

Symposium 3: 9th
International Symposium
on Solid Oxide Fuel Cell
(SOFC) Materials, Science
& Technology

Wednesday, January 25, 2012

**SOFC Applications and
Technology Overview**

1:30 PM-3:20 PM

Room: Coquina Salon H

Session Chair(s): Narottam Bansal, Prabhakar Singh

1:30 PM

(ICACC-S3-001-2012) Recent Developments in the SECA Program (Invited)

Briggs White*, Dept. of Energy, USA

2:00 PM

(ICACC-S3-002-2012) Long-term evaluation of Ce-modified (Mn,Co) spinel coating for SOFC application in a 3-cell short stack geometry (Invited)

Yeong-Shyung Chou*, Edwin C Thomsen, Jung-Pyung Choi, Jeffry W Stevenson, Gordon G Xia, Jeff F Bonnett, William E Voldrich, Pacific Northwest National Lab, USA

2:30 PM

(ICACC-S3-003-2012) Performance of electrolyte supported cells based on thin electrolyte (Invited)

Mihails Kusnezoff*, Nikolai Trofimenko, Fraunhofer IKTS, Germany; John Olenick, Kathy Olenick, ENrG, USA

3:00 PM

Break

**SOFC Applications and IC
Development**

3:20 PM-5:50 PM

Room: Coquina Salon H

Session Chair(s): Jeffry Stevenson, Mihails Kusnezoff

3:20 PM

(ICACC-S3-004-2012) Highlighting DOE EERE Efforts for the Development of SOFC Systems for APU and Stationary Applications (Invited)

David Peterson*, Dimitrios Papageorgopoulos, Department of Energy, Office of Energy Efficiency and Renewable Energy, USA

3:50 PM

(ICACC-S3-005-2012) La(1-y)Ca_yTi(1-x)Mn_xO₃ as an interconnect material for solid oxide fuel cells

Niloufar Raeis Hosseini*, Pohang University of Science and Technology (POSTECH), Republic of Korea; Hee Chul Yoon, Nigel Sammes, Pohang university of science and technology (POSTECH), Republic of Korea; Jong Shik Chung, Pohang University of Science and Technology (POSTECH), Republic of Korea

4:10 PM

(ICACC-S3-006-2012) Coating Optimization of Commercialized MnCoO-CeO spinel and the Effect of Thickness on Electrical Conductivity

Jung-Pyung Choi*, Jeffry W Stevenson, Scott Ryan, Matt Chou, Pacific Northwest National Lab, USA

4:30 PM

(ICACC-S3-007-2012) A High H₂S Tolerant Ni-GDC Anode with a GDC Barrier Layer

Chunchuan Xu*, Phillip Gansor, John W Zondlo, Katarzyna Sabolsky, Edward M

Sabolsky, West Virginia University, USA

4:50 PM

(ICACC-S3-008-2012) Composite Interconnector for SOFC

Sergey Somov*, Solid Cell Inc., USA; Olivia Graeve, Alfred University, USA; Sam Ghosh, RocCera LLC, USA; Heinz Nabielek, Solid Cell Inc., USA

5:10 PM

(ICACC-S3-009-2012) Stability against chromium poisoning in ferritic cathodes

Amaia Arregui*, Lide M. Rodriguez, University of Trento, Italy; Stefano Modena, Massimo Bertoldi, Sofcpower S.p.A., Spain; Vincenzo M. Sglavo, University of Trento, Italy

5:30 PM

(ICACC-S3-010-2012) Component interactions after long-term operation of an SOFC stack with LSM cathode

Juergen Malzbender*, Peter Batfalsky, Robert Vassen, Valdimir Shemet, Frank Tietz, Forschungszentrum Jülich, Germany

Symposium 3: Poster Session

5:00 PM-7:30 PM

Room: Exhibition Hall, Ocean Center

(ICACC-S3-P035-2012) CdMnS Thin Film Synthesis using CBD: Application in Photoelectrochemical Cell

Jaiprakash Shivprasad Dargad*, Nanda S Korde, Dayanand Science College, Latur, MS, India, India

(ICACC-S3-P036-2012) Investigation of novel solid oxide fuel cell cathodes based on impregnation of $\text{SrTi}_x\text{Fe}_{1-x}\text{O}_{3-\delta}$ into ceria-based backbones

Mathias Brinch-Larsen*, Martin Sjøgaard, Johan

Hjelm, Henrik L Frandsen, Risø DTU, Denmark

(ICACC-S3-P037-2012) Interface and grain boundary effects on the electrical conductivity of epitaxial and nanocrystalline ceria thin films

Giuliano Gregori*, Marcus C Göbel, Max Planck Institute for Solid State Research, Germany; Xiangxin Guo, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China; Joachim Maier, Max Planck Institute for Solid State Research, Germany

(ICACC-S3-P038-2012) Development of GDC-(LiNa)CO₃ Nano-Composite Electrolytes for Low Temperature Solid Oxide Fuel Cells

Rajalekshmi Chockalingam*, Ashok K Ganguli, Suddhasatwa Basu, Indian Institute of Technology, India

(ICACC-S3-P039-2012) Sintering and thermo-mechanical behavior investigation of strontium and cobalt doped LaCrO₃ ceramic interconnect

Clawsio Rogerio Sousa*, Wilson Acchar, Larissa Silva, UFRN, Brazil; Sonia Castanho, IPEN, Brazil

(ICACC-S3-P040-2012) Fabrication of Dual Layer Ceramic Interconnect on a NiO-YSZ Anode Support for Flat Tubular Solid Oxide Fuel Cells

Mi Young Yoon*, Hae Jin Hwang, Inha University, Republic of Korea; Rak-Hyun Song, Korea Institute of Energy Research, Republic of Korea

(ICACC-S3-P041-2012) Methane Oxidation behavior of Perovskite Type Catalysts for Solid Oxide Fuel Cells

Jong Seol Yoon*, INHA university, Republic of Korea; Byung Hyun Choi, Mi-Jung Ji, Korea Institute of Ceramic Engineering and Technology, Republic of Korea; Hae Jin Hwang, INHA university, Republic of Korea

(ICACC-S3-P042-2012) A porous burner, no-chamber-based solid oxide fuel cell

D. Hotza*, J. Aguilar, A. Oliveira, UFSC, Brazil

(ICACC-S3-P043-2012) Characterization of scandium doped lanthanum strontium ferrite as cathodes for solid oxide fuel cells

Jungdeok Park*, Jing Zou, Heechul Yoon, Jongshik Chung, POSTECH, Republic of Korea

(ICACC-S3-P044-2012) Preparation and evaluation of $\text{Ca}_{3-x}\text{BixCo}_4\text{O}_{9+\delta}$ ($0 < x \leq 0.5$) as novel cathodes for intermediate temperature-solid oxide fuel cells

Jing Zou*, Jungdeok Park, Heechul Yoon, Taewook Kim, Jongshik Chung, Pohang University of Science and Technology, Republic of Korea

(ICACC-S3-P045-2012) n-Dodecane reforming over Ni-YSZ cermet catalysts with $\text{K}_2\text{Ti}_2\text{O}_5$

Taewook Kim*, Hyeonhui Kim, Jong-Shik Chung, POSTECH, Republic of Korea

(ICACC-S3-P046-2012) Deposition of $\text{Mn}_{1.5}\text{Co}_{1.5}\text{O}_4$ thin films by thermal co-evaporation on Crofer 22APU interconnects for chromium poisoning SOFC electrolyte protection purpose

Massimiliano Bindi*, Davide Beretta, Edison.S.p.A., Italy; Federico Smeacetto, Lakshmi Chandru Ajitdoss, Polytechnic of Turin, Italy

(ICACC-S3-P047-2012) A Comparative assessment of Chromium Evaporation from Bulk and Surface Aluminized Iron and Nickel Base Alloys

Le Ge*, Prabhakar Singh, University of Connecticut, USA

Thursday, January 26, 2012

Electrode Materials and Microstructural Engineering I

8:00 AM-10:00 AM

Room: Coquina Salon H

Session Chair(s): Briggs White, S. Elangovan

8:00 AM

(ICACC-S3-011-2012) Improved Anodic Performance of $\text{Ce}(\text{Mn,Fe})\text{O}_2\text{-La}(\text{Sr})\text{Fe}(\text{Mn,Co})\text{O}_3$ Composite Oxide For Direct Hydrocarbon Type SOFCs (Invited)

Tatsumi Ishihara*, Tae Ho Shin, Young-Wan Ju, Kyushu University, Japan

8:30 AM

(ICACC-S3-012-2012) Silver Based Composite Cathodes for High Performance SOFCs

Ayhan Sarikaya*, Vladimir Petrovsky, Fatih Dogan, Missouri University of Science and Technology, USA

8:50 AM

(ICACC-S3-013-2012) Production and Characterization of Micro-Tubular Solid Oxide Fuel Cells

Michele Casarin*, Ricardo De la Torre Garcia, Vincenzo M Sglavo, University of Trento, Italy

9:10 AM

(ICACC-S3-014-2012) In-situ XRD of Operating LSCF Cathode Suggests Gradual Compositional Change

John S Hardy*, Jared W Templeton, Dan J Edwards, Zigui Lu, Jeffry W Stevenson, Pacific Northwest National Laboratory, USA

9:30 AM

(ICACC-S3-015-2012) Performance and

Accelerated Degradation of Infiltrated Cathode Systems for Solid Oxide Fuel Cells (Invited)

Ann Call*, Megna Shah, Scott A Barnett, Northwestern University, USA

9:50 AM

Break

Electrode Materials and Microstructural Engineering II

10:00 AM-12:10 PM

Room: Coquina Salon H

Session Chair(s): Briggs White, S. Elangovan

10:00 AM

(ICACC-S3-016-2012) Investigation of Microstructural Effect of Ni-Yttria Stabilized Zirconia for SOFC Anode (Invited)

Toshio Suzuki*, Koichi Hamamoto, Bo Liang, Toshiaki Yamaguchi, Hirofumi Sumi, Yoshinobu Fujishiro, National Institute of Advanced Industrial Science and Technology, Japan; Brian Ingram, Jeremy Kropf, John D Cater, Argonne National Laboratory, USA

10:30 AM

(ICACC-S3-017-2012) Manganese induced Structural Modifications in Yttria Stabilized Zirconia (YSZ)

Manoj Kumar Mahapatra*, Na Li, Waleed Ahmad, Mark Aindow, Prabhakar Singh, University of Connecticut, USA

10:50 AM

(ICACC-S3-018-2012) Interactions of Electrolyte-(La_{0.8}Sr_{0.2})_xMnO₃ Air Electrode-Interconnect Tri-layers for Solid Oxide Fuel Cells (Invited)

Kathy Lu*, Tongan Jin, Virginia Tech, USA

11:10 AM

(ICACC-S3-019-2012) Investigation of cobalt-free perovskite Ba_{0.95}La_{0.05}FeO_{3-δ} as a cathode for proton-conducting solid oxide fuel cells

Litao Yan, Xingjian Xue*, University of South Carolina, USA

11:30 AM

(ICACC-S3-020-2012) Freeze-Tape Casting for the Design of Anode and Cathode Materials in Solid Oxide Fuel Cells (SOFCs)

Jacob Bunch*, Yu Chen, University of South Carolina, USA; Mathew May, Citadel, USA; Fanglin Chen, University of South Carolina, USA

11:50 AM

(ICACC-S3-021-2012) Liquid Tin Anode Direct JP-8 Fuel Stack Performance and System Development

Mark Koslowske*, Jonathan Brodie, Connor MacKean, Jeff Bentley, Thomas Tao, CellTech Power, LLC, USA

Mechanical and Thermal Properties

1:30 PM-3:10 PM

Room: Coquina Salon H

Session Chair(s): Toshio Suzuki, Yeong-Shyung Chou

1:30 PM

(ICACC-S3-022-2012) Weibull strength variations between room temperature and high temperature Ni-3YSZ anode supports

Declan J Curran*, Henrik Lund Frandsen, Steffen Rasmussen, Peter Vang Hendriksen, DTU, Denmark

1:50 PM

(ICACC-S3-023-2012) (Sc₂O₃)_{0.1}(CeO₂)_{0.01}(ZrO₂)_{0.89} / (Y₂O₃)_{0.08}(ZrO₂)_{0.92} layered electrolytes

Yan Chen*, Nina Orlovskaya, University of Central Florida, USA; Jay Neutzler, Joshua Sightler, Xinyu Huang, University of South Carolina, USA; Thomas Graule, Jakob Kuebler, Empa, Swiss Federal Laboratories for Materials Science and Technology, Switzerland

2:10 PM

(ICACC-S3-024-2012) Thermomechanical Degradation Behavior of SOFC Materials

Haijoon Lee, Elizabeth R. Kupp*, Gary L Messing, Penn State University, USA

2:30 PM

(ICACC-S3-025-2012) Characterization of Zirconia by Means of Thermoanalytical Methods: From the Green Body to Dense Bulk Ceramics

Ekkehard Post*, NETZSCH Geraetebau GmbH, Germany; Bob Fidler, NETZSCH Instruments North America, LLC, USA

2:50 PM

Break

SOFC Electrolyte and Seal

3:10 PM-6:10 PM

Room: Coquina Salon H

Session Chair(s): Tatsumi Ishihara, Prabhakar Singh

3:10 PM

(ICACC-S3-026-2012) Evaluation of Approaches to Improving Long Term Stability of Solid Oxide Electrolysis Stack (Invited)

S. Elangovan*, Joseph J Hartvigsen, Feng Zhao, Dennis Larsen, Insoo Bay, Ceramatec, Inc., USA

3:40 PM

(ICACC-S3-027-2012) A Techno-Economic Model of Solid Oxide Electrolysis Systems for H₂ or Syngas Production

Joseph J Hartvigsen*, S. Elangovan, Daniel

Milobar, Ceramatec, Inc., USA

4:00 PM

(ICACC-S3-028-2012) Improved Air Electrode Materials for Solid Oxide Electrolysis Cells

Michael Keane*, Atul Verma, Prabhakar Singh, University of Connecticut, USA

4:20 PM

(ICACC-S3-029-2012) Compliant sealing glass for SOFC applications: electrical stability with YSZ and alumina coating under DC loading (Invited)

Yeong-Shyung Chou*, Edwin C Thomsen, Jung-Pyung Choi, William E Voldrich, Jeffry W Stevenson, Pacific Northwest National Lab, USA

4:50 PM

(ICACC-S3-030-2012) Viscous Sealants for Intermediate Temperature Solid Oxide Fuel Cells (Invited)

Mark O. Naylor*, Scott Misture, James Shelby, Kazuo Inamori School of Engineering, Alfred University, USA

5:10 PM

(ICACC-S3-031-2012) Glass-ceramic sealant in planar SOFC short stack; thermal cycle stability and chemical compatibility with stack components

Federico Smeacetto*, Milena Salvo, Pierluigi Leone, Massimo Santarelli, Gustavo Ortigoza Villalba, Politecnico di Torino, Italy; Massimiliano Bindi, Edison Spa, Italy; Lakshmi C Ajitdoss, Monica Ferraris, Politecnico di Torino, Italy

5:30 PM

(ICACC-S3-032-2012) Development of Viscous Sealing Glasses for Solid Oxide Fuel Cells

Cheol-Woon Kim*, MO-SCI Corporation, USA; Richard K Brow, Missouri University of Science and Technology, USA

5:50 PM

(ICACC-S3-033-2012) Effect of environmental exposure on the microstructural stability of two alkali barium silicate glasses

Amit Shyam*, Rosa Trejo, Valerie García-Negrón, Alex Ladouceur, Melanie Kirkham, Dana McClurg, Zach Ladouceur, Edgar Lara-Curzio, Oak Ridge National Laboratory, USA

Friday, January 27, 2012
**Novel Processing
Approaches for Cell and
Stack Materials**

8:00 AM-10:00 AM

Room: Coquina Salon H

Session Chair(s): Kathy Lu, Amit Shyam

8:00 AM

(ICACC-S3-034-2012) Fabrication of Cathode Layer by Non-contact Printing Process

Koichi Kikuta*, Naoki Yashiro, Shun Ayabe, Nagoya University, Japan

8:20 AM

(ICACC-S3-035-2012) Processing of CGO electrolyte layers with a thickness of ~1 μm : thin film wet coating methods and PVD

Tim Van Gestel*, Feng Han, Hyo-Jeong Moon, Sven Uhlenbruck, Hans Peter Buchkremer, Forschungszentrum Jülich, Germany

8:40 AM

(ICACC-S3-036-2012) Enhanced Ionic Conductivity of CeO₂-YSZ Nanocomposite Electrolyte

Alka Gupta*, Samir Sharma, Shobit Omar, Kantesh Balani, Indian Institute of Technology Kanpur, India

9:00 AM

(ICACC-S3-037-2012) Synthesis and Calorimetric Studies of

La_{9.33+x}(Si/GeO₄)₆O_{2+3x/2}: Fast Oxide Ion Conductors

S. Mahboobeh Hosseini*, Alexandra Navrotsky, University of California, Davis, USA

9:20 AM

(ICACC-S3-038-2012) Sr Doped LaPO₄ Monazite for Proton Conductivity

Jesse P Angle*, Mai Ng, Peter E.D Morgan, Martha L Mecartney, UC Irvine, USA

9:40 AM

Break

**Cell Component, Cell
Design and Reliability**

10:00 AM-12:20 PM

Room: Coquina Salon H

Session Chair(s): Nguyen Minh, Jeffrey Stevenson

10:00 AM

(ICACC-S3-039-2012) Current Developments in Solid Oxide Fuel Cell Development at Forschungszentrum Juelich

Robert Steinberger-Wilckens, Ludger Blum, Hans-Peter Buchkremer, L.G.J. de Haart, Jürgen Malzbender*, Michael Pap, Forschungszentrum Juelich, Germany

10:20 AM

(ICACC-S3-040-2012) Low temperature proton conduction in nanocrystalline ceria

Giuliano Gregori*, Mona Shirpour, Rotraut Merkle, Joachim Maier, Max Planck Institute for Solid State Research, Germany

10:40 AM

(ICACC-S3-041-2012) Mixed conducting praseodymium cerium gadolinium oxide

(PCGO) nano-composite cathode for ITSOFC applications

Rajalekshmi Chockalingam*, Ashok Kumar Ganguli, Suddhasatwa Basu, Indian Institute of Technology, India

11:00 AM

(ICACC-S3-042-2012) High Protonic Conductivity in LaBaGaO₄

Kevin Huang*, Xuan Zhao, Nansheng Xu, University of South Carolina, USA

11:20 AM

(ICACC-S3-043-2012) Portable 100W Power Generator based on Efficient Planar SOFC Technology

Andreas Poenicke*, Sebastian Reuber, Mareike Schneider, Michael Stelter, Alexander Michaelis, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

11:40 AM

(ICACC-S3-044-2012) Nano-crystalline 8-mol% Scandia Stabilized Zirconia: Synthesis, Characterization and Its Chemical Compatibility with SOFC Cathode Material

Soumyajit Koley*, Ashok K Sahu, Arijit Laik, Sadequa J Patwe, Nagabhusan S Achary, Bhabha Atomic Research Centre, India

12:00 PM

(ICACC-S3-045-2012) Development of improved tubular metal supported solid oxide fuel cells resistant to high fuel utilization

Laida Otaegui*, Lide Mercedes Rodriguez-Martinez, Amaia Arregi, Ander Laresgoiti, Igor Villarreal, Ikerlan, Spain