

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-5:50 PM

Room: Coquina Salon A

Session Chair(s): Mrityunjay Singh, Tatsuki Ohji

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-12:00 PM

Room: Coquina Salon A

Session Chair(s): Nahum Travitzky, Eugene
Medvedovski

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

**(ICACC-S8-011-2012) Ceramic Injection
Moulding Using a Partially Water-Soluble
Binder System: Effect of Back-Bone Polymers
on the Process**

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

University, USA; Morgana L Fall, Ceralink Inc., USA; Alex Zaretski, Kuang H Wu, Florida International University, USA; Holly S Shulman, Ceralink Inc., USA

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

(ICACC-S8-030-2012) Raw Material Scarcity and its Impact on the US Advanced Ceramic Technology

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

pressure and high temperature

Naoki Kondo*, Mikinori Hotta, Hideki Hyuga, Kiyoshi Hirao, Hideki Kita, National Institute of Advanced Industrial Science and Technology (AIST), Japan

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*, Mikinori Hotta, Hideki Kita, National Institute of Advanced Industrial Science and Technology, Japan; Yasuhisa Izutsu, Stereo Fabric Research Association, Japan

Novel Processing

1:30 PM-5:20 PM

Room: Coquina Salon A

Session Chair(s): Ian Nettleship, Yi-Bing Cheng

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 Kiriwara, 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 Pre ceramic 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 Schlordt, 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-NO_x 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-Il Kim, Shin-Il 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, Hatsuhiko Usami, Meijyo University, Japan; Yuji Iwamoto, Nagoya Institute of Technology, Japan

(ICACC-S8-P106-2012) Structural and optical properties of Zn_{1-x}MgxO blue phosphors 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, Challapalli 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 Si₃N₄ ceramics fabricated by using HfO₂ 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 Si₃N₄/TiN Nanocomposites Prepared by Pressureless Sintering of TiN-Coated Si₃N₄ Powder

Kristoffer Krnel*, 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