Symposium 8: 6th International Symposium on Advanced Processing and Manufacturing Technologies for Structural and Multifunctional Materials & Systems, (APMT) In Honor of Professor R. Judd Diefendorf

Monday, January 23, 2012
Opening Session in Honor of Professor R. Judd Diefendorf

1:30 PM
(ICACC-S8-001-2012) Aerospace Materials Development (Invited)
Russell Judd Diefendorf*, Clemson U., USA

2:00 PM
(ICACC-S8-002-2012) Assessment of Ceramic Matrix Composites for Targeted Applications (Invited)
Robert Shinavski*, Hyper-Therm High-Temperature Composites, Inc, USA

2:30 PM
(ICACC-S8-003-2012) Development of Oxide Ceramic Fibers for Technical and Medical Applications (Invited)
Bernd Clauss*, Dirk Schawaller, Stephanie Zinn, Alexander Müller, Michael R Buchmeiser, ITCF Denkendorf, Germany

3:00 PM
Break

3:20 PM
(ICACC-S8-004-2012) From carbon fiber to ceramic matrix composite (Invited)
Francis Teyssandier*, René Pailler, University of Bordeaux 1, France

3:50 PM
(ICACC-S8-005-2012) Multiscale Damage Evolution Behaviors of Carbon Fiber-Dispersed Si/SiC Matrix Triple Phase Composites (Invited)
Yutaka Kagawa*, The University of Tokyo, Japan

4:20 PM
(ICACC-S8-006-2012) UBE’s precursor polymers and the derived functional ceramics (Invited)
Toshihiro Ishikawa*, Ube Industries, Ltd., Japan

4:50 PM
(ICACC-S8-007-2012) Industrial Aspects of PyC- and SiC-CVD Processes (Invited)
Roland Weiss*, Karl Brennfleck, Dieter Kehr, Schunk Kohlenstofftechnik GmbH, Germany

5:20 PM
(ICACC-S8-008-2012) Carbon Fiber Reinforced Composites Manufactured by Reactive Melt Infiltration Processes (Invited)
Walter Krenkel*, Rebecca Voigt, Franziska Lenz, University of Bayreuth, Germany
Tuesday, January 24, 2012
Advanced Forming and Powder Technology

8:10 AM
(ICACC-S8-009-2012) Additive Manufacturing of complex-shaped ceramic structures (Invited)
Nahum Travitzky*, Peter Greil, University of Erlangen-Nuremberg, Germany

8:40 AM
(ICACC-S8-010-2012) Fabrication of Complex-Shaped Ceramic Components by Injection Molding of Ceramic Suspension Gels at Room Temperature
Valerie L Wiesner*, Jeffrey P Youngblood, Rodney W Trice, Purdue University, USA

9:00 AM
Oxana Weber*, Thomas Hanemann, Karlsruhe Institute of Technology, Germany

9:20 AM
(ICACC-S8-012-2012) Low Pressure Injection Molding of Advanced Ceramic Components with Complex Shapes for Mass Production
Eugene Medvedovski*, Umicore Thin Film Products, USA; Michael Peltsman, Peltsman Corp., USA

9:40 AM
Break

10:00 AM
(ICACC-S8-013-2012) Shaping of Large-Sized Sputtering Targets
Alfred Kaiser*, LAEIS GmbH, Luxembourg

10:20 AM
(ICACC-S8-014-2012) Pressure slip casting of calcium containing coarse grain oxide ceramics
Stefan Schaffoener*, Christos G Aneziris, TU Bergakademie Freiberg, Germany

10:40 AM
(ICACC-S8-015-2012) Characterization of Ceramic Powders during Compaction Using Electrical Measurements
Timothy Pruyn*, Rosario Gerhardt, Georgia Institute of Technology, USA

11:00 AM
(ICACC-S8-016-2012) Highly particle-oriented alumina powder compact prepared from non-aqueous dispersed slurry
Satoshi Tanaka*, Ryoichi Furushima, Keizo Uematsu, Nagaoka University of Technology, Japan

11:20 AM
(ICACC-S8-017-2012) Mechanical Milling and Densification of High Purity Si-C Powder with Low Contamination
Sea-Hoon Lee*, Byung-Hun An, Hai-Doo Kim, KIMS, Republic of Korea

11:40 AM
(ICACC-S8-018-2012) The Role of Milling Liquids in Processing Metal-Ceramic-Precursor Powders
Nadja Holstein*, University of Applied Science Koblenz, Germany; Katharina Wiegandt, Jochen Kriegesmann, Hamburg University of Technology, Germany; Rolf Janssen, University of Applied Science Koblenz, Germany
Advanced Composite Manufacturing
1:30 PM-3:20 PM
Room: Coquina Salon A
Session Chair(s): Erica Corral, Jow-Lay Huang

1:30 PM
(ICACC-S8-019-2012) Processing of Advanced Ceramic Matrix Composites (CMCs) Based on Multifunctional Enhancement Mechanism
(Invited)
Shaoming Dong*, Bin Wu, Jianbao Hu, Xiangyu Zhang, Yusheng Ding, Ping He, Le Gao, Zhen Wang, Haijun Zhou, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

2:00 PM
(ICACC-S8-020-2012) Graphene Ceramic Composites (Invited)
Luke Walker, Victoria Marotto, Mario Valdez, University of Arizona, USA; Mohammad A Rafiee, Nikhil Koratkar, Rensselaer Polytechnic Institute, USA; Erica L Corral*, University of Arizona, USA

2:20 PM
(ICACC-S8-021-2012) Contribution to the understanding of the microstructure of first generation Si-C-O fibers
Francis Teyssandier*, Géraldine Puyoo, Stéphane Mazerat, Georges Chollon, René Pailler, Jean-Marc Leyssale, Florence Babonneau, Collège de France, France

2:40 PM
(ICACC-S8-022-2012) Direct 3D printing of composite microstructures
Noah R Philips*, Brett G Compton, Neil Reilly-Shapiro, Matt R Begley, UCSB, USA

3:00 PM
Break

SPS and Micro-Wave Assisted Technology
3:20 PM-5:20 PM
Room: Coquina Salon A
Session Chair(s): Erica Corral, Jow-Lay Huang

3:20 PM
(ICACC-S8-023-2012) Study on spark-plasma-sintered beta-Si3N4 based nanocomposites
(Invited)
Jow-Lay Huang*, Ching-Huan Lee, National Cheng-Kung University, Taiwan; Horn-Hwa Lu, 2 Department of Mechanical Engineering, National Chin-Yi University of Technology, Taiping, Taichung 411, Taiwan, Republic of China, Taiwan; Pramoda Kumar Nayak, National Cheng-Kung University, Taiwan

3:40 PM
(ICACC-S8-024-2012) Critical Analysis of Spark Plasma Sintering Scale-up Processing and Production of Complex Shape Parts Assisted by Spark Plasma Joining
William Pinc*, Luke S Walker, University of Arizona, USA; Daniela Fredrick, Thermal Technologies, USA; Erica Corral, University of Arizona, USA

4:00 PM
(ICACC-S8-025-2012) Optical Transparent Nano-structured and Nano-composite Ceramics Prepared by Spark Plasma Sintering
Jing Liu*, University of California, USA; Wenlong Yao, Amiya K Mukherjee, OSRAM SYLVANIA INC., USA

4:20 PM
(ICACC-S8-026-2012) In situ carbon nanotube reinforced ceramics via Microwave Assist Technology sintering
Shawn Michael Allan*, Frank J Cabe, Ceralink Inc., USA; Amit Datye, Florida International
4:40 PM
(ICACC-S8-027-2012) Nanostructured Optical Materials via Field Assisted Sintering Technology (FAST)
Chris Haines*, Rajendra Sadangi, Darold Martin, Kendall Mills, US Army ARDEC, USA

5:00 PM
(ICACC-S8-028-2012) FAST Processing of SiC Monolithics and Fiber Reinforced SiC Composites
Sean Gephart*, Jogender Singh, Anil Kulkarni, Penn State University, USA; Robert Shinavski, Hyper-Therm High-Temperature Composites, Inc, USA; Anthony Calomino, David Brewer, NASA - Langley Research Center, USA

Wednesday, January 25, 2012
Green Manufacturing
8:00 AM-10:00 AM
Room: Coquina Salon A
Session Chair(s): Richard Sisson, Hiroshi Tsuda

8:00 AM
(ICACC-S8-029-2012) Incorporating Global Issues, Green Manufacturing and Innovation into Materials Processing Education
Richard D Sisson*, Worcester Polytechnic Institute, USA

8:20 AM
Michael David Hill*, Trans-Tech Inc., USA

8:40 AM
(ICACC-S8-031-2012) Lithium ion battery recycling
Yan Wang*, Diran Apelian, Worcester Polytechnic Institute, USA

9:00 AM
(ICACC-S8-032-2012) Green-Conscious Ceramic Injection Moulding
Oxana Weber*, Thomas Hanemann, Karlsruhe Institute of Technology, Germany

9:20 AM
(ICACC-S8-033-2012) High Volume Production for High Performance Ceramics
William J Walker*, Federal-Mogul Corporation, USA

9:40 AM
Break

Joining and Integration
10:00 AM-12:00 PM
Room: Coquina Salon A
Session Chair(s): Richard Sisson, Hiroshi Tsuda

10:00 AM
(ICACC-S8-034-2012) TEM observation of the Ti interlayer between SiC substrates during diffusion bonding (Invited)
Hiroshi Tsuda*, S. Mori, Osaka Prefecture University, Japan; M. C Halbig, M. Singh, NASA Glenn Research Center, USA

10:20 AM
(ICACC-S8-035-2012) Hybrid ceramic-metal tubes for steam pipes
Carolin Spatz*, Fraunhofer-Center Lightweight design for high temperature environments, Germany; Nico Langhof, Walter Krenkel, University of Bayreuth, Germany

10:40 AM
(ICACC-S8-036-2012) Joining of Alumina by Alumina-Zirconia Interlayer under low
**11:00 AM**
*(ICACC-S8-037-2012) Low temperature joining of boron carbide ceramics*
Kiyoto Sekine*, Stereo Fabric Research Association, Japan; Takeshi Kumazawa, Mino Ceramic Co., Ltd., Japan; Wubian Tian, Stereo Fabric Research Association, Japan; Hideki Hyuga, Hideki Kita, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**11:20 AM**
*(ICACC-S8-038-2012) Joining of alumina by using polymer blend*
Ken’ichiro Kita*, Naoki Kondo, National Institute of Advanced Industrial Science and Technology (AIST), Japan; Yasuhisa Izutsu, Stereo Fabric Research Association, Japan; Hideki Kita, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**11:40 AM**
*(ICACC-S8-039-2012) Diffusion Bonding of Rigid Alumina Pieces Using Porous Alumina Interlayers*
Hiroyuki Miyazaki*, Mkinori Hotta, Hideki Kita, National Institute of Advanced Industrial Science and Technology, Japan; Yasuhisa Izutsu, Stereo Fabric Research Association, Japan

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**Novel Processing**

**1:30 PM**
*(ICACC-S8-040-2012) The Processing of Materials Systems for Perfusion Bioreactors used in Regenerative Medicine (Invited)*
Ian Nettleship*, Anthony Finoli, Eva Schmelzer, Jorg Gerlach, University of Pittsburgh, USA

**2:00 PM**
*(ICACC-S8-041-2012) Optimization of the sintering process for multi-layer CGO membranes by in situ techniques*
Andreas Franz-Josef Kaiser*, Risø DTU National Laboratory for Sustainable Energy, Denmark; Aditya S Prasad, Banaras Hindu University, India; Søren P Foghmoes, Vincenzo Esposito, Risø DTU National Laboratory for Sustainable Energy, Denmark

**2:20 PM**
*(ICACC-S8-042-2012) Quantitative validation of a multi-scale model of pyrocarbon chemical vapor infiltration from propane*
Gerard L. Vignoles*, William Ros, University Bordeaux 1, France; Georges Chollon, Francis Langlais, CNRS, France; Christian Germain, University Bordeaux, France

**2:40 PM**
*(ICACC-S8-043-2012) Fabrication of Dendritic Electrodes for Solid Oxide Fuel Cells by Using Micro Stereolithography*
Naoki Komori*, Katsuya Noritake, Osaka University, Japan; Satoko Tasaki, Soshu Kirihara, Osaka University Joining and Welding Research Institute, Japan

**3:00 PM**
Break

**3:20 PM**
*(ICACC-S8-044-2012) Sol-gel processing of TiC Composites (Invited)*
Yi-Bing Cheng*, Jie Zhing, Monash University, Australia; Shuquan Liang, Central South
University, China; Kun Wang, Huanting Wang, Tim Williams, Monash University, Australia; Han Huang, The University of Queensland, Australia

3:40 PM
(ICACC-S8-045-2012) Preparation of highly crystalline nano zeolites by bead milling and post-milling recrystallization method
toru WakiHara*, Junichi Tatami, Katsutoshi Komeya, Takeshi Meguro, Yokohama National University, Japan

4:00 PM
(ICACC-S8-046-2012) Phase Pure SiAlON Ceramics from Preceramic Polymers Filled with Nano-particles
Enrico Bernardo*, Giulio Parcianello, Stefano Pilati, Paolo Colombo, University of Padova, Italy

4:20 PM
(ICACC-S8-047-2012) Novel Cladding Technologies of Thermal Nanoparticle Spraying and Patterning
Soshu Kirihara*, Yusuke Itakura, Yasunori Uehara, Satoko Tasaki, Osaka University, Japan

4:40 PM
(ICACC-S8-048-2012) Fabrication and Characterization of Zeolite-geopolymer Hybride Materials
Shinobu Hashimoto*, Hayami Takeda, Tomoya Iwata, Sawao Honda, Yuji Iwamoto, Nagoya Institute of Technology, Japan

5:00 PM
(ICACC-S8-049-2012) Influence of Nd2O3 on Willemite Crystalline Glazes
Neetu Sharma*, Lalit K Sharma, Harvinder Kaur, N.A.S. (P.G.) College, India

Symposium 8: Poster Session
5:00 PM-7:30 PM
Room: Exhibition Hall, Ocean Center

(ICACC-S8-P099-2012) Research in Recycling Technology of Fiber Reinforced Polymers by Superheated Steam: Effect of Surface Treatment on Recycled Glass Fiber
Jian Shi*, Interdisciplinary Graduate School of Science and Technology of Shinshu University, Japan; Ryouhei Kobayashi, Jun Katou, Limin Bao, Faculty of Textile Science and Technology, Shinshu University, Japan

(ICACC-S8-P100-2012) Microstructure and Dielectric Properties of MnCO3 and Nb2O5 Doped BaTiO3-ceramics
Vojislav Mitic*, Vesna Paunovic, Jelena Purenovic, Jelena Nedin, Faculty of Electronic Engineering, Serbia; Miroslav Miljkovic, Laboratory for Electron Microscopy, Serbia

(ICACC-S8-P101-2012) Additives for the Preparation of Al-Al2O3-Precursor Powders
Nadja Holstein*, Tobias Schloradt, University of Applied Science Koblenz, Germany; Rolf Janssen, Hamburg University of Technology, Germany; Jochen Kriegesmann, University of Applied Science Koblenz, Germany

(ICACC-S8-P102-2012) Laser machining of melt infiltrated ceramic matrix composite
Greg Ojard*, Pratt & Whitney, USA; Dave Jarmon, United Technologies Research Center, USA; Dave Brewer, NASA - Langley Research Center, USA

(ICACC-S8-P103-2012) De-NOx Evaluation of SCR Catalyst Fabricated Using Aluminum Dross
Min A Bea*, Hong Dae Kim, Kwang Ho Kim,
Man Sig Lee, Korea Institute of Industrial Technology, Republic of Korea

(ICACC-S8-P104-2012) Effect of Debinding and Sintering Condition on Thermal Conductivity of Pressureless Sintered AlN Ceramics
Sang-Jin Lee*, Mokpo National University, Republic of Korea; Sang-Moon Na, Seung-II Kim, Shin-II Go, YJC Co., LTD., Republic of Korea

(ICACC-S8-P105-2012) Thermal and Dielectric Properties of Metal Substrate Coated for Ceramic-Based Insulating Thin Film.
Sawao Honda*, Yuuki Takeuchi, Nagoya Institute of Technology, Japan; Nozomi Komada, Hatsuhiyo Usami, Meijyo University, Japan; Yuji Iwamoto, Nagoya Institute of Technology, Japan

(ICACC-S8-P106-2012) Structural and optical properties of Zn1-xMgxO blue phosphor synthesized by chemical solution method
Yuhei Inata*, Nagoya Institute of Technology, Japan; Koji Inoue, Mie Prefecture Industrial Research Institute, Japan; Sawao Honda, Shinobu Hashimoto, Yuji Iwamoto, Nagoya Institute of Technology, Japan

(ICACC-S8-P107-2012) Mechanochemical Synthesis of ReB2 Powder
Nina Orlovskaya, Zhilin Xie*, Mikhail Klimov, Helge Heinrich, David Restrepo, Richard Blair, Chhallapalli Suryanarayana, University of Central Florida, USA

(ICACC-S8-P108-2012) Flash sintering mechanisms in fully dense yttria-stabilized zirconia
John Downs*, University of Trento, Italy; Rishi Raj, University of Colorado, USA; Vincenzo M Sglavo, University of Trento, Italy

Thursday, January 26, 2012
Processing, Structure and Properties

8:10 AM-12:00 PM
Room: Coquina Salon A
Session Chair(s): Vojislav Mitic, Junichi Tatami

8:10 AM
(ICACC-S8-050-2012) Texturing Technologies for Group IVB Metal Diboride Ceramics (Invited)
Guo-Jun Zhang*, Shanghai Institute of Ceramics, China

8:40 AM
(ICACC-S8-051-2012) Contact Surface Influence on Microstructure and Dielectric Properties of Doped BaTiO3-ceramics
Vojislav Mitic*, Vesna Paunovic, Jelena Purenovic, Faculty of Electronic Engineering, Serbia; Slobodanka Jankovic, Faculty of Mathematics, Serbia; Vladimir Pavlovic, Faculty of Agriculture, Serbia

9:00 AM
(ICACC-S8-052-2012) Numerical Analysis of Fracture Behavior in Anisotropic Microstructures
Hisashi Serizawa*, Seigo Tomiyama, Tsuyoshi Hajima, Hidekazu Murakawa, Osaka University, Japan

9:20 AM
(ICACC-S8-053-2012) Grain boundary structures of silicon nitrides with Lu2O3-SiO2 and Lu2O3-Yb2O3-SiO2 additives
Keiichi Fukunaga*, AIST, Japan; Naoki Kondo, Hideki Kita, Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST), Japan; Tomohiro Saito, Japan Fine Ceramics Center, Japan; Yuichi Ikuhara, The University of Tokyo, Japan
9:40 AM
Break

10:00 AM
(ICACC-S8-054-2012) Amorphous Silicon nitride - Carbon nanotube composite coatings: the impact of nanotube structure and density on mechanical properties
Sugeetha Vasudevan*, Brian W Sheldon, Kevin Sena, Brown University, USA

10:20 AM
(ICACC-S8-055-2012) Development of electrical discharge machinable ZTA ceramics with 24 vol.-% of TiC, TiN, TiCN, TiB2 and WC as electrically conductive phase
Richard Landfried*, Frank Kern, Rainer Gadow, University of Stuttgart, Germany

10:40 AM
(ICACC-S8-056-2012) Electrical conductivity of CNT-dispersed Si$_3$N$_4$ ceramics fabricated by using HfO$_2$ as a sintering aid
Mitsuaki Matsuoka*, Sara Yoshio, Junichi Tatami, Toru Wakihara, Katsutoshi Komeya, Takeshi Meguro, Yokohama National University, Japan

11:00 AM
(ICACC-S8-057-2012) Electrically Conductive Si$_3$N$_4$/TiN Nanocomposites Prepared by Pressureless Sintering of TiN-Coated Si$_3$N$_4$ Powder
Kristoffer Krenel*, Jozef Stefan Institute, Slovenia; Aljosa Maglica, Lek d.d., Slovenia; Tomaz Kosmac, Jozef Stefan Institute, Slovenia

11:20 AM
(ICACC-S8-058-2012) The influence of SiC coating on the ablation of ZrB2-coated Carbon/Carbon composites prepared by low pressure chemical vapor deposition
Dongjia Yao*, Hejun Li, Qiangang Fu, Xiaohong Shi, Kezhi Li, Xiyuan Yao, Northwestern Polytechnical University, China

11:40 AM
(ICACC-S8-059-2012) Physical and mechanical properties of nano-and microstructure of Al2O3 and Zr2O3 oxide coatings
Alexander D Pogrebnyak*, Sumy State University, Ukraine; Vyacheslav M Beresnev, Kharkov National University, Ukraine; Alisa S Kaverina, Sumy State University, Ukraine; Dmitrii A Kolesnikov, Belgorod State University, Russian Federation; Ivan V Yakuschenko, Maxim V Ilyashenko, Sumy State University, Ukraine; Nemat A Makhmudov, Samarkand branch of the Tashkent State University of Informatics, Uzbekistan