023</td>
<td>Cutting Performance of SiAlON Based Ceramic Materials</td>
<td>A. Çelik, I. Lazoğlu, Y. Karpat, A. Kara, F. Kara</td>
<td>Anadolu University, Turkey, Koç University, Turkey, Bilkent University, Turkey</td>
</tr>
<tr>
<td>S14-P024</td>
<td>Synthesis and Characterization of SiAlON by Reduction Nitridation of Aluminosilicate Zeolite</td>
<td>T. Wakihara, T. Yamakawa, A. Ibara, J. Tatami, K. Komeya, T. Meguro</td>
<td>Yokohama National University, Japan</td>
</tr>
<tr>
<td>S14-P025</td>
<td>Effect of α-Si₃N₄ Addition on Sintering of α-Sialon Powder via Carbonthermal Reduction Nitridation of Boron-rich Slag-based Mixture</td>
<td>J. Wu, X. Xue</td>
<td>Northeastern University, China</td>
</tr>
<tr>
<td>S14-P026</td>
<td>Nano Emulsion Silicone Coating on Polyester Textile: Improve Adhesion Using Atmospheric Plasma Treatment</td>
<td>M. Parvinzadeh, I. Ebrahimi</td>
<td>Islamic Azad University, Iran, Isfahan University of Technology, Iran</td>
</tr>
<tr>
<td>S14-P027</td>
<td>Influence of Nanosilica on Surface Properties of Polybutylene Terephthalate/Silica Nanocomposites</td>
<td>M. Parvinzadeh, R. Hajiraeei</td>
<td>Islamic Azad University, Iran</td>
</tr>
<tr>
<td>S14-P028</td>
<td>Flammability and Thermal Properties of Polyethylene Terephthalate Fibers Coated with Nano, Micro and Macro Emulsion Silicone</td>
<td>M. Parvinzadeh, M. H. Rahimi, M. Y. Navidi</td>
<td>Islamic Azad University, Iran</td>
</tr>
<tr>
<td>S14-P029</td>
<td>Effects of Processing on the Characteristics of Boron Nitride Whiskers</td>
<td>Y. Zhang, L. Zhao, H. Gong</td>
<td>Shandong University, China</td>
</tr>
</tbody>
</table>
S14-P030  Mechanical Properties of Hexagonal Boron Nitride Libricated Composites  
G. Górny, L. Stobierski, P. Rutkowski; AGH University of Science and Technology, Poland,

Structural Oxide Ceramics

S14-P031  Fabrication and Evaluation of Arrayed Needle-like TiO₂ Particle – Transparent Resin Composite Films  
S. Kikitsu¹, T. Otsuka¹, H. Miyazaki¹, H. Suzuki², T. Ota³;¹ Shimane University, Japan, ²Shizuoka University, Japan, ³Nagoya Institute of Technology, Japan

S14-P032  Effect of the Starting Materials on the Microstructure of Ce-TZP/BaAl₁₂O₁₉ Composites  
S. Oori, T. Kojima, N. Uekawa, K. Kakegawa; Chiba University, Japan

S14-P033  SH – Synthesis of Composite Ceramic Materials Based on Zirconium Compounds  
Z. A. Mansurov, I. V. Tancereva, A. Tulepova, I. M. Vongay, A. N. Karabalin; RSE Institute of Combustion Problem, Kazakhstan

S14-P034  Effect of Additive on the Microstructure for ZrO₂-based Ceramics  
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S14-P035  Recession Behavior of Yb₂SiO₅ under High Speed Steam Jet at High Temperatures  
S. Ueno¹, T. Ohji², H.-T. Lin³;¹ Nihon University, Japan, ²National Institute of Advanced Science and Technology, Japan, ³Oak Ridge National Laboratory, USA

S14-P036  Rheological Properties of Mg-Al₂O₃ Feedstock for the Powder Injection Molding  
S. M. Taheri, M. Alimadadi, M. Alizadeh; Iran Materials and Energy Research Center, Iran

Functional Oxide Ceramics

S14-P041  Theroretical Study Electronic, Mechanical and Optical Properties of ZrO₂ Polymorphs  
J. Feng¹,², Z. C. Huang¹, J. C. Chen², R. Zhou², W. Pan¹;¹ Tsinghua University, China, ²Kunming University of Science and Technology, China

S14-P042  Corrosion Behavior of SnO₂-based Electrode Ceramics in Soda-lime Glass Liquid  
G. Luo, Q. Shen, Q. Li, C. Wang, L. Zhang; Wuhan University of Technology, China

S14-P043  Preparation of Bulk Na₂O–BaO–PbO–Nb₂O₅–SiO₂ Glass-Ceramic Dielectrics for Energy Storage Sources  
J. Luo, Q. Tang, Q. Zhang, J. Zhu, D. Han, L. Wang, J. Du; General Research Institute for Nonferrous Metals, China

S14-P044  Synthesis and Characterization of AgCl-Transparent Regin Photochromic Composites  
H. Shimoguchi¹, H. Miyazaki¹, H. Suzuki¹, T. Ota²;¹ Shimane University, Japan, ²Shizuoka University, Japan, ³Nagoya Institute of Technology, Japan
S14-P045  Effect of Electric Field and Temperature on Microstructure in Sodium Potassium Niobate - Cement Composites  
R. Potong, R. Rianyoi, P. Jarupoom, K. Pengpat, A. Chaipanich; Chiang Mai University, Thailand

S14-P046  Influence of Curing Age on Microstructure in Barium Titanate – Portland Cement Composites  
R. Rianyoi, R. Potong, N. Jaitanong, A. Chaipanich; Chiang Mai University, Thailand

S14-P047  Electric and Dielectric Study of Gd$^{3+}$ Substituted Mg Ferrite Synthesized by Conventional Ceramic Method  
J. Chand$^1$, G. Kumar$^{1,2}$, M. Singh$^3$; $^1$Himachal Pradesh University, India, $^2$Green Hills Polytechnic College, India

S14-P048  Characterization of Fe-doped Layered Titanate Synthesized by Various Methods  
S. Tajiri$^1$, A. Nakahira$^{1,2}$; $^1$Osaka Pref. Univ., Japan, $^2$Tohoku University, Japan

S14-P049  Effects of TiO$_2$ Doping Fe-Mn-Cu-Co Spinel on the Physical Properties of Diesel Oil  
D. Huang$^1$, J. Zhou$^{1,2}$, H. Cao$^1$, Y. Dai$^{1,2}$, W. Chen$^{1,2}$; Wuhan University of Technology, China, $^2$State Key Laboratory for Advanced Technology for Materials Synthesis and Processing, China

S14-P050  Dielectric Characteristics and Phase Evolution of Mg(Ta$_{1-x}$Nb$_x$)$_2$O$_6$ (x=0–0.16) Ceramics at Microwave Frequencies  
C.-L. Huang, J.-Y. Chen; National Cheng Kung University, Taiwan

S14-P051  Study on Characteristic Phonon Spectrum of Negative Thermal Expansion Materials with Framework Structure for Material Design  
Y. Yamamura, K. Saito; University of Tsukuba, Japan

Ceramics Films and Coatings

S14-P052  Mechanical Properties and Microstructure of Cr-Zn-N-O Thin Films Prepared by Pulsed Laser Deposition  
F. Sekiguchi$^1$, J. Shirahata$^1$, H. Asami$^2$, T. Suzuki$^1$, T. Nakayama$^1$, H. Suematsu$^1$, K. Niihara$^1$; $^1$Nagaoka University of Technology, Japan, $^2$Tomakomai National College of Technology, Japan

S14-P053  Mechanical Properties and Microstructure of (Cr,Ti)(N,O) Thin Films Prepared by Pulsed Laser Deposition  
H. Asami$^1$, K. Takazawa$^1$, K. Kuwahara$^1$, T. Suzuki$^2$, T. Nakayama$^1$, H. Suematsu$^1$, K. Niihara$^2$; $^1$Tomakomai National College of Technology, Japan, $^2$Nagaoka University of Technology, Japan

S14-P054  The Composition Material on Basis of Diamond Powder, which Plated by Cobalt  
O. V. Derevyanko$^1$, M. V. Luchka$^1$, I. L. Shabalin$^1$, V. O. Evdokimov$^1$, E. M. Shlychok$^1$; $^1$Frantsevych Institute for Problems of Materials Science of NASU, Ukraine, $^2$The University of Salford, UK

S14-P055  Zirconia Based Ceramic Coating on a Metal with Plasma Electrolytic Oxidation  
T. Kato, T. Akatsu, Y. Shinoda, F. Wakai; Tokyo Institute of Technology, Japan

S14-P056  Laser Chemical Vapor Deposition of AlN Film by Using Al(acac)$_3$ and NH$_3$ Precursors  
Y. You, A. Ito, R. Tu, T. Goto; Tohoku University, Japan

S14-P057  High-speed Preparation of YBa$_2$Cu$_3$O$_7$ Film on Polycrystalline Al$_2$O$_3$ Substrate by Laser Chemical Vapor Deposition Using Nd:YAG Laser  
P. Zhao, A. Ito, R. Tu, T. Goto; Tohoku University, Japan

S14-P058  Effect of Laser Power on Preparation of Ti(O,N) Films by Laser Chemical Vapor Deposition Using a Diode Laser  
T. Yonesaki, A. Ito, T. Goto; Tohoku University, Japan

S14-P059  Phase Evolution and Thermo-Physical Properties of (La$_x$Gd$_{1-x}$)$_2$(Zr,Ce)$_2$O$_7$ Systems for Thermal Barrier Coating (TBC)  
H.-T. Kim$^1$, K. Kwak$^1$, B.-C. Shim$^1$, S.-M. Lee$^1$, S. Kim$^1$, Y.-S. Oh$^1$, B.-K. Jang$^2$; $^1$Korea Institute of Ceramic Engineering and Technology, Korea, $^2$National Institute of Materials Science, Japan

S14-P060  Synthesis and Nanomechanical Property Characterization of Tenary B-C-N Films  
D.-I. Kim, D. Jeong, K.-H. Kim; Pusan National University, Korea
S14-P061 Optimization of Alumina Slurry Properties and Drying Conditions in the Spray Drying Process and Characterization of Corresponding Coating Fabricated by Atmospheric Plasma Spray
Y. Bai¹, J. F. Yang¹, S. W. Lee², H. Chen³, F. L. Yu¹; ¹Xi’an Jiaotong University, China, ²Sun Moon University, Korea

Sintering of Ceramics

S14-P062 Fabrication of Al₂O₃-W Functionally Graded Materials by Slipcasting Method
T. Katayama¹, S. Sukenaga¹, N. Saito¹, H. Kagata², K. Nakashima¹; ¹Kyushu University, Japan, ²Advanced Ceramic Section, TOTO Ltd., Japan

S14-P063 Effect of TiO₂ Addition on the Properties of Al₂O₃-ZrO₂ Composites Prepared by Spark Plasma Sintering
O. Ormanci¹, E. Yilmaz, I. Akin, F. Sahin, O. Yucel, G. Goller; Istanbul Technical University, Turkey

S14-P064 Residual Stress in 81%SiO₂-13%B₂O₃-4%Na₂O-10%Al₂O₃ Sintered by Spark Plasma Sintering (SPS) and Hot-pressing
J. Y. Zhang, H. Zhan, Z. Y. Fu; Wuhan University of Technology, China

S14-P065 Consolidation of Stacking Disordered SiC Powder by High Pressure SPS
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S14-P066 Preparation of Vanadium Dioxide Ceramics by Pressureless Sintering and spark Plasma Sintering
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S14-P067 Spark Plasma Sintered Transparent Lutetium Oxide by Two-Step Pressure
L. An, A. Ito, T. Goto; Tohoku University, Japan

S14-P068 Electrical Conductivity of Silicon Carbide Consolidated with Stacking Disorder-order Transformation by Spark Plasma Sintering
T. Shibata¹, Y. Kodera¹, M. Ohyanagi¹, Z. A. Munir²; ¹Ryukoku University, Japan, ²University of California, USA

S14-P069 Precipitation of Ni Nanoparticle on TiN Powder by Rotary CVD and Its Densification of TiN/Ni by SPS
H. Hanekawa, R. Tu, T. Goto; Tohoku University, Japan

S14-P070 Synthesis and Densification of TiN/TiB₂ Ceramic Composites via Reactive Spark Plasma Sintering Method
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S14-P071 Microstructure and Mechanical Properties of Magnesium-Aluminum Joined Layers by Spark Plasma Sintering
M. Gao¹, R. Tu¹, T. Goto¹; ¹Tohoku University, Japan, ²Wuhan University of Technology, China

S14-P072 Pressure Assisted Sinter-joining of AlN Ceramics
K. Kubota¹, J. Tatami, T. Wakihara, T. Meguro, K. Komeya; Yokohama National University, Japan

S14-P073 Milliwave Sintering of Silicon Carbide with Boron and Carbon Additives
M. Sekimoto¹, T. S. Suzuki², H. Tanaka², T. Nishimura², Y. Sakka²; ¹University of Tsukuba, Japan, ²National Institute for Materials Science, Japan

S14-P074 Effects of Mechanical Alloying and Microwave Heating on Synthesis and Sintering of Alumina-Mullite-Zirconia Composites
S. Ghaffari, T. Ebadzade, M. Alizade; Iran Materials and Energy Research Center, Iran

S14-P075 Effect of B₂O₃ Additive on Structural Ordering and Lattice Orientation during the Consolidation of Turbostratic BN
K. Yasui, N. Toyoefuku, Y. Kodera, M. Ohyanagi; Ryukoku University, Japan
S14-P076  *In-situ* Measurement of Sintering Shrinkage Behavior of Silicon Carbide under Pressure and its Analysis by Master Sintering Curve Theory
S. Kawakami¹, J. Tatami¹, T. Wakihara¹, K. Komeya¹, T. Meguro¹, P. Xin², M. Ando³; ¹Yokohama National University, Japan, ²Covalent Materials Corporation, Japan

S14-P077  Characterization of Microstructure and Thermal Properties of Nano and Micro-sized Ceramic Powders for APS Deposition of Ceramic Layers
G. Moskal, A. Iwaniak, M. Hetmanczyk; The Silesian University of Technology, Poland

S14-P078  Characterization of Microstructure and Thermal Properties of Nano and Micro-sized Ceramic Powders for APS Deposition of Ceramic Layers
G. Moskal, A. Iwaniak, M. Hetmanczyk; The Silesian University of Technology, Poland

S14-P080  Young's Modulus and Poisson's Ratio of Liquid Phase-Sintered Silicon Carbide
Y. Okuzono, Y. Hirata, N. Matsunaga, S. Sameshima; Kagoshima University, Japan

S14-P081  Mechanical and Thermal Properties of 99% and 92% Alumina at Cryogenic Temperatures
Z. Xie, H. Chen, W. Xue, X. Tang; Tsinghua University, China

S14-P082  Investigation of Structural Properties of Hetero-Module Composite in the B₃C-BN-TiC-SiC-C System
Z. Kovziridze¹, J. G. Heinrich², R. Görke², H. Bornhoff², U. Kahnert², N. Nizharadze¹, G. Tabatadze¹; ¹Georgian Technical University, Georgia, ²Clausthal University of Technology, Germany

S14-P083  The Application of Fractography to Strength Estimation of Porous Alumina
T. Kobayashi, T. Misaki, K. Uemura, T. Shiota, K. Yasuda; Tokyo Institute of Technology, Japan

S14-P084  Wetting and Adhesion of Cu on AlN
C.-H. Wang¹, W.-H. Tuan¹, P. Shen²; ¹National Taiwan University, Taiwan, ²Jilin University, China

S14-P085  Numerical Analysis of Cation Diffusion in Yttria-zirconia Nanostructured Ceramics
R. L. G. Romero¹, D. Gómez-García¹, J. J. Meléndez¹, A. Domínguez-Rodríguez¹, F. L. Cumbra-Hernández¹; ¹Universidad de Sevilla, Spain, ²Universidad de Extremadura, Spain

S14-P086  AE Monitoring of Microdamage Accumulation of Ceramic for Artificial Joints
J. Ikeda¹, K. Nakamura, F. Miyaji¹, Y. Yamada¹, S. Wakayama²; ¹Japan Medical Materials Corp., Japan, ²Tokyo Metropolitan University, Japan

S14-P087  Dynamic Mechanical Properties and Damping Mechanism of 0-3 PMN/CNFs/EP Composites
M. Shi, Z. Huang, Y. Qin; Wuhan University of Technology, China

S14-P088  PFM Investigation of Morphology and Interface Feature in PZT-PVDF-Portland Cement Composites
N. Jaitanong¹, H. R. Zeng², G. R. Li², Q. R. Yin², W. C. Vittayakom¹, R. Yimnirun³, A. Chaipanich¹; ¹Chiang Mai University, Thailand, ²Shanghai Institute of Ceramic, China, ³Suranaree University of Technology, Thailand

S14-P089  Surface Roughness Effects on Partial-Transient-Liquid-Phase Joining of Ceramics
C. C. Bartlow, S. M. Hong, T. B. Reynolds, A. M. Glaeser; University of California, USA

S14-P090  Analysis of the Apparent Indentation Size Effect in Hot-pressed Boron Suboxide Ceramics
R. Machaka¹, T. Derry¹, I. Sigalas¹, J. Neethling¹²; ¹University of the Witwatersrand, South Africa, ²NMMU, South Africa

S14-P091  A Finite Element Approach to the Study of the Nanoindentation Response of Hot-pressed Boron Suboxide Ceramics
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