Monday, October 7, 2013

Theater

Plenary session

Co-Chair(s): Tatsuya Kawada and Subhash Singhal

9:50 **Opening Remarks**

10:10 OT-01 **Current Status of National SOFC Projects in Japan**
K. Horiuchi (New Energy and Industrial Technology Development Organization, Japan)

10:30 OT-02 **SECA Program Overview and Status**
S.D. Vora (U. S. DOE, National Energy Technology Laboratory, USA)

10:50 OT-03 **The Status of SOFC R&D in the FCH JU Program**
B. De Colvenaer, M. Atanasiu (Fuel Cells and Hydrogen Joint Undertaking, Belgium)

11:10-11:20 Break

Stacks and Systems I

Co-Chair(s): Tatsuya Kawada and Subhash Singhal

11:20 OT-04 **Overview on the Jülich SOFC Development Status**
L. Blum, P. Batfalsky, L.G.J. de Haart, J. Malzbender, N.H. Menzler, R. Peters, W.J. Quadakkers, J. Remmel, F. Tietz, D. Stolten (Forschungszentrum Jülich, Germany)

11:40 OT-05 **Introduction of Solid Oxide Fuel Cell Research in SICCAS**
S.R. Wang, Z.L. Zhan, T.L. Wen (Shanghai Institute of Ceramics, Chinese Academy of Sciences, China)

12:00-13:30 Lunch & Poster Session

Stacks and Systems II

Co-Chair(s): Karl Föger and Nguyen Minh

13:30 OT-06 **Status of the Solid Oxide Fuel Cell Development at Topsoe Fuel Cell A/S and DTU Energy Conversion**
N. Christiansen, S. Primdahl (Topsoe Fuel Cell A/S, Denmark), M. Wandel, S. Ramousse, A. Hagen (Danish Technical University, Denmark)

13:50 OT-07 **Recent Progress of SOFC Combined Cycle System with Segmented-in-Series Tubular Type Cell Stack at MHI**
Y. Kobayashi, Y. Ando, M. Nishiura, H. Kishizawa, M. Iwata, N. Matake, K. Tomida (Mitsubishi Heavy Industries, Ltd., Japan)

14:10 OT-08 **Development of Solid Oxide Fuel Cells at Versa Power Systems and FuelCell Energy**
B. Borglum (Versa Power Systems, Canada), H. Ghezel-Ayagh (FuelCell Energy, Inc., USA)

14:30 OT-09 **Solid Oxide Fuel Cell – Gas Turbine Hybrid Power Plant**
M. Henke, C. Willich, M. Steilen, J. Kallo, K.A. Friedrich (German Aerospace Center, Germany)

14:50-15:10 Coffee Break

15:10 OT-10 **Hexis' SOFC System Galileo 1000 N – Lab and Field Test Experiences**
A. Mai, B. Iwanschitz, J.A. Schuler, R. Denzler, V. Nerlich, A. Schuler (Hexis Ltd., Switzerland)

15:30 OT-11 **Development and Manufacturing of SOFC-Based Products at SOFCpower SpA**
O. Bucheli (HTceramix SA, Switzerland), M. Bertoldi, S. Modena, A.V. Ravagni (SOFCpower SpA. Italy)

15:50 OT-12 **CFY-Stacks for Use in Stationary SOFC and SOEC Applications**
S. Megel, C. Dosch, S. Rothe, M. Kusnezoff, N. Trofimenko, V. Sauchuk, A. Michaelis (Fraunhofer Institute for Ceramic Technologies and Systems, Germany), C. Bienert, M. Brandner, A. Venskutonis, W. Kraussler, L.S. Sigl (Plansee SE, Austria)

16:10 OT-13 **Comparative Experimental and Technical-Economic Evaluation of a 1 kW_{el} vs. 2.5 kW_{el} Tubular SOFC System for Residential Applications**
C. Boigues-Muñoz, S.J. McPhail (ENEA. Italy), G. Cinti, D. Penchini (Università degli Studi di Perugia, Italy), F. Polonara (Università Politecnica della Marche, Italy)

16:30-18:30 Poster Session (Co-Chairs: Kazuhisa Sato and André Weber)

Room A
Metal Supported Cells I
Co-Chair(s): Sergey Bredikhin and Xiao-Dong Zhou

11:20 OA-04 **Low-Cost, REDOX-Stable, Low-Temperature SOFC Developed by Ceres Power for Multiple Applications: Latest Development Update**
R. Leah, A. Bone, M. Lankin, A. Selcuk, R. Pierce, L. Rees, D. Corcoran, P. Muhl, Z. Dehaney-Steven, C. Brackenbury, M. Selby, S. Mukerjee (Ceres Power Ltd., UK)

11:40 OA-05 **The Status of Metal-Supported SOFC Development and Industrialization at Plansee**
T. Franco, M. Haydn (Plansee SE, Austria), A. Weber (Karlsruhe Institute of Technology, Germany), W. Schafbauer (Plansee SE, Austria), L. Blum, U. Packbier, D. Roehrens, N.H. Menzler (Forschungszentrum Jülich, Germany), J. Rechberger (AVL List GmbH, Austria), A. Venskutonis, L.S. Sigl (Plansee SE, Austria), H.-P. Buchkremer (Forschungszentrum Jülich, Germany)

12:00-13:30 Lunch & Poster Session

Room A
Metal Supported Cells II
Co-Chair(s): Sergey Bredikhin and Xiao-Dong Zhou

13:30 OA-06 **Metal Supported Solid Oxide Fuel Cells: From Materials Development to Single Cell Performance and Durability Tests**
J. Mougin, A. Brevet (CEA-LITEN, France), J.C. Grenier (CNRS, Université de Bordeaux, ICMCB, France), R. Laucournet (CEA-LITEN, France), P.O. Larsson (HÖGANÄS AB, Sweden), D. Montinaro (SOFCpower, Italy), L.M. Rodriguez-Martinez, M.A. Alvarez (IKERLAN, Spain), M. Stange (SINTEF, Norway), S. Trombert (BAIKOWSKI, France)

13:50 OA-07 **Progress in Metal-Supported SOFCs Using Hydrogen and Methane Fuels**
O. Kesler, M. Cuglietta, J. Harris, J. Kuhn, M. Marr, C. Metcalfe (University of Toronto, Canada)

14:10 OA-08 **R&D and Commercialization of Metal-Supported SOFC Personal Power Products at Point Source Power**
M.C. Tucker, B. Carreon, J. Charyasatit, K. Langston, C. Taylor, J. Manjarrez, N. Burton, M. LaBarbera, C.P. Jacobson (Point Source Power, Inc., USA)

14:30 OA-09 **Coating Developments for Metal-Supported Solid Oxide Fuel Cells**
M. Stange, C. Denonville, Y. Larring, C. Haavik (SINTEF, Norway), A. Brevet, A. Montani, O. Sicardy, J. Mougin (CEA-LITEN, France), P.O. Larsson (HÖGANÄS AB, Sweden)

14:50-15:10 Coffee Break

Metal Interconnects

Co-Chair(s): Manfred Martin and Katsuhiko Yamaji

15:10 OA-10 **Oxidation Behavior of Fe-Cr Ferritic Alloy for SOFC Interconnects ZMG232G10 in Air and H_2/H_2O**
K. Yamamura, T. Uehara, S. Tanaka, N. Yasuda (Hitachi Metals, Ltd., Japan)

15:30 OA-11 **Nano Coated Interconnects for SOFC (NaCoSOFC)**
J. Froitzheim (Chalmers University of Technology, Sweden), A. Magraso (University of Oslo, Norway), T. Holt (Topsoe Fuel Cells, Denmark), M.W. Lundberg (AB Sandvik Materials Technology, Sweden), H.F. Windisch (Chalmers University of Technology, Sweden), R. Berger (Sandvik Materials Technology, Sweden), R. Sachitanand (Chalmers University of Technology, Sweden), J. Westlinder (Sandvik Materials Technology, Sweden), J.E. Svensson (Chalmers University of Technology, Sweden), R. Haugsrud (University of Oslo, Norway)

15:50 OA-12 **Improvement of Oxidation Resistance of Crofer 22 APU with Modified Surface for Solid Oxide Fuel Cell Interconnects**
N. Demeneva, S. Bredikhin (ISSP RAS, Russia)

16:10 OA-13 **Long Term Performance of Stacks with Chromium-Based Interconnects (CFY)**
M. Brandner, C. Bienert (Plansee SE, Austria), S. Megel, M. Kusnezoff, N. Trofimenko, V. Sauchuk (Fraunhofer Institute of Ceramic Technologies and Systems, Germany), A. Venskutonis, W. Kraussler (Plansee SE, Austria), A. Michaelis (Fraunhofer Institute of Ceramic Technologies and Systems, Germany), L.S. Sigl (Plansee SE, Austria)

16:30-18:30 Poster Session (Co-Chairs: Kazuhisa Sato and André Weber)

Tuesday, October 8, 2013

Theater

Stacks and Systems III

Co-Chair(s): Massimo Santarelli and Robert Steinberger-Wilckens

9:00 OT-14 **Saint-Gobain's All Ceramic SOFC Stack: Architecture and Performance**
S. Giles, G. Lin, A. Mohanram, Y. Narendar, J. Pietras, F.C. Qi, W.R. Robbins, R.J. Sliwoski (Saint-Gobain NRDC, USA)

9:20 OT-15 **Development of a New Concept SOFC at Murata**
Y. Tomoshige, N. Mori, M. Iha, T. Takada, T. Konoike (Murata Manufacturing Co., Ltd, Japan)

9:40 OT-16 **Microtubular Solid Oxide Fuel Cells (mSOFCs)**
M. Kendall (Adelan Ltd., UK), A.D. Meadowcroft, K. Kendall (University of Birmingham, UK)

10:00 OT-17 **Development of Microtubular SOFCs for Portable Power Sources**
H. Sumi, T. Yamaguchi, K. Hamamoto, T. Suzuki, Y. Fujishiro (AIST, Japan)

10:20-10:40 Coffee Break

10:40 OT-18 **AVL SOFC Systems on the Way of Industrialization**
J. Rechberger, M. Reissig, M. Hauth (AVL List GmbH, Austria)

11:00 OT-19 **Alternative Fuels and Perspectives Solid Oxide Fuel Cells Usage in Air Transport**
L.S. Yanovskiy, A.V. Baykov, V.V. Raznoschikov, I.S. Averkov (Central Institute of Aviation Motors, Russia)

11:20 OT-20 **Eneramic® Power Generator – A Reliable and Cycleable 100W SOFC System**
S. Reuber, A. Pönicke, C. Wunderlich, A. Michaelis (Fraunhofer Institute for Ceramic Technologies and Systems, Germany)

11:40 OT-21 **SOFC System Using a Hot Gas Ejector for Offgas Recycling for High Efficient Power Generation from Propane**
R.-U. Dietrich, A. Lindermeir, C. Immisch (CUTEC Institut GmbH, Germany), C. Spieker, C. Spitta (Zentrum für BrennstoffzellenTechnik, Germany), S. Stenger, R. Leithner (TU Braunschweig, Germany), T. Küster, A. Oberland (TU Clausthal, Germany)

12:00-13:30 Lunch & Poster Session

New Applications I

Co-Chair(s): Alan Atkinson and Tohru Yamamoto

13:30 OT-22 **SOFCOM Project: Proof-of-Concept of WWTU Plant Feeding a SOFC CHP System Integrated with CO_2 Removal**
M. Santarelli (Politecnico di Torino, Italy), J. Kiviaho (Technologian Tutkimuskeskus VTT, Finland), L. Meucci (Società Metropolitana Acque Torino, Italy), L. Vega (MATGAS 2000 A.I.E., Spain), V. Chiodo (CNR-ITAE, Italy), J. Jevulski (Instytut Energetyki, Poland), H. Spliethoff (Technical University of Munich, Germany)

13:50 OT-23 **SOFC Operation: Direct Fuel Utilization, Pressurization and Reversibility**
N.Q. Minh (University of California, San Diego, USA)

14:10 OT-24 **Stack Temperature Estimation in System Environment by Utilizing the Design of Experiments Methodology**
M. Halinen, A. Pohjoranta, J. Pennanen, J. Kiviaho (VTT Technical Research Centre of Finland, Finland)

14:30 OT-25 **Pressurized Solid Oxide Fuel Cells: Measurements of Impedance Spectra and Anodic Concentration Polarization**
P.C. Wu, H.S. Jheng, S.S. Shy (National Central University, Taiwan)

14:50-15:10 Coffee Break

15:10 OT-26 **An Innovative SOFC Hybrid Based Prime Supply for Telecom Applications**
M. Ferraro, G. Brunaccini, G. Napoli, F. Sergi, G. Dispenza, N. Randazzo, V. Antonucci (National Research Council of Italy, Italy)

15:30 OT-27 **2-D Simulation of Heat and Mass Transfer Effects on Charge/Discharge Characteristics of a Solid Oxide Redox Flow Battery**
H. Ohmori (Konica Minolta, Inc., Japan), H. Iwai (Kyoto University, Japan)

15:50 OT-28 **Coupling and Modeling an SOFC System with a High-Performing Metal Hydride Storage**
A.M. Pour, R. Steinberger-Wilckens, A. Dhir (University of Birmingham, UK)

16:10 OT-29 **Power-to-Storage – The Use of an Anode-Supported Solid Oxide Fuel Cell as a High-Temperature Battery**
N.H. Menzler, A. Hospach, L. Niewolak, M. Bram, O. Tokariev, C. Berger, P. Orzessek, W.J. Quadakkers, Q. Fang, H.P. Buchkremer (Forschungszentrum Jülich, Germany)

16:30-18:30 Poster Session (Co-Chairs: Fumitada Iguchi and Bilge Yildiz)

Room A

Anode I

Co-Chair(s): Ellen Ivers-Tiffée and Yusuke Shiratori

9:00 OA-14 **Full Ceramic Fuel Cells Based on Strontium Titanate Anodes, an Approach Towards More Robust SOFCs**
P. Holtappels (Technical University of Denmark, Denmark), J.T.S. Irvine (University of St Andrews, UK), B. Iwanschitz (Hexis AG, Switzerland), L.T. Kuhn (Technical University of Denmark, Denmark), L.Y. Lu (University of St Andrews, UK), Q. Ma, J. Malzbender (Forschungszentrum Jülich, Germany), A. Mai (Hexis AG, Switzerland), T. Ramos (Technical University of Denmark, Denmark), J. Rass-Hansen (Topsoe Fuel Cell A/S, Denmark), B.R. Sudireddy (Technical University of Denmark, Denmark), F. Tietz, V. Vasechko (Forschungszentrum Jülich, Germany), S. Veltzé (Technical University of Denmark, Denmark), M.C. Verbraeken (University of St Andrews, UK)

9:20 OA-15 **Investigation of Microstructure of Sr-Doped Lanthanum Vanadium Oxide Anode Based on SDC Electrolyte**
K. Tamm, R. Raudsepp, R. Kanarbik, P. Möller, G. Nurk, E. Lust (University of Tartu, Estonia)

9:40 OA-16 **Performance of LST-GDC Composite Anodes for Solid Oxide Fuel Cells**
L.Q. Fan, Y.W. Wang, H. Huo, Y.P. Xiong (Harbin Institute of Technology, China)

10:00 OA-17 **Fabrication of Low Ni-Containing SOFC Anode Using Mixed Ionic and Electronic Conductors**
R. Kikuchi, T. Minami, A. Takagaki, T. Sugawara, S.T. Oyama (The University of Tokyo, Japan)

10:20-10:40 Coffee Break

10:40 OA-18 **Improving the Performance of SOFC Anodes by Decorating Perovskite with Ni Nanoparticles**
S. Boulfrad (King Abdullah University of Science and Technology, Saudi Arabia), M. Cassidy (University of St Andrews, UK), E. Traversa (King Abdullah University of Science and Technology, Saudi Arabia), J.T.S. Irvine (University of St Andrews, UK)

11:00 OA-19 **Effects of Metal Additives on Power Generating Property of Direct Hydrocarbon Type SOFC Using $LaGaO_3$ Electrolyte**
T. Ishihara, T.H. Shin, S. Ida (Kyushu University, Japan)

11:20 OA-20 **Capabilities and Challenges for Tungsten Carbide Anodes**
A. Torabi (University of Toronto, Canada), T.H. Etsell (University of Alberta, Canada)

11:40 OA-21 **Ni-$Zr_{0.75}Ce_{0.25}O_{2-\delta}$ Composite as Steam Methane Reformable SOFC Anode**
S. Biswas, A.D. Sharma (CSIR-Central Glass & Ceramic Research Institute, India), A. Buragohain, C.V. Stayanarayana (CSIR-National Chemical Laboratory, India), R.N. Basu (CSIR-Central Glass & Ceramic Research Institute, India)

12:00-13:30 Lunch & Poster Session

Anode II

Co-Chair(s): Min-Fang Han and John Irvine

13:30 OA-22 **Development of Redox Resistant Infiltrated Tubular SOFCs**
A.R. Hanifi, X. Chen, J. Seens (University of Alberta, Canada), P. Sarkar (Alberta Innovates-Technology Futures, Canada), T.H. Etsell (University of Alberta, Canada)

13:50 OA-23 **Carbon-Resistant Micro Tubular SOFCs Fabricated by Co-Spinning Process Based on a Phase-Inversion Method**
X. Meng (Shanghai Jiao Tong University, China), X. Gong, N. Yang, X. Tan (Shandong University of Technology, China), Y. Yin, Z.-F. Ma (Shanghai Jiao Tong University, China)

14:10 OA-24 ***In situ* Spectroscopic Studies of Carbon Formation in SOFCs Operating with *Syn-gas***
M.D. McIntyre, J.D. Kirtley, D.M. Halat, K.W. Reeping, R.A. Walker (Montana State University, USA)

14:30 OA-25 **Beneficial Effects of Low ppm Levels of H_2S on the Performance of Ni-YSZ SOFC Anodes in Syngas Fuels**
A. Singh, S. Paulson, J.M. Hill, V. Birss (University of Calgary, Canada)

14:50-15:10 Coffee Break

Alternative Fuels

Co-Chair(s): Min-Fang Han and John Irvine

15:10 OA-26 **Fuel-Flex SOFC Running on Internal Gradual Reforming**
S.D. Nobrega, F.C. Fonseca (Instituto de Pesquisas Energéticas, Brazil), P. Gelin (CNRS-Université de Lyon, France), F.B. Noronha (Instituto Nacional de Tecnologia, Brazil), S. Georges, M.C. Steil (CNRS-Université de Grenoble, France)

15:30 OA-27 **Biomass Gasifier–SOFC Systems: From Electrode Studies to the Development of Integrated Systems and New Applications**
P.V. Aravind, M. Liu, L. Fan, E. Promes, S.Y. Giraldo, T. Woudstra (Delft University of Technology, Netherlands)

15:50 OA-28 **Methanol as an Oxygenated SOFC Fuel: An *in situ* Optical Analysis of the Fuel Utilization Chemical Mechanism**
M.B. Pomfret (U.S. Naval Research Laboratory, USA), D.A. Steinhurst (Nova Research, Inc., USA), J.C. Owrutsky (U.S. Naval Research Laboratory, USA)

16:10 OA-29 **Performance Characteristics of Liquid Antimony Anode Direct Carbon Fuel Cell**
H. Wang, Y. Shi (Tsinghua University, China), W. Yuan (Shenhua Ningxia Coal Industry Group Co. Ltd., China), T. Cao, N. Cai, X. Liang (Tsinghua University, China)

16:30-18:30 Poster Session (Co-Chairs: Fumitada Iguchi and Bilge Yildiz)

Room B

Metallic Interconnect Coatings

Co-Chair(s): Haruo Kishimoto and Nigel Sammes

9:00 OB-14 **Effect of Thermal-Sprayed $Mn_{1.5}Co_{1.5}O_4$ Coating on Oxidation Suppression of Metallic Interconnects**
K.-Z. Fung, S.-Y. Tsai, H.-C. Ho (National Cheng Kung University, China)

9:20 OB-15 **Electrodeposition Method for SOFC Interconnector Coating**
S. Inoue, H. Nonaka, T. Saito, M. Yoda, Y. Takuwa (Osaka Gas Co, Ltd., Japan)

9:40 OB-16 **Novel Multilayered PVD-Coating in a Roll to Roll Mass Production Process**
M.W. Lundberg, R. Berger, J. Westlinder, N. Folkeson, H. Holmberg (AB Sandvik Materials Technology, Sweden)

Electrolyte/Thin Film I

Co-Chair(s): Haruo Kishimoto and Nigel Sammes

10:00 OB-17 **Evaluation of Stress Condition of Operated Anode Supported-Type SOFC under Operating Conditions Based on Raman Scattering Spectroscopy**
S. Onuki, S. Onodera, F. Iguchi, M Shimizu, T. Kawada, H. Yugami (Tohoku University, Japan)

10:20-10:40 Coffee Break

Electrolyte/Thin Film II

Co-Chair(s): Haruo Kishimoto and Nigel Sammes

10:40 OB-18 **Sol-Gel Thin-Film Electrolyte Anode-Supported SOFC – From Layer Development to Stack Testing**
N.H. Menzler, F. Han, D. Sebold, Q. Fang, L. Blum, H.P. Buchkremer (Forschungszentrum Jülich, Germany)

11:00 OB-19 **Ultimate Performance of Anode-Supported SOFC by Realizing Thin-film Electrolyte and Nano-Structure Electrode**
H.-S. Noh, K.J. Yoon, B.-K. Kim, H.-J. Je, H.-W. Lee, J.-H. Lee, J.-W. Son (KIST, Korea)

11:20 OB-20 **YSZ Films Prepared by Reactive Magnetron Sputtering: Effect of the Thickness on the Electrical Properties**
P. Briois (IRTES-LERMPS, UTBM, France), L. Yu (LEPMI, INPG-ENSEEG, France), M.A.P. Yazdi (IRTES-LERMPS, UTBM, France), S. Georges (LEPMI, INPG-ENSEEG, France), A. Billard (IRTES-LERMPS, UTBM, France)

11:40 OB-21 **Atomic Layer Deposition, a Key Technique for Processing Thin-Layered SOFC Materials - Case of Epitaxial Thin Layers of CeO_2 Catalyst**
A. Marizy, T. Désaunay, D. Chery (CNRS, ENSCP Chimie-Paristech, PSL, France), P. Roussel (CNRS, Ecole Nationale Supérieure de Chimie de Lille, France), A. Ringuedé, M. Cassir (CNRS, ENSCP Chimie-Paristech, PSL, France)

12:00-13:30 Lunch & Poster Session

Electrolyte/Thin Film III

Co-Chair(s): Enrico Traversa and Shaorong Wang

13:30 OB-22 **Performance of Ultra-Thin Film Solid Oxide Fuel Cells in Methane and Natural Gas Fuels: The Role of Electrode Microstructure**
Y. Takagi, K. Kerman, S. Ramanathan (Harvard University, USA)

13:50 OB-23 **Electrical Characterization of YSZ Thin Films Using a Calibrated Platinum Micro-Electrode**
S. Georges, N. Bailly, E. Djurado (LEPMI, CNRS-Grenoble INP-Université de Savoie-Université Joseph Fourier, France)

Proton Conducting Fuel Cells

Co-Chair(s): Enrico Traversa and Shaorong Wang

14:10 OB-24 **Advanced Electrodes for Intermediate Temperature Proton Conducting Fuel Cell**
G. Taillades, P. Pers, P. Batocchi, M. Taillades (Université Montpellier 2, France)

14:30 OB-25 **Micro-Protonic Ceramic Fuel Cells with $Y:BaZrO_3$ Electrolyte Prepared by Pulsed Laser Deposition (PLD)**
K. Bae, D.Y. Jang, H. Jung, J.W. Kim (Korea University, Korea), J.-W. Son (KIST, Korea), J.H. Shim (Korea University, Korea)

14:50-15:10 Coffee Break

Sealing

Co-Chair(s): Enrico Traversa and Shaorong Wang

15:10	OB-26	**Effect of Ceramic Filler Particles on the Sealing Capability of a SrO-Based Glass Seal** H.-J. Je, K.J. Yoon, J.-W. Son, J.-H. Lee, B.-K. Kim, H.-W. Lee (KIST, Korea)
15:30	OB-27	**SOFC Sealing with Thermiculite 866 and Thermiculite 866 LS** J.R. Hoyes (Flexitallic Ltd., UK), M. Rautanen (VTT, Finland)
15:50	OB-28	**Long Term Behavior of Viscous High-Temperature Sealing Glasses** J. Suffner, C. Dobler (Schott AG, Germany)
16:10	OB-29	**Glass Ceramic Seal for Electrochemical Devices** S.T. Reis (Saint-Gobain Innovative Materials, USA), M. Schwartz (Saint-Gobain Recherche, France)

16:30-18:30 Poster Session (Co-Chairs: Fumitada Iguchi and Bilge Yildiz)

Wednesday, October 9, 2013

Theater

New Applications II

Co-Chair(s): Norbert Menzler and Gyeong Man Choi

9:00 OT-30 **300 W SOFC-Generator with Endothermic Reforming of Propane and Other Innovative Concepts**
C. Szepanski, A. Lindermeir, R.-U. Dietrich (CUTEC Institut GmbH, Germany), S. Stenger, R. Leithner (TU Braunschweig, Germany), R. Deichmann, L. Dörrer, G. Borchardt (TU Clausthal, Germany)

9:20 OT-31 **Direct Flame Fuel Cell Performance Using a Multi-Element Diffusion Flame Burner**
Y.Q. Wang, Y.X. Shi, X.K. Yu, N.S. Cai, S.Q. Li (Tsinghua University, China)

Cell Design and Performance I

Co-Chair(s): Norbert Menzler and Gyeong Man Choi

9:40 OT-32 **Development of Medium-Temperature Solid Oxide Fuel Cell Materials and Single Cells in Estonia**
E. Lust, G. Nurk, P. Möller, I. Kivi, R. Kanarbik, K. Tamm, A. Heinsaar (University of Tartu, Estonia)

10:00 OT-33 **Performance of Tubular Direct Carbon Fuel Cell Based On a Anode Support Solid Oxide Fuel Cell**
T.-H. Lim, J.-W. Lee, S.-B. Lee, S.-J. Park, R.-H. Song (KIER, Korea)

10:20-10:40 Coffee Break

10:40 OT-34 **"Evolved Materials and Innovative Design for High Performance, Durable and Reliable SOFC Cell and Stack" Presentation and Status of the European Project EVOLVE**
R. Costa, A. Ansar (German Aerospace Center, Germany)

11:00 OT-35 **Fabrication of Laminate-type SOFC; Printed Fuel Cell**
S. Suda (Shizuoka University, Japan), J.P. Wiff, S. Shimada (FCO Power Inc., Japan)

11:20 OT-36 **Fabrication and Performance of Ceramic Anode-Supported Solid Oxide Fuel Cells**
Z. Yang, Z. Pang, T. Zhu, Z. Zheng, M. Han (China University of Mining and Technology, China)

11:40 OT-37 **Cathode Supports of SOFCs with a Hierarchical Pore Structure**
D.H. Dong, X. Shao, Z.T. Wang, G.M. Parkinson, C.-Z. Li (Curtin University of Technology, Australia)

12:00-18:30 Excursion (optional)

18:30-21:00 Banquet

Room A

Processing

Co-Chair(s): Jean-Marc Bassat and San Ping Jiang

9:00 OA-30 **Microstructural Engineering of SOFC and SOEC Electrode Interfaces**
J.T.S. Irvine (University of St Andrews, UK)

9:20 OA-31 **SOFC Anode Fabricated by Magnetically Aligning of Ni Particles**
K. Nagato, N. Shikazono (The University of Tokyo, Japan), A. Weber, D. Klotz (Karlsruher Institut für Technologie, Germany), M. Nakao (The University of Tokyo, Japan),
E. Ivers-Tiffée (Karlsruher Institut für Technologie, Germany)

9:40 OA-32 **Core-Shell Structured $Sr_{0.88}Y_{0.08}TiO_3$-$Ce_{0.8}Sm_{0.2}O_{1.9}$ Composite as an Anode for Solid Oxide Fuel Cells Operating with CH_4**
W. Yang, Z. Ma, C. Sun, L. Chen (Key Laboratory for Renewable Energy, Chinese Academy of Sciences, China)

10:00 OA-33 **Novel In-situ Sintering Spinel Composite Cathodes for Metal Supported SOFCs**
E. Dietzen, N. Trofimenko, M. Kusnezoff, V. Sauchuk, C. Belda, A. Michaelis (Fraunhofer Institute of Ceramic Technologies and Systems, Germany)

10:20-10:40 Coffee Break

Cathode I
Co-Chair(s): Jean-Marc Bassat and San Ping Jiang

10:40 OA-34 **Oxygen Electrode Kinetics and Surface Composition of Dense $(La_{0.75}Sr_{0.25})_{0.95}MnO_3$ on YSZ**
Y. Wu, K.V. Hansen, K. Norrman, T. Jacobsen, M.B. Mogensen (Technical University of Denmark, Denmark)

11:00 OA-35 **Impact of Chemical Composition of Strontium-Doped Lanthanum Manganite Cathode on Microstructural Change and Performance During Long-Term Operation of SOFCs**
T. Matsui, Y. Mikami, H. Muroyama, K. Eguchi (Kyoto University, Japan)

11:20 OA-36 **Equivalent Circuit Model Analysis of LSM/ScSZ Composite Cathodes Prepared by Impregnating LSM/ScSZ Powder Slurry into a Prefabricated Porous ScSZ Layer**
H. Shimada (Tokyo Institute of Technology, Japan), A. Hagiwara (Tokyo Electric Power Company Inc., Japan), M. Ihara (Tokyo Institute of Technology, Japan)

11:40 OA-37 **The Application of Ion Beam Analysis to Mass Transport Studies in Mixed Electronic Ionic Conducting Electrodes**
J.A. Kilner, H.T. Lozano, M. Burriel, S. Cook (Imperial College London, UK), J. Druce (Kyushu University, Japan)

12:00-18:30 Excursion (optional)
18:30-21:00 Banquet

Room B

Modeling and Simulation I
Co-Chair(s): Olaf Deutschmann and Tomofumi Tada

9:00 OB-30 **Ab Initio Calculation of the Defect Structure of Ceria**
M. Martin, T. Zacherle, A. Schriever, R.A. De Souza, S. Grieshammer (RWTH Aachen University, Germany)

9:20 OB-31 **Computational Studies on Ionic and Electronic Conduction of Rare-Earth-Based Oxides Based on Density Functional Theory**
M. Sakaue, H. Kasai (Osaka University, Japan), T. Ishihara (Kyushu University, Japan)

9:40 OB-32 **Determining Surface Chemistry and Vibrational Properties of SOFC Anode Materials Through Ab Initio Calculations**
M. Parkes (Imperial College London, UK), K. Refson (Rutherford Appleton Laboratory, UK), M. d'Avezac (University College London, UK), G. Offer, N. Brandon (Imperial College London, UK), N. Harrison (Rutherford Appleton Laboratory, UK)

10:00 OB-33 **First-Principles Calculations of the Anodic Oxidation Reactions of Solid Oxide Fuel Cell: Oxygen Potential Effect on Nickel (111) Surface**
S. Liu, T. Ishimoto, H. Kohno, M. Koyama (Kyushu University, Japan)

10:20-10:40 Coffee Break

10:40 OB-34 **Parallelized Meso-Scale Kinetic Monte Carlo Simulations for SOFC Characterization**
T. Tada (Tokyo Institute of Technology, Japan), N. Watanabe (Mizuho Information and Research Institute, Inc., Japan)

11:00	OB-35	**Coverage Dependent Thermodynamics for Sulfur Poisoning of Ni Based Anodes** D.S. Monder (IIT Hyderabad, India), K. Karan (University of Calgary, Canada)
11:20	OB-36	**Theoretical Study on the Effect of Three-Dimensional Porous Structure on the Sintering of Nickel Nanoparticles in the Ni/YSZ Anode** J. Xu, Y. Higuchi, N. Ozawa, K. Sato, T. Hashida, M. Kubo (Tohoku University, Japan)
11:40	OB-37	**Cellular Automata Modelling of Microstructure Evolution of Ni Cermet Anode** X. Wang, A. Atkinson (Imperial College London, UK)

12:00-18:30	Excursion (optional)
18:30-21:00	Banquet

Thursday, October 10, 2013

Theater

Durability and Reliability I

Co-Chair(s): Mark Williams and Harumi Yokokawa

9:00 OT-38 **A Global Framework for Examination of Degradation in SOFC**
K. Gerdes (U.S. DOE, NETL, USA), M.C. Williams (URS Corp., USA), R. Gemmen, B. White (U.S. DOE, NETL, USA)

9:20 OT-39 **Report of Five-Year NEDO Project on Durability/Reliability of SOFC Stacks**
H. Yokokawa (AIST / The University of Tokyo, Japan)

9:40 OT-40 **Durability Verification of Residential SOFC CHP System**
M. Suzuki, Y. Takuwa, S. Inoue, K. Higaki (Osaka Gas Co., Ltd., Japan)

10:00 OT-41 **Chemical Degradation of SOFCs: External Impurity Poisoning and Internal Diffusion-Related Phenomena**
K. Sasaki, T. Yoshizumi, K. Haga, H. Yoshitomi, T. Hosoi, Y. Shiratori, S. Taniguchi (Kyushu University, Japan)

10:20-10:40 Coffee Break

10:40 OT-42 **Multimodal Assessment of Durability and Reliability of Flattened Tubular SIS Stacks**
Y. Matsuzaki, K. Nakamura, T. Somekawa, K. Fujita (Tokyo Gas Co., Ltd., Japan), T. Horita, K. Yamaji, H. Kishimoto (AIST, Japan), M. Yoshikawa, T. Yamamoto, Y. Mugikura (Central Research Institute of Electric Power Industry, Japan), H. Yokokawa, N. Shikazono (The University of Tokyo, Japan), K. Eguchi, T. Matsui (Kyoto University, Japan), S. Watanabe, K. Sato, T. Hashida, T. Kawada (Tohoku University, Japan), K. Sasaki, S. Taniguchi (Kyushu University, Japan)

11:00 OT-43 **Durability Testing of a Short SOFC Stack under Direct Internal Steam Reforming of Methane**
Q. Fu (European Institute for Energy Research, Germany), P. Freundt (ElringKlinger AG, Germany), J. Bomhard (European Institute for Energy Research, Germany), F. Hauler (ElringKlinger AG, Germany)

11:20 OT-44 **Local Activation and Degradation of Electrochemical Processes in a SOFC**
Z. Wuillemin, Y. Antonetti, C. Beetschen, O. Millioud (HTceramix SA, Switzerland), S. Ceschini (SOFCpower SpA, Italy), H. Madi, J. Van herle (Ecole Polytechnique Fédérale de Lausanne, Switzerland)

11:40 OT-45 **Intelligent Analysis for Evaluating Physical Degradation using Acoustic Emission**
K. Fukui (Osaka University, Japan), K. Sato, T. Hashida, J. Mizusaki (Tohoku University, Japan), M. Numao (Osaka University, Japan)

12:00-13:30 Lunch & Poster Session

Durability and Reliability II

Co-Chair(s): Viola Birss and Jong-Ho Lee

13:30 OT-46 **Application of FIB-TOF-SIMS and FIB-SEM-EDX Methods for the Analysis of Element Mobility in Solid Oxide Fuel Cells**
R. Kanarbik, P. Möller, I. Kivi, E. Lust (University of Tartu, Estonia)

13:50 OT-47 **Microstructural Change of Ni–YSZ Anode under Thermal Cycles with Redox Treatments**
M. Kubota, H. Muroyama, T. Matsui, K. Eguchi (Kyoto University, Japan)

14:10 OT-48 **Surface Segregation and Chromium Deposition and Poisoning on $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ Cathodes of Solid Oxide Fuel Cells**
L. Zhao (Curtin University, Australia), J. Drennan (The University of Queensland, Australia), C. Kong (The University of New South Wales, Australia), S. Amarasinghe (Ceramic Fuel Cells Ltd., Australia), S.P. Jiang (Curtin University, Australia)

14:30 OT-49 **Chromium Poisoning of $La_2NiO_{4+\delta}$ Cathodes**
S.-N. Lee, A. Atkinson, J. Kilner (Imperial College London, UK)

14:50-15:10 Coffee Break

15:10 OT-50 **Sulfur Poisoning of Ni/Stabilized-Zirconia Anodes – Effect on Long-Term Durability**
A. Hauch, A. Hagen, J. Hjelm, T. Ramos (Technical University of Denmark, Denmark)

15:30 OT-51 **Cubic-Tetragonal Phase Transformation of YSZ Electrolyte in SOFCs**
T. Shimonosono, H. Kishimoto, M. Nishi, M.E. Brito, K. Yamaji, H. Yokokawa, T. Horita (AIST, Japan)

15:50 OT-52 **The Effect of Ferroelasticity of $La_{1-x}Sr_xCo_{1-y}Fe_yO_{3-\delta}$ on the Mechanical Stability of Solid Oxide Fuel Cells**
Y. Kimura (Tohoku University, Japan), J. Tolchard, M.-A. Einarsrud, T. Grande (Norwegian University of Science and Technology, Norway), K. Amezawa, S. Hashimoto, T. Kawada (Tohoku University, Japan)

16:10 OT-53 **Chemical Expansion in SOFC Materials: Ramifications, Origins, and Mitigation**
S.R. Bishop (Kyushu University, Japan), D. Marrocchelli (Massachusetts Institute of Technology, USA), N. Perry (Kyushu University, Japan), H.L. Tuller (Massachusetts Institute of Technology, USA), G. Watson (Trinity College Dublin, Ireland), B. Yildiz (Massachusetts Institute of Technology, USA), K. Amezawa (Tohoku University, Japan), J. Kilner (Imperial College London, UK)

16:30-18:30 Poster Session (Co-Chairs: Shin-ichi Hashimoto and Yueping Xiong)

Room A

Cathode II

Co-Chair(s): John Kilner and Keiji Yashiro

9:00 OA-38 **Defect Structure of $BaCo_{0.7}Fe_{0.22}Nb_{0.08}O_{3-\delta}$**
T. Lee, H.-I. Yoo (Seoul National University, Korea)

9:20 OA-39 **Influence of Donor Doping on Cathode Performance: $(La,Sr)(Ti,Fe)O_{3-\delta}$ Case Study**
N.H. Perry (Kyushu University, Japan), D. Pergolesi (Paul Scherrer Institut, Switzerland), K. Sasaki, S.R. Bishop, H.L. Tuller (Kyushu University, Japan)

9:40 OA-40 **Electrochemical Properties of $Sm_{0.5}Sr_{0.5}Co_{1-x}Nb_xO_{3-\delta}$ (x = 0, 0.1) as Cathode Materials in Intermediate Temperature-Solid Oxide Fuel Cells**
S. Yoo, A. Jun (Ulsan National Institute of Science and Technology, Korea), J. Shin (Dong-Eui University, Korea), G. Kim (Ulsan National Institute of Science and Technology, Korea)

10:00 OA-41 **$Tb_xCe_{0.95-x}Gd_{0.05}O_{2-\delta}$ ($0.15 \leq x \leq 0.40$) Cathode Materials Prepared through Solid State Route for Low Temperature SOFC**
R. Chockalingam, S. Basu (IIT Delhi, India)

10:20-10:40 Coffee Break

10:40 OA-42 **Surface Chemistry and Non-Stoichiometry of $Nd_2NiO_{4+\delta}$ Epitaxial Thin Films with Different Orientation and Strain**
N. Tsvetkov, Q. Lu, Y. Chen, B. Yildiz (Massachusetts Institute of Technology, USA)

11:00 OA-43 **Highlights on the Anisotropic Oxygen Transport Properties of Nickelates with K_2NiF_4-Type Structure: Links with the Electrochemical Properties of the Corresponding IT-SOFC's Cathodes**
J.M. Bassat (CNRS, Université de Bordeaux, ICMCB, France), M. Burriel (Imperial College London, UK), M. Ceretti (Institut Charles Gerhardt, France), P. Veber, J.C. Grenier (CNRS, Université de Bordeaux, ICMCB, France), W. Paulus (Institut Charles Gerhardt, France), J.A. Kilner (Imperial College London, UK)

11:20 OA-44 **Compatibility of Praseodymium Nickelates with Various Cathode Current Collectors and Electrolytes**
E. Dogdibegovic (University of South Carolina, USA), J. Templeton (Pacific Northwest National Laboratory, USA), J. Yan (University of South Carolina, USA), J.W. Stevenson (Pacific Northwest National Laboratory, USA), X.-D. Zhou (University of South Carolina, USA)

11:40 OA-45 **Lanthanide Nickelates $Ln_2NiO_{4+\delta}$ (Ln = La, Pr or Nd): Promising Cathode Materials for Metal Supported Cells**
J.C. Grenier, A. Flura, S. Dru, C. Nicollet, V. Vibhu, S. Fourcade, A. Rougier, J.M. Bassat (CNRS-Univ. Bordeaux, ICMCB, France), A. Brevet, J. Mougin (CEA-Grenoble, France)

12:00-13:30 Lunch & Poster Session

Cathode III
Co-Chair(s): Jean-Claude Grenier and Naoki Shikazono

13:30 OA-46 **Electronic Activation at Oxide Hetero-Structure at Elevated Temperatures – Source of Markedly Accelerated Oxygen Reduction Kinetics**
Y. Chen, Z. Cai, Y. Kuru, H.L. Tuller, B. Yildiz (Massachusetts Institute of Technology, USA)

13:50 OA-47 **$(La,Ba)CoO_3$ and $Pr_{1.9}(Ni,Cu,Ga)O_4$ Composite Oxide as Active Cathode for Intermediate Temperature Solid Oxide Fuel Cells Using Doped $LaGaO_3$ Electrolyte Films**
J.-E. Hong, J. Xie, S. Ida, T. Ishihara (Kyushu University, Japan)

14:10 OA-48 **Effect of Cation Nonstoichiometry on Surface Reactivity of $LaCoO_3$-Based Cathode**
A. Takeshita, S. Miyoshi, S. Yamaguchi (The University of Tokyo, Japan), T. Kudo, Y. Sato (JX Nippon Oil & Energy Corporation, Japan)

14:30 OA-49 **The Effect of Cation Substitution on Chemical Stability of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$-Based Mixed Conductors**
F. Wang, T. Nakamura, K. Yashiro, J. Mizusaki, K. Amezawa (Tohoku University, Japan)

14:50-15:10 Coffee Break

Modeling and Simulation II
Co-Chair(s): Jean-Claude Grenier and Naoki Shikazono

15:10 OA-50 **Internal Multi-Physics Phenomena of SOFC with Direct Internal Reforming**
V. Menon (Karlsruhe Institute of Technology, Germany), V.M. Janardhanan (IIT Hyderabad, India), S. Tischer, O. Deutschmann (Karlsruhe Institute of Technology, Germany)

15:30 OA-51 **Three-Dimensional Design Optimization of an Anode-Supported SOFC Using FEM**
M. Andersson, J. Yuan, B. Sundén (Lund University, Sweden)

15:50 OA-52 **Impact of Manifolding on Performance of a Solid Oxide Fuel Cell Stack**
R.T. Nishida (Queen's-RMC Fuel Cell Research Centre, Canada), S.B. Beale (National Research Council, Canada), J.G. Pharoah (Queen's-RMC Fuel Cell Research Centre, Canada)

16:10 OA-53 **Three-Dimensional Numerical Simulations of Heat and Mass Transfer and Degradation in a SOFC Cell Stack**
T. Mori, K. Nishimura, M. Suzuki (Osaka Gas Co., Ltd., Japan)

16:30-18:30 Poster Session (Co-Chairs: Shin-ichi Hashimoto and Yueping Xiong)

Friday, October 11, 2013

Theater

Electrolysis

Co-Chair(s): Mogens Mogensen and Rak-Hyun Song

9:00 OT-54 **Biogas Upgrading: By Steam Electrolysis or Co-Electrolysis of Biogas and Steam?**
J.B. Hansen (Haldor Topsøe A/S, Denmark), F. Fock, H.H. Lindboe (Ea Energianalyse A/S, Denmark)

9:20 OT-55 **Performance and Stability of High Temperature Solid Oxide Electrolysis Cells (SOECs) for Hydrogen Production**
K.J. Yoon, J.-W. Son, J.-H. Lee, B.-K. Kim, H.-J. Je, H.-W. Lee (KIST, Korea)

9:40 OT-56 **Performances of Doped Ceria Hydrogen Electrodes with Highly Dispersed Ni-Based Nanoparticles for Solid Oxide Electrolysis Cells**
H. Uchida, P. Puengjinda, K. Miyano, H. Nishino, K. Kakinuma, S. Deki, M. Watanabe (University of Yamanashi, Japan)

10:00 OT-57 ***In-Operando* Raman Spectroscopy Study of Passivation Effects on Ni-CGO Electrodes in CO_2 Electrolysis Conditions**
V. Duboviks, R.C. Maher, G. Offer, L.F. Cohen, N.P. Brandon (Imperial College London, UK)

10:20-10:40 Coffee Break

10:40 OT-58 **Carbon Deposits and Pt/YSZ Overpotentials in CO/CO_2 Solid Oxide Electrochemical Cells**
Y. Yu, A. Geller (University of Maryland, USA), B. Mao, R. Chang, Z. Liu (Lawrence Berkeley National Laboratory, USA), B.W. Eichhorn (University of Maryland, USA)

11:00 OT-59 **Reversing and Repairing Microstructure Degradation in Solid Oxide Cells During Operation**
C. Graves (Technical University of Denmark, Denmark)

11:20 OT-60 **Stability of Interface between YSZ Electrolyte and GDC Interlayer in Solid Oxide Electrolysis Cell**
S.J. Kim, G.M. Choi (POSTECH, Korea)

11:40 OT-61 **Innovative Dual Membrane Architecture for Reversible Fuel Cells**
M. Viviani (CNR-IENI, Italy), A.S. Thorel (Mines-Paris Tech, France), A. Barbucci (University of Genoa, Italy), D. Vladikova (IEES-BAS, Bulgaria), A. Chesnaud (Mines-Paris Tech, France), I. Genov, G. Raikova (IEES-BAS, Bulgaria), E. Mercadelli, A. Sanson (CNR-ISTEC, Italy), M.P. Carpanese (University of Genoa, Italy), Z. Stoynov (IEES-BAS, Bulgaria), S. Presto (CNR-IENI, Italy), P. Piccardo (University of Genoa, Italy)

12:00-12:20 Closing (Tatsuya Kawada and Subhash Singhal)

Room A

Modeling and Simulation III

Co-Chair(s): Toshiaki Matsui and Steven Shy

9:00 OA-54 **Characteristic Length of Oxide-Ion Conduction for Prediction of Active Thickness in SOFC Anode**
M. Kishimoto, H. Iwai, M. Saito, H. Yoshida (Kyoto University, Japan)

9:20 OA-55 **Microstructural Modeling and Effective Properties of Infiltrated SOFC Electrodes**
A. Bertei (University of Pisa, Italy), J.G. Pharoah, D.A.W. Gaweł (Queen's-RMC Fuel Cell Research Centre, Canada), C. Nicolella (University of Pisa, Italy)

9:40 OA-56 **Recent Developments of 3D Coupled Multiphysics SOFC Modelling at Forschungszentrum Jülich**
M. Peksen, A. Al-Masri, R. Peters, L. Blum, D. Stolten (Forschungszentrum Jülich, Germany)

10:00 OA-57 **Three-Dimensional Performance Model for Oxygen Transport Membranes**
A. Häffelin, C. Niedrig, S. Wagner, A. Weber, E. Ivers-Tiffée (Karlsruhe Institute of Technology, Germany)

10:20-10:40 Coffee Break

10:40 OA-58 **Advanced 3D Imaging and Analysis of SOFC Electrodes**
F. Tariq, M. Kishimoto, S.J. Cooper (Imperial College London, UK), P. Shearing (University College London, UK), N. Brandon (Imperial College London, UK)

11:00 OA-59 **Electrode Reoxidation in Solid-Oxide Cells: Detailed Modeling of Nickel Oxide Film Growth**
J.P. Neidhardt (German Aerospace Center, Germany), R.J. Kee (Colorado School of Mines, USA), W.G. Bessler (Offenburg University of Applied Sciences, Germany)

11:20 OA-60 **Enhancing SOFC-Stack Performance by Model-Based Adaptation of Cathode Gas Transport Conditions**
H. Geisler, M. Kornely, A. Weber, E. Ivers-Tiffée (Karlsruhe Institute of Technology, Germany)

11:40 OA-61 **Developing 3-D Model of Intermediate-Temperature SOFC with GDC Electrolyte**
L. Wang (University of Maryland, USA), G.S. Jackson (Colorado School of Mines, USA), B.M. Blackburn (Redox Power Systems LLC, USA)