Symposium 8: Engineering Ceramics and Ceramic Matrix Composites: Design, Development, and Applications

Monday, June 3, 2013

Properties and Characterization I

1:20 PM-6:10 PM
Room: Windsor Complex
Session Chair(s): Guo-Jun Zhang, Dileep Singh

1:20 PM
(PACRIM10-S08-001-2013) Synthesis of sol-gel based nano alumina particles and their mixing with clay for fluoride removal purposes (Invited Speaker)
Indra Bhushan Singh*, CSIR-Advanced Materials and Processing Research Institute (AMPRI), Bhopal, India

1:50 PM
(PACRIM10-S08-002-2013) Microstructure and Mechanical Properties of Si3N4 Nanoceramics by Carbothermal Reduction and Spark Plasma Sintering
Ching-Yu Chen*, Ching-Huan Lee, National Cheng Kung University, Taiwan; Horng-Hwa Lu, National Chin Yi University of Technology, Taiwan; Jow-Lay Huang, National Cheng Kung University, Taiwan

2:10 PM
(PACRIM10-S08-003-2013) Core-shell Al-Si3N4 composite particles for manufacturing alumina-based composites
Malgorzata Sopicka-Lizer*, Daniel Michalik, Jerzy Myalski, Tomasz Pawlik, Bartosz Hekner, Silesian University of Technology, Poland

2:30 PM
(PACRIM10-S08-004-2013) Synthesis and microstructure of reaction hot-pressing Al4SiC4 bulk ceramic
Xiaoxiao Huang*, Harbin Institute of Technology, China

2:50 PM
(PACRIM10-S08-005-2013) Preparation of Zirconium Phosphate Bonded Silicon Nitride Porous Ceramics Reinforced by In-Situ Reacted Silicon Nitride Nanowires
Fei Chen*, Feiyu Li, Qiang Shen, Lianmeng Zhang, Wuhan University of Technology, China

3:10 PM
Break

3:30 PM
(PACRIM10-S08-006-2013) Microstructure development and mechanical property of Tungsten Carbide/Alumina composite
Wei-Hsio Chen*, Pramoda K Nayak, National Cheng Kung University, Taiwan; Hao-Tung Lin, Kun Shan University, Taiwan; Yang-Yuan Chen, Academia Sinica, Taiwan; Jow-Lay Huang, National Cheng Kung University, Taiwan

3:50 PM
(PACRIM10-S08-007-2013) Preparation and characterization of TiO2 and Al2O3 thick films by laser CVD using CO2 and Nd:YAG lasers
Ming Gao*, Akihiko Ito, Takashi Goto, Institute for Materials Research, Tohoku University, Japan

4:10 PM
(PACRIM10-S08-008-2013) Synthesis and Characteristics of Heteroatom-doping Carbon Nanotube Array
Qi Zhen*, Shaoming Dong, Yanmei Kan, Yue Leng, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China
4:30 PM
(PACRIM10-508-009-2013) Roll-to-Roll silver nanowires as transparent electrode layer in P3HT-PCBM based solar cell
Byung-Yong Wang, Korea Institute of Science and Technology, Republic of Korea; Dae-Soon Lim, Korea University, Republic of Korea; Jun-Sup Kim, PNT Co. Ltd, Republic of Korea; Young-Jei Oh*, Korea Institute of Science and Technology, Republic of Korea

4:50 PM
(PACRIM10-508-010-2013) Mechanisms of wet foam stabilization to porous ceramics
Ashish Pokhrel*, Seo D Nam, Jung G Park, Ik Jin Kim, Processing and Application of Inorganic Materials (PAIM), Hanseo University, Republic of Korea

5:10 PM
(PACRIM10-508-011-2013) Study on the plasma erosion resistance of ZrO2p(3Y)/BN-SiO2 composite ceramics
Xiaoming Duan*, Dechang Jia, Zhihua Yang, Yang Yu, Yu Zhou, Daren Yu, Yongjie Ding, Harbin Institute of Technology, China

5:30 PM
(PACRIM10-508-012-2013) Laser lift-off processing for flexible piezoelectric energy harvester based on PZT thin films
Chong Yun Kang*, Young Ho Do, Min Gyu Kang, Woo Suk Jung, Electronic Materials Research Center, Korea Institute of Science and Technology, Republic of Korea; Seok Jin Yoon, Research Planning & Coordination Division, Korea Institute of Science and Technology, Republic of Korea

8:30 AM-12:00 PM
Room: Windsor Complex
Session Chair(s): Walter Krenkel, Randall Hay

8:30 AM
Shaoming Dong*, Bin Wu, Xiangyu Zhang, Yusheng Ding, Zhen Wang, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

9:00 AM
(PACRIM10-508-014-2013) Properties of Cf/SiC Composites with Different Reinforcement Arrangement
Yusheng Ding*, Jinshan Yang, Shaoming Dong, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

9:20 AM
(PACRIM10-508-015-2013) Preparation of C/SiC Ceramic Matrix Composite Containing Boron-bearing Species
Fan Zhou*, Shaoming Dong, Zhen Wang, Bin Wu, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

9:40 AM
(PACRIM10-508-016-2013) Properties of C/C-SiC Composites Prepared by a Novel Silicon Infiltration Method
Haijun Zhou*, Shaoming Dong, Yusheng Ding, Zhen Wang, Liangrun Zhang, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

10:00 AM
Break

10:20 AM
(PACRIM10-508-017-2013) Ceramic Matrix Composites Manufactured by Multistep Densification of Si-O-C Fibre Preform
Laurence Maille*, Marie Anne Dourges, Simon Le Ber, Patrick Weisbecker, René Pailler, Laboratory for Thermostructural Composites, France

Tuesday, June 4, 2013
Properties and Characterization II
10:40 AM
Randall Hay*, Air Force Research Lab, USA; Pavel Mogilevsky, Emmanuel Boakye, UES, Inc., USA

11:00 AM
(PACRIM10-S08-019-2013) Fracture Criterion of Short Carbon Fiber-Dispersed SiC Matrix Composite under Mixed Mode Condition
Inoue Ryo*, Kakisawa Hideki, Kagawa Yutaka, The University of Tokyo, Japan

11:20 AM
(PACRIM10-S08-020-2013) Effect of Z-fiber density on the tension property of 2D Z-pinned C/SiC composites
Huajie Xu*, Litong Zhang, Laifei Cheng, Science and Technology on Thermostructural Composite Materials Laboratory, China

11:40 AM
(PACRIM10-S08-021-2013) Processing, mechanical and thermal properties of Lu-Si-O-N ceramics
Zhilin Tian*, Luchao Sun, Jingyang Wang, Shenyang National Laboratory for Materials Science, Institute of Metal Research, Chinese Academy of Sciences, China

Ultra High Temperature Ceramics and Composites

1:20 PM-5:40 PM
Room: Windsor Complex
Session Chair(s): Yanchun Zhou, Shaoming Dong

1:20 PM
(PACRIM10-S08-022-2013) High Performance SRBSN (Sintered Reaction Bonded Silicon Nitride) (Invited Speaker)
Hai-Doo Kim*, Korea Institute of Materials Science, Republic of Korea

1:50 PM
(PACRIM10-S08-023-2013) Employing Mechanical Alloying plus Hot Pressing Method to Prepare Nanocrystalline Si-B-C-N Composite Ceramic
Zhihua Yang*, Dechang Jia, Pengfei Zhang, Xiaoming Duan, Yu Zhou, Peifeng Zhang, Harbin Institute of Technology, China; Yangai Liu, China University of Geosciences, China

2:10 PM
(PACRIM10-S08-024-2013) Ultra-High Temperature Ceramic (UHTC) Composites with Sol-gel Processing: Materials for Extreme Environments (Invited Speaker)
Yi-Bing Cheng*, Caen Ang, Tim Williams, David Vowles, Monash University, Australia; Aaron Seeber, CSIRO, Australia; Chris Wood, Sonya Slater, DSTO, Australia; Huang Ting Wang, Kun Wang, Monash University, Australia

2:40 PM
(PACRIM10-S08-025-2013) MAX Phase Containing CMCs fabricated by Reactive Melt Infiltration (Invited Speaker)
Franziska Lenz, Nico Langhof, Walter Krenkel*, University of Bayreuth, Germany

3:10 PM
Break

3:30 PM
(PACRIM10-S08-026-2013) Microstructural development and mechanical properties of TiB2-TiC composite prepared by two-step pressureless sintering (Invited Speaker)
Yu Zhou*, Yujin Wang, Harbin Institute of Technology, China

4:00 PM
(PACRIM10-S08-027-2013) Properties of Carbon Fiber Reinforced ZrC-SiC Ceramic Matrix Composites Prepared by Polymer Infiltration and Pyrolysis Method
Liangrun Zhang*, Shaoming Dong, Haijun Zhou, Ping He, Le Gao, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China
Wednesday, June 5, 2013

Applications in Aeronautics, Space, Automotive, Microelectronics, Energy and Environmental Systems

8:30 AM (PACRIM10-S08-032-2013) CMC Technology
Advancements for Gas Turbine Engine Applications (Invited Speaker)
Joseph Grady*, NASA Glenn Research Center, USA

9:00 AM (PACRIM10-S08-033-2013) Design and testing of a C/C-SiC nozzle extension manufactured via filament winding technique and liquid silicon infiltration
Fabian Breede*, German Aerospace Center (DLR), Germany

9:20 AM (PACRIM10-S08-034-2013) Process development for manufacturing and design of nonoxide CMC (Invited Speaker)
Dietmar Koch*, Enrico Klatt, Fabian Breede, Martin Friess, German Aerospace Center, Germany

9:50 AM (PACRIM10-S08-035-2013) Long-Term Properties and Degradation of Ceramics for Gas Turbines
Mark van Roode*, Mark van Roode & Associates, USA; Arun K Bhattacharya, Solar Turbines Incorporated, USA; Mattison K Ferber, Oak Ridge National Laboratory, USA

10:10 AM Break

10:30 AM (PACRIM10-S08-036-2013) Low-cost fabrication of CMC by injection molding
Hagen Klemm*, Müller-Köhn Axel, Moritz Tassilo, FhG IKTS Dresden, Germany

10:50 AM (PACRIM10-S08-037-2013) Development and Practical Applications of Indentation Based Techniques to Measure Stresses in Multi-Material Systems (Invited Speaker)
Rajan Tandon*, Sandia National Lab, USA
11:20 AM
(PACRIM10-S08-038-2013) Residual strains in structural stone: a degradation mechanism
Victoria Shushakova*, Universität Göttingen, Germany; Edwin R. Fuller, NC State University, USA; Siegfried Siegesmund, Universität Göttingen, Germany; Florian Heidelbach, Universität Bayreuth, Germany

11:40 AM
(PACRIM10-S08-039-2013) Temperature Dependence of Resistivity of MoSi2-Si Composite Thin Films
Ryo Kanai, Ryosuke Kitani*, Yuuki Sato, Shinzo Yoshikado, Doshisha University, Japan

Thursday, June 6, 2013

Joining and Environmental Effects

8:30 AM-11:40 AM
Room: Windsor Complex
Session Chair(s): Yi-Bing Cheng, Michael Halbig

8:30 AM
(PACRIM10-S08-040-2013) Joining of SiC ceramics through reaction bonding method (Invited Speaker)
Dongliang Jiang*, Jingxian Zhang, Shanghai Institute of Ceramics, China

9:00 AM
(PACRIM10-S08-041-2013) Integration of SiC-Based Ceramic Composites using REABOND Technology
Michael C Halbig*, NASA Glenn Research Center, USA; Mrityunjay Singh, Craig E Smith, Ohio Aerospace Institute, USA

9:20 AM
(PACRIM10-S08-042-2013) Design and lifetime optimization of ceramic-metal braze joints for high temperature applications
Alexander Bezold*, RWTH Aachen University, Germany; Geng Chen, RWTH Aachen University, Germany; Anke Kaletsch, Johanna Hummes, Christoph Broeckmann, RWTH Aachen University, Germany

9:40 AM
(PACRIM10-S08-043-2013) Microstructure and Properties of C/SiC/GH783 Joint Brazed with Cu-Ti + Mo
Shangwu Fan*, Xing Wang, Laifei Cheng, Litong Zhang, Northwestern Polytechnical University, China

10:00 AM
Break

10:20 AM
(PACRIM10-S08-044-2013) Improving the strength of ZrB2-SiC joint with in situ TiB whiskers array
Tiesong Lin*, Weiqi Yang, Peng He, Harbin Institute of Technology, China

10:40 AM
(PACRIM10-S08-045-2013) Effect of oxidation on the thermal radiation properties of 2D C/SiC composites
Fuyuan Wang*, Laifei Cheng, Litong Zhang, Northwestern Polytechnical University, China

11:00 AM
(PACRIM10-S08-046-2013) Investigation of MoSi2 melt infiltrated RSiC and its oxidation behavior
Hanning Xiao*, Wenming Guo, Jixiang Yin, Hunan University, China

11:20 AM
(PACRIM10-S08-047-2013) Microstructure observation and oxidation behavior of SiBCN-based composites
Zhen Wang*, Shaoming Dong, Bin Wu, Jianbao Hu, State Key Laboratory of High Performance Ceramics and Superfine Microstructure, China