

# Symposium 9: Porous Ceramics: Novel Developments and Applications

## Monday, January 23, 2012 Processing Methods for Porous Ceramics I

1:30 PM-3:20 PM

Room: Coquina Salon C

Session Chair(s): Paolo Colombo

### **1:30 PM**

#### **(ICACC-S9-001-2012) Multifunctional carbon bonded filters for metal melt filtration (Invited)**

Christos G. Aneziris\*, Markus Emmel, Vasilis Rongos, Institute of Ceramics, Glass and Construction Materials, Germany

### **2:00 PM**

#### **(ICACC-S9-002-2012) Fabrication and Properties of Highly Porous Ceramic Monolith by Gelation Freezing Route**

Manabu Fukushima, Tatsuki Ohji\*, Yu-ichi Yoshizawa, National Institute of Advanced Industrial Science and Technology (AIST), Japan

### **2:20 PM**

#### **(ICACC-S9-003-2012) Effect of Freezing Gradient on Pore Size and Orientation for Freeze-Cast Alumina**

Sarah Miller\*, Katherine Faber, Northwestern University, USA

### **2:40 PM**

#### **(ICACC-S9-004-2012) Porous Coatings for**

#### **Complex 3D-Structures Formed by Self-Assemblage**

Michael Woiton\*, Madeleine Heyder, Bavarian Center for Applied Energy Research, Germany; Alexandra Laskowsky, University of Magdeburg, Germany; Edda Stern, Bavarian Center for Applied Energy Research, Germany; Michael Scheffler, Christoph J Brabec, University of Magdeburg, Germany

### **3:00 PM**

Break

## Processing Methods for Porous Ceramics II

3:20 PM-6:20 PM

Room: Coquina Salon C

Session Chair(s): Yuji Iwamoto

### **3:20 PM**

#### **(ICACC-S9-005-2012) Processing, Microstructure and Properties of Reticulated Carbon Foam (Invited)**

Rudolph Andrew Olson\*, David P Haack, Porvair-SELEE Corporation, USA

### **3:50 PM**

#### **(ICACC-S9-006-2012) Porous ceramics with tailorable properties**

Prashant Karandikar\*, Glen Evans, Michael Aghajanian, M Cubed Technologies, Inc., USA

### **4:10 PM**

#### **(ICACC-S9-007-2012) The effect of setting mechanism on the properties of ceramic foams produced by O/W emulsions**

Fernando Santos Ortega\*, FEI, Brazil

### **4:30 PM**

#### **(ICACC-S9-008-2012) Additive manufacturing of macro-cellular ceramic structures (Invited)**

Nahum Travitzky\*, Tobias Schlordt, Lorenz Schlier, University of Erlangen-Nuremberg,

Germany; Jochen Cypris, Mirosław Weclas, University of Applied Sciences Nuremberg, Germany; Tobias Fey, Peter Greil, University of Erlangen-Nuremberg, Germany

**5:00 PM**

**(ICACC-S9-009-2012) Wollastonite and cordierite foams from silicones filled with micro-particles and novel processing**

Enrico Bernardo\*, Giulio Parcianello, Paolo Colombo, University of Padova, Italy; Siobhan Matthews, SCF Processing Ltd, Ireland

**5:20 PM**

**(ICACC-S9-010-2012) Preparation of porous  $\beta$ - $\text{Si}_3\text{N}_4$  ceramics in an air atmosphere furnace**

Amit K Gandhi, Kevin Paul Plucknett\*, Dalhousie University, Canada

**5:40 PM**

**(ICACC-S9-011-2012) Porous Silicon Oxycarbide Glasses from Polyhydridomethylsiloxane Using a Templating Approach**

Gian D Soraru, University of Trento, Italy; Yigal Blum\*, SRI International, USA; Parakkulam Aravind, University of Trento, Italy

**6:00 PM**

**(ICACC-S9-012-2012) Preparation of Porous Alumina Ceramic with Ultra-high Porosity by Freeze Casting**

Duanyang Li\*, Meishuan Li, Institute of Metal Research, CAS, China

## Tuesday, January 24, 2012

# Membranes and High SSA Ceramics

8:00 AM-10:10 AM

Room: Coquina Salon C

Session Chair(s): Irene Peterson

**8:00 AM**

**(ICACC-S9-013-2012) Ordered-microporous membranes-preparation, properties and prospects (Invited)**

Masahiko Matsukata\*, Waseda University, Japan

**8:30 AM**

**(ICACC-S9-014-2012) Synthesis and characterization of carbon dioxide-permselective organoamino group-functionalized amorphous silica membranes**

Akira Kawai, Nagoya Institute of Technology, Japan; Keita Miyajima, Noritake Co., Limited, Japan; Koichiro Sekimoto, Sawao Honda, Yuji Iwamoto\*, Nagoya Institute of Technology, Japan

**8:50 AM**

**(ICACC-S9-015-2012) Gas Permeability and Fracture Properties of Porous Alumina with Various Pore Structures for Support Substrates of Ceramic Membranes**

Sawao Honda\*, Norimasa Nishihara, Shinobu Hashimoto, Nagoya Institute of Technology, Japan; Tomokazu Eda, Hirokazu Watanabe, Keita Miyajima, Noritake Co., Limited, Japan; Yuji Iwamoto, Nagoya Institute of Technology, Japan

**9:10 AM**

**(ICACC-S9-016-2012) Porous membranes derived from Polysiloxanes for electrochemical applications**

Michaela Wilhelm\*, Michael Adam, Georg Grathwohl, University of Bremen, Germany

**9:30 AM**

**(ICACC-S9-017-2012) Synthesis of Novel Polysiloxane and Polycarbosilane Aerogels from Si-H and Si-Vy Bearing Precursors**

Gian D Soraru\*, Penzo Campostrini, Parakkulam Aravind, Amelie Gaston, University of Trento, Italy; Yigal Blum, SRI International,

USA

**9:50 AM**

Break

## Structure and Properties of Porous Ceramics I

10:10 AM-12:10 PM

Room: Coquina Salon C

Session Chair(s): Alek Pyzik

**10:10 AM**

**(ICACC-S9-018-2012) Aluminum titanate-based composites for diesel particulate filter application (Invited)**

Monika Backhaus-Ricoult\*, Corning Incorporated, USA

**10:40 AM**

**(ICACC-S9-019-2012) Effect of Pore Size Distribution and Cell Geometry on Filtration Efficiency and Pressure Drop (Invited)**

Irene Peterson\*, Greg Merkel, Jianguo Wang, Michael Fischer, Alper Ozturk, Courtney Warren, Corning Incorporated, USA; Maxime Moreno, Corning Incorporated, France; Michelle Wallen, Jennifer Heine, Corning Incorporated, USA

**11:10 AM**

**(ICACC-S9-020-2012) SiC foams decorated with ceramic nanowires: permeation and aerosol filtration behavior**

Murilo D.M. Innocentini, Rafael F. Caldato, Universidade de Ribeirão Preto, Brazil; Eduardo Tanabe, José R. Coury, Universidade Federal de São Carlos, Brazil; Manabu Fukushima, AIST, Japan; Paolo Colombo\*, University of Padova, Italy

**11:30 AM**

**(ICACC-S9-021-2012) A novel method for pore size and porosity analysis of meso- and**

**macroporous solids using electroacoustics**

Andrei Dukhin, Dispersion Technology Inc, USA; Matthias Thommes\*, Quantachrome Instruments, USA

**11:50 AM**

**(ICACC-S9-022-2012) Effect of h-BN content on thermal shock resistance and dielectric properties of porous h-BN/Si<sub>3</sub>N<sub>4</sub> composite ceramics prepared by gel casting**

Shengjin Wang, Dechang Jia\*, Zhihua Yang, Xiaoming Duan, Yu Zhou, Harbin Institute of Technology, China

## Structure and Properties of Porous Ceramics II

1:30 PM-3:10 PM

Room: Coquina Salon C

Session Chair(s): Thomas Watkins

**1:30 PM**

**(ICACC-S9-023-2012) Photoactivities of Porous PEO Coatings on Titanium Plates and Wire Meshes**

Liza Kate Mirelman\*, Bill Clyne, Chris Dunleavy, James Curran, University of Cambridge, United Kingdom

**1:50 PM**

**(ICACC-S9-024-2012) The Effect of the Water-Silica Interface on Enhanced Proton Transport**

Glenn K. Lockwood\*, Stephen H Garofalini, Rutgers, the State University of New Jersey, USA

**2:10 PM**

**(ICACC-S9-025-2012) Intentionally Porous Alumina and Aluminates**

Miriana Vadala\*, Doru C Lupascu, University of Duisburg Essen, Germany

**2:30 PM**

**(ICACC-S9-026-2012) Characterizing the**

### **Reduction of $\text{Ni}_x\text{Mg}_{1-x}\text{Al}_2\text{O}_4$**

Brenden Eric Hill\*, Michelene E Miller, Katelyn C Glass, Scott T Misture, Alfred University, USA

**2:50 PM**

Break

## **Mechanical Properties of Porous Ceramics**

3:10 PM-5:20 PM

Room: Coquina Salon C

Session Chair(s): Monika Backhaus-Ricoult

**3:10 PM**

### **(ICACC-S9-027-2012) Fracture Toughness of Porous SiC at Elevated Temperature (Invited)**

Thomas R. Watkins\*, Kevin J Wright, Amit Shyam, ORNL, USA; Randall J Stafford, Cummins Inc, USA

**3:40 PM**

### **(ICACC-S9-028-2012) Failure Stress and Apparent Elastic Modulus of Diesel Particulate Filter Ceramics**

Andy A Wereszczak, Ethan E Fox\*, Michael J Lance, Oak Ridge National Lab, USA

**4:00 PM**

### **(ICACC-S9-029-2012) Strengthening technique of porous alumina using a TEOS solution treatment**

Shinobu Hashimoto\*, Ryuta Hanai, Yuta Ito, Sawao Honda, Yuji Iwamoto, Nagoya Institute of Technology, Japan

**4:20 PM**

### **(ICACC-S9-030-2012) Elastic Modulus of Porous Cordierite by Flexure Test Method Compared to Sonic/Resonance Test Methods**

Randall Stafford\*, Kevin Golovin, Cummins, Inc, USA; Andrew Dickinson, Cummins, Inc., USA; Thomas Watkins, Amit Shyam, Oak Ridge National Laboratory, USA

**4:40 PM**

### **(ICACC-S9-031-2012) Crack growth during double torsion fracture toughness testing of machined honeycomb ceramics**

James Zimmermann\*, Kyle Hoff, Jamie Westbrook, Glenn Morgan, Tim Meyer, Corning, USA

**5:00 PM**

### **(ICACC-S9-032-2012) Converting macro to micro-stress and strain in porous and in microcracked ceramics**

Giovanni Bruno\*, Corning Inc., USA; Andrey N Levandovskiy, Alexander M Efremov, Corning OOO, Russian Federation

## **Symposium 9: Poster Session**

5:00 PM-8:00 PM

Room: Exhibition Hall, Ocean Center

### **(ICACC-S9-P109-2012) Local structural characterizations of transition metal cation-doped amorphous silica-based membranes for high-temperature gas separation**

Akito Mori\*, Kouhei Higashiguchi, Kouji Hataya, Sawao Honda, Yuji Iwamoto, Nagoya Institute of Technology, Japan

### **(ICACC-S9-P110-2012) Fabrication of porous zirconia with high volume fraction of closed pores formed by impurities**

Tomoya Umeda, Shinobu Hashimoto\*, Nagoya Institute of Technology, Japan; Kiyoshi Hirao, Naoki Kondo, Hideki Hyuga, You Zhou, National Institute of Advanced Industrial Science and Technology (AIST), Japan; Sawao Honda, Yuji Iwamoto, Nagoya Institute of Technology, Japan

### **(ICACC-S9-P111-2012) Processing of functional thin films for gas separation**

**membranes and solid oxide fuel cells with sol-gel ink-jet printing**

Jan Hoffmann, Tim Van Gestel\*, Geng Hu, Norbert Menzler, Martin Bram, Hans Peter Buchkremer, Forschungszentrum Jülich, Germany

**(ICACC-S9-P112-2012) Fibrous Alumina Scaffolds for Bone Tissue Engineering Applications**

Saralashrita Mohanty, Santanu Dhara\*, IIT Kharagpur, India; Arun Prabhu Rameshbabu, VIT University, India

**(ICACC-S9-P113-2012) Obtaining of porous corundum ceramics by utilization of waste rice husk. Investigation of composition, structure and thermal degradation of rice husk**

Irena Georgieva Markovska\*, Assen Zlatarov University, Bulgaria

Wednesday, January 25, 2012

**Applications of Porous Ceramics**

8:00 AM-10:00 AM

Room: Coquina Salon C

Session Chair(s): James Zimmermann

**8:00 AM**

**(ICACC-S9-033-2012) The State of the Diesel Particulate Filter (DPF) (Invited)**

Martin Murtagh\*, Corning Incorporated, USA

**8:30 AM**

**(ICACC-S9-034-2012) Ultra High Porosity Acicular Mullite Ceramic Designed for Filtration of Diesel Particles and Reduction of NOx (Invited)**

Alek j Pyzik\*, Bob Newman, Rob Ziebarth, Mike Malanga, Dow Chemical Company, USA

**9:00 AM**

**(ICACC-S9-035-2012) Solid foam monoliths as supports for zeolite catalysts**

Wilhelm Schwieger\*, Amer Inayat, Sofia Lopez, Friedrich-Alexander-Universität Erlangen Nürnberg, Germany; Hannsjörg Freund, Max-Planck-Institut, Germany; Andreas Schwab, Thomas Zeiser, Friedrich-Alexander-Universität Erlangen Nürnberg, Germany

**9:20 AM**

**(ICACC-S9-036-2012) Immobilization of Silver-Modified Nitrogen-Doped Anatase TiO<sub>2</sub> Nanoparticles on Porous Rutile TiO<sub>2</sub> Ceramic Foam and its Photocatalytic Disinfection on *E. coli* bacteria under Visible Light Illumination**

Caixia Sun, Qi Li\*, Lihua Cao, Shian Gao, Institute of Metal Research, Chinese Academy of Sciences, China; Jian K Shang, University of Illinois at Urbana-Champaign, USA

**9:40 AM**

Break

**Porous Ceramics joins Symposium 5: Bioceramics for a joint session at 10:00 AM in Salon C**