22nd conference in series of the European Fuel Cell Forum in Lucerne

13th EUROPEAN SOFC & SOE FORUM 2018

3–6 July 2018

KKL Lucerne/Switzerland

Conference Chairs:
Prof. Ellen Ivers-Tiffée
Dr. André Weber KIT Germany

PROGRAMME

International SOLID OXIDE TECHNOLOGIES Conference
Fuel Cell, Electrolyser, Membrane Reactors
with Exhibition, Industry Workshops and Tutorials

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Schedule of Events

www.EFCF.com/Events

Motto 2018: Progress in Solid Oxide Technologies – From Fundamentals to Systems.

Tuesday, 3 July 2018

09:30 – 10:00	Registration for **Tutorials** – 2nd floor Club Rooms above Auditorium
10:00 – 17:00	**Fuel Cells & Hydrogen** Tutorial Dr. G. G. Scherer & Dr. J. Van herle
10:00 – 17:00	**Electrochemical Impedance Spectroscopy** Tutorial Dr. André Weber & Dr. Dino Klotz
11:00 – 16:00	**Exhibition set-up**
16:00 – 18:00	**Poster pin-up / Opening** of the exhibition On-site **Registration** open (continued on the following days)
18:00 – 19:00	**Welcome gathering** in the exhibition in the splendid KKL (ground floor)

Wednesday, 4 July 2018

08:00 – 16:00	On-site **Registration**
08:00 – 09:00	**Speakers Breakfast** (info at the registration desk)
09:00 – 18:00	**Exhibition** & Poster area open; **Poster Session I** 13:15 – 15:00
12:30	Press Conference by invitation only
09:00 – 18:00	**Conference Sessions 1 – 6** incl. **plenary & keynote** presentations on Projects & Activities in various countries, Changes in Power Generation & Distribution, Status of Industry & Major Groups, Technical Highlights; networkings & exhibition
18:30 – 23:00	**Swiss Surprise Night** - separate registration, 80 places available

Thursday, 5 July 2018

08:00 – 16:00	On-site **Registration**
08:00 – 09:00	**Speakers Breakfast** (info at the registration desk)
09:00 – 18:00	**Exhibition** & Poster area open; **Poster Session II** 13:15 – 15:00
09:00 – 18:00	**Conference Sessions 7–12, keynote** on „Future of European stationary Fuel Cell Industry", networking & exhibition
19:30 – 23:25	Great **Dinner on the Lake**

Friday, 6 July 2018

08:00 – 10:00	On-site **Registration**, **Speakers Breakfast**
09:00 – 12:00	**Exhibition & Poster** area open
12:00 – 14:00	Poster removal
09:00 – 16:15	**Conference Sessions 13 – 16** including **keynote** of gold medal of honour winner 2018: Harumi Yokokawa; poster presentation, networking & exhibition
15:00 – 16:15	**Closing & Award Ceremony:** Best poster, best scientific contribution & outstanding lifetime work; **Keynote**: „Thermodynamic stability of perovskite oxygen electrode in interactions with YSZ, GDC or gaseous impurities in air" Harumi Yokokawa, Institute of Industrial Science, The University of Tokyo
16:15 – 17:00	**Goodbye** coffee and travel refreshment in front of the Luzerner Saal

Welcome by the Organisers

Welcome to the 13th European SOFC & SOE Forum 2018! The KKL, the beautiful and impressive Culture and Congress Center of Lucerne, Switzerland, provides the frame for this 22nd event in series of successful conferences in Fuel Cell and Hydrogen Technologies. Competent staff, smooth technical services and excellent food allow the participants to focus on science, technology and networking in a creative and productive work atmosphere.

Once more we face the challenge to adapt the programme to the evolving needs of the scientific and technical community around high temperature electroceramic technologies. Solid Oxide Fuel Cells, mainly micro-CHP, find their way to the market. The interest in Power-to-Gas applications is confirmed, boosting the interest on Solid Oxide Electrolysers. Intermittent Renewable Energy Sources require new answers for their integration with flexible solutions. Solid Oxide Membrane Reactors offer unseen possibilities as gas conversion devices, capable of several polygeneration modes. They offer a relevant alternative to an all electric Copper-Plate Europe scenario and its associated costs.

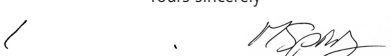
Solid Oxide technology is yet far away from full recognition of its potential and role it can play! Major efforts are still required, from materials and engineering over manufacturing and innovative business models. The European Fuel Cell Forum aspires to provide an exchange platform that those efforts can be carried forward in a targeted manner – and allow for joint progress of the whole industry!

While the technology and its environment change rapidly, we want to keep one thing constant: The focus on facts and physics. The EFCF is independent from public or private financial sponsors and can therefore grant for autonomy. The participants and exhibitors are the base of the event. Your participation made this event possible, please consider those days as your personal reward!

A very special thank you for this year's conference goes to Prof. Dr. Ellen Yvers-Tiffee and Dr. Andre Weber from the Karlsruhe Institute of Technology, Germany. Both present a very strong scientific experience while working closely together with industrial partners on fundamental aspects of understanding. We also would like to thank the Scientific Advisory Committee and the Scientific Organising Committee for their excellent support (www.EFCF.com/SAC, .../SOC). Based on more than 300 uploaded contributions, they have composed a sound scientific programme picturing the recent progress in high temperature electroceramics from more than 30 countries and 6 continents – we all look forward to seeing this exciting programme of the 13th European SOFC & SOE Forum. As tradition, a Special Issue of "Fuel Cells – From Fundamental to Systems" will be edited from invited papers. Finally, we will have the priviledge to hear a keynote from Prof. Harumi Yokokawa from the University of Tokyo, Japan, the winner of the 2018 Christian Friedrich Schönbein Gold Medal of Honour for his outstanding contribution to the advancement of SOFC technology.

Our sincere thanks also go to all the presenters, the session chairs, the exhibitors, the International Board of Advisors, the media, the KKL staff and our co-workers. We thank all of you for your attendance and support. May we all have a wonderful week in Lucerne with fruitful technical debates and personal exchanges!

Yours sincerely



Olivier Bucheli & Michael Spirig

The European Fuel Cell Forum EFCF

www.EFCF.com

The sole purpose of the European Fuel Cell Forum is the promotion of fuel cell and hydrogen technologies through the EFCF conferences, expositions, promotion events (Green Salon & Rondo), literature and media. It is an enabling, high level exchange platform, providing scientific sessions and tutorials, a technical exhibition, as well as international project meetings and recreational networking events in the charming and inspirational area of Lucerne, in the heart of Switzerland.

Every summer the EFCF invites more than 10'000 stakeholders around the world to participate in this internationally recognised event on the shores of the picturesque lake Lucerne.

The EFCF has a heritage of more than 24 years! As far back as 1994 the 1st EUROPEAN SOFC FORUM attracted leading international speakers as well as a global audience. Since then, a high quality conference series has been established. The conference topics alternate annually. On even years the conference concentrates on "Solid Oxide Cells" (SOC): Fuel Cells, Electrolysers and Membrane Reactors. On odd years, the conference concentrates on "Hydrogen Fuel Cell and Direct Alcohol Fuel Cell" as well as "Hydrogen Processing: Production, Storage and Infrastructure". The 13th EUROPEAN SOFC & SOE FORUM 2018 keeps up with this tradition. It grow to the EUROPEAN REFERENCE EVENT in the field of SOC, where the entire community likes to meet.

Unlike many commercial conferences, the EFCF is organised by FCH technologists and scientists - active members of the European FCH community. Comprehensive exchange of scientific and technical information and high-level networking are the main objectives. Dedicated to continuously grow the EFCForum as one of the most prominent and interesting meeting places. To ensure a permanent progress the recommendations of the renowned EFCF International Board of Advisors are considered and the trends of the sector observed and anticipated (www.EFCF.com/IBoA). The organisers ensure that the stakeholders needs are always the focus of the EFCF, with the ambition to build a bridge from science to technology and from technology to products!

EFCF is looking confident on the 2018 event and the future already terminated events, where well-respected Chairs have been nominated.

Future EFCFs: www.EFCF.com/20yy

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Prof. Frano Barbir, University of Split, Croatia
Dr. Ulf Bossel, ALMUS AG, Switzerland
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Prof. Michael Eikerling, Simon Fraser University, Canada
Dr. Karl Föger, formerly Ceramic Fuel Cells, Australia

Scientific Advisory Committee

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Of the **13th European SOFC & SOE Forum 2018**

Prof. Ellen Ivers-Tiffée, KIT, Germany (Chair)
Dr. André Weber, KIT, Germany (Chair)
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Dr. Jari Kiviaho, VTT Technical Research Center of Finland, Finland
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Dr. Andreas Mai, Hexis AG, Switzerland
Dr. Birgit Thoben, Robert Bosch GmbH, Germany
Dr. Dario Montinaro, SOLIDpower SpA., Italy
Dr. Emad Batawi, Bloom Energy, USA
Dr. Subhashish Mukerjee, Ceres Power, UK

The Scientific Advisory Committee has been formed to structure the technical program of the this year's conference. This panel has exercised full scientific independence in all technical matters.

Dr. Nancy L. Garland, Department of Energy, USA
Prof. Hubert A. Gasteiger, TU München, Germany
John Bøgild Hansen, Haldor Topsøe A/S, Denmark
Prof. Angelika Heinzel, Universität Duisburg-Essen, Germany
Prof. John Irvine, University of St. Andrews, United Kingdom
Prof. Ellen Ivers-Tiffée, Karlsruhe Institute of Technology, Germany
Prof. Deborah Jones, CNRS, France
Prof. John A. Kilner, Imperial College London, UK
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Prof. Massimo Santarelli, Politecnico di Torino, Italy
Prof. Kazunari Sasaki, Kyushu University, Japan
Dr. Günther G. Scherer, formerly PSI, Villigen, Switzerland, Singapore
Dr. Günter Schiller, DLR, Germany
Dr. Subhash Singhal, Pacific Northwest National Laboratory, USA
Prof. Robert Steinberger-Wilckens, Uni Birmingham, UK (Chair)
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Dr. Christian Wunderlich, IKTS, Germany

The IBoA guides EFCF in technical and strategic matters. It currently consists of the above-mentioned 31 distinguished experts (21 countries; 6 continents; 16% women).

13th European SOFC & SOE Forum

Conference Chairs:

Prof. Ellen Ivers-Tiffée Dr. André Weber

Karlsruhe Institute of Technology (KIT)

The 2018 conference has as its theme Solid Oxide Technologies: Fuel Cells (SOFC), Electrolysers (SOE) & Membrane Reactors (SOMR).

One of the major global tasks of today and tomorrow is to provide safe, reliable, affordable, and environmental-friendly energy, as well as highly efficient technologies for its use. Against this background, Solid Oxide Technologies continue to have great future prospects – for decentralized power supply, as electrolysers for high efficiency hydrogen and/or syngas generation, and for power-to-gas technology, thus assisting the world's transition to a lower carbon energy future. All these applications have common requirements regarding high performance, reliability and cost efficiency. These challenging demands call for interdisciplinary research, ranging all the way from basic science to system technology. Supplementing the vast body of high-level experimental research, modelling activities are becoming increasingly paramount, as their output greatly facilitates model-based in-situ diagnosis and performance prediction.

We are delighted to chair the 13th European SOFC & SOE Forum and are greatly indebted to all research groups from academia, large-scale research institutions and from industry worldwide for their many valuable contributions. The Forum will present a complete overview of the current state of the art in solid oxide science & engineering technology, covering fuel cells, electrolysers and membrane reactors. Aiming at high quality, the technical program has been carefully set up by the Scientific Advisory Committee, ensuring full independence in all scientific and technical manners. All papers presented as lectures or posters will be collated in the electronic proceedings which will be distributed to all participants and later to libraries, research institutions and universities.

In keeping with this year's motto "Progress in Solid Oxide Technologies – From Fundamentals to Systems", the detailed technical program spans the bridge from basic science & know-how at the materials and cell level right up to stacks, products and industrial achievements. The 13th European SOFC & SOE Forum is an international meeting place that provides an excellent opportunity to present recent technical progress, establish new contacts by networking, and to exchange technical, industrial and business information. We are therefore placing our hopes in productive interactions and fruitful discussions between researchers, engineers and manufacturers, between developers and end users, and between academia and industry.

Ellen Ivers-Tiffée and André Weber
Karlsruhe Institute of Technology (KIT), Germany

Conference language is English

Prof. Ellen Ivers-Tiffée

Prof. Ellen Ivers-Tiffée holds the chair of materials for electrical and electronic engineering at the Karlsruhe Institute of Technology (KIT), Germany. After obtaining her PhD in materials science at Erlangen University, she worked at Siemens AG, Corporate Research and Technology, where she headed several European SOFC research projects. In 1996, she became a full professor at Universität Karlsruhe (KIT) and is head of the Institute of Materials for Electrical and Electronic Engineering. Her research on functional ceramics for the energy sector focuses on the characterisation of electrical & electrochemical reactions and transport processes and on methods of model-based materials development.

Ellen Ivers-Tiffée is a member of both German national science academies, Leopoldina and Acatech, a Fellow of The Electrochemical Society, a Fellow of the School of Engineering at The University of Tokyo, Japan, and an elected a member of the senate of the German Research Foundation (DFG). She has served the European Fuel Cell Forum for more than a decade as a member of the International Board of Advisors, and was awarded the Christian-Friedrich-Schönbein medal in 2014. She holds eleven patents, has published more than 350 peer-reviewed journal papers & conference proceedings and has authored seven book chapters on SOFC topics & impedance spectroscopy.

Dr. André Weber

Dr. André Weber is a senior researcher at the Institute for Applied Materials (IAM-WET) at Karlsruhe Institute of Technology (KIT), where he heads both the fuel cell and battery research groups. In addition, he acts as scientific manager of the "Fuel Cell Test Laboratory"– a joint lab of KIT and the European Institute for Energy Research (ElfER). After studying electrical engineering at RWTH Aachen University, and a stay at Siemens Central Research in Munich, he obtained his PhD at Universität Karlsruhe (KIT). During this time, he was strongly involved in the establishment of the SOFC group at IAM-WET, and has collaborated with many groups in numerous European and International research projects since 2000.

His research is related to the electrical testing and modelling of fuel cells and batteries, with a special emphasis on the detailed characterisation by means of electrochemical impedance spectroscopy. The work of his research groups ranges from fundamental studies on model systems, to the analysis of commercial products, aiming at an understanding of the complex coupling of electrochemical reactions and transport mechanisms in electrochemical devices. André Weber has authored or co-authored several book chapters, 80 conference proceedings, and more than 100 peer-reviewed journal papers on scientific topics related to fuel cells and batteries.

Scientific Organizing Committee

www.EFCF.com/SOC

Of the **13th European SOFC & SOE Forum 2018**

Prof. Ellen Ivers-Tiffée, KIT, Germany (Chair)
Dr. André Weber KIT, Germany (Chair)
Dr. Cornelia Endler, KIT, Germany
Dr. Andre Leonide, Siemens AG, Germany
Andreas Häffelin, Robert Bosch GmbH, Germany
Dr. Jean Claude Njodzefon, Robert Bosch GmbH, Germany
Dr. Annika Utz, Robert Bosch GmbH, Germany
Prof. Ludger Blum, Forschungszentrum Jülich, Germany
Dr. Lara Almar, KIT, Germany
Dr. Mihails Kusnezoff, IKTS-Fraunhofer, Germany
Dr. Dino Klotz, Kyushu University, Japan

The Scientific Organizing Committes has been formed to confirm the quality of the written contributions and redact the proceedings of the current conference. This panel has exercised full scientific independence in all technical matters.

EFCF Online Library

www.EFCF.com/O-Lib

The EFCF online library offers fast and easy access to both free and purchased information. The library is constantly being updated, and currently contains Proceedings with ISBN dating back to 2011, with files from as far back as 1994 gradually being converted and uploaded.

In addition, the library offers access to the Programmes of the EFCF Conferences Presentation slides, direct Links to the EFCF Special Issue Series and Impressions of all EFCFs. For all information on this valuable know-how resource go to www.EFCF.com/Lib

Publication Offers: Proceedings (ISBN), Journals

www.EFCF.com/PP

The complete proceedings will be available in electronic format and distributed to all conference participants for an optimal scientific exchange. In addition, EFCF offers three possibilities for publication of the works:

1.a. Authors may benefit from a publication of their contribution in the web-accessible proceedings, under the 2018 ISBN: 978-3-905592-23-8 (see www.EFC.com/LIB: Proceedings with ISBN).

1.b. Authors can apply for inclusion of their contribution in a Special Issue of „FUEL CELLS – From Fundamentals to Systems" (www.fuelcells.wiley-vch.de). Selected papers will need to comply with the journal's guidelines and go through a peer-review process.

2. Authors are also free to publish their work ELSEWHERE.

In the case of 1.b. and 2. only the title, contact and one page abstract will appear in the ISBN proceedings to avoid copyright conflicts.

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At the EFCF conferences, participants are not permitted to take pictures of the presentations (literary property). This allows presenters to show their latest results, which are e.g. intended for publication in a scientific paper at a later date. However, presenters usually indicate their willingness to share their presented and eventually copyedited slides to the conference registrants. Upon receiving the authors permission, presentations of the current and previous years will be made available in the online library www.EFCF.com/Lib for all registered participants of the European Fuel Cell Forum with an approved login. To obtain download rights after the conference, post-registration is possible by „filing Contact Data" on the www.EFCF.com/Lib on-line form.

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Oral Session Programme

A1 Luzerner Saal

S-Chair: Ellen Ivers-Tiffée, André Weber, O. Bucheli, M. Spirig

09:00 P1: Opening Session (A01)

09:00 **Welcome by the Organizers (A0101)**
Olivier Bucheli, Michael Spirig;
European Fuel Cell Forum, Luzern/Switzerland

09:05 **Welcome by the Chairs (A0102)**
Ellen Ivers-Tiffée, André Weber;
Karlsruher Institut für Technologie (KIT), Karlsruhe/Germany

09:15 **Welcome to Switzerland (A0103)**
Stefan Oberholzer, Rolf Schmitz, Benoît Revaz;
Swiss Federal Office of Energy, Bern/Switzerland

A2 Luzerner Saal

S-Chair: Ellen Ivers-Tiffée, André Weber

09:30 P2: Overviews, Changes, Prospects, Challenges of Solid Oxide Technologies (A02)

09:30 **Overview on the European FCH Joint Undertaking Projects & Activities in Stationary Applications (A0201)**
Bart Biebuyck, Mirela Atanasiu, Antonio Aguilo-Rullan;
FCH JU, Brussels/Belgium

09:50 **Overview of U.S. DOE EERE Activities Relevant to Solid Oxide Electrolysis (A0202)**
David R. Peterson (1), Eric L. Miller (2);
(1) US Department of Energy, Office of Energy Efficiency and Renewable Energy, Fuel Cell Technologies Office, Golden, Colorado/USA, (2) US Department of Energy, Office of Energy Efficiency and Renewable Energy, Fuel Cell Technologies Office, Washington DC/USA

Session Overview

Legend: Px: = Plenary

10:10	**Changes in Power Generation and Distribution and the Role of SOFC (A0203)** Kai Weeber, Peter Horstmann, Julia Miersch; Robert Bosch GmbH, Stuttgart/Germany
10:30	**SOC Technology: Prospectives, Applications and Challenges (A0204)** Mihails Kusnezoff, Stefan Megel, Nikolai Trofimenko, Matthias Jahn; Fraunhofer IKTS, Dresden/Germany
10:50	**Break – Ground Floor in the Exhibition**

A3 Luzerner Saal

S-Chair: John Bøgild Hansen, Yuto Tagaki

11:15 Status of industry and major groups I (A03)

11:15	**HEXIS Galileo 1000 N and HEXIS' next Generation SOFC System (A0301)** Andreas Mai, Felix Fleischhauer, Roland Denzler, Jan Gustav Grolig, Michael Dold, Alexander Schuler; Hexis Ltd., Winterthur/Switzerland
11:30	**Development progress on the Ceres Power ‚SteelCell' technology platform: enhanced performance and accelerating commercial development (A0302)** Robert Leah, Adam Bone, Eva Hammer, Ahmet Selcuk, Mahfujur Rahman, Andy Clare, Subhasish Mukerjee, Mark Selby; Ceres Power Ltd, Horsham/UK
11:45	**Stack Development and Industrial Scale-Up (A0303)** Christian Geipel, Kai Herbrig, Frank Mittmann, Martin Pötschke, Ludwig Reichel, Thomas Strohbach, Alexander Surrey, Christian Walter; sunfire GmbH, Dresden/Germany

B3 Auditorium

S-Chair: Alan Atkinson, Jan Van herle

11:15 Advanced characterisation techniques I (B03)

11:15	**Dual atmosphere effect at 600 °C: challenges and mitigation strategies (B0301)** Claudia Göbel, Caterina Bo, Patrik Alnegren, Jan-Erik Svensson, Jan Froitzheim; Chalmers University of Technology, Gothenburg/Sweden
11:30	**Live observation of the oxidation of coated interconnects with environmental electron microscopy (B0302)** Stéphane Poitel (1,3), Zhu-Jun Wang (2), Marc Willinger (2), Jan Van herle (3), Cécile Hébert (1); (1) Laboratoire de spectrométrie et microscopie électronique, Ecole Polytechnique Fédérale de Lausanne, Lausanne/Switzerland, (2) Department of Inorganic Chemistry, Fritz Haber Institute of the Max Planck Society, Berlin/Germany, (3) Group of Energy Materials (GEM), Ecole Polytechnique Fédérale de Lausanne, Sion/Switzerland.
11:45	**Direct Visualization of Active Sites and Oxide-ion Distribution in an Anode-supported Solid Oxide Fuel Cell (B0303)** Merika Chanthanumataporn, Tsuyoshi Nagasawa, Katsunori Hanamura; Department of Mechanical Engineering, Tokyo Institute of Technology, Tokyo/Japan

Wednesday, July 4, 2018

Morning

12:00	**Achievements of NEDO durability projects on SOFC stacks in the light of physicochemical properties (diffusion and chemical reactions) (A0304)** Harumi Yokokawa; Institute of Industrial Science, The University of Tokyo, Tokyo/Japan	12:00	**Characterisation of the local morphology at triple-phase boundaries after SOFC/SOEC operation (B0304)** G. Rinaldi (1), A. Nakajo (1), M. Cantoni (3), W.K.S. Chiu (2), J. Van herle (1); (1) Group of Energy Materials, École Polytechnique Fédérale de Lausanne, Lausanne/Switzerland, (2) Department of Mechanical Engineering, University of Connecticut, Storrs/USA, (3) Interdisciplinary Centre for Electron Microscopy, École Polytechnique Fédérale de Lausanne, Lausanne/Switzerland
12:15	**Development, Manufacturing and Deployment of SOC-Based Products at SOLIDpower (A0305)** Massimo Bertoldi (1), Olivier Bucheli (2), Alberto V. Ravagni (1,2); (1) SOLIDpower SpA, Mezzolombardo/Italy, (2) HTceramix SA, Yverdon-les-Bains/Switzerland	12:15	**Operando NAP-HT-XPS and impedance spectroscopy study of pulsed laser deposited Ni-$Ce_{0.9}Gd_{0.1}O_{2-\delta}$ solid oxide fuel cell electrode (B0305)** Gunnar Nurk (1), Kuno Kooser (2,4), Ove Korjus (1), Rait Kanarbik (1), Samuli Urpelainen (3), Tanel Käämbre (2), Urmas Joost (2), Mati Kook (2), Margus Kodu (2), Priit Möller (1), Indrek Kivi (1), Mihkel Vestli (1), Jean-Jacques Gallet (5), Edwin Kukk (4), Enn Lust (1); (1) University of Tartu Institute of Chemistry, Tartu/Estonia, (2) University of Tartu, Institute of Physics, Tartu/Estonia, (3) Lund University, MAX IV Laboratory, Lund/Sweden, (4) University of Turku, Department of Physics and Astronomy, Turku/Finland, (5) Synchrotron-Soleil, L'orme des Merisiers, Cedex/France
12:30	**Lunch – 2nd Floor on the Terrace / Coffee – Ground Floor in the Exhibition & 1st Floor in the Poster Session**		

Wednesday, July 4, 2018

Afternoon

A4	**Tract A (ground- and first floor)**	**S-Chair: Ellen Ivers-Tiffée, André Weber**
13:15	**Poster Session I (A04 covering All Oral Session Topics)**	

A5 Luzerner Saal

S-Chair: Mark Selby, Jean-Claude Njodzefon

15:00 Status of industry and major groups II (A05)

15:00 **SOEC activities at Haldor Topsoe: status and perspectives on electrification of the chemical industry (A0501)**
Rainer Küngas, Peter Blennow, Thomas Heiredal-Clausen, Tobias Holt Nørby, Jeppe Rass-Hansen, John Bøgild Hansen, Poul Georg Moses;
Haldor Topsoe A/S, Lyngby/Denmark

15:15 **Opportunities and challenges in protonic ceramic fuel cell development in Japan toward ultra-high efficiency (A0502)**
Yasunobu Mizutani (1,2), Toshiaki Yamaguchi (1), Yuji Okuyama (3);
(1) National Institute of Advanced Industrial Science and Technology (AIST), Aichi/Japan, (2) Toho Gas Co. Ltd., Aichi/Japan, (3) University of Miyazaki, Miyazaki/Japan

15:30 **Development of SOC at Forschungszentrum Jülich (A0503)**
Ludger Blum (1), Qingping Fang (1), L.G.J. (Bert) de Haart (1), Willem J. Quadakkers (1), Nikolaos Margaritis (2), Norbert H. Menzler (1), Roland Peters (1);
(1) Institute of Energy and Climate Research, (2) Central Institute of Engineering, Electronics and Analytics, Forschungszentrum Jülich GmbH, Jülich/Germany

15:45 **Power to Gas and Fuels: SOC Concepts at DTU Energy (A0504)**
Anke Hagen, Peter Vang Hendriksen;
DTU Energy, Roskilde/Denmark

B5 Auditorium

S-Chair: Hirofumi Sumi (tbc), Norbert Menzler

15:00 State of the art and novel manufacturing I (B05)

15:00 **Improving performance of SOC through 3D printing of electrolytes (B0501)**
Arianna Pesce (1)*, Cecilia Hernández (1), Irene Sánchez (1), Silvia Masciandaro (1), Alex Morata (1), Marc Torrell (1), Albert Tarancon (1,2);
(1) IREC, Catalonia Institute for Energy Research, Barcelona/Spain, (2) ICREA, Barcelona/Spain

15:15 **High stability of CGO barrier layers processed by Pulsed Laser Deposition for Large-Area SOFCs (B0502)**
Miguel Morales (1), Arianna Pesce (1), Aneta Slodczyk (1), Marc Torrell (1), Dario Montinaro (2), Paolo Piccardo (3), Albert Tarancón (1,4), Alex Morata (1);
(1) IREC, Catalonia Institute for Energy Research, Dept of Advanced Materials for Energy Applications, Barcelona/Spain, (2) SOLIDPower SpA., Mezzolombardo/Italy, (3) Università degli Studi di Genova, Department of Chemistry and Industrial Chemistry, Genova/Italy, (4) ICREA, Barcelona/Spain

15:30 **Tailoring electrode/electrolyte interfaces to increase SOFC performance by laser micro-patterning (B0503)**
José A. Cebollero, Miguel Á. Laguna-Bercero, Ruth Lahoz, Ángel Larrea;
Instituto de Ciencia de Materiales de Aragón, Universidad de Zaragoza-CSIC, Zaragoza/Spain

15:45 **LSCF nanofiber cathodes by water-based sol-gel electrospinning for IT-SOFC applications (B0504)**
Paola Costamagna (1), Elena Marzia Sala (1), Wenjing Zhang (2), Marie Lund Traulsen (2), Peter Holtappels (2);
(1) Department of Civil, Chemical and Environmental Engineering, University of Genoa, Genoa/Italy, (2) DTU Energy, Risø Campus, Roskilde/Denmark

16:00 Break – Ground Floor in the Exhibition & 1st Floor in the Poster Session

A6 Luzerner Saal

S-Chair: Yasunobu Mizutani, Dario Montinaro

16:30 Product presentation and demonstration (A06)

16:30 **Hot box module development and operation of Saint-Gobain's all-ceramic Solid Oxide Fuel Cell for residential applications (A0601)**
Yuto Takagi (1), Brian Feldman (1), John Pietras (1), Stefan Megel (2), Jens Schnetter (2), Sebastian Hielscher (2), Gregor Ganzer (2), Mihails Kusnezoff (2);
(1) Saint-Gobain Northboro R&D Center, Northboro, Massachusetts/USA, (2) Fraunhofer IKTS, Dresden/Germany

16:45 **The new enerday PowerTrailer - SOFC powered hybrid generators for off-grid applications (A0602)**
Matthias Boltze, Gregor Holstermann, Arne Sommerfeld;
new enerday GmbH, Neubrandenburg/Germany

17:00 **Biogas power generation with SOFC to demonstrate energy circulation suitable for Mekong Delta, Vietnam (A0603)**
Yusuke Shiratori (1), Mio Sakamoto (1), Takeo Yamakawa (2), Takuya Kitaoka (2), Hiroshi Orishima (3), Hajime Matsubara (4), Yoshinobu Watanabe (5), Shuji Nakatsuka (6), Tin Chanh Duc Doan (7), Chien Mau Dang (7);
(1) International Research Center for Hydrogen Energy, Kyushu University, Fukuoka City/Japan, (2) Faculty of Agriculture, Kyushu University, Fukuoka City/Japan, (3) MAGNEX CO. LTD., Tokyo/Japan, (4) Meiwa CO. LTD., Ishikawa/Japan, (5) Nakayama Iron Works, LTD., Saga/Japan, (6) Daicen Membrane-Systems LTD., Hyogo/Japan, (7) Institute for Nanotechnology, Vietnam National University, Ho Chi Minh City/Vietnam

17:15 **Operational Results of an 150/30 kW RSOC System in an Industrial Environment (A0604)**
Konstantin Schwarze, Oliver Posdziech (1), Joshua Mermelstein (2), Simon Kroop (3);
(1) sunfire GmbH, Dresden/Germany, (2) Boeing, Huntington Beach/USA, (3) Salzgitter Mannesmann Forschung GmbH, Salzgitter/Germany

B6 Auditorium

S-Chair: Keiji Yashiro, Edith Bucher

16:30 Advanced characterisation techniques II (B06)

16:30 **From In-Situ to In-Operando Evaluation of SOFC Cathodes for Enhanced ORR Activity and Durability (B0601)**
Eric Wachsman;
Maryland Energy Innovation Institute, University of Maryland, Maryland/USA

16:45 **Relationship between crystal orientation and oxygen exchange rate in $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ (B0602)**
Mathew Niania (1), Richard Chater (1), John Kilner (1,2);
(1) Imperial College London, Department of Materials, London/UK, (2) International Institute for Carbon Neutral Energy Research, Kyushu University, Kyushu/Japan

17:00 **Impact of Triple Phase Boundary Reaction in SOFC Mixed Conducting Cathodes (B0603)**
Keita Mizuno (1), Yoshinobu Fujimaki (1), Takashi Nakamura (1), Yuta Kimura (1), Kiyofumi Nitta (2), Oki Sekizawa (2), Yasuko Terada (2), Fumitada Iguchi (1), Keiji Yashiro (1), Hiroo Yugami (1), Tatsuya Kawada (1), Koji Amezawa (1);
(1) Tohoku University, Sendai/Japan, (2) Japan Synchrotron Radiation Research Institute, Hyogo/Japan

17:15 **Investigation of Electrode Reaction and Degradation by Using Patterned Thin Film Model Electrode (B0604)**
K. Amezawa (1), Y. Fujimaki (1), K. Mizuno (1), S. Kageyama (1), Y. Shinomiya (1), T. Nakamura (1), Y. Kimura (1), K. Nitta (2), O. Sekizawa (2), Y. Terada (2), F. Iguchi (1), K. Yashiro (1), H. Yugami (1), T. Kawada (1);
(1) Tohoku University, Sendai/Japan, (2) Japan Synchrotron Radiation Research Institute, Hyogo/Japan

17:30	**Artificial intelligence for automatic optical inspection of multilayered solid oxide membranes (A0605)** Anton Litke, Petrus Martens, Ronald van Olmen, Greg Norsworthy, Roderik Höppener; HaikuTech Europe BV, Maastricht/Netherlands	17:30	**Multilayered $La_{0.6}Sr_{0.4}CoO_{3-\delta}$ and $Gd_{0.1}Ce_{0.9}O_{2-\delta}$ thin films with enhanced oxygen surface exchange properties for IT-SOFCs (B0605)** Katherine Develos-Bagarinao (1), Jeffrey De Vero (1), Kozue Ogasawara (1), Riyan Budiman (1), Haruo Kishimoto (1), Tomohiro Ishiyama (1), Katsuhiko Yamaji (1), Teruhisa Horita (1), Harumi Yokokawa (1,2); (1) Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology, Ibaraki/Japan, (2) Institute of Industrial Science, The University of Tokyo, Tokyo/Japan
17:30	**Functional SOFC Interfaces Created by Aerosol-Spray Deposition (A0606)** Neil Kidner, Kari Riggs, Gene Arkenberg, Matthew Seabaugh, Scott Swartz; Nexceris, LLC, Ohio/USA	17:30	**Influence of H_2O and CO_2 on the surface composition and oxygen exchange kinetics of IT-SOC air electrodes (B0606)** Vincent Thoréton (1), John Druce (1), Tatsumi Ishihara (1), John Kilner (1,2); (1) WPI-International Institute for Carbon-Neutral Energy Research, Fukuoka/Japan, (2) Department of Materials, Imperial College London, London/UK
18:00	**End of Sessions**		
18:30	**Swiss Surprise** Registered participants meet between KKL and railway station		

Thursday, July 5, 2018

A7	**Luzerner Saal**	**S-Chair: Ellen Ivers-Tiffée, André Weber**
09:00	**P3: Keynote - European Industry (A07)**	
09:00	**The Future of European Stationary Fuel Cell Industry (A0701)** Jorgo Chatzimarkakis; Hydrogen Europe, Brussels/Belgium	
09:25	**5 Min to change to Auditorium for B08 Session**	

A8 Luzerner Saal

S-Chair: Ludger Blum, Stefan Diersch

09:30 Balance of plant components (A08)

09:30 **Experimental analysis for thermal performance of heat distribution system in Hot BoP of 2kW-class SOFC (A0801)**
Young Bae Kim, Eunju Kim, Jonghyuk Yoon, Hyoung Woon Song;
Plant Engineering Center, Institute for Advanced Engineering, Gyeonggi-do/Korea

09:45 **Experimental prototype construction of a small scale plate heat exchanger desorber coupled to an SOFC (A0802)**
Vikrant Venkataraman (1), Eridei Amakiri (2), Robert Steinberger-Wilckens (2);
(1) Delft University of Technology, Process & Energy, Delft/Netherlands, (2) Centre for Fuel Cell & Hydrogen Research, School of Chemical Engineering, University of Birmingham, Birmingham/UK

10:00 **Entropy considerations leading to a validated to the essence reduced model for SOFC and SOEC high temperature heat exchangers (A0803)**
Jean-Paul Janssens, Michel Dubuisson, Yves De Vos;
BOSAL Energy Conversion Industry, Lummen/Belgium

10:15 **High Temperature Steam/CO_2 Co-electrolysis Using Solid Oxide Electrolyser Stack at Shanghai Institute of Applied Physics (A0804)**
Guoping Xiao, Chengzhi Guan, Peng Chen, Jian-Qiang Wang; Center for Thorium Molten Salt Reactor System, Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shangha/China

B8 Auditorium

S-Chair: Koji Amezawa, Olivier Guillon

09:30 State of the art and novel manufacturing II (B08)

09:30 **Cell3Ditor: Cost-effective and flexible 3D printed SOFC stacks for commercial applications (B0801)**
A. Hornés (1), M. Rosa (2), V. Esposito (2), C. Chapout (3), G. Le Meillour (3), L. Hernández (4), C. Crawshaw (5), D. Rodríguez (6), D. Lieftink (7), A. Ansar (8), M. Torrell (1), A. Morata (1), A. Tarancón (1);
(1) Catalonia Institute for Energy Research, Barcelona/Spain, (2) Technical University of Denmark, Roskilde/Denmark, (3) 3DCeram, Limoges/France, (4) University of La Laguna, Tenerife/Spain, (5) Promethean Particles Ltd, Genesis Park, Nottingham/UK, (6) Francisco Alberto S.A.U., Barcelona/Spain, (7) HyGear Fuel Cell Systems B.V., Arnhem/Netherlands, (8) Saan Energi AB., Lund/Sweden

09:45 **Ex Situ Sintering of Dual-Phase Cathodes for Metal-Supported Fuel Cells (B0802)**
David Udomsilp (1,2), Florian Thaler (1,2), Cornelia Bischof (1), Norbert H. Menzler (2), L.G.J. de Haart (2), Alexander K. Opitz (1,3), Olivier Guillon (1,4), Martin Bram (1,2); (1) Christian Doppler Laboratory for Interfaces in Metal-Supported Electrochemical Energy Converters, (2) Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Jülich/Germany, (3) Vienna University of Technology, Institute of Chemical Technologies and Analytics, Vienna/Austria, (4) Jülich Aachen Research Alliance: JARA-Energy, Jülich/Germany

10:00 **Performance and stability evaluation of a novel full-ceramic inert substrate-supported solid oxide fuel cell (B0803)**
Jean-Claude Njodzefon (1), Nicolas Maier (1), Johannes Schmieg (2), Matthias Meffert (2), Heike Störmer (2), Dagmar Gerthsen (2) Piero Lupetin (1); (1) Robert Bosch GmbH, Renningen/Germany, (2) Laboratorium für Elektronenmikroskopie (LEM), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

10:15 **Magnetic alignment of LSM particles in SOFC cathode (B0804)**
Keisuke Nagato (1), Seigo Yoshino (1), Takaaki Shimura (2), Masayuki Nakao (1), Naoki Shikazono (2,3);
(1) Graduate School of Engineering, Tokyo/Japan,
(2) Institute of Industrial Science, The University of Tokyo, Tokyo/Japan, (3) JST CREST, Saitama/Japan

10:30 Break – Ground Floor in the Exhibition

A9 Luzerner Saal

S-Chair: Marc P. Heddrich , Annabelle Brisse

11:00 Solid Oxide Technologies in P2X and chemical processing applications (A09)

11:15 **Design and operation of a highly integrated laboratory scale Power-to-Liquid plant (A0901)**
Gregor Herz, Paul Adam, Erik Reichelt, Stefan Megel, Matthias Jahn;
Fraunhofer IKTS, Dresden/Germany

11:30 **Electrochemical Tailoring of Syngas during High Temperature Co-Electrolysis (A0902)**
L. Dittrich (1), S. Foit (1), I.C. Vinke (1), R.-A. Eichel (1,2), L.G.J. de Haart (1);
(1) Institute of Energy and Climate Research, Fundamental Electrochemistry (IEK-9), Forschungszentrum Jülich GmbH, Jülich/Germany, (2) Institute of Physical Chemistry, RWTH Aachen University, Aachen/Germany

11:45 **Ammonia Synthesis Gas Generation by SOEC (A0903)**
John Bøgild Hansen;
Haldor Topsøe A/S, Lyngby/Denmark

12:00 **Highly efficient Power-to-Gas Process by Integration of High-Temperature Electrolysis and CO_2 Methanation (A0904)**
Stefan Harth (1), Manuel Gruber (1), Dimosthenis Trimis (1), Oliver Posdziech (2), Jörg Brabandt (2);
(1) Karlsruhe Institute of Technology, Karlsruhe/Germany, (2) Sunfire Gmbh, Dresden/Germany

12:15 **Study of STEAM as sweep gas in SOE oxygen electrode (A0905)**
Giovanni Cinti, Linda Barelli, Gianni Bidini;
Università degli Studi di Perugia, Department of Engineering, Perugia/Italy

B9 Auditorium

S-Chair: John Irvine, Laura Almar

11:00 State of the art and novel materials (B09)

11:15 **Interaction of a barium-calcium-silicate glass composite sealant with Sanergy HT 441 (B0901)**
Sonja-M. Groß-Barsnick (1), Nikolaos Margaritis (1), Ute de Haart (2), Pawel Huczkowski (3), Willem J. Quadakkers (3); (1) Forschungszentrum Jülich GmbH. Central Institute of Engineering, Electronics and Analytics (ZEA-1), (2) Institute of Energy and Climate Research (IEK-3), (3) Institute of Energy and Climate Research (IEK-2), Jülich/Germany

11:30 **Development of a $MnCo_{1.9}Fe_{0.1}O_4$ protection layer for SOFC interconnects applied by WPS and densified by reactive sintering (B0902)**
Nikita Grigorev (1,2), Kathrin Sick (1), Norbert H. Menzler (1), Olivier Guillon (1), Rainer Telle (2);
(1) Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung: Werkstoffsynthese und Herstellungsverfahren (IEK-1), Jülich/Germany, (2) RWTH Aachen, Institut für Gesteinshüttenkunde (GHI), Aachen/Germany

11:45 **Hydrogen separation membrane based on $NiCu/Nd_{5.5}WO_{11.25-\delta}$ nanocomposite (B0903)**
Vladislav Sadykov (1,2), Alexey Krasnov (1), Yulia Fedorova (1), Anton Lukashevich (1), Lydmila Bobrova (1), Yulia Bespalko (1), Nikita Eremeev (1), Pavel Skriabin (1), Oleg Smorygo (3);
(1) Boreskov Institute of Catalysis SB RAS, Novosibirsk/Russia, (2) Novosibirsk State University, Novosibirsk/Russia, (3) Powder Metallurgy Institute, Minsk/Republic of Belarus

12:00 **Development of proton conductive ceramics fuel cell for high reliability and low cost (B0904)**
Noboru Taniguchi, Tomohiro Kuroha, Yuichi Mikami, Kosuke Yamauchi, Takehito Goto;
Panasonic Corporation, Moriguchi City, Osaka/Japan

12:15 **Properties of (La1-xSrx)2(Ni0.9Mn0.1)O4+δ based cathodes (B0905)**
Yatir Sadia (1,2), Stephen J Skinner (1); (1) Department of Materials, Royal School of Mines Imperial College London, London/UK, (2) Department of Material Engineering, Ben Gurion University of the Negev, Beer Sheva/Israel

12:00	**Innovative CNG and LNG plant concepts for bio-syngas upgrading through steam electrolysis (SOEC) and catalytic methanation (A0906)** Régis Anghilante (1), Christian Müller (2), Max Schmid (3), David Colomar (1), Felix Ortloff (2), Reinhold Spörl (3), Annabelle Brisse (1), Frank Graf (2); (1) EIFER, Karlsruhe/Germany, (2) DVGW-EBI, Karlsruhe/Germany, (3) Institute of Combustion and Power Plant Technology, Stuttgart/Germany	12:00	**$La_{0.6}Sr_{0.4}Ga_{0.3}Fe_{0.7}O_3$ as a stable, flexible platform for symmetric/reversible Solid Oxide Cells (B0906)** Andrea Bedon (1), Giovanni Carollo (1), Alberto Garbujo (1), Mathilde Rieu (2), Jean-Paul Viricelle (2), Cristian Savaniu (3), John T.S. Irvine (3), Marta Boaro (4), Marta Maria Natile (5,1), Antonella Glisenti (1,5); (1) Dipartimento di Scienze Chimiche, University of Padova, Padova/Italy, (2) Mines Saint-Etienne, Univ Lyon, CNRS, Saint-Étienne/France, (3) School of Chemistry, University of St-Andrews, Scotland/UK, (4) Dipartimento Politecnico di Ingegneria e Architettura, University of Udine, Udine/Italy, (5) Istituto di Chimica della Materia Condensata e Tecnologie per l'Energia, Padova/Italy
12:30	**Lunch – 2nd Floor on the Terrace / Coffee – Ground Floor in the Exhibition & 1st Floor in the Poster Session**		

Afternoon

Thursday, July 5, 2018

Afternoon

A10	**Tract A (ground- and first floor)**	**S-Chair: Ellen Ivers-Tiffée, André Weber**
13:15	**Poster Session II (A10 covering All Oral Session Topics)**	

A11 Luzerner Saal — S-Chair: Jürgen Rechberger, Andreas Mai

15:00 System performance (A11)

15:00 **Solid Oxide Electrolyser System operational at the H_2 refueling station of Karlsruhe (A1101)**
Annabelle Brisse (1), Maxime Zeller (1), Bastian Ludwig (1), Joerg Brabandt (2);
(1) European Institute for Energy Research (EIFER), Karlsruhe/Germany,
(2) Sunfire GmbH, Dresden/Germany

15:15 **Results from industrial size biogas-fed SOFC plant (DEMOSOFC project) (A1102)**
M. Acri (1), U. Fausone (1), E. Fontell (2), M. Gandiglio (3), T. Hakala (2), J. Kiviaho (4), A. Lanzini (3), E. Lorenzi (1), M. Rautanen (4), M. Santarelli (3);
(1) SMAT Società Metropolitana Acque Torino, Turin/Italy, (2) Convion LTD, Espoo/Finland,
(3) Politecnico di Torino, Turin/Italy, (4) VTT, Technical Research Center of Finland, Espoo/Finland

15:30 **Transition Cycles during Operation of a reversible Solid Oxide Electrolyser/Fuel Cell (rSOC) system (A1103)**
Jérome Aicart, Stéphane di Iorio, Marie Petitjean, Pascal Giroud, Géraldine Palcoux, Julie Mougin;
Univ. Grenoble Alpes - CEA/LITEN, Grenoble/France

15:45 **Operating results of the Flexifuel-SOFC system with gasified biomass using CFY-stack module (A1104)**
Stefan Megel (1), Jens Schnetter (1), Mihails Kusnezoff (1), Martin Hauth (2), Stefan Weissensteiner (2), Michael Seidl (2), Christopher Sallai (2), Christian Ramerstorferc(3), Thomas Brunner (3), Ingwald Obernberger (3);
(1) Fraunhofer IKTS, Dresden/Germany, (2) AVL List GmbH, Graz/Austria,
(3) BIOS BIOENERGIESYSTEME GmbH, Graz/Austria

B11 Auditorium — S-Chair: Nigel P. Brandon, Julie Mougin

15:00 State of the art and novel fuel electrode materials (B11)

15:00 **Exsolution of nickel nanoparticles from perovskite oxides under applied potentials. (B1101)**
David N. Miller, George M. Carins, John T.S. Irvine;
School of Chemistry, University of St Andrews, Fife/UK

15:15 **Development of perovskite cathodes with in-situ exsolution of transition metals for the generation of syngas from co-electrolysis of CO_2 and H_2O (B1102)**
Vasileios Kyriakou (1), Dragos Neagu (2), Evangelos Papaioannou (2), Ian Metcalfe (2), Mauritius C.M. van de Sanden (1), Michail Tsampas (1);
(1) Dutch Institute For Fundamental Energy Research (DIFFER), Eindhoven/Netherlands,
(2) School of Engineering, Newcastle University, Newcastle/UK

15:30 **Nano-composite Nickel Yttria-Stablised Zirconia Anode (B1103)**
Jingyi Chen (1), Xin Wang (1), Paul Boldrin (1), Chris Starkey (2), Alan Atkinson(1), Nigel Brandon (1);
(1) Imperial College London, London/UK,
(2) University College London, Department of Chemistry, London/UK

15:45 **Exsolution and integration of nanosized SMART catalysts for next generation SOFC anodes (B1104)**
Dariusz Burnat (1), Lorenz Holzer (1), Tanja Franken (1), Andreas Mai (2), Andre Heel (1);
(1) ZHAW - Zurich University of Applied Sciences, Winterthur/Switzerland,
(2) Hexis A.G., Winterthur/Switzerland

16:00 Break – Ground Floor in the Exhibition & 1st Floor in the Poster Session

A12 Luzerner Saal

S-Chair: Mihail Kusnezoff, Jongsup Hong

16:30 Design of systems (A12)

16:30 **Development of a multi fuel SOFC platform for CHP and CCHP applications (A1201)**
Michael Seidl, Nikolaus Soukup, Stefan Weissensteiner, Christopher Sallai, Ralf Lehner, Martin Hauth;
AVL List GmbH, Graz/Austria

16:45 **COMPASS SOFC system: Cathode tolerance to combusted ethanol for rapid stack heat up (A1202)**
Johannes Funk (1,3), Vincent Lawlor (1), Jörg Mathé (1), Michael Reissig (1), Bernd Reiter (1), Thomas Krauss (1), Jürgen Rechberger (1), Edith Bucher (2), Andreas Egger (2), Klaus Reichmann (3);
(1) AVL-List GmbH, Graz/Austria, (2) Chair of Physical Chemistry, Montanuniversitaet Leoben, Leoben/Austria, (3) Institute for Chemistry and Materials Technology, Technical University Graz, Graz/Austria

17:00 **rSOC System Development at Forschungszentrum Jülich (A1203)**
Roland Peters, Matthias Frank, Ludger Blum, Detlef Stolten;
Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Jülich/Germany

17:15 **Effect of fuel-electrode off-gas recirculation in ReSOC system coupled with waste steam for electrical energy storage system (A1204)**
Van-Tien Giap (1,2), Young Sang Kim (1), Kook Young Ahn (1,2);
(1) Department of Clean Fuel & Power Generation, Environment System Research Division, Korea Institute of Machinery & Materials (KIMM), Daejeon/Korea, (2) Environment & Energy Mechanical Engineering, KIMM Campus, University of Science and Technology (UST), Daejeon/Korea

B12 Auditorium

S-Chair: Bert de Haart, Yoshio Matsuzaki

16:30 Understanding lifetime at different levels - fuel electrodes (B12)

16:30 **The local morphological changes of Nickel-Gadolinium Doped Ceria anodes in humidified conditions (B1201)**
Anna Sciazko (1,2), Takaaki Shimura (1,3), Yosuke Komatsu (1), Naoki Shikazono (1);
(1) Institute of Industrial Science, The University of Tokyo, Tokyo/Japan, (2) Department of Fundamental Research in Energy Engineering, AGH University of Science and Technology, Krakow/Poland, (3) Tokyo University of Agriculture and Technology, Tokyo/Japan

16:45 **Redox Cycling of Ni/YSZ and Ni/GDC Anodes for Metal-Supported Fuel Cells (B1202)**
Florian Thaler (1,2), David Udomsilp (1,2), Wolfgang Schafbauer (3), Cornelia Bischof (1,3), Yosuke Fukuyama (4), Mari Kawabuchi (4), Shunsuke Taniguchi (5), Alexander K. Opitz (1,6), Martin Bram (1,2);
(1) Christian Doppler Laboratory for Interfaces in Metal-Supported Electrochemical Energy Converters, (2) Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research (IEK-1), Jülich/Germany, (3) Plansee SE, Innovation Services, Reutte/Austria, (4) Nissan Motor Co., Ltd. Nissan Research Center, Kanagawa/Japan, (5) Kyushu University, Fukuoka/Japan, (6) Vienna University of Technology, Institute of Chemical Technologies and Analytics, Vienna/Austria

17:00 **Investigations on the influence of phenol as a model tar on Ni/YSZ anodes using electrical impedance spectroscopy (B1203)**
Michael Geis (1), Stephan Herrmann (1), Sebastian Fendt (1), Hyeondeok Jeong (2), Christian Lenser (2), Norbert Menzler (2), Hartmut Spliethoff (1); (1) Technische Universität München, Institute for Energy Systems, Garching/Germany, (2) Forschungszentrum Jülich GmbH, IEK-1, Jülich/Germany

17:15 **Exploring the Increased Sulfur Tolerance of Ni/CGO Anodes during Reformate Operation (B1204)**
Matthias Riegraf, Günter Schiller, Rémi Costa, K. Andreas Friedrich;
German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Electrochemical Energy Technology, Stuttgart/Germany

17:30	**Development and optimization study of highly efficient two-stage SOFC module with fuel regenerator (A1205)** Kazuo Nakamura (1), Takahiro Ide (1), Kazuki Isshiki (1), Shumpei Taku (1), Tatsuya Nakajima (1), Tatsuki Dohkoh (1), Marie Shirai (1), Shunnosuke Akabane (1), Toru Hatae (1), Kei Ogasawara (2); (1) Tokyo Gas Co., Ltd., Fundamental Technology Dept., Yokohama/Japan, (2) The Japan Gas Association, Tokyo/Japan	17:30	**Short Stack and Durability Testing of SOFC Containing Impregnated $La_{0.20}Sr_{0.25}Ca_{0.45}TiO_3$ Anodes (B1205)** Robert Price (1), Ueli Weissen (2), Jan G. Grolig (2), Andreas Mai (2), John T. S. Irvine (1); (1) School of Chemistry, University of St Andrews, Fife/UK, (2) Hexis AG, Winterthur/Switzerland
17:45	**Proof-of-concept Test Results of SOFC-Engine Hybrid Power Generation System (A1206)** Young Duk Lee (1), Young Sang Kim (1), Sanggyu Kang (1), Kook Young Ahn (1), Sungho Choi (2), Jinah Park (2), Han Ho Song (3); (1) Fuel Cell Hybrid Research Center, Korea Institute of Machinery & Materials, Daejeon/Korea, (2) SOFC Research Center, MiCo Inc., Gyeonggi-do/Korea, (3) Department of Mechanical Engineering, Seoul National University, Seoul/Korea	17:45	**Use of Novel Dopants on Solid Oxide Fuel Cell Anodes to Reduce Carbon Deposition and Improve Sulfur Tolerance (B1206)** Rhiannon Dixon, Robert Steinberger-Wilckens; Centre for Doctoral Training in Fuel Cells & Their Fuels, School of Chemical Engineering, University of Birmingham, Birmingham/UK
18:00	**End of Sessions**		
18:30	**Dinner on the Lake**	**Boarding 19.20, Lake side of KKL pier 5/6 – back 23.25 (short stop in Brunnen 22.30 for early return by train)**	




A13 Luzerner Saal

S-Chair: Henrik Lund Frandsen, Dino Klotz

09:00 Electrode and cell modelling (A13)

09:00 **Exploiting the full potential of 3D simulations through novel characterisation metrics at the particle level (A1301)**
Antonio Bertei (1,2), Vladimir Yufit (1), Farid Tariq (1), Nigel Brandon (1);
(1) Department of Earth Science and Engineering, Imperial College London, London/UK, (2) Department of Civil and Industrial Engineering, University of Pisa, Pisa/Italy

09:15 **Mass and heat transport in porous SOFC electrodes (A1302)**
Niklas Russner, Dominik Horny, Jochen Joos, Ellen Ivers-Tiffée;
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

09:30 **Understanding the impact of microstructure on SOC reaction mechanisms: Illustration on LSCF and LSCF-CGO electrodes (A1303)**
H. Moussaoui (1), F. Monaco (1), R. Sharma (1), J. Debayle (2), Y. Gavet (2), M. Hubert (3), P. Cloetens (3), E. Siebert (4), J. Vulliet (5), F. Lefebvre-Joud (1), J. Laurencin (1);
(1) Univ. Grenoble Alpes - CEA/LITEN, Grenoble/France, (2) Ecole des Mines de Saint-Etienne, SPIN, CNRS, LGF, Saint-Etienne/France, (3) European Synchrotron Radiation Facility (ESRF), Grenoble/France, (4) Univ. Grenoble Alpes - CNRS, LEPMI, Saint-Martin-d'Hères/France, (5) CEA-DAM, DAM, Le Ripault, Monts/France

09:45 **Validation of Engineering FEA Predictive Sintering Models of Steel Supported SOFCs (A1304)**
Rallou Chatzimichail (1,2), Dr. Richard Dawson (1), Dr. Sarah Green (1), Daniel Sullivan (2), Dr. Mark Selby (2), Dr. Subhasish Mukerjee (2); (1) Lancaster University, Engineering Dept., Lancaster/UK, (2) Ceres Power Ltd., Horsham/UK

10:00 **Numerical assessment of mesoscale modification of thin electrolyte in anode-supported solid oxide fuel cells (A1305)**
Masashi Kishimoto, Masaya Sasaki, Hiroshi Iwai, Hideo Yoshida;
Department of Aeronautics and Astronautics, Kyoto University, Kyoto/Japan

B13 Auditorium

S-Chair: Robert Steinberger-Wilckens, Paola Costamagna

09:00 Understanding lifetime at different levels – from materials to systems (B13)

09:00 **Influence of primary tar and H2S on Solid Oxide Fuel Cell anodes in Integrated Biomass Gasifier SOFC Systems (B1301)**
Alessandro Cavalli (1), Roberta Bernardini (1,2), P. V. Aravind (1);
(1) Process & Energy Department, Delft University of Technology, Delft/Netherlands, (2) Department of Energy, Systems, Faculty of Engineering, University of Pisa, Pisa/Italy

09:15 **Evaluation of Protective Layer Coatings for SOFC Interconnects via Inkjet Printing (B1302)**
Sathish Pandiyan (1), Manuel Bianco (2), María Gálvez Sánchez (1), Robert Steinberger-Wilckens (1); (1) Fuel Cell Research Group, School of Chemical Engineering, Edgbaston, University of Birmingham, Birmingham/UK, (2) GEM Group, Inst. Mech. Eng., Ecole Polytechnique Fédérale de Lausanne (EPFL), Sion/Switzerland

09:30 **Degradation Study of Tape-Casted Metal Supported Solid Oxide Fuel Cell (B1303)**
Zaka Ruhma (1), Keiji Yashiro (1), Fumitada Iguchi (2), Itaru Oikawa (3), Yoshiaki Hayamizu (3), Hitoshi Takamura (3), Tatsuya Kawada (1);
(1) Graduate School of Environmental Studies, Tohoku University, Sendai/Japan,
(2) Department of Materials Science, Graduate School of Engineering, Tohoku University, Sendai/Japan

09:45 **Characterisation on critical acceleration factors for stability of SOFC cells and application of advanced characterisation techniques (B1304)**
Vanja Subotić (1), Bernhard Stoeckl (1), Michael Preininger (1), Norbert H. Menzler (2), Vincent Lawlor (3), Stefan Pofahl (3), Hartmuth Schroettner (4), Christoph Hochenauer (1); (1) Institute of Thermal Engineering, Graz University of Technology, Graz/Austria, (2) Forschungszentrum Jülich GmbH, IEK-1, Jülich/Germany, (3) AVL List GmbH, Graz/Austria, (4) Institute for Electron Microscopy and Nanoanalysis, Graz University of Technology, Graz/Austria

10:00 **Galvanostatic and potentiostatic operation of real landfill gas fueled SOFCs (B1305)**
Hendrik Langnickel, Christopher Graves, Anke Hagen;
Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde/Denmark

10:15	**Kinetic modelling of catalytic reactions in solid oxide cells operating under pressure in co-electrolysis mode (A1306)** Pauline Thibaudeau (1,2), Anne-Cécile Roger (2), Sébastien Thomas (2), Marie Petitjean (1), Guilhem Roux (1); (1) CEA/Liten-Université de Grenoble Alpes, Grenoble/France, (2) ICPEES UMR 7515 CNRS-Université de Strasbourg, Strasbourg/France	10:15	**Long-term testing of SOFC and preliminary findings on accelerated testing (B1306)** Ludger Blum (1), Qingping Fang (1), Sonja M. Groß-Barsnick (2), L.G.J. (Bert) de Haart (1), Norbert H. Menzler (1), Willem J. Quadakkers (1); (1) Institute of Energy and Climate Research, (2) Central Institute of Engineering, Electronics and Analytics, Forschungszentrum Jülich GmbH, Jülich/Germany
10:30	**Break – Ground Floor in the Exhibition**		

Morning

Friday, July 6, 2018

Morning

A14 Luzerner Saal

S-Chair: Jari Kiviaho, Christian Walter

11:00 Stack and system modelling (A14)

11:00 A predictive degradation model for SOFC-cells and stacks (A1401)
Sebastian Dierickx, André Weber, Ellen Ivers-Tiffée;
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

11:15 Computational efficient 3D multiphysics models to estimate the long-term mechanical behavior of SOC stacks (A1402)
Henrik Lund Frandsen, Maria Navasa, Tesfaye Tadesse Molla, Peter Vang Hendriksen;
Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde/Denmark

11:30 Thermo-mechanical reliability of SOFC stacks: impact of component tolerances and operating conditions (A1403)
Fabio Greco (1), Arata Nakajo (1), Zacharie Wuillemin (2), Jan Van herle (1);
(1) GEM Group, Institute of Mechanical Engineering, Faculty of Engineering Sciences and Technology, EPFL Valais Wallis, Sion/Switzerland, (2) SOLIDpower-HTceramix, Yverdon-les Bains/Switzerland

B14 Auditorium

S-Chair: Eric D. Wachsman, Katherine Develos-Bagarinao

11:00 Understanding lifetime at different levels - air electrodes (B14)

11:00 Performance and durability of SOFC cathodes - effects of sulfur dioxide (B1401)
J. Szász (1), C. Endler-Schuck (1), H. Störmer (2), D. Gerthsen (2), E. Ivers-Tiffée (1);
(1) Institute for Applied Materials (IAM-WET), (2) Laboratory for Electron Microscopy (LEM), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

11:15 Degradation of $La_{0.6}Sr_{0.4}CoO_{3-\delta}$ electrodes in humid atmospheres: effect of microstructure (B1402)
Andreas Egger (1), Martin Perz (1), Edith Bucher (1), Christian Gspan (2), Werner Sitte (1);
(1) Montanuniversitaet Leoben, Chair of Physical Chemistry, Leoben/Austria, (2) Institute for Electron Microscopy and Nanoanalysis (FELMI), Graz University of Technology & Graz Centre for Electron Microscopy (ZFE), Graz/Austria

11:30 Durability studies of microtubular solid oxide fuel cell electrolysers using praseodymium nickelate electrodes (B1403)
Miguel A. Laguna-Bercero (1), Miguel Morales (2), Angel Larrea (1);
(1) Instituto de Ciencia de Materiales de Aragón, Universidad de Zaragoza-CSIC, Zaragoza/Spain,
(2) Universidad Tecnológica de Panamá, Ancón/Panamá

11:45	**Numerical investigation of the thermomechanical behaviour of sealing joints within high-temperature SOFC stacks (A1404)** Sophia Bremm (1), Sebastian Dölling (1), Wilfried Becker (1), Ludger Blum (2), Roland Peters (2), Jürgen Malzbender (2), Detlef Stolten (2); (1) Technische Universität Darmstadt, Fachgebiet Struktur-mechanik, Darmstadt/Germany, (2) Forschungszentrum Jülich GmbH, Jülich/Germany	11:45	**Oxygen exchange kinetics of SOFC and SOEC air electrodes affected by long-term changes of surface composition (B1404)** Edith Bucher (1), Christian Berger (1), Martin Perz (1), Andreas Egger (1), Nina Schrödl (1), Christian Gspan (2), Werner Sitte (1); (1) Montanuniversitaet Leoben, Leoben/Austria, (2) Institute for Electron Microscopy and Nanoanalysis (FELMI), Graz University of Technology & Graz Centre for Electron Microscopy (ZFE), Graz/Austria
12:00	**Dynamic Characteristics of Solid Oxide Fuel Cells under Electrical Load Change (A1405)** Jongsup Hong (1), Yonggyun Bae (1,2), Sanghyeok Lee (2), Jun-Young Park (3), Insung Lee (4), Kyung Joong Yoon (2), Jong-Ho Lee (2); (1) Yonsei University, Seoul/South Korea, (2) Korea Institute of Science and Technology (KIST), (3) Sejong University, Seoul/South Korea, (4) Research Institute of Industrial Science & Technology (RIST), Seoul/South Korea, Incheon/South Korea	12:00	**Influence of Electrode Reaction on Cr-poisoning in SOFC MIEC Cathodes (B1405)** Shota Kageyama, Yusuke Shindo, Yoshinobu Fujimaki, Keita Mizuno, Yuta Kimura, Takashi Nakamura, Fumitada Iguchi, Keiji Yashiro, Hiroo Yugami, Tatsuya Kawada, Koji Amezawa; Tohoku University, Sendai/Japan
12:15	**Dynamic and steady state analysis of a power to methane system using a commercial solid oxide cell (SOC) electrochemical reactor (A1406)** S. Santhanam, M. P. Heddrich, K. A. Friedrich; German Aerospace Center (DLR), Stuttgart/Germany	12:15	**Sulfur poisoning behavior of $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ thin film cathodes at low sulfur concentration (B1406)** Jeffrey C. De Vero (1), Katherine Develos-Bagarinao (1), Shu Sheng Liu (1), Haruo Kishimoto (1), Tomohiro Ishi-yama (1), Katsuhiko Yamaji (1)Teruhisa Horita (1), Harumi Yokokawa (1,2); (1) National Institute of Advanced Industrial Science and Technology, Ibaraki/Japan, (2) Institute of Industrial Science, The University of Tokyo, Tokyo/Japan
12:30	**Lunch & Coffee – 2nd Floor on the Terrace**		

Afternoon

Friday, July 6, 2018

Afternoon

A15	Luzerner Saal	S-Chair: Koichi Eguchi, Anke Hagen	B15	Auditorium	S-Chair: Rainer Küngas, Julie Mougin
13:30	**Cell and Stack design & characterisation (A15)**		**13:30**	**Understanding lifetime at different levels – electrolysis (B15)**	
13:30	**Development of a compact 5kWe Ceres Power ‚SteelCell' stack for multiple applications (A1501)** Robert Leah, Adam Bone, Lee Rees, Andrew Ballard, Tomasz Domanski, Chris Nobbs, Nick Lawrence, Joshua Ryley, Subhasish Mukerjee, Mark Selby; Ceres Power Ltd, Horsham/UK		13:30	**CO_2 electrolysis - how gas purity and over-potential affect detrimental carbon deposition (B1501)** A. Hauch (1), T. L. Skafte (1), R. Küngas (2), M.L.Traulsen (1), S. H. Jensen (1); (1) Dept. for Energy Storage and Conversion, Technical University of Denmark, Roskilde/Denmark, (2) Dept. Sustainable Solutions, Haldor Topsoe A/S, Lyngby/Denmark	

13:45	**Development of Ammonia-fueled Solid Oxide Fuel Cell Systems (A1502)** Koichi Eguchi (1), Yosuke Takahashi (2), Hayahide Yamasaki (3), Hidehito Kubo (4), Akihiro Okabe (5), Takenori Isomura (6), Takahiro Matsuo (7); (1) Kyoto University, Kyoto/Japan, (2) Noritake Company Ltd., Nagoya/Japan, (3) Nippon Shokubai, Osaka/Japan, (4) Toyota Industries, Aichi/Japan, (5) Mitsui Chemical, Tokyo/Japan, (6) Tokuyama, Tokyo/Japan, (7) IHI, Tokyo/Japan	13:45	**Long-term steam electrolysis at solid oxide cells operated close to the thermal neutral voltage (B1502)** Annabelle Brisse, Josef Schefold; European Institute for Energy Research (EIFER), Karlsruhe/Germany
14:00	**Performance Improvement by Process Development of Plansee MSCs (A1503)** Cornelia Bischof (1), Lukas Martetschläger (1), Andre Gladbach (1), Stephan Hummel (1), Andreas Malleier (1), Wolfgang Schafbauer (1), Martin Bram (2,3), Lorenz Sigl (1); (1) Plansee SE, Reutte/Austria, (2) Forschungszentrum Jülich, Jülich/Germany, (3) Christian Doppler Laboratory for Interfaces in Metal-Supported Electrochemical Energy Converters, Jülich/Germany	14:00	**Increasing the lifetime of stacks in CO_2 electrolysis (B1503)** Rainer Küngas, Peter Blennow, Thomas Heiredal-Clausen, Tobias Holt Nørby, Jeppe Rass-Hansen, Poul Georg Moses; Haldor Topsoe A/S, Lyngby/Denmark
14:15	**Electrochemical characterisation of LSCF-CGO and SSC-SDC infiltrated mesoporous oxygen electrodes for SOEC under co-electrolysis (A1504)** Lucile Bernadet, Elba Hernández, Isabel Guevara, Marc Torrell, Albert Tarancón; Catalonia Institute for Energy Research (IREC), Department of Advanced Materials for Energy, Barcelona/Spain	14:15	**Performance and Durability of a 10 layer SOE Stack operated under pressurized conditions (B1504)** Marc Riedel, Marc P. Heddrich, K. Andreas Friedrich; German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Stuttgart/Germany
14:30	**Modified energy efficiencies of proton-conducting SOFCs with partial conductions of oxide -ions and holes (A1505)** Yoshio Matsuzaki (1,2), Yuya Tachikawa (2), Koki Sato (1), Takaaki Somekawa (1), Junichiro Otomo (3), Hiroshige Matsumoto (2), Shunsuke Taniguchi (2), Kazunari Sasaki (2); (1) Tokyo Gas Co., Ltd., Kanagawa/Japan, (2) Kyushu University, Fukuoka/Japan, (3) The University of Tokyo, Chiba/Japan	14:30	**Degradation and lifetime analysis of SOEC stacks (B1505)** Qingping Fang, Yulin Yan, Ludger Blum; Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Jülich/Germany
14:45	**Improving SOEC cell and stack performance via post- firing/post-assembly infiltration (A1506)** Peter Vang Hendriksen, Xiaofeng Tong, Ming Chen, Simona Ovtar, Henrik Lund Frandsen and Wolff-Ragnar Kiebach; Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde/Denmark	14:45	**Post-mortem analysis of a 25-cell solid oxide electrolysis stack operated for 9000 hours (B1506)** Ming Chen (1), Rainer Küngas (2), Janet Jonna Bentzen (1), Sebastian Molin (1), Peter Blennow (2), Kion Norrman (1); (1) Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde/Denmark, (2) Haldor Topsoe A/S, Lyngby/Denmark
15:00	**5 Min to change from B15 Session to Luzerner Saal for A16 Plenary Session**		

Afternoon

Friday, July 6, 2018

A16	Luzerner Saal	S-Chair: Ellen Ivers-Tiffée, André Weber, O. Bucheli, M. Spirig
15:05	**P4: Closing Ceremony with Keynote by the Gold Medal of Honour Winner 2018 (A16)**	
15:05	**Summary by the Chairs (A1601)** Ellen Ivers-Tiffée, André Weber; Karlsruher Institut für Technologie (KIT), Karlsruhe/Germany	
15:20	**Information on Next EFCF:** **2019: 7th European low-temperature FUEL CELLS, ELECTROLYSERS & H2 PROCESSING Forum** **2020: 14th European SOFC, SOE & SOMR Forum and other Events: SSI-22 (A1602)** Michael Spirig (1), Olivier Bucheli (1), Anke Hagen (2), Peter Vang Hendriksen (2), Jongsup Hong (3); (1) European Fuel Cell Forum, Luzern/Switzerland, (2) DTU Energy, Roskilde/Denmark, (3) Yonsei University, Seoul/South Korea	
15:30	**Christian Friedrich Schönbein Award 2018 for the Best Poster (Bronze), the Best Science Contribution (Silver) and a recognized Lifetime Work (Gold) (A1603)** Ellen Ivers-Tiffée (1), André Weber (1), Olivier Bucheli (2), Michael Spirig (2); (1) Karlsruher Institut für Technologie (KIT), Karlsruhe/Germany, (2) European Fuel Cell Forum, Luzern/Switzerland	
15:40	**Gold Medal Winner Keynote 2018** **Thermodynamic stability of Perovskite oxygen electrode in interactions with YSZ, GDC or gaseous Impurities in air (A1604)** Harumi Yokokawa; Institute of Industrial Science, The University of Tokyo, Tokyo/Japan	
16:05	**Thank you and Closing by the Organizers (A1605)** Olivier Bucheli, Michael Spirig; European Fuel Cell Forum, Luzern/Switzerland	
16:15	**End of Sessions – End of Conference / Good bye coffee and travel refreshment in front of the Luzerner Saal**	

A4 Poster Session I (with all Session Topics) — Wednesday, 4 July 2018 — Afternoon 13:15 – 15:00
A10 Poster Session II (with all Session Topics) — Thursday, 5 July 2018 — Afternoon 13:15 – 15:00

Status of industry and major groups I + II — A03 + A05

Metal-Supported SOFCs for Rapid-Start and Transient Response Applications (A0307)
Michael C. Tucker, Emir Dogdibegovic, Ruofan Wang;
Energy Conversion Group, Lawrence Berkeley National Laboratory, California/USA

Commercialisation prospects for SOFCs in the EU (A0308)
Arjen de Jong (1), Tuomas Hakala (2), Stephen McPhail (3);
(1) Blueterra BV, Veenendaal/Netherlands, (2) Convion, Espoo/Finland, (3) ENEA, Rome/Italy

Technical Approaches for SOFC commercialization at MiCo (A0309)
Songho Choi(1), Jinah Park(1), Junwoo Lee(1), Minjae Lee(1), Youngil Kim(1), Young Duk Lee(2), Kook Young Ahn(2), Han Ho Song(3); (1) MiCoPower Division, MiCo Ltd., Gyeonggi/Korea, (2) Fuel Cell Hybrid Research Center, Korea Institute of Machinery & Materials, Daejeon/Republic of Korea, (3) Department of Mechanical Engineering, Seoul National University, Seoul/Republic of Korea

Product presentation and demonstration — A06

How rSOC technology enables the development of new energy services for buildings and the energy transition (A0607)
Nicolas Bardi, Caroline Rozain, Marc Potron; Sylfen, SAS., Grenoble/France

Status on demonstration of fuel cell based micro-CHP units in Europe (A0609)
Eva Ravn Nielsen (1), Carsten Brorson Prag (1), Till M. Bachmann (2), Federica Carnicelli (2), Edward Boyd (3), Ian Walker (3), Lisa Ruf (3), Aled Stephens (4);
(1) Technical University of Denmark, Department of Energy Conversion and Storage, Roskilde/Denmark, (2) EIFER (European Institute For Energy Research), Karlsruhe/Germany, (3) Element Energy, London/United Kingdom, (4) Energy Saving Trust, London/United Kingdom

Advanced characterisation techniques I — B03

Performance of LSM-YSZ cathodes in an inert-supported and co-sintered SOFC design (B0307)
F. Wankmüller (1), J. Szász (1), M. Meffert (2), H. Störmer (2), J. Schmieg (2), P. Lupetin (3), D. Gerthsen (2), E. Ivers-Tiffée (1);
(1) Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany, (2) Laboratory for Electron Microscopy (LEM), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany, (3) Robert Bosch GmbH, Renningen/Germany

Application of Distribution of Relaxation Times (DRT) Analysis to Microtubular SOFCs (B0308)
Hirofumi Sumi;
National Institute of Advanced Industrial Science and Technology (AIST), Nagoya/Japan

State of the art and novel manufacturing I — B05

(B0507 see B0502)

SLA-3D Printed Electrolytes for Solid Oxide Fuel Cells (B0508)
Lorena Hernández-Afonso (1), Jesús Canales-Vázquez (2), Albert Tarancón Rubio (3,4), Pedro Esparza Ferrera (1);
(1) University of La Laguna, San Cristóbal de La Laguna, Canary Island/Spain,
(2) University of Castilla-La Mancha, Albacete/Spain,
(3) Catalonia Institute for Energy Research (IREC), Barcelona/Spain,
(4) ICREA, 23 Passeig Lluís Companys, Barcelona/Spain

Demonstration Kit for Simple SOFC Experiments at Institutions of Higher Learning (A0611)
Ulf Bossel; ALMUS AG, Oberrohrdorf/Switzerland

eCOs - a Commercial CO_2 Electrolysis System Developed by Haldor Topsoe (A0612)
Rainer Küngas, Peter Blennow, Thomas Heiredal-Clausen, Tobias Holt Nørby, Jeppe Rass-Hansen, Poul Georg Moses; Haldor Topsoe A/S, Lyngby/Denmark

Balance of plant components A08

Effect of Alloy Composition on the Oxidation Behavior and Cr Evaporation of High-Cr Steels for SOFC cathode Air Preheater (A0807)
Kun Zhang (1), Jong-Eun Hong (2), Robert Steinberger-Wilckens (1);
(1) Fuel Cell Research Group, School of Chemical Engineering, University of Birmingham, Birmingham/UK,
(2) Fuel Cell Laboratory, Korea Insititute Research, Daejeon/Korea

Alternative catalysts for the high-temperature H_2O/CO_2 co-electrolysis to syngas (A0808)
Nicky Bogolowski, Beatriz Sánchez Batalla, Jean-Francois Drillet;
Dechema-Forschungsinstitut, Frankfurt a.M./Germany

Nickel-molybdenum catalyst for biogas combined steam/dry reforming (A0809)
Artur J Majewski, Robert Steinberger-Wilckens;
School of Chemical Engineering, College of Engineering and Physical Sciences, University of Birmingham, Edgbaston/UK

Optimization Study on the Design and the Operation of Plasma Reformer (A0810)
Hyoungwoon Song, Jonghyuk Yoon, Youngbae Kim, Eunju Kim;
Plant Engineering Center, Institute for Advanced Engineering, Gyeonggi-do/Korea

Experimental study for thermal performance of oscillating flow inside an asymmetric micro pulsating heat exchanger (A0811)
Young Bae Kim, Eunju Kim, Jonghyuk Yoon, Hyoung Woon Song;
Plant Engineering Center, Institute for Advanced Engineering, Gyeonggi-do/Korea

Investigation of combustion characteristics in an afterburner for SOFC systems by numerical simulations (A0812)
Shing-Cheng Chang, Cheng-Hao Yang, Chien-Chang Hung, Heng-Ju Lin, Chun-Han Li, Wen-Sheng Chang;
Green Energy & Environment Research Laboratories, Industrial Technology Research Institute, Tainan City/Taiwan, R.O.C.

Tailoring SOFC electrode microstructures for improved performance (B0509)
Paul A. Connor (1), Xingling. Yue (1), Cristian D. Savaniu (1), Robert Price (1), Georgios Triantafyllou (1), Mark Cassidy (1), Gwilherm Kerherve (2), David J. Payne (2), Robert C. Maher (3), Lesley F. Cohen (3), Rumen I. Tomov (4), Bartek A. Glowacki (4), R.Vasant Kumar (4), John T.S. Irvine (1);
(1) School of Chemistry, University of St Andrews, St Andrews Fife/UK, (2) Department of Materials, Imperial College London, (3) The Blackett Laboratory, Imperial College London, London/UK, (4) Department of Materials Science and Metallurgy, University of Cambridge, Cambridge/UK

Protective coatings for SOFC SOEC interconnects: Impact of fabrication technique on electrical conductivity (B0510)
Di Iorio Stephane (1), Piquero Thierry (1), Sova Aleksey (2), Rafal Tomaszek (3);
(1) CEA/LITEN, Grenoble/France,
(2) University of Lyon, ENISE, ECL, LTDS Labotatory, Saint-Etienne/France,
(3) FST Flame Spray Technologies, Duiven/Netherlands

Effects of Nanoscale PEALD YSZ Interlayer for AAO based Thin Film Solid Oxide Fuel Cells (B0511)
Wonjong Yu, Gu Young Cho, Yoon Ho Lee, Yeageun Lee, Yusung Kim, Sanghoon Lee, Seung Hwan Ko, Suk Won Cha; Department of Mechanical Engineering and Aerospace Engineering, Seoul National University, Seoul/Korea

Microtubular fuel cell electrolysers using impregnation of praseodymium and manganese oxides (B0512)
Alodia Orera, Jorge Silva, Miguel A. Laguna-Bercero;
Instituto de Ciencia de Materiales de Aragón, Universidad de Zaragoza-CSIC, Zaragoza/Spain

Internal reforming of hydrocarbon fuel in thin-film-based SOFC at low-temperature range (≤ 650 °C) (B0513)
Cam-Anh Thieu (1,2), Ho-Il Ji (1), Kyung Joong Yoon (1), Jong-Ho Lee (1,2), Ji-Won Son (1,2);
(1) High-temperature Energy Materials Research Center, KIST, Seoul/Korea,
(2) Div. Nano & Information Tech., KIST School, UST, Seoul/Korea

Molten salt synthesis of $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.75}Nb_{0.05}O_{3-\delta}$ for symmetric solid oxide fuel cells (B0514)
Chengzhi Guan (1,2), Qing Liu (1), Cheng Peng (1), Guoping Xiao (1), Jian-Qiang Wang (1), Zhiyuan Zhu (1);
(1) Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai/China,
(2) University of Chinese Academy of Sciences, Beijing/China

Surface modification of SUS-430 alloys for SOFC interconnect application (B0515)
Hamid Abdoli (1), Morteza Torabi (1), Mohammad Ali Faghihi Sani (2);
(1) Renewable Energy Department, Niroo Research Institute (NRI), Tehran/Iran,
(2) Department of Materials Science and Engineering, Sharif University of Technology, Tehran/Iran

Dry-reforming catalysts for utilization of biogas in SOFCs: experimental characterisation of new materials (A0813)
A. Baldinelli (1), L. Barelli (1), G. Bidini (1), A. Di Michele (2), F. Gallorini (3), F. Mondi (1), E. Sisani (1);
(1) Università degli Studi di Perugia - Department of Engineering, Perugia/Italy,
(2) Università degli Studi di Perugia - Department of Physics and Geology, Perugia/Italy, (3) VGA srl, Deruta/Italy

New Class of Materials for Desulfurization Desulfurization and Purification of Natural Gas, LPG and Biogas Feedstocks (A0814)
Gokhan Alptekin;
SulfaTrap LLC, Colorado/United States

Solid Oxide Technologies in P2X and chemical processing applications A09

Progress of the European Project Efficient Co-Electrolyser for Efficient Renewable Energy Storage - Eco (A0907)
Anke Hagen (1), Marie Petitjean (2), Jan van Herle (3), Julian Dailly (4), Marc Torell (5), Stefan Diethelm (6), Frederic Mercier (7), Jacobo Rubio Fernandez (8), Marco Duarte Lindemann Lino (9);
(1) DTU Energy, Roskilde/Denmark, (2) CEA, Grenoble/France, (3) EPFL, Valais/Switzerland,
(4) EIFER, Karlsruhe/Germany, (5) IREC, Barcelona/Spain, (6) Htceramix SA, Yverdon/Switzerland,
(7) ENGIE-Laborelec, Linkebeek/Belgium, (8) Enagas, Barcelona/Spain, (9) VdZ, Düsseldorf/Germany

Proton-conducting solid oxide electrolytic cell with a scaffold-structure cathode to synthesize ammonia (A0908)
Kangyong Lee (1), Seungjin Jung (2), Woochul Jung (2), Joongmyeon Bae (1);
(1) Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, (2) Department of Material Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon/Korea

Chemical performance of SOEC stacks for syngas production and diagnostic tools for SOEC systems (A0909)
Dominik Schäfer, Qingping Fang, Ludger Blum;
Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research, Jülich/Germany

Co-electrolysis: a theoretical foundation (A0911)
Markus Nohl (1), Severin Foit (1), I. C. Vinke (1), R.A. Eichel (1,2), L. G. J. de Haart (1);
(1) Institute of Energy and Climate Research, Fundamental Electrochemistry (IEK-9),
Forschungszentrum Jülich GmbH., Jülich/Germany,
(2) Institute of Physical Chemistry, RWTH Aachen University, Aachen/Germany

Cobalt Manganese based coatings via inkjet printing for metallic interconnect in Solid Oxide Cell applications (B0516)
Simone Anelli (1), Mari Carmen Monterde (2), Miguel Morales (1), Isabel Guevara (1), Marc Torrell (1), José Antonio Calero (2), Albert Tarancón (1);
(1) IREC, Catalonia Institute for Energy Research, Dept. Advanced Materials for Energy, Barcelona/Spain,
(2) AMES, Barcelona/Spain

Fabrication of Proton conducting Ceramic membranes for the production of Ammonia (B0517)
Narendar Nasani (1,2), Zac Dehaney-Steven (2), Lauren Sammes (2), John TS Irvine (1);
(1) School of Chemistry, University of St Andrews, , Fife/UK, (2) Low Emissions Resources Corporation, New York/USA

Carbon Formation Studies in Composite Anodes containing YSZ for Direct Hydrocarbon SOFC (B0518)
Mohamed Shahid, Suddhasatwa Basu;
Department of Chemical Engineering, Indian Institute of Technology Delhi, Hauz Khas/India

Study of constraints of NiO-GDC/GDC/LSCF-GDC manufactured by tape casting and reactive magnetron sputtering processes of solid oxide fuel cells (B0519)
C.I. Hernandez Londoño (1), L. Combemale (2), A. Billard (1);
(1) Femto-ST, 4FEMTO-ST (UMR CNRS 6174), Energy Department,
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Advanced characterisation techniques II B06

LST-CGO anodes: deconvolution of impedance spectra and relationship with composition and microstructure (B0607)
Dariusz Burnat (1), Lorenz Holzer (2), Gunnar Nurk (3), Andre Heel (1);
(1) IMPE - Institute for Materials and Process Engineering, Zurich University of Applied Sciences,
(2) ICP - Institute for Computational Physics, ZHAW - Zurich University of Applied Sciences, Winterthur/Switzerland,
(3) University of Tartu, Institute of Chemistry, Tartu/Estonia

Testing novel nickel and cobalt infiltrated STN anodes for carbon tolerance using in situ Raman spectroscopy and electrochemical impedance spectroscopy (B0608)
Daniel Bøgh Drasbæk (1), Marie Lund Traulsen (1), Robert Walker (2), Peter Holtappels (1);
(1) Department of Energy Conversion and Storage, Technical University of Denmark, DTU, Roskilde/Denmark,
(2) Walker Research Group, Montana State University, Montana/USA

Monitoring a commercial µ-CHP SOFC-Stack by electrochemical impedance spectroscopy (B0609)
Tobias Herrmann, Marius Dillig, Jürgen Karl; EVT, University of Erlangen-Nuremberg, Nürnberg/Germany

Integration of a SOFC in the valorization of alcoholic wastes for the sustainable generation of electricity – Life Ecoelectricity Project (A0912)
Rubén Beneito, Juan Carratalá, Adrián Alfonso, Julián Fortes, Verónica Benavente;
Energy Area, Management and Innovation Department, AIJU Technological Center, Ibi (Alicante)/Spain

All-embracing analysis of a solid oxide cell stack operating in co-electrolysis mode (A0913)
Marco Graziadio (1,2), Alessandro Cavalli (3), Carlos Boigues Munoz (1), Stephen J. McPhail (1), Maurizio Carlini (2);
(1) Engineering Faculty, University of Tuscia, Viterbo/Italy, (2) DTE-PCU-SPCT, ENEA, Rome/Italy,
(3) Process and Energy Laboratory, TU DELFT, Delft/Netherlands

Performance Characteristics of Flat-Tubular Solid Oxide Co-electrolysis Cells for Syngas Production by Electrochemical Conversion of H_2O/CO_2 (A0914)
Tak-Hyoung Lim, Dong-Young Lee, Jong-Eun Hong, Seung-Bok Lee, Rak-Hyun Song;
Fuel Cell Laboratory, Korea Institute of Energy Research, Daejeon/South Korea

Solid Oxide Cell Technology for Power-to-Gas and Energy Storage Application (A0915)
Günter Schiller, Rémi Costa, Michael Lang;
Deutsches Zentrum für Luft- und Raumfahrt (DLR), Institut für Technische Thermodynamik, Stuttgart/Germany

System performance A11

Analysis of 5 kW solid oxide fuel cell systems with optimal BOP configurations and performances (A1107)
Cheng-Hao Yang, Heng-Ju Lin, Shing-Cheng Chang, Chun-Han Li, Wen-Sheng Chang;
Green Energy & Environment Research Laboratories, Industrial Technology Research Institute, Tainan City/Taiwan, R.O.C.

Strategies and challenges for transient operation of reversible Solid Oxide Cell (rSOC) electrochemical reactor systems (A1108)
S. Santhanam, M. P. Heddrich, K. A Friedrich; German Aerospace Center (DLR), Stuttgart/Germany

Development of unsteady state damage models for H_2S-contaminated SOFCs (A1109)
Abdolkarim Sheikhansari, Jonathan Paragreen, Simon Blakey;
Department of Mechanical Engineering, University of Sheffield, Sheffield/UK

Biogas-fed SOFC: Performance Investigation with Variable CH_4/CO_2 Composition (A1110)
Hossein Madi, Stefan Diethelm, David Constantin, Jan Van herle;
Group of Energy Materials (GEM), Faculty of Engineering Sciences (STI), Ecole Polytechnique Fédérale de Lausanne (EPFL), Sion/Switzerland

Characterisation of Glass-Ceramic Sealants by Electrochemical Impedance Spectroscopy (B0610)
Roberto Spotorno, Marlena Ostrowska, Paolo Piccardo;
Università degli Studi di Genova, Dipartimento di Chimica e Chimica Industriale (DCCI), Genova/Italy

SOFC characterisation based on using an algebraic fractional-order identification approach (B0611)
Boštjan Dolenc (1), Gjorgji Nusev (1,2), Vanja Subotić (3), Christoph Hochenauer (3), Nicole Gehring (4), Dani Juricic (1), Pavle Boškoski (1); (1) Jožef Stefan Institute, Ljubljana/Slovenia, (2) Jožef Stefan International Postgraduate School, Ljubljana/Slovenia, (3) Institute of Thermal Engineering, Graz University of Technology, Graz/Austria, (4) Johannes Kepler University Linz, Linz/Austria

Operando high temperature x-ray diffraction and electrochemical impedance study of $Sr_2Fe_{1.5}Mo_{0.5}O_{6-d}$ properties (B0612)
Ove Korjus (1), Kadi Lillmaa (1), Jaan Aruväli (2), Enn Lust (1), Gunnar Nurk (1); (1) Institute of Chemistry, University of Tartu, Tartu/Estonia, (2) Institute of Ecology and Earth Sciences, University of Tartu, Tartu/Estonia

Identification of disturbances in SOFC operation and prediction of cell degradation (B0613)
Vanja Subotić (1), Đani Juričić (2), Bernhard Stoeckl (1), Boštjan Dolenc (2), Pavle Boškoski (2), Michael Preininger (1), Gjorgij Nusev (2), Norbert H. Menzler (3), Hartmuth Schroettner (4), Christoph Hochenauer (1);
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Electrochemical Characterisation of Solid Oxide Fuel Cells through Patterned Electrodes (B0614)
Sanghoon Lee (1), Ikwhang Chang (2), Meilin Liu (3), Seung Hwan Ko (1), Suk Won Cha (1,4);
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(2) Department of Automotive Engineering, Wonkwang University, Jeonbuk/Korea,
(3) School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia/USA,
(4) Institute of Advanced Machines and Design, Seoul National University, Seoul/Korea

Quantitative Analysis of LSCF and LSM-YSZ Cathode Microstructure by FIB/SEM Tomography (B0615)
F. Wankmüller, J. Joos, E. Ivers-Tiffée;
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

Development of technology for improving the durability of the hydrogen electrode in Solid oxide electrolyzer cells(SOECs) (B0616)
Min Jin Lee, Jae Hwa Shin, Hae Jin Hwang; Materials Science and Engineering, Inha University, Incheon/Korea

Application of X in the loop in Automotive Fuel Cell System Test (B0617)
Peiqi Wang, Huicui Chen, Fengxiang Chen, Peng Yu, Tong Zhang;
Clean Energy Automobile Engineering Center, School of Automotive Studies, Tongji University, Shanghai/China

Transfer of established PEM-FC Cathode air filters to SOFC (A1111)
Stefan Diersch; MANN+HUMMEL Innenraumfilter GmbH & Co. KG, Himmelkron/Germany

Cu-Mn foam as air side contact layer – interface adhesion and area specific resistance after aging (A1112)
Belma Talic, Li Han, Philipp Zielke, Anders Christian Wulff, Peter Vang Hendriksen, Henrik Lund Frandsen;
Department of Energy Conversion and Storage, Technical University of Denmark, Roskilde/Denmark

Design of systems A12

(A1207 see A1204)

Proof of concept for rSOC systems (A1208)
Dr. Richard Schauperl, Dr. David Reichholf, Franz Koberg, Dr. Jürgen Rechberger; AVL List GmbH, Graz/Austria

Influence of heat transfer on operation of a solid oxide fuel cell/gas turbine hybrid demonstrator (A1209)
Marc P. Heddrich, Mike Steilen, Marius Tomberg, K. Andreas Friedrich;
German Aerospace Center (DLR), Institute of Engineering Thermodynamics, Stuttgart/Germany

Development of an SOFC Power Generation System using Carbon-Neutral Biogas (A1210)
Kimito Kawamura (1,2), Kenichiro Takeda (1), Toshihiro Oshima (2), Tsutomu Kawabata (2), Shunsuke Taniguchi (2), Tomomasa Kanda (1), Kazunari Sasaki (2);
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(2) Kyushu University, Next-Generation Fuel Cell Research Center, Fukuoka-shi/Fukuoka, Japan

Solid oxide electrolyzer devices using proton and oxide-ion conducting electrolyte (A1211)
Yuya Tachikawa (1,2), Yoshio Matsuzaki (2,3,4), Takaaki Somekawa (2,3), Koki Sato(2,3), Shunsuke Taniguchi (2,4,5), Kazunari Sasaki (1,2,4,5,6); (1) Faculty of Engineering, Kyushu University, Fukuoka/Japan, (2) Center for Co-Evolutional Social Systems (CESS), Kyushu University, Fukuoka/Japan, (3) Fundamental Technology Department, Tokyo Gas Co. Ltd., Kanagawa/Japan, (4) Next-Generation Fuel Cell Research Center (NEXT-FC), Kyushu University, Fukuoka/Japan, (5) International Research Center for Hydrogen Energy, Kyushu University, Fukuoka/Japan,
(6) International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Fukuoka/Japan

Electrode and cell modelling A13

Model assisted identification of DRT peaks for different cell configurations by varying operating conditions (A1307)
Priscilla Caliandro, Arata Nakajo, Stefan Diethelm, Jan Van herle;
Group of Energy Materials (GEM), École Polytechnique Fédérale de Lausanne, Lausanne/Switzerland

State of the art and novel manufacturing II B08

(B0807 see B0801)

Kinetic investigation of co-sintered LSM/YSZ solid oxide cell oxygen electrodes (B0808)
Jean-Claude Njodzefon, Yingjing Zheng, Eric Matte, Piero Lupetin;
Robert Bosch GmbH, Renningen/Germany

Mass-manufacturing and quality assurance of SOFC stacks in FCH JU projects qSOFC and INNO-SOFC (B0809)
Markus Rautanen (1), Olli Himanen (1), Jyrki Mikkola (1), Johan Tallgren (1), Enn Õunpuu (2), Sergii Pylypko (2), Matti Noponen (3), Paul Hallanoro (3), Jukka Göös (3), Anton Litke (4), Roderik Höppener (4), Simon Hailer (5), Uwe Maier (5), Robert Berger (6), Stephen McPhail (7), Lars Steckkönig (8);
(1) VTT Technical Research Centre of Finland, VTT/Finland, (2) Elcogen AS, Tallinn/Estonia, (3) Elcogen Oy, Vantaa/Finland, (4) Haiku Tech, Maastricht/Netherlands, (5) ElringKlinger AG, Dettingen an der Erms/Germany,
(6) Sandvik Materials Technology AB, Sandviken/Sweden, (7) Agenzia Nazionale per le Nuove Technologie, L'Energia e lo Sviluppo Economico, Roma/Italy, (8) MüKo Maschinenbau GmbH, Weinstadt/Germany

State of the art and novel materials B09

Performance and stability of doped phase-stabilized $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ as IT-SOFC cathode under different ambient conditions (B0907)
L. Almar (1), J. Szász (1), H. Störmer (2), D. Gerthsen (2), E. Ivers-Tiffée (1); (1) Institute for Applied Materials (IAM-WET), (2) Laboratory for Electron Microscopy (LEM), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

Copper-containing fuel electrodes for solid oxide electrolysis cells (B0909)
Carolin E. Frey, Nikolas Grünwald, Norbert H. Menzler, Olivier Guillon;
Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research (IEK), IEK-1: Materials Synthesis and Processing, Jülich/Germany

La2NiO4+δ / (Ce,Pr)O2 based Efficient Composite Oxygen Electrodes for Solid Oxide Electrolysis Cells (B0910)
V. Vibhu (1), A. Flura (3), S. Foit (1), K. Schiemann (1), I.C. Vinke (1), R.A Eichel (1,2), J.M. Bassat (3), L.G.J. de Haart (1);
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Spatial dependence of carbon deposition in Solid Oxide Fuel Cells: Chemical equilibria and kinetics (A1308)
J.N. Stam, P.V. Aravind; Process & Energy Department, Delft University of Technology, Delft/Netherlands

Material-, cell evaluation and simulation to improve mechanical reliability of SOFCs (A1309)
Keiji Yashiro (1), Mayu Muramatsu (1), Satoshi Watanabe (1), Tadashi Sakamoto (1), Kenjiro Terada (2), Masami Sato (2), Toshiyuki Hashida (3), Kazuhisa Sato (3), Fumitada Iguchi (3), Hiroo Yugami (3), Koji Amezawa (4), Takashi Nakamura (4), Yuta Kimura (4) and Tatsuya Kawada (1);
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Model-system supported impedance simulation of composite electrodes (A1312)
Alexander K. Opitz (1,2), Matthias Gerstl (1,2) Martin Bram (1,3);
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Process optimization of a SOFC system for the combined production of hydrogen and electricity (A1313)
M. Pérez-Fortes (1), A. Mian (1), S. Diethelm (1), L. Wang (1), J. Van herle (1), S. Santhanam (2), M.P. Heddrich (2), S.F. Au (3), E. Varkaraki (3), R. Makkus (4), I. Mirabelli (4), R. Schoon (5), M. Testi (6), L. Crema (6);
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BioCORE - Thermodynamic evaluation of biogas powered reversible SOC system (A1314)
Stephan Herrmann (1), Michael Geis (1), Maximilian Hauck (1), Felix Fischer (1), Sebastian Fendt (1), Matthias Gaderer (2), Hartmut Spliethoff (1);
(1) Lehrstuhl für Energiesysteme, Technische Universität München, Garching bei München/Germany, (2) Professur für Regenerative Energiesysteme, Technische Universität München, Straubing/Germany

Thermodynamic modelling, design and system analysis of a 100 kWe reversible solid oxide system process chain (A1315)
Vikrant Venkataraman (1), S Hajimolana (1), Theo Woudstra (1), P.V. Aravind (1);
Delft University of Technology, Delft/Netherlands

Dynamic Process Simulation of an SOFC CHP System during transient operation (A1316)
Nikolaus Soukup, Alexander Julian Pfleger, Marika Natalie Gasteiger, Martin Hauth;
AVL List GmbH, Graz/Austria

Numerical and Experimental Investigation of Manifold Design Optimization on the Performance of 1 kW-class Flat Tubular SOFC Stack Operating with Reformed Natural Gas (A1318)

Electrode properties of Al doped La2CuO4 as new cathode material for intermediate-temperature SOFCs (B0911)
A. Udhlani, L. Mathur, S. Gautam, A. Jaiswal, B. Singh, D. Kumar; Department of Ceramic Engineering, Indian Institute of Technology, Banaras Hindu University, Varanasi/India

The Contribution of Microstructure on Electrochemical and Catalytic Properties in Lanthanum-Doped Strontium Titanate (LST) (B0913)
Graham Stevenson, Enrique Ruiz-Trejo, Bowen Song, Nigel Brandon;
Imperial College London, South Kensington Campus, London/UK

Stability and Electrochemical Activity of Co-doped La2NiO4+δ as Oxygen Electrodes for Solid Oxide Cells (B0916)
V. Vibhu (1), S. Foit (1), K. Schiemann (1), I.C. Vinke (1), R.-A. Eichel (1,2), L.G.J. de Haart (1);
(1) Institute of Energy and Climate Research, Fundamental Electrochemistry (IEK-9), Forschungszentrum Jülich GmbH, Jülich/Germany, (2) Institute of Physical Chemistry, RWTH Aachen University, Aachen/Germany

Development of High Performing Proton-Conductor based Solid Oxide Electrolysis Cells (SOECs) in Idaho National Laboratory (B0917)
Dong Ding, Wei Wu, Ting He; Idaho National Laboratory, Idaho/USA

$(Cu,Fe)_3O_4$ spinel coating thermally converted from sputtered CuFe metallic layer for IT-SOFCs interconnect application (B0918)
Shujiang Geng, Yue Pan; School of Metallurgy, Northeastern University, Shenyang/China

Synergistic interaction of Au-Mo modification on Ni/GDC for H_2O Electrolysis in SOECs (B0919)
Ch. Neofytidis (1,2), E. Ioannidou (1,2), L. Sygellou (1), S.G. Neophytides (1), D.K. Niakolas (1);
(1) Foundation for Research and Technology, Institute of Chemical Engineering Sciences, Patras/Greece, (2) Department of Chemical Engineering, University of Patras, Greece, Patras/Greece

Strategy for enhancing stability of solid oxide electrolysis cells at high current density (B0920)
Xiaofeng Tong, Simona Ovtar, Ming Chen, Karen Brodersen, Peter V. Hendriksen;
Department of Energy Conversion and Storage, Technical University of Denmark, DTU Risø Campus, Roskilde/Denmark

Using Tetragonal Zirconia for Hydrocarbon-Feed Solid Oxide Fuel Cell (B0921)
Taghi Amiri (1), Thomas H. Etsell (1), Jingli Luo (1), Partha Sarkar (2);
(1) Department of Chemical and Materials Engineering, University of Alberta, Alberta/Canada, (2) Alberta Innovates - Technology Futures, Edmonton, Alberta/Canada

Kashif Rashid (1,2), Dong Sang Keun (2,1);
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(2) Thermal Energy System Laboratory, Korea Institute of Energy Research (KIER), Daejeon/Korea

Transient Behavior and Control Strategy for Reversible Solid Oxide Cells During Interchangeable Operation: a Preliminary Analysis (A1319)
Yshar S. Hajimolana (1), Jakub Kupecki (2,3), Konrad Motylinski (2), Vikrant Venkataraman (1), P.V. Aravind (1);
(1) Delft University of Technology, Delft/Netherlands,
(2) Institute of Power Engineering, Department of High Temperature Electrochemical Processes, Warsaw/Poland,
(3) National Fuel Cell Research Center, University of California, Irvine, California/USA

Development of a Modeling Platform for Dynamic SOFC-System Simulation in a Wide Operational Range (A1320)
Laura Nousch (1), Thomas Pfeifer (2), Mathias Hartmann (2);
(1) Technische Universität Dresden, Institute of Power Engineering, Dresden/Germany, (2) Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Dresden/Germany

Modeling of an RSOC system integrated with high temperature heat storage unit through heat pipes (A1321)
Paolo Marocco, Domenico Ferrero, Andrea Lanzini, Massimo Santarelli;
DENERG, Politecnico di Torino, Torino/Italy

Real time flow visualization on short stack interconnects (A1322)
Pierre Coquoz, Noelia Coton, Fabienne Marti, Julien Mialet, Raphael Ihringer;
Fiaxell Sàrl, Lausanne/Switzerland

Numerical analysis of the distributions of current efficiency inside a PCSOFC (A1323)
Kunpeng Li (1), Takuto Araki (2), Atushi Maeda (1), Kohei Shimosawa (1), Yuji Okuyama (3);
(1) Graduate School of Engineering, Yokohama National University, Kanagawa/Japan, (2) Faculty of Engineering, Yokohama National University, Kanagawa/Japan, (3) Department of Environmental Robotics, Faculty of Engineering, University of Miyazaki, Miyazaki/Japan

Performance optimization by means of a non-isothermal FEM model for SOFC stack layers (A1324)
N. Russner, H. Geisler, S. Dierickx, A. Weber, E. Ivers-Tiffée;
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

Development and parameterization of a transmission line model for Ni/YSZ anodes (A1325)
Timo Mundloch, Sebastian Dierickx, André Weber, Ellen Ivers-Tiffée;
Institute for Applied Materials (IAM-WET), Karlsruhe Institute of Technology (KIT), Karlsruhe/Germany

Characterisation of hybrid conducting electrolyte using BZY/YSZ composite for LT-SOFCs (B0922)
Yusung Kim (1), Ikwhang Chang (2), Wonjong Yu (1), Wonyeop Jeong (1), Sangbong Ryu (1), Seung Hwan ko (1), Suk Won Cha (1);
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(2) Department of Automotive Engineering, Wonkwang University, , Jeonbuk/Korea

Preparation of multi-layered coatings including of FGM and nanostructured ceramic oxide layers (B0923)
Amirhossein Javadi (1), Amirhossein Pakseresht (2), Saeed Shakhesi (1);
(1) Department of Nanotechnology, Engineering Research Institute, Tehran/Iran,
(2) Materials and Energy Research Centre, Karaj/Iran

Effects of TiO_2 and SDC addition on the properties of YSZ electrolyte (B0924)
Chin Tien Shen (1), Yi Hsuan Lee (1), Yu Pin Hsien (1), Kan Rong Lee (1), Yi Hua Wei (2), Chung Jen Tseng (1);
(1) Dept. Mechanical Engineering, National Central University, Taoyuan/Taiwan,
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In situ exsolution of nickel nanoparticles from $Ba_xCe_{0.5}Zr_{0.3}Y_{0.2-y}Ni_yO_{3-\delta}$ perovskite (B0925)
Mei Wang, Cristian Savaniu, Jianing Hui, John T.S. Irvine; School of Chemistry, University of St Andrews, Fife/UK

Evaluation of the chemical composition and the physical properties of $Ce_{1-x-y}Gd_xPr_yO_{2-\delta}$ (CGPO) as a potential electrolyser anode (B0926)
Chen-Yu Tsai, Catriona M. McGilvery, Ainara Aguadero, Stephen Skinner; Imperial College London, Department of Materials, London/UK

Higher-order Ruddlesden-Popper phase materials as potential IT-SOFC cathodes (B0927)
Mudasir A. Yatoo (1,2), Ainara Aguadero (1), Stephen J. Skinner (1,2);
(1) Department of Materials, Faculty of Engineering, Imperial College, London/UK,
(2) EPSRC Centre for Doctoral Training in Advanced Characterisation of Materials, London/UK

Comparative study of $La_{0.5}Sr_{0.5}CoO_3$ cathodes synthesized by conventional and impregnation route in solid oxide fuel cells (B0928)
Baijnath, Pankaj Tiwari, Suddhasatwa Basu;
Department of Chemical Engineering, Indian Institute of Technology Delhi, New Delhi/India

LST27 Anodes for SOFCs: Redox Stable and Sulfur Tolerant Material (B0929)
Hossein Madi (1), Dariusz Artur Burnat (2), Andreas Mai (3), Jan Van herle (1);
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Numerical analysis of cross-electrode interaction in SOFCs with thin electrolyte (A1326)
Hiroshi Iwai, Ryoma Kadomiya, Masashi Kishimoto, Motohiro Saito, Hideo Yoshida;
Department of Aeronautics and Astronautics, Kyoto University, Kyoto/Japan

Integration of a Solid Oxide Fuel Cell with an Organic Rankine Cycle and Absorption Chiller for Dynamic Generation of Power and Cooling for a Residential Application (A1327)
Maryam Asghari, Jack Brouwer;
Department of Mechanical and Aerospace Engineering, University of California, National Fuel Cell Research Center, Irvine, California/U.S.A.

Fault diagnosis in SOFC-based generation plants under varying operating conditions (A1328)
Paola Costamagna (1), Andrea De Giorgi (2), Gabriele Moser (2), Lissy Pellaco (2), Andrea Trucco (2);
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(2) DITEN, University of Genoa, Genoa/Italy

Dynamic Modeling of Solid Oxide Electrolyser System under Two Different Thermal Control Strategies (A1329)
Alireza Saeedmanesh, Jack Brouwer;
Department of Mechanical and Aerospace Engineering, University of California, National Fuel Cell Research Center, Irvine, California/U.S.A.

Thermal stress and strain in flat tubular SOFCs: FEA simulation and optical validation (A1330)
Harald Schlegl (1), Jong-Eun Hong (2), Kyung-Hoon Kim (3), Sung-Tae Park (4), Rak-Hyun Song (2), Richard Dawson (1);
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(3) Hankook Kwang-yu co. ltd.(HK Oil), Pohang/Korea, (4) Pohang University of Science and Technology (POSTECH), Pohang/Korea

Progressive Performance Improvement for a Kilowatt SOFC Power System (A1331)
Shih-Kun Lo (1), Wen-Tang Hong (1), Hsueh-I Tan (1), Lieh-Kuang Chiang (1), Yu-Hsin Hsu (1), Ruey-Yi, Lee (1), Tzu-Hsiang Yen (2), Ming-Jer Tsai (2), Wen-Cheng Kang (2);
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(2) Green Technology Research Institute CPC Corporation Taiwan, Nan-Tzu District/Taiwan (R.O.C.)

Modeling analysis of a reversible solid oxide fuel cell on dynamic characteristics (A1332)
Zheng Zong, Zihang Zhang, Jun Zhou, Yiheng Wan, Qianchang Chen, Kai Wu, Yonghong Cheng;
Center of Nanomaterials for Renewable Energy, State Key Laboratory of Electrical Insulation and Power Equipment, Xi'an Jiaotong University, Xi'an/China

Cobalt-Nickel Ruddlesden-Popper type perovskite as cathode for IT-SOFC (B0930)
Alberto Garbujo (1), Giovanni Carollo (1), Andrea Bedon (1), Marta Maria Natile (1,2), Fabrice Mauvy (3), Antonella Glisenti (1);
(1) Dipartimento di Scienze Chimiche, University of Padova, Padova/Italy,
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(3) Institut de Chimie de la Matière Condensée de Bordeaux, Université de Bordeaux, Pessac/France

Reactivity of $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-d}$ with LSGM powders treated at temperatures (B0933)
Laura Baqué; CNEA-CONICET, Centro Atómico Bariloche, Bariloche/Argentina

Microstructure and polarization characteristics of LSCM-GDC composite fuel electrode (B0934)
Ryosuke Yokoi (1), Takaaki Shimura (2, 3), Anna Sciazko(3), Naoki Shikazono (3);
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(2) Tokyo University of Agriculture and Technology, Tokyo/Japan,
(3) Institute of Industrial Science, The University of Tokyo, Tokyo/Japan

Production of synthetic diesel via CO_2 Electrolysis (B0935)
John Irvine, Lauren Sammes, Mariana Heringer; School of Chemistry, University of St Andrews, Fife/UK

Sintering temperature effect on $Ln_2NiO_{4\pm\delta}$ electrochemical performance as SOFC cathode (B0936)
Mohammad Golmohammad, Hamid Abdoli, Morteza Torabi, Abolfazl Molaahmad, Shahriyar Bozorgmehri;
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Upgrading biogas through CO_2 electrolysis (B0937)
Nuoxi Zhang, Lauren Sammes, John Irvine; School of Chemistry, University of St Andrews, Fife/UK

Evaluation of conduction mechanism and electronic state of the Ruddlesden-Popper type oxides at high temperature (B0939)
Yihan Ling(1,2,3), Frank Tietz (1), Koji Amezawa (3);
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Sai ram Gajjala, Zenzhen Fu, Rasit Koc;
Mechanical Engineering and Energy Processes Department, Southern Illinois University, Carbondale Il/U.S.A

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Yong Sun Park, Yesol Lim, Hae Jin Hwang; Inha University, Nam-gu Incheon/Korea

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Sungmin Kang (1), Yuseong Kim (2), Jaesuk Lee (1), Suk Won Cha (2), Joongmyeon Bae (1);
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FEM simulation of creep behavior in SOFC anode substrates (A1334)
Farid Salari, Hamid Abdoli;
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Thermodynamically Consistent 1D Model of YSZ Blocking Electrode for Electrochemical Impedance Spectroscopy (A1336)
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A multiscale approach to the numerical simulation of the SOFC stack (A1409)
Marcin Mozdzierz, Janusz S. Szmyd, Grzegorz Brus;
AGH University of Science and Technology, Krakow/Poland

Multi-Service Real-time control method research on integrated testing platform of FCV Powertrain System (A1410)
Haiyu Gao (1), Tong Zhang (1,2) Shengyu Ma (1), Hua Chai (1);
(1) School of Automotive Studies, Tongji University, Shanghai/China,
(2) National Fuel Cell Vehicle and Powertrain System Engineering Research Center, Tongji University, Shanghai/China

InputCharacterisation and screen printing of glass ceramic pastes as sealants for SOFC (B0942)
Svenja Dittrich, Elisabeth Reitz, Karl Günter Schell, Ethel Claudia Bucharsky, Michael J. Hoffmann; Karlsruhe Institute of Technology, Institute for Applied Materials – Ceramic Materials and Technologies, Karlsruhe/Germany

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Pravin Kumar (1), Rajendra Kumar Singh (1), Prabhakar Singh (2);
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The structural and electrical properties of Sm doped $SrTiO_3$ anode for IT-SOFCs (B1110)
Saurabh Singh (1), Prabhakar Singh (1), Massimo Viviani (2);
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Experimental clarification of the R.W.G.S. reaction effect in H_2O/CO_2 SOEC co-electrolysis conditions (B1111)
E. Ioannidou (1,2), Ch. Neofytidis (1,2), S.G. Neophytides (1), D.K. Niakolas (1);
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Effect of CoO_x nanoparticles decoration in the $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ performance as cathode (B1112)
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(2) Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Buenos Aires/Argentina

Sulphur tolerance effects of $Ce_{0.8}Sm_{0.2}O_{2-\delta}$ modified $Sr_{0.92}Y_{0.08}Ti_{1-x}Ni_xO_{3-\delta}$ anode in solid oxide fuel cells (B1113)
Jun Ho Kim (1), Hee Su Kim (2), Jeong Woo Yun (1);
(1) School of Chemical Engineering, Gwangju/Republic of Korea,
(2) Department of Green Technology Research, Korea Construction Equipment Technology Institute, Gunsansi/Republic of Korea

Sr- and Ba- doped $LaCuO_{3-\delta}$ perovskites with mixed ionic-electronic conductivity as IT-SOFC cathode materials (B1114)
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Model-based Performance Analysis of a Solid Oxide Co-electrolyzer to Produce Syngas for Industrial Applications (A1411)
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Integrated plasma gasification and SOFC system simulation using Aspen Plus (A1412)
Simon Vecten (1), Ben Herbert (2), Michael Wilkinson (2), Andy Shaw (3), Nuno Bimbo (1) and Richard Dawson (1);
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(2) AVL List GmbH, Graz/Austria,
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Large planar SOFC MEA operation on ammonia: Experimental analysis and performance evaluation (A1508)
Bernhard Stoeckl, Vanja Subotić, Michael Preininger, Christoph Hochenauer;
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Multi-layer thin film electrolytes for application in High Temperature Ceramic Electrochemical Devices (A1509)
Rémi Costa (1), Feng Han (1), Robert Semerad (2), Anthony Chesnaud (3), Mohamed Sennour (3), Alain Thorel (3), Laurent Dessemond (4,5);
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Sannan Toor, Eric Croiset;
University of Waterloo, Waterloo/Canada

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Anna Olszewska (1), Zhihong Du (2), Konrad Świerczek (1), Anna Niemczyk (1), Hailei Zhao (2,3), Wojciech Skubida (1);
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Molybdenum and Cobalt doped $SrFe_{1-x}M_xO_3$ and $Ca_2Fe2_{-x}M_xO_5$ Cathode for Intermediate Temperature Solid Oxide Fuel Cell (B1116)
Baijnath, Pankaj Tiwari, Suddhasatwa Basu;
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Nanometric roughness of the three-phase boundary in the degradation of infiltrated and redox-cycled anodes (B1207)
Antonio Bertei (1,2), Bowen Song (1), Enrique Ruiz-Trejo (1), Farid Tariq (1), Vladimir Yufit (1), Nigel Brandon (1);
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Diffusion rates of reactants and components in solid oxide cells (B1208)
Søren Højgaard Jensen (1), Anne Hauch (1), Xiufu Sun (1), Ming Chen (1), Sune Dalgaard Ebbesen (1,2), Mogens Bjerg Mogensen (1);
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Haldor Topsoe A/S, Lyngby/Denmark

Development of a SOFC cell with self-made nanopowders (A1511)
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Operation of SOLIDPower™ SOFC 4-Cell Stack under Dynamic Electronic Load (A1513)
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Chih-Kuang Lin (1), Hsu-Luan Hsu (1), Szu-Han Wu (2), Wei-Hong Shiu (2), Chien-Kuo Liu (2), Ruey-Yi Lee (2);
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Study of solid oxide fuel cell stabilisation under load using EIS analysis and polarisation curves (B1311)
Abdolkarim Sheikhansari, Jonathan Paragreen, Simon Blakey;
Department of Mechanical Engineering, University of Sheffield, Sheffield/UK

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Carlos Bernuy-Lopez, Robert Berger, Jörgen Westlinder;
SMT R&D, AB Sandvik Materials Technology, Sandviken/Sweden

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Alexandra Ploner (1), Anke Hagen (1), Anne Hauch (1), Rémi Costa (2), Matthias Riegraf (2), Günter Schiller (2);
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Long-term Degradation Analysis of SOFC Performance (B1314)
Tohru Yamamoto, Hiroshi Morita, Yoshihiro Mugikura;
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Takaaki Shimura (1,2), An He (2), Naoki Shikazono (2); (1) Tokyo University of Agriculture and Technology, Tokyo/Japan, (2) Institute of Industrial Science, The University of Tokyo, Tokyo/Japan

Improving the reversible performance of LSM oxygen electrode by infiltration of LNC nano-particles (B1409)
Shamim Shahrokhi, Alireza Babaei, Cyrus Zamani;
School of Metallurgy and Materials Engineering, College of Engineering, University of Tehran, Tehran/Iran

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Laura Baqué (1), Analía Soldati (1), Erico Teixeira-Neto (2), Horacio Troiani (1), Anja Schreiber (3), Andrea Voss (4), Lars Giebeler (4), Adriana Serquis (1);
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Guillaume Jeanmonod, Stefan Diethelm, Jan Van herle;
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Investigation of solid oxide electrolysis cell degradation during co-electrolysis (B1508)
T. Theuer (1), S.R. Foit (1), I.C. Vinke (1), R-A. Eichel (1,2), L.G.J. de Haart (1);
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(2) Institute of Physical Chemistry, RWTH Aachen University, Aachen/Germany

Durability of SOECs with modified electrodes (B1509)
Megha Rao, Xiufu Sun, Anke Hagen;
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Degradation in High-Temperature Co-Electrolysis Using Reversible Solid Oxide Fuel Cells: A Review (B1510)
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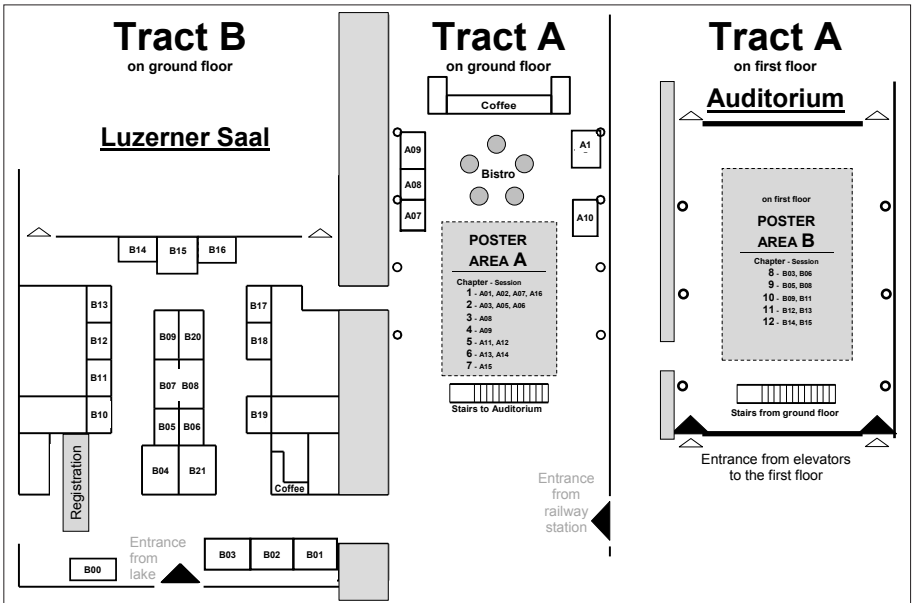

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A10	**Almus AG** Oberrohrdorf / **Switzerland**	UBOCELL SOFC Module, SOFC Demo-Kit; portable SOFC systems	almus-ag.ch
B15	**Bosal Energy Conversion Industry** Vianen / **The Netherlands**	SOFC/SOEC heat exchangers and reformers	eci.bosal.com
B10	**Bronkhorst (Schweiz) AG** Reinach / **Switzerland**	Massflowmeter and controller for gas and liquid and pressure, controlled evaporation	bronkhorst.com
A08	**CAP CO., Ltd.** Yokohama / **Japan**	Anode gas recycle blower for SOFC	cap-co.jp
B12	**CEA - LITEN** Grenoble / **France**	R&D for SOEC, SOFC and reversible operation (rSOC)	liten.cea.fr
B05	**Cerpotech AS** Tiller / **Norway**	Ceramic powders for solid oxide cells, membranes	cerpotech.com
B21	**Chaozhou Three-Circle (Group) Co. Ltd.** Chaozhou City / **China**	SOFC Electrolytes, single cells and stacks	cctc.cc
B11	**EPFL Valais Wallis** Sion / **Switzerland**	Energy Material Services - SOFC, SOEC, electro-ceramic membranes,biogas ...: Modeling, testing, system optimization, ...	gem.epfl.ch
B04	**Fiaxell Sarl** Lausanne / **Switzerland**	SOFC/SOEC button cell test fixture, short stack kit, gold, platinum & Crofer M_grid for current collection, specialty inks, ceramic processing (powders, slurry, sintering setter tiles), impedance spectrometer, and gas monitoring (mfc, gas panels, hydrogen generator) etc.	fiaxell.com
B16	**FLEXITALLIC Ltd** West Yorkshire / **United Kingdom**	Gasket & Sealing products, Thermiculite 866/866LS and 870	flexitallicsofc.com

B07/08	**Forschungszentrum Jülich GmbH** Jülich / **Germany**	R&D for SOFC, SOE and ROB	fz-juelich.de
B03	**fuelcellmaterials** Lewis Center / **United States**	SOFC materials & components and hydrogen sensors	fuelcellmaterials.com
B19	**FuelCon AG** Magdeburg-Barleben / **Germany**	Test and Diagnostic Systems for Fuel Cells and Batteries	fuelcon.com
B02	**G. Bopp & Co. AG** Zürich / **Switzerland**	High precision woven wire cloth for SOFC anodes made of AISI 304 / AISI 316 / Nickel / Crofer / Inconel etc.	bopp.ch
B01	**Gamry Instruments** Warminster PA / **United States**	Interface 1010, Reference 600+	gamry.com
B14	**Haikutech Europe BV** Maastricht / **The Netherlands**	Laboratory and manufacturing lines for SOFC-MEA with: tape casters, cutting/punching machines, screen printers, dryers, presses, neural network based ultra-high resolution surface inspector	haikutech.com
B00 + B13	**Info Corners**	Various flyers	EFCF.com
A09	**KCeraCell Co., Ltd.** Geumsan-gun / **Republic of Korea**	SOFC materials, Cells, Stack	kceracell.com
B06	**KERAFOL GmbH** Eschenbach i.d.Opf. / **Germany**	Electrolyte substrates, ceramic fuel cells	kerafol.com
B03	**Nexceris, LLC** Lewis Center OH / **United States**	SOFC materials & components and hydrogen sensors	nexceris.com
A15	**Noritake Co., Limited** Miyoshi-cho Miyoshi / **Japan**	SOFC cell, SOFC materials, sealing glass	www.noritake.co.jp/eng/
B17	**Praxair Surface Technologies, Inc.** Woodinville, WA / **USA**	Metallic Oxide Powders & Shapes	praxair.com/specialtyceramics

B20	**Scribner Associates, Inc**. 28387 Southern Pines / **USA**	Fuel Cell Test Station, Redox Flow Battery, etc	scribner.com
B09	**SOLIDpower S.p.A.** Mezzolombardo / **Italy**	BlueGEN micro CHP system Concept BlueGEN EVO & Large Stack Module	solidpower.com
B18	**SulfaTrap LLC** Colorado / **United States**	Sulfur and contaminant removal sorbents for purification of natural gas, LPG and diesel fuel feed streams for fuel cells and sulfur sensor to determine end-of-life indication for the sulfur removal sorbent	sulfatrap.com
A07	**Thermo Electron (Karlsruhe) GmbH** Karlsruhe / **Germany**	FTIR-, Raman und UV/VIS Spektrometer	thermofisher.com

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Special Networking Events

www.EFCF.com/Events

Welcome Gathering
Tuesday, 3 July: 18:00, on the terrace of the KKL above the registration area. Meet old friends, find new ones and enjoy the splendid view of lake and historic town – a perfect start to the conference.

EFCF Swiss Surprise Night (optional, limited to 80 participants)
Wednesday, 4 July: 18:30, place to be announced. A special surprise excursion to one of the picturesque showplaces closed to Lucerne. This is an enjoyable networking evening with Swiss folklore, music, drinks and Swiss cuisine. Tickets are sold on a first-come-first-served basis for CHF 120.– per person. During your on-line registration please select the option to purchase tickets in advance for you and your guests.

Dinner on the Lake
Thursday, 5 July: 19:30 Pier 6 («Brücke 6») next to Congress Centre: A very special boat will take the EFCF participants and their guests on a tour of the lake, past magnificent landscape and to the «Rütli» glade, birthplace of Switzerland (1291). Enjoy the unique blend of music, drinks and a candle-light dinner while gliding past beautiful scenery. Live music contributes to this unforgettable evening. This event is included in the conference fee. During your online registration please indicate your attendance and feel free to purchase additional tickets for your guests (CHF 120.– per person).

Entertainment for Accompanying Person (Spouse Programmes)
During the European Full Cell Forum your guests and yourself have the possibility to explore the beautiful region of Lucerne together with an experienced local guide. Bucher Travel Inc. and the Lucerne Tourist Office are able to organize for you and your guests entertaining trips around local attractions. It is possible to take a tour of Lucerne visiting the medieval part of the city, followed by a tour of the picturesque surrounding area e.g. Mount Pilatus, the Glass Factory & Mount Stanserhorn, etc. The excursions are arranged locally on a daily basis depending on weather conditions and requests. To get more information about the programmes and to book an activity, please visit www.EFCF.com – Registration – Spouse Programmes or contact in advance Bucher Travel Inc., booking@buchertravel.ch, +41 41 418 55 42 and/or visit www.luzern.com. The EFCF team can support you on-site at the registration desk in finding further offers and opportunities, except during the main registration time (Tuesday afternoon, Wednesday morning). Accompanying persons may participate in the «Swiss Surprise» and «Dinner on the Lake» for CHF 120.– per person as well as in the lunches on the terrace of the KKL. Please purchase guest tickets as long as they are available during your on-line registration. Additional lunch tickets for CHF 45.– per person are sold on-site only as long as available. The exhibitions can always be visited for free.

Free Project Meeting Support Enquiry

www.EFCF.com/FPM

Stakeholders interested in the Free Organization Support Service for their project-, set-up- or other issue-meetings can get more information at www.EFCF.com/FPM or via email to forum@EFCF.com.

Samples of successful collaboration are www.EFCF.com/MDC, www.EFCF.com/GSM.

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69469 Weinheim/Germany

Lucerne

www.EFCF.com/Lucerne

Lucerne is located in the heart of Switzerland on the Lake of Lucerne admired for its beauty and tranquility. Nostalgic paddle wheel steamers connect the romantic town to charming sites. From there you may ascend picturesque „Mount Rigi" and steep „Mount Pilatus", or reach the high regions in the Alps of Switzerland. Cogwheel mountain trains, cable cars or aerial tramways take you past alpine scenery to breath-taking panoramic views of the Top of Switzerland. Most places can be reached with between 1 – 3 hours travel.

Lucerne itself is built along the „Lake of Lucerne" and the „Reuss River", outflow of the lake. The medieval part is closest to the waterfront. Bridges connect both banks. The famous wooden „Kapellbrucke" has been perfectly rebuilt by local artisan after total destruction by a catastrophic fire in 1993. Lucerne is located in the heart of Western Europe and is an ideal start location for further travels around the continent before or after the conference.

Organized by:
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