SYMPOSIUM 3: 11th International Symposium on Solid Oxide Fuel Cells (SOFC): Materials, Science and Technology
Tuesday, January 28, 2014

Status and Prospectives of SOFC and SOEC
1:30 PM-4:50 PM
Room: Coquina Salon H
Session Chair(s): Mihails Kusnezoff, Narottam Bansal, Alexander Michaelis, Jeffry Stevenson

1:30 PM
(ICACC-S3-001-2014) SOFC as the central control and essentials supply of plant factory aka vertical farming
Ling-yuan Tseng*, Electric Energy Express, Taiwan

1:50 PM
(ICACC-S3-002-2014) High-Temperature Direct Fuel Cell Material Experience
Chao-Yi Yuh*, Mohammad Farooque, FuelCell Energy, Inc., USA

2:10 PM
(ICACC-S3-003-2014) Biomass gasification and catalytic reforming for SOFC
Un Hoi Cheong*, Wen-Cheng J Wei, national taiwan university, Taiwan

2:30 PM
Break

2:50 PM
(ICACC-S3-004-2014) Stacks on basis of CFY interconnects: status and prospects
Mihails Kusnezoff*, Stefan Megel, Nikolai Trofimenko, Alexander Michaelis, Fraunhofer IKTS, Germany

3:10 PM
(ICACC-S3-005-2014) SOECs: Prospects and Problems (Invited Speaker)
Peter Vang Hendriksen*, Ragnar Kiebach, Ming Chen, Xiufu Sun, Jens V Høgh, Karsten Agersted, Janet J Bentzen, Yi-Lin Liu, Sebastian Molin, Sune Ebbesen, Christopher Graves, Anne Hauch, Per Hjalmarsson, Jacob R Bowen, Mogens B Mogensen, Technical University of Denmark, Denmark; Christoffer G Greisen, Topsoe Fuel Cell, Denmark; Brian V Mathiesen, Aalborg University, Denmark

3:40 PM
(ICACC-S3-006-2014) SOEC developments status at sunfire GmbH (Invited Speaker)
Denis Klemm*, Thomas Strohbach, sunfire GmbH, Germany; Andreas Glauche, KERAFOl Keramische Folien GmbH, Germany; Josef Scheufeld, EIFER Institut, Germany; Danilo Schimanke, Christian Geipel, Christian von Olshausen, sunfire GmbH, Germany

4:10 PM
(ICACC-S3-007-2014) Development of a cost-efficient and performing High Temperature Steam Electrolysis stack
Julie Mougin*, Magali Reytier, Julie Cren, Marie Petitjean, CEA/LITEN, France

4:30 PM
(ICACC-S3-008-2014) Stability Testing Beyond 1000 Hours of Solid Oxide Cells under Steam Electrolysis Operation
Josef Scheufold*, Annabelle Brisse, European Institute for Energy Research, Germany

Wednesday, January 29, 2014

Cell Manufacturing
8:00 AM-10:00 AM
Room: Coquina Salon H
Session Chair(s): Toshio Suzuki, Enrico Traversa
**8:00 AM**
(ICACC-S3-009-2014) Progress and Challenges of Metal supported SOFC (Invited Speaker)
Niels Christiansen*, Topsoe Fuel Cell A/S, Denmark

**8:30 AM**
(ICACC-S3-010-2014) mT-SOFC: Fabrication and performance under fuel cell and electrolysis operation modes (Invited Speaker)
Victor M Orera*, Miguel A Laguna-Bercero, Angel Larrea, Hernan Monzón, C.S.I.C., Spain

**9:00 AM**
(ICACC-S3-011-2014) Doping NiO and 8YSZ, and optimisation of tape cast multilayer design for production of Metal Supported Solid Oxide Fuel Cell by co-sintering
Pradnyesh Satardekar*, University of Trento, Italy; Dario Montinaro, Viale Trento, Italy; Vincenzo M Sglavo, University of Trento, Italy

**9:20 AM**
(ICACC-S3-012-2014) Single Step Production of Cathode Supported SOFC
Angela Gondolini*, Elisa Mercadelli, Paola Pinasco, Alessandra Sanson, ISTEC-CNR, Italy

**9:40 AM**
Break

**Joining Technology**
10:00 AM-12:00 PM
Room: Coquina Salon H
Session Chair(s): Prabhakar Singh, Niels Christiensen

**10:00 AM**
(ICACC-S3-013-2014) Novel glass-ceramic compositions for application as sealants for Solid Oxide Cells (Invited Speaker)
Federico Smeacetto*, Auristela De Miranda, Milena Salvo, Monica Ferraris, Pierluigi Leone, Andrea Lanzini, Massimo Santarelli, Politecnico di Torino, Italy

**10:30 AM**
(ICACC-S3-014-2014) Microstructure and thermal cycling properties of reactive air brazed joints (Invited Speaker)
Erik Skiera*, Chichi Li, Bernd Kuhn, Tilmann Beck, Lorenz Singheiser, Forschungszentrum Jülich, Germany

**11:00 AM**
(ICACC-S3-015-2014) Compliant sealing glass for SOFC applications: effect of fillers on thermal cycling and validation in a generic stack fixture test
Yeong-Shyung Chou*, Jung-Pyung Choi, Jeffrey W Stevenson, Pacific Northwest National Lab, USA; V. Garcia-Negron, R. Trejo, Beth Armstrong, Edgar Lara-Curzio, Oak Ridge National Lab, USA

**11:20 AM**
(ICACC-S3-016-2014) High-Temperature Viscous Sealing Glasses for Solid Oxide Fuel Cells
Cheol-Woon Kim*, Joe Szabo, Ray Crouch, Rob Baird, MO-SCI Corporation, USA; Richard K Brow, Jen Hsien Hsu, Casey Townsend, Raphael Reis, Missouri University of Science and Technology, USA

**11:40 AM**
(ICACC-S3-017-2014) Characterization and Performance of a High-temperature Glass Sealant for Solid Oxide Fuel Cell
Chien-Kuo Liu*, Ruey-Yi Lee, Kun-Chao Tsai, Szu-Han Wu, Kin-Fu Lin, Institute of Nuclear Energy Research, Taiwan

**Micro-SOFCs**
1:30 PM-5:50 PM
Room: Coquina Salon H
Session Chair(s): Vincenzo Esposito, Ling-yuan Tseng, Sascha Kuehn, Caine Finnerty

**1:30 PM**
(ICACC-S3-018-2014) Full Metal Fuel Cells (FMFCs) with Solid Oxide Thin Films allow start-up from room temperature to 850 °C in 10 Seconds (Invited Speaker)
Sascha Kuehn*, Karina Paciejewska, Andrea Stoeck, Stephan Mnich, Lars Winkler, eZelleron, Germany

2:00 PM
(ICACC-S3-019-2014) WATT Fuel Cell & Parker Hannifin Target RV & Marine CHP Markets
(Invited Speaker)
Caine Finnerty*, Sarah DeWald, WATT Fuel Cell, USA

2:30 PM
(ICACC-S3-020-2014) All-ceramic μSOFC fully integrated in Si for a new generation of reliable micropower generators (Invited Speaker)
Iñigo Garbayo, IMB-CNMI, CSIC, Spain; Dolors Pla, Alex Morata, IREC, Spain; Luis Fonseca, IMB-CNMI, CSIC, Spain; Simone Sanna, Vincenzo Esposito, DTU RISO, Denmark; Neus Sabaté, IMB-CNMI, CSIC, Spain; Albert Tarancón*, IREC, Spain

3:00 PM
Break

3:20 PM
(ICACC-S3-021-2014) Thin-film and nanostructure-based anode-supported solid oxide fuels cells by multi-scale architecture: Low-temperature performance and thermomechanical stability (Invited Speaker)
Ji-Won Son*, Korea Institute of Science and Technology (KIST), Republic of Korea

3:50 PM
(ICACC-S3-022-2014) The Eneramic® Power Generator - A Reliable Fuel Cell Battery Hybrid System for Off-grid Power Supply
Andreas Poenicke*, Sebastian Reuber, Christian Wunderlich, Alexander Michaelis, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

4:10 PM
(ICACC-S3-023-2014) Portable solid oxide fuel cells (SOFCs) and holder operated with biofuel
Mu-Min Chen*, Un-Hoi Cheong, Wen-Cheng J Wei, National Taiwan University, Taiwan

4:30 PM
(ICACC-S3-024-2014) Fabrication and characterization of a micro-reformer unit fully integrated in silicon for ethanol conversion
Dolors Pla, IREC, Spain; Nuria Jiménez, INTE-UPC, Spain; Marc Salleras, IMB-CNMI, CSIC, Spain; Iñigo Garbayo, Gerard Gadea-Diez, Alex Morata, IREC, Spain; Neus Sabaté, IMB-CNMI, CSIC, Spain; Jordi Llorca, INTE-UPC, Spain; Albert Tarancón*, IREC, Spain

4:50 PM
(ICACC-S3-025-2014) Performance of Ni-based Anode Supported SOFCs with Doped Ceria Electrolyte at Low Temperatures (300~550°C)
Toshio Suzuki*, Bo Liang, Toshiaki Yamaguchi, Hirofumi Sumi, Koichi Hamamoto, Yoshinobu Fujihiro, National Institute of Advanced Industrial Science and Technology, Japan; Nigel Sammes, POSTECH, Republic of Korea

5:10 PM
(ICACC-S3-026-2014) Adjustment of process parameters for attaining a dense gadolinium-doped ceria layer for production of microtubular SOFC cells
Karina Maria Paciejewska*, Sascha Kuehn, Stephan Mnich, eZelleron GmbH, Germany

5:30 PM
(ICACC-S3-027-2014) Extrusion and optimization of carbon resistant tubular IT-SOFCs
Andrea Azzolini*, Vincenzo M Sglavo, Università di Trento, Italy

Thursday, January 30, 2014
Air Electrode

8:00 AM-10:00 AM
Room: Coquina Salon H
Session Chair(s): Peter Hendriksen, Nguyen Minh

8:00 AM
(ICACC-S3-028-2014) Synthesis of SmBa0.5Sr0.5Co2O5+δ powder and its application
as composite cathode for intermediate temperature solid oxide fuel cell
Tai-Nan Lin*, Maw-Chwain Lee, Ruey-Yi Lee, The Institute of Nuclear Energy Research, Taiwan

8:20 AM
(ICACC-S3-029-2014) Defect Equilibria of (Pr0.6Sr0.4)(Co0.2Fe0.8)O3-δ
Calvert Sebasdan Barclay*, Liang Zhao, Sean Bishop, Kyushu University, Japan; Keith Duncan, University of the West Indies, Mona Campus, Jamaica

8:40 AM
(ICACC-S3-030-2014) Increasing the oxygen exchange rate of CeO2 based materials for SOFC electrodes
Liang Zhao*, Nicola Perry, Tateshi Diao, Kazunari Sasaki, Sean Bishop, Kyushu university, Japan

9:00 AM
(ICACC-S3-031-2014) Mechanism for Enhancement of Electrochemical Performance on LaNi0.6Fe0.4O3-δ - Ce0.9Gd0.1O1.95 Composite Electrode
Riyen Achmad Budiman*, Shin-Ichi Hashimoto, Keiji Yashiro, Koji Amezawa, Tatsuya Kawada, Tohoku University, Japan

9:20 AM
(ICACC-S3-032-2014) High performance and highly durable infiltrated cathodes using Pr-modified Ce0.9Gd0.1O1.95 backbone
Alfred Samson*, Martin Søgaard, Nikolaos Bonanos, Christodoulos Chatzichristodoulou, Peter Vang Hendriksen, Technical University of Denmark, Denmark

9:40 AM
Break

Air Electrode / Interfacial Reactions
10:00 AM-12:00 PM
Room: Coquina Salon H

10:00 AM
Session Chair(s): Josef Schefold, Ji-Won Son

10:00 AM (ICACC-S3-033-2014) Donor Doping of a P-Type SOFC Cathode: Influence of La on Sr(Ti,Fe)O3-δ
Defect Chemistry and Performance
Nicola H. Perry*, John W Druce, Kyushu University, Japan; Daniele Pergolesi, Paul Scherrer Institut, Switzerland; John A Kilner, Imperial College, United Kingdom; Sean R Bishop, Kyushu University, Japan; Harry L Tuller, Massachusetts Institute of Technology, USA

10:20 AM
(ICACC-S3-034-2014) Effects of Sr Doping on the Conductivity and ORR Kinetics of La2NiO4
Xingbo Liu, Bo Guan*, Hui Zhang, West Virginia University, USA

10:40 AM
(ICACC-S3-035-2014) Effect of dopants on the lattice structure, electrical and electrochemical properties of La2NiO4+δ
Yongna Shen, Hailei Zhao*, Jingcan Xu, Chunyang Yang, University of Science and Technology Beijing, China

11:00 AM
(ICACC-S3-036-2014) Infiltrated lanthanum nickelate cathodes on protonic ceramic fuel cells utilizing thin BaCe0.2Zr0.7Y0.1O3-δ electrolytes
Sean M Babiniec*, Sandrine Ricote, Neal P Sullivan, Colorado School of Mines, USA; Anthony Manerbino, CoorsTek, Inc., USA

11:20 AM
(ICACC-S3-037-2014) Investigating Humidity Effects on LSM/YSZ Cathodes of Anode-Supported SOFCs using In-Operando X-ray Diffraction
John S Hardy*, Jared W Templeton, Jeffry W Stevenson, Pacific Northwest National Laboratory, USA

11:40 AM
(ICACC-S3-038-2014) A study of cathode contact strength of solid oxide fuel cells: effect of particle
size and sealing temperature
Yeong-Shyung Chou*, Franco Spadoni, Eric Riel, Jung-Pyung Choi, Jeffry W Stevenson, Pacific Northwest National Lab, USA

Interfacial Reactions / Fuel Electrode
1:30 PM-5:40 PM
Room: Coquina Salon H
Session Chair(s): Julie Mougin, Sean Bishop, Denis Klemm, Victor Orera

1:30 PM
(ICACC-S3-039-2014) Solid Oxide Fuel Cell Interface Dynamics and Associated Electrochemical Performance Degradation
Chuan Zhang, Daniel R Mumm*, University of California, Irvine, USA

1:50 PM
(Break)

2:10 PM
(ICACC-S3-041-2014) Fuel distribution in SOFC stacks derived from the gas conversion impedance
Rasmus Rode Mosbæk*, Johan Hjelm, DTU Energy Conversion, Denmark; Rasmus Barfod, Haldor Topsøe A/S, Denmark; Peter V Hendriksen, DTU Energy Conversion, Denmark

2:30 PM
(ICACC-S3-042-2014) Interaction of perovskite type lanthanum-calcium-chromites-titanates La1-xCaxCr1-yTiO3-δ with solid electrolyte materials
Chriiffe Omar Belda, Egle Dietzen, Mihails Kusnezoff*, Nikolai Trofimenko, Fraunhofer IKTS, Germany; Uladzimir Vasook, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V., Germany; Alexander Michaelis, Fraunhofer IKTS, Germany; Ulrich Guth, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V., Germany

2:50 PM
Break

3:10 PM
(ICACC-S3-043-2014) Nanostructured Electrodes for Solid Oxide Fuel Cells (Invited Speaker)
Fatih Dogan*, Aligul Buyukksoy, Ayhan Sarikaya, Vladimir Petrovsky, Missouri University of Science and Technology, USA

3:40 PM
(ICACC-S3-044-2014) Titanate perovskites designed to exsolve Cu-based alloy nanoparticles for SOFC applications
Syed Munawer Bukhari*, Dragos Neagu, John Irvine, University of St Andrews, United Kingdom

4:00 PM
(ICACC-S3-045-2014) Ordered Mesoporous cerments as anodes for intermediate temperatures Solid Oxide Fuel Cells
Laura Almar, Marc Torrell, Alex Morata, IREC, Spain; Lluis Yedra, LENS-MIND-IN2UB, UB, Spain; Sonia Estradé, TEM-MAT, Scientific and Technological Centers, (CCIT), UB, Spain; Bibiana Colledeforns, IREC, Spain; Francesca Peiró, LENS-MIND-IN2UB, UB, Spain; Teresa Andreu, Albert Tarancón*, IREC, Spain

4:20 PM
(ICACC-S3-046-2014) Method for Calculating Effective conductivity of SOFC electrodes from 3D tomography images
Denis Roussel*, Christophe L Martin, David Jauffrès, University of Washington, USA; Aaron Lichtner, Rajendra Bordia, Grenoble INP, France

4:40 PM
(ICACC-S3-047-2014) Structure characterization and transport properties of Mn-CeO2 and Fe-CeO2
Liang Zhao*, Kyushu university, Japan; Junji Hyodo, Tatsumi Ishihara, Kyushu University, Japan; Kazunari Sasaki, Kyushu university, Japan; Sean Bishop, Kyushu University, Japan
5:00 PM
(ICACC-S3-048-2014) Characterization of Doped Yttrium Chromites as Electrode for Solid Oxide Fuel Cell by Impedance
Xingbo Liu, Wenyuan Li*, Mingyang Gong, West Virginia University, USA

5:20 PM
(ICACC-S3-049-2014) Electrocatalysis for Solid Oxide Fuel Cells with Proton-Conducting Oxides in the Anodes
Zhe Cheng*, Florida International University, USA

Friday, January 31, 2014
Interconnects / Coatings
8:00 AM-10:10 AM
Room: Coquina Salon H
Session Chair(s): Federico Smeacetto, Chien-Kuo Liu

8:00 AM
(ICACC-S3-050-2014) Reactive Air Aluminization with Dip coating process for Planar SOFC Stacks (Invited Speaker)
Jung-Pyung Choi*, Jeffry W Stevenson, Jeff F Bonnett, Matt Chou, Pacific Northwest National Lab, USA

8:30 AM
(ICACC-S3-051-2014) Interplay Among Chemistry, Microstructure and Functional Properties of Plasma Sprayed Lanthanum Strontium Manganite
SuJung Han*, Yikai Chen, Richard J Gambino, Sanjay Sampath, Stony Brook University, USA

8:50 AM
(ICACC-S3-052-2014) Development of materials systems for SOFC interconnector application
Yu-Ming Chen*, An-Chou Yeh, National Tsing Hua University, Taiwan; Wei-Ja Shong, Chien-Kuo Liu, Institute of Nuclear Energy Research, Taiwan

9:10 AM
(ICACC-S3-053-2014) NTN Composite Interconnect for SOFC
Arkady Malakhov*, Solid Cell Inc, USA; Sam Ghosh, RocCera LLC, USA

9:30 AM
(ICACC-S3-054-2014) Mn1.5 Co1.5 O4 coatings on Crofer22APU obtained by Electrophoretic Deposition (EPD) for application in Solid Oxide Fuel Cells (SOFCs)
Auristela De Miranda*, Politecnico di Torino, Italy; Sandra Cabanas-Polo, University of Erlangen-Nuremberg, Germany; Federico Smeacetto, Milena Salvo, Politecnico di Torino, Italy; Aldo Boccaccini, University of Erlangen-Nuremberg, Germany; Monica Ferraris, Politecnico di Torino, Italy

9:50 AM
Break

Electrolytes and Membranes
10:10 AM-12:10 PM
Room: Coquina Salon H
Session Chair(s): Mihails Kusnezoff, Albert Tarancon

10:10 AM
(ICACC-S3-055-2014) Oxygen ion Conductors with Enhanced Properties for SOFC Applications (Invited Speaker)
Kuan-Zong Fung*, Shu-Yi Tsai, Chung-Ta Ni, Chi-Yang Liu, National Cheng Kung University, Taiwan

10:40 AM
(ICACC-S3-056-2014) Rational Approach for Designing Cathode Materials for Proton Conducting Electrolytes Operating at 600°C (Invited Speaker)
Enrico Traversa*, King Abdullah University of Science and Technology, Saudi Arabia

11:10 AM
(ICACC-S3-057-2014) Enhanced mass diffusion phenomena in highly defective doped ceria
Vincenzo Esposito*, De Wei Ni, Zeming He, Wei Zhang, Julie Glasscock, Christodoulos Chatzichristodoulo, Severine Ramousse, Andreas
Kaiser, Technical University of Denmark, Denmark

11:30 AM
(ICACC-S3-058-2014) Effect of manganese dioxide addition to cubic phase stability, densification and electrical conductivity of scandia-stabilized zirconia
R. Muccillo*, Emanuelle Z Santos, IPEN, Brazil

11:50 AM
(ICACC-S3-059-2014) Electro-chemo-mechanical properties of the non-stoichiometric oxide Pr doped ceria
Sean Bishop*, Kyushu University, Japan; Dario Marrocchelli, Trinity College Dublin, Ireland; Di Chen, Jaejin Kim, Harry L Tuller, Massachusetts Institute of Technology, USA