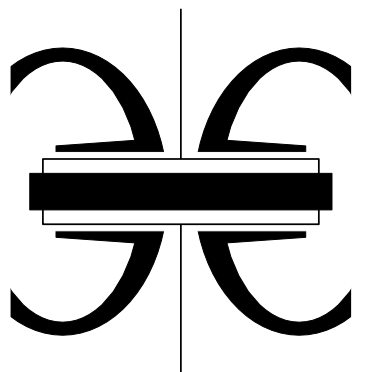


Proceedings EFCF 2019

Low-Temperature
Fuel Cells, Electrolysers & H₂ Processing



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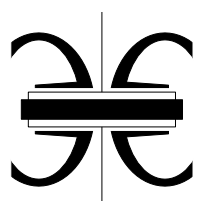


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(2) *FEV Group GmbH, Germany*
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AutoStack Industrie – Mature and Cost Competitive Stack Technology for Automotive Mass Production
André Martin (1), Ludwig Jörissen (2)
(1) *André Martin Consulting, Idstein, Germany*
(2) *Centre for Solar and Hydrogen Research (ZSW), Ulm, Germany*
- A0407 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Development Trend of Fuel Cell Vehicles in China
Liqun Lin ,Tao Fu , Jiangshui Luo, Yingting Yi
*Collaborative Innovation Center of Clean Energy, Longyan University.
Dongxiao North Street 1, 364012 Longyan/China*
- A0408 (Abstract only)**..... Error! Bookmark not defined.
Future European Fuel Cell Technology: Fit for Automatic Manufacturing and Assembly
Martin Biák
*Chemnitz University of Technology
Department of Advanced Powertrains
Reichenhainer Straße 70, 09126 Chemnitz, Germany*
- A1501** Error! Bookmark not defined.
Assessment of PEMFC performance for marine application
Eleonora Gadducci, Loredana Magistri, Thomas Lamberti
Università degli Studi di Genova – DIME, 15 Via all’Opera Pia, IT-16145 Genova
- A1502** Error! Bookmark not defined.
Fuel Cell Cargo Pedelecs (FCCPs)
Joerg Dieter Weigl (1), Fabian Halft (1), Björn Offermann (2)
(1) *Unicorn Engineering GmbH
Universitätspark 1/1, DE-73525 Schwäbisch Gmünd*
(2) *Deutsches Zentrum für Luft- und Raumfahrt (DLR) German Aerospace Center
Institute of Technical Thermodynamics, Electrochemical Energy Technology, Pfaffenwaldring 38-40,
DE-70569 Stuttgart*
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Energy management controller for FCHEV based on Sat-Nav data
Yousif Al-Sagheer, Robert Steinberger-Wilckens
*Birmingham Centre for Fuel Cell and Hydrogen Research
University of Birmingham, B15 2TT, UK*
- A1504 (Published in EFCF Special Issue Series, www.EFCF.com/LIB)** Error! Bookmark not defined.
45% Cell Efficiency in DMFCs via Process Engineering
Andreas Glüsen, Martin Müller, Detlef Stolten
*Institute for Energy and Climate Research - IEK-3: Energy Process Engineering
Wilhelm-Johnen-Straße, D-52425 Jülich*
- A1505 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Design of Energy Management System of a PEM Fuel Cell/Battery Hybrid Power System with Heat-recovery System
Kai Ou (1), Dong-Ji Xuan (2), Wei-Wei Yuan (1), Tie-Qing Zhang (1), Young-Bae Kim (1)
(1) *Dep. Mechanical Engineering, Chonnam National University
77 Yongbong-ro, Gwangju, Republic of Korea*
(2) *School of Mechanical and Electrical Engineering, Wenzhou University*





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Global Deployment of Large Capacity Stationary Fuel Cells

Eveline Weidner, Rafael Ortiz Cebolla, Jonathan Davies

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A development of solid-state hydrogen storage system

Moon-Sun Chung

Hydrogen Energy Research Team

152 Gajeong-ro, Yuseong-gu, Daejeon, Republic of Korea

**Chapter 05 - Sessions B02, B11, B15****B02 PEFC Degradation & Testing****B11 Acidic Membrane Materials****B15 Diffusive Media for FC & Electrolysers****Content****Page B02, B11, B15 - ..****B0201 (Invited Talk) Error! Bookmark not defined.****Multi-step Kinetic Model for Pt Dissolution**

Kunal Karan (1), Barath Jayasankar (1,2)

*(1) Department of Chemical and Petroleum Engineering, University of Calgary
2500 University Dr NW, Calgary, Alberta, Canada**(2) FCP Fuel cell powertrain GMBH, Chemnitz, Germany HRB 31357***B0203 (Published in EFCF Special Issue Series, www.EFCF.com/LIB) Error! Bookmark not defined.****CFD Simulation of Industrial PEM Fuel Cells with Local Degradation Effects**

Clemens Fink (1), Sönke Gößling (2), Larisa Karpenko-Jereb (3)

*(1) AVL List GmbH, Hans-List-Platz 1, 8020 Graz, Austria**(2) ZBT, Carl-Benz-Str 201, 47057 Duisburg, Germany**(3) Graz University of Technology, Inffeldgasse 10/II, 8010 Graz, Austria***B0204 (Published in EFCF Special Issue Series, www.EFCF.com/LIB) Error! Bookmark not defined.****Sub-zero Start-up of Fuel Cell: Diagnostics, Modelling, and Strategies**

Jianbo Zhang (1), Fusen Huang (1), Shangshang Wang (1), Lei Yao (2), Junning Wen (5), Jie Peng (2), Muriel Siegwart (3,4), Magali Cochet (3), Pierre Boillat (3,4), Zhili Chen (5), Takemi Chikahisa (6)

*(1) School of Vehicle and Mobility, State Key Laboratory of Automotive Safety and Energy, Tsinghua University, Beijing 100084, China**(2) Department of Engineering Mechanics, Tsinghua University, Beijing 100084, China**(3) Electrochemistry Laboratory (LEC), Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland**(4) Laboratory for Neutron Scattering and Imaging (LNS), Paul Scherrer Institut, CH-5232 Villigen PSI, Switzerland**(5) Department of Mechanical Engineering and Aeronautics and Astronautics, School of Science and Technology, Tokai University, Hiratsuka 2591292, Japan**(6) Division of Energy and Environmental Systems, Graduate School of Engineering, Hokkaido University, Sapporo, Hokkaido 0608628, Japan***B0205 (Published in EFCF Special Issue Series, www.EFCF.com/LIB) Error! Bookmark not defined.****Predictive model for performance and platinum degradation simulation of high temperature PEM fuel cells in transient operating conditions**

Ambrož Kregar (1,2), Gregor Tavčar (1), Andraž Kravos (1), Tomaž Kutrašnik (1)

*(1) UL, Faculty of Mechanical Engineering, Aškerčeva 6, SI-1000 Ljubljana, Slovenia**(2) TU Graz, IPTC, Stremayrgasse 9 A-8010 Graz, Austria***B0206 (Abstract only, published elsewhere) Error! Bookmark not defined.****Carbon corrosion in PEMFC: linking startup/shutdown and accelerated stress tests**

A. Bisello, E. Colombo, M. Coppola, A. Baricci, A. Casalegno

*Politecnico di Milano — Department of Energy, via Lambruschini 40, Milano 20156 Italy***B1101 (Published in EFCF Special Issue Series, www.EFCF.com/LIB) Error! Bookmark not defined.****PBI-type Polymers and Acidic Proton Conducting Ionic Liquids – Conductivity and Molecular Interactions**

Jingjing Lin, Jürgen Giffin, Klaus Wippermann, Carsten Korte

Forschungszentrum Jülich, Institut für Energie- und Klimaforschung (IEK-3)



- B1102** Error! Bookmark not defined.
Heteropoly Acid Based Membranes for Excellent Durability and High Performance in Fuel Cell Applications
Andrew M. Herring, Andrew R. Motz, Mei-Chen Kuo
*Department of Chemical and Biological Engineering
Colorado School of Mines, Golden, CO 80401, USA*
- B1103 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Chemical Stability Enhancement of Sulfonated Poly(arylene ether ketone) Fuel Cell Membrane by Fixation of Cerium Ion
Yongman Park, Dukjoon Kim
*School of chemical Engineering, Sungkyunkwan University, Suwon, Gyeonggi, 16419, Republic of Korea
Tel.: +82-31-290-7250*
- B1104 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Atomistic MD study of Nafion in dispersions: Understanding the role of solvent in the ionomer aggregate structure, sulfonic group clustering and acid dissociation
Atefeh Tarokh, Kunal Karan, Sathish Ponnurangam
*Department of Chemical and Petroleum Engineering, University of Calgary
2500 University Dr NW, Calgary, Alberta, Canada*
- B1105 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Protic Organic Ionic Plastic Crystals as Novel Proton Conductors
Jiangshui Luo, Yingting Yi, Michael Wübbenhorst
*Department of Physics and Astronomy, KU Leuven
Celestijnenlaan 200d - box 2416, 3001 Leuven, Belgium*
- B1106** Error! Bookmark not defined.
Anion Influence on the Properties of Acidic Protic Ionic Liquids
Hui Hou, Jürgen Giffin, Carsten Korte
*Forschungszentrum Jülich GmbH, IEK-3
Wilhelm-Johnen-Straße, 52428 Jülich, Germany*
- B1107** Error! Bookmark not defined.
Diagnosis of MEA Degradation for health management of Polymer Electrolyte Fuel Cells
Derek Low, Lisa Jackson, Sarah Dunnett
*Department of Aeronautical and Automotive Engineering
Loughborough University
Loughborough, United Kingdom*
- B1110 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Investigating Polymer Membrane Durability in Polymer Electrolyte Fuel Cells Operating at Intermediate Temperatures
Ahmed Ibrahim*, Ahmad El-kharouf
*Centre for Fuel Cell and Hydrogen Research, School of Chemical Engineering
University of Birmingham, B15 2TT, UK*
- B1111 (Abstract only)** Error! Bookmark not defined.
In situ estimation of the effective membrane diffusion coefficient in a PEMFC
Kush Chadha, S. Martemianov, A. Thomas
*Institut Pprimé CNRS – Université de Poitiers – ISAE-ENSMA – UPR 3346 SP2MI – Téléport 2 11
Boulevard Marie Curie BP 30179 F86962 FUTUROSCOPE CHASSENEUIL Cedex
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- B1112 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Experimental and theoretical studies of transport properties of a protic ionic liquid
Jiangshui Luo, Yingting Yi, Michael Wübbenhorst
*Department of Physics and Astronomy, KU Leuven
Celestijnenlaan 200d - box 2416, 3001 Leuven, Belgium*



- B1113 (Abstract only, published elsewhere).....** Error! Bookmark not defined.
Multi-block copolymers with highly sulfonated poly(arylene sulfone) block for Proton Exchange Membrane Fuel Cells
Sang-Woo Jo (1,2), Hee-Tak Kim (1), Young Taik Hong (2), Tae-Ho Kim (2)
(1) Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology (KAIST)
291 Daehak-ro, Yuseong-gu, 34141, Daejeon/Republic of Korea
(2) Membrane Research Center, Korea Research Institute of Chemical Technology
141 Gajeong-ro, Yuseong-gu, 34114, Daejeon/Republic of Korea
- B1114** Error! Bookmark not defined.
High-Temperature Polymer Electrolyte Fuel Cells based on Protic Ionic Liquid Electrolytes
Josef Sanarov, Jürgen Giffin, Carsten Korte
Forschungszentrum Jülich GmbH
Wilhelm-Johnen-Straße, DE-52428 Jülich
- B1116 (Abstract only, published elsewhere).....** Error! Bookmark not defined.
Activation energy landscape for Brønsted acid–base systems
Yingting Yi, Jiangshui Luo, Michael Wübbenhorst
Department of Physics and Astronomy, KU Leuven
Celestijnenlaan 200d - box 2416, 3001 Leuven, Belgium
- B1501 (Published in EFCF Special Issue Series, www.EFCF.com/LIB)** Error! Bookmark not defined.
Investigating the Influence of Structural Modification of MicroPorous Layer and Catalyst Layer on Performance and Water Management of PEM Fuel Cells through Neutron Tomography
A. Mohseninia(1), D. Kartouzian(1), P. Langner (1), M.Eppler(1), H. Markötter (2), J. Scholta (1), I. Manke (2)
(1) Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Württemberg (ZSW), Helmholtzstraße 8, 89081 Ulm, Germany
(2) Helmholtz-Zentrum Berlin, Hahn-Meitner-Platz 1, 14109 Berlin, Germany
- B1502** Error! Bookmark not defined.
Advances in PEM Fuel Cell Liquid Water Management
Preston Stolberg, Alexander Coverdill, Mehdi Mortazavi, Vedang Chauhan, Jingru Benner, Anthony D. Santamaria
Department of Mechanical Engineering
Western New England University
1215 Wilbraham Rd, Springfield, MA 01119
- B1503 (Abstract only, published elsewhere).....** Error! Bookmark not defined.
Mass transport of Water Vapor in a Polymer Electrolyte Fuel Cell with Evaporation Cooling
Magali Cochet (1), Victoria Manzi-Orezzoli (1), Dirk Scheuble (1), Pierre Boillat (1,2)
(1) Electrochemistry Laboratory (LEC)
(2) Laboratory for Neutron Scattering and Imaging (LNS)
Paul Scherrer Institut, 5232 Villigen, Switzerland
- B1504 (Abstract only)** Error! Bookmark not defined.
Next Generation Gas Diffusion Layers (GDLs) – A Design for Manufacture and Assembly (DFMA) Analysis
Whitney G. Colella (1), Jason Morgan (2)
(1) Gaia Energy Research Institute LLC, Arlington, VA, 22203-1966, USA
(2) AvCarb Material Solutions
2 Industrial Avenue, Lowell, MA, 01851, USA



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Correlation of porous transport layers properties and polymer electrolyte water electrolysis performance

Tobias Schuler (1), Thomas J. Schmidt (1,2), Felix N. Büchi (1)

(1) *Electrochemistry Laboratory, Paul Scherrer Institut*

CH-5232 Villigen-PSI, Switzerland

(2) *Laboratory of Physical Chemistry, ETH Zürich, CH-8093 Zürich, Switzerland*

B1506 (Abstract only, published elsewhere)..... Error! Bookmark not defined.

Direct water pathways in PEFC GDLs for improved liquid water management

Christoph Csoklich (1), Thomas J. Schmidt (1,2), Felix N. Büchi (1)

(1) *Electrochemistry Laboratory, PSI, Forschungsstrasse 111, 5232 Villigen PSI, Switzerland*

(2) *Laboratory of Physical Chemistry, ETH Zürich, 8093 Zürich, Switzerland*

Chapter 06 - Sessions B04, B05, B14**B04: Pt Alloys Catalysts****B05: Pt Catalyst Supports, Alloys & Observation****B14: Pt-free Catalysts****Content****Page B04, B05, B14 - ..****B0401 (Abstract only, published elsewhere).....** Error! Bookmark not defined.**Decoding Structure - ORR Activity Relationships Thanks to Surface Distortion**

Raphaël Chattot (1, 2), O. Le Bacq (3), A. Pasturel (3), Pierre Bordet (4), J. Drnec (2), L. Dubau (1), Frédéric Maillard (1)

(1) *Univ. Grenoble Alpes, CNRS, Grenoble-INP, Université Savoie-Mont-Blanc, LEPMI, 38000 Grenoble, France*(2) *European Synchrotron Radiation Facility, ID 31 Beamline, BP 220, F-38043 Grenoble Cedex, France*(3) *Univ. Grenoble Alpes, CNRS, Grenoble-INP, SIMAP, 38000 Grenoble, France*(4) *Univ. Grenoble Alpes, CNRS, Institut Néel, 38000 Grenoble, France***B0403 (Abstract only, published elsewhere).....** Error! Bookmark not defined.**Top-Down Synthesis of Nanostructured Electrocatalysts for the Oxygen Reduction Reaction**

Johannes Fichtner, Sebastian Watzele, Batyr Garlyyev, Regina M. Kluge, Aliaksandr S. Bandarenka

*Physics of Energy Conversion and Storage, Technical University of Munich James-Franck-Str. 1, DE-85748 Garching b. München, Germany***B0404 (Abstract only, published elsewhere).....** Error! Bookmark not defined.**Flow Synthesis of NiPt-Alloy and PtNiPt Core Shell Nanoparticles**

Steffen Woderich, Christoph Gimmler, Horst Weller

*Fraunhofer Center for Applied Nanotechnology Grindelallee 117, D-20146 Hamburg***B0405 (Abstract only, published elsewhere).....** Error! Bookmark not defined.**Pt-alloys supported on Hollow Graphitic Sphere support – an efficient and stable catalyst for ORR**

Karl J.J. Mayrhofer (1, 2), Marc Ledendecker (1), Daniel Göhl (1), Johannes Knossalla (3), Daniel Jalalpoor (3), Paul Paciok (4), Marc Heggen (4), Ferdi Schüth (3)

(1) *Forschungszentrum Jülich GmbH, Helmholtz Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Egerlandstr. 3, 91058 Erlangen, Germany*(2) *Max-Planck-Institut für Eisenforschung GmbH, Department of Interface Chemistry and Surface Engineering, Max-Planck-Strasse 1, 40237 Düsseldorf, Germany*(3) *Max-Planck-Institut für Kohlenforschung, Department of Heterogeneous Catalysis, Kaiser-Wilhelm-Platz 1, 45470 Mülheim an der Ruhr, Germany*(4) *Ernst-Ruska Centre for Microscopy and Spectroscopy with Electrons and Peter Grünberg Institute, Forschungszentrum Jülich, 52425 Jülich, Germany***B0406 (Published in EFCF Special Issue Series, www.EFCF.com/LIB)** Error! Bookmark not defined.**A highly active and strained Pt₃Y alloy catalyst for application in low temperature fuel cells**

Rosemary Brown (1), Mykhalio Vorokhta (2), Tomáš Skála (2), Ivan Khalakhan (2), Niklas Lindahl (1), Björn Eriksson (3), Thomas Vonderach, Carina Lagergren (3), Iva Matolínová (2), Vladamír Matolín (2), Björn Wickman (1)

(1) *Department of Physics, Chalmers University of Technology Gothenburg, Sweden*(2) *Charles University, Prague, Czech Republic*(3) *Department of Chemical Engineering, KTH Royal Institute of Technology, Stockholm, Stockholm, Sweden*

- B0407 (Abstract only)**..... Error! Bookmark not defined.
Tungsten Trioxide as a Co-Catalyst for Low-Purity Hydrogen
Douglas Stewart (1,2), Keith Scott (1), Mohamed Mamlouk (1), Edward Brightman (2), Andrew J. Wain (3), Donald Macphee (2)
(1) *School of Engineering, Newcastle University, Newcastle upon Tyne, NE1 7RU.*
(2) *Enocell Ltd., Biocity Scotland, Bo'Ness Rd, Newhouse, ML1 5UH.*
(3) *National Physical Laboratory, Hampton Rd, Teddington, TW11 0LW.*
- B0408 (Abstract only)**..... Error! Bookmark not defined.
Electrodes with a low PGM loading for PEM electrochemical systems
Sergey Nefedkin (1), Maria Klimova (1), Elena Kolomeitseva (1), Oleg Petrii (2)
(1) *National Research University "MPEI", Moscow, 111250, Russia*
(2) *Lomonosov Moscow State University, Moscow, 119991, Russia*
- B0409 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
One-Dimensional PtAg-based Alloy Nanorod Catalysts for Proton Exchange Membrane Fuel Cells
Elok Fidiani*, Shangfeng Du
*School of Chemical Engineering, University of Birmingham
United Kingdom*
- B0410 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Adapting Pt nanowire catalysts for high performance PEMFC GDEs and CCMs
Peter Mardle, Shangfeng Du
*Centre for Fuel Cell and Hydrogen Research
School of Chemical Engineering, University of Birmingham, Birmingham B15 2TT, UK*
- B0411** Error! Bookmark not defined.
Development of a physicochemical model for the platinum degradation in fuel cells
Christian Palavinskas, Ulrich Berger, Frank Sahlbach, Dennis Backofen, Ralf Wascheck
*IAV GmbH
Rockwellstraße 16, 38518 Gifhorn/Germany*
- B0412** Error! Bookmark not defined.
Recent Advances in Electrocatalysis based on Pt-alloys for PEM Fuel Cell of Breton SpA
Fabio Bassetto, Michele Casarin, Stefano Zeggio
- B0413** Error! Bookmark not defined.
Ethanol electro-oxidation reaction (EOR) in alkaline medium using conductive polyaniline (PANI) as a promoter for Pd/GC catalysts
Alexandros Symillidis, Stella Georgiadou, Wen-Feng Lin
*Department of Chemical Engineering, Loughborough University
Loughborough University Campus, LE11 3TU, Loughborough/UK*
- B0414 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Boosting oxygen catalysis performance of the-state-of-art catalysts by multi-field modulation
Jia Li
Laboratory for Computational Materials Engineering, Graduate School at Shenzhen, Tsinghua University, Shenzhen 518055, P. R. China
- B0415 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Screening fuel cell electrocatalyst performance in gas diffusion electrodes
Konrad Ehelebe, Dominik Seeberger, Mike Paul, Simon Thiele, Karl Mayrhofer, Serhiy Cherevko
Forschungszentrum Jülich GmbH, Helmholtz-Institute Erlangen-Nürnberg for Renewable Energy (IEK-11), Egerlandstr. 3, D-91058 Erlangen

- B0416** Error! Bookmark not defined.
Effect of Ultra-low Pt Loadings on the PEFC Performance of Pt₃Ni Aerogel Cathode Catalyst Layers
Seçil Ünsal (1), Viktoriia A. Saveleva (1), Maximilian Georgi (2), Juan Herranz (1), Alexander Eychemüller (2), Thomas J. Schmidt (1,3)
(1) *Electrochemistry Laboratory, Paul Scherrer Institut 5232 Villigen, Switzerland*
(2) *Physical Chemistry, Technische Universität Dresden, 01062 Dresden, Germany*
(3) *Laboratory of Physical Chemistry, ETH Zürich 8093 Zürich, Switzerland*
- B0417 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Analysis of the distribution of carbon monoxide poisoning in a segmented-in-series PEMFC system through mass spectrometry and thermal imaging
Velia Fabiola Valdes Lopez, Tom Mason, Rhodri Owen, Jason In Sung Cho, Toby Neville, Paul Shearing, Dan Brett
*Electrochemical Innovation Lab
University College London
Torrington Place
London, WC1E 7JE*
- B0501 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Engineering Atomic Diffusion in Pt Alloy Nanoparticles Towards Highly Active and Stable ORR Electrocatalysts
Zhongxiang Wang, Yangbo Ma, Xiaozhang Yao, Fei Qin, Lin Gan
Division of Energy and Environment, Graduate School at Shenzhen, Tsinghua University, Shenzhen 518055, PR China
- B0502 (Abstract only, published elsewhere)** Error! Bookmark not defined.
Optimization of Pt Loading on Nanoporous Carbon Scaffolds for Use as a PEMFC Cathode Catalyst Layer
Marwa Atwa, Xiaoan Li, F. Forouzandeh, Samantha Luong, Erwan Bertin, M.J. Parnian, Kunal Karan, Viola Birss
*Department of Chemistry, University of Calgary
2500 University Drive NW, Calgary, AB, Canada T2N 1N4*
- B0503 (Abstract only)** Error! Bookmark not defined.
Mesoporous N-doped Carbon as Stable Pt Catalyst Support for the Oxygen Reduction Reaction
Julia Melke(1,2), Sven Küspert (1,2), Patrick Elsässer (1), Anna Fischer (1,2,3)
(1) *Institute of Inorganic and Analytical Chemistry, University Freiburg*
(2) *FMF – Freiburg Materials Research Center, University Freiburg*
(3) *FIT - Freiburg Center for Interactive Materials and Bioinspired Technologies, University Freiburg
Albertstraße 21, D-79104 Freiburg*
- B0504 (Published in EFCF Special Issue Series, www.EFCF.com/LIB)** Error! Bookmark not defined.
Oxide-supported PEFC Electrocatalysts
Kazunari Sasaki (1,2,3,4,5,6), Masaru Nagamine (2), Daiki Kawachino (2), Hirotoishi Odoi (2), Shohei Matsumoto (2), Yoshiki Nakazato (2), Zhiyun Noda (3), Junko Matsuda (3,4), Stephen M. Lyth (4,5), Akari Hayashi (1-5)
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(1) *Next-Generation Fuel Cell Research Center (NEXT-FC)*
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(5) *Platform of Inter/ Transdisciplinary Energy Research (Q-PIT)*
(6) *Senior Vice President*
Motooka 744, Nishi-ku, Fukuoka-shi, Fukuoka 819-0395, Japan
- B0505 (Abstract only)** Error! Bookmark not defined.
Hydrogen Oxidation Reaction on polycrystalline, nano-sized and single Pt atoms
Daniel J. Weber, Mehtap Oezaslan



Carl von Ossietzky University Oldenburg, Carl-von-Ossietzky Str. 9-11, DE-26111 Oldenburg/
Germany

B0506 Error! Bookmark not defined.

Open Circuit Voltage of Platinum-Assisted Fuel Cells with Proton-Conducting Electrolytes

Ulf Bossel

ALMUS AG

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CH-5452 Oberrohrdorf / Switzerland

B0507 Error! Bookmark not defined.

Long-term stable phosphorus doped alloy catalysts and phosphorus doped carbon substrates for high performance PEMFC by pulse-plating-deposition

M. Braun (1), M. Baumgärtner (1), A. Stephan (2), N. Schumacher (2), H. Natter (2),
I. Radev (3), V. Peinecke (3)

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Electrochemical Tip-Enhanced Raman Spectroscopy: Nanoscale Reactivity Mapping with Chemical Specificity

Jonas H. K. Pfisterer, Masoud Baghernejad, Giovanni Giuzio, Katrin F. Domke

B0509 (Abstract only, published elsewhere)..... Error! Bookmark not defined.

Ionic Liquid Modified Pt Nanowire Electrodes for Proton Exchange Membrane Fuel Cells

Huixin Zhang (1,2), Shangfeng Du (1)

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8 Guangrong Road, Hongqiao District, Tianjin300130, China

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Design Strategies for Support and Electrocatalyst Materials in Polymer Electrolyte Fuel Cells

Marc Ledendecker (1), Daniel Göhl (1), Paul Paciok (4), Johannes Knossalla (2),
Marc Heggen (5), Daniel Jalalpoor (2), Yang Shao-Horn (3), Ferdi Schüth (2), Yuriy
Román-Leshkov (3), Karl Mayrhofer (1,4)

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Surface structure depended electrocatalytic property by X-ray absorption spectroscopy and density functional theory methods

Linjuan Zhang, Jing Zhou, Jian-Qiang Wang

Shanghai Institute of Applied Physics, Chinese Academy of Sciences

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- B1401 (Invited Talk, Abstract only)** Error! Bookmark not defined.
Platinum Group Metal-free Electrocatalysts for Fuel Cell Applications
Xi Yin, Hoon T. Chung, Siddharth Komini Babu, Ulises Martinez,
Geraldine M. Purdy, Edward F. Holby, Piotr Zelenay
Los Alamos National Laboratory
Los Alamos, New Mexico 87545, USA
- B1403 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Iron Liquid Modified CoNC Electrocatalyst for Proton Exchange Membrane Fuel Cells
Min Wang (1,2), Huixin Zhang (1), Sichun Mu (2), Xiaochao Ji (3), Ihtasham Hammy Salam (4), John Varcoe (4), Shangfeng Du (1)*
(1) School of Chemical Engineering, University of Birmingham, UK
(2) State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, China
(3) School of Metallurgy and Materials, University of Birmingham, UK
(4) Department of Chemistry, University of Surrey, UK
- B1404 (Abstract only)**..... Error! Bookmark not defined.
Recent Advances in Molecular Catalysts for Oxygen Reduction Reaction
Lior Elbaz (1), Ariel Friedman (1), Noam Zion (1), Zeev Gross (2)
(1) Chemistry Department, Bar-Ilan University, Ramat-Gan 5290002, Israel
(2) Schulich Faculty of Chemistry, Technion-Israel Institute of Technology, Haifa 3200008, Israel
- B1405 (Published in EFCF Special Issue Series, www.EFCF.com/LIB)** Error! Bookmark not defined.
Green Hydrogen and PEFCs for Our Future Sustainable Growth
K. Ota, T. Nagai, K. Matsuzawa, Y. Kuroda, S. Mitsushima, A. Ishihara
Yokohama National University
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- B1406 (Abstract only)**..... Error! Bookmark not defined.
Loading impact of a PGM-free catalyst on mass activity in PEMFCs
Ana Marija Damjanović (1), Burak Koyutürk (1), Yan-Sheng Li (1), Christian Eickes (2), Hany El-Sayed (1), Hubert A. Gasteiger (1), Tim-Patrick Fellingner (1), Michele Piana (1)
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(2) Greenerity GmbH, 4 Rodenbacher Chaussee, DE-63457 Hanau
- B1409 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Searching and designing metastable spinel oxides for highly active water oxidation [1]
Yan Duan (1,2,3), Zhichuan J.Xu (1,2,3,4)
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B1410 (Abstract only, published elsewhere)..... Error! Bookmark not defined.

Catalytic Activity of Fe-based Perovskites/Spinels for Water Oxidation: The Influence of Metal-Oxygen Hybridization

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B1411 (Abstract only, published elsewhere)..... Error! Bookmark not defined.

Correlation of O-vacancies and electrochemical activity of PrBaCo₂O_{5+δ} (0.4 ≤ δ ≤ 0.8)

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B1412 (Abstract only, published elsewhere)..... Error! Bookmark not defined.

The Effects of Fe in Ba_{0.5}Sr_{0.5}Co_xFe_{1-x}O_{3-δ} Towards the Oxygen Evolution Reaction in Alkaline Media

Dino Aegerter (1), Bae-Jung Kim (1), Emiliana Fabbri (1), Mario Borlaf (2), Thomas Graule (2), Thomas J. Schmidt (1,3)

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**Chapter 07 - Sessions B07, B08, B10, B13**

- B07/08: Oxygen Evolution and Reduction Reactions
CO₂ Reduction**
- B10 Alkaline Membrane Materials**
- B13: Photoelectrochemical Water Splitting**

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Ifan E. L. Stephens	
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Effect of Alkaline Ionomer on HER performance in AEM Water Electrolysis: In situ Electrochemical-Raman Study	
Alaa Y Faid (1), Alejandro Oyarce Barnett (2), Frode Seland (1), Svein Sunde (1)	
(1) Norwegian University of Science and Technology	
(2) SINTEF Sustainable Energy Technology	
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Electrodes for Alkaline Polymer Electrolyte Water Electrolyser	
Hongmei Yu, Jun Chi, Guang Jiang, Jia Jia, Bowen Qin, Baolian Yi, Zhigang Shao	
Laboratory of Fuel Cells, Dalian Institute of Chemical Physics	
Chinese Academy of Sciences	
457 Zhongshan Road, Dalian, China, 116023	
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Determination of Real Electroactive Surface Area of Ni-, Co-, Fe-, and Ir-based Oxide Electrocatalysts	
Sebastian Watzele, Pascal Hauenstein, Aliaksandr S. Bandarenka	
Physics of Energy Conversion and Storage, Technical University of Munich	
James-Franck-Str. 1, DE-85748 Garching b. München, Germany	
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New low Ir loaded anodes for low temperature water electrolysis (PEMWE) based on doped tin dioxide (SnO₂, TO) aerogel as a catalyst support.	
Lluís SOLA-HERNANDEZ, Christian BEAUGER	
MINES ParisTech, PSL University, Centre procédés, énergies renouvelables et systèmes énergétiques (PERSEE), CS 10207 rue Claude Daunesse, F-06904, Sophia Antipolis Cedex, France	
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Hierarchical porous Ni₃S₄ with enriched Ni³⁺ as a robust electrocatalyst for efficient oxygen evolution reaction	
Kai Wan, Jiangshui Luo, Xuan Zhang, Jan Fransaer	
Department of Materials Engineering, KU Leuven	
Leuven 3001, Belgium	
kai.wan@kuleuven.be	
jan.fransaer@kuleuven.be	
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Mehtap Oezaslan	
Carl von Ossietzky University Oldenburg, Carl-von-Ossietzky Str. 9-11, DE-26111 Oldenburg/Germany	

- B0803** Error! Bookmark not defined.
Electrochemical Production of Formic Acid / Formate by CO₂,H₂O co-Electrolysis using High Performance Gas Diffusion Electrodes
A. Löwe (1), D. Kopljar (2), F. Bienen (2), N. Wagner (2), E. Klemm (1)
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Pfaffenwaldring 55, D-70569 Stuttgart/Germany*
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- B0804** Error! Bookmark not defined.
Sn/Cu Catalysts for CO₂RR: Impact of Composition and Morphology on Product Selectivity
Wenbo Ju, Corsin Battaglia
*Empa, Swiss Federal Laboratories for Materials Science and Technology, Überlandstrasse 129,
8600 Dübendorf, Switzerland*
- B0805 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
3D Nanoporous Carbon Scaffold for CO₂ conversion
Erwan Bertin, Ben Godwin, Marwa Atwa, and Viola Birss*
*Department of Chemistry, University of Calgary
2500 University Drive, Calgary, AB, Canada T2N 1N4*
- B0806 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Exceptionally active iridium evolved from a pseudo-cubic perovskite for oxygen evolution in acid
Yubo Chen (1,2,3), Zhichuan J. Xu (1,2,3,4)
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1 CREATE Way, Singapore 138602, Singapore*
- B0807 (Published in EFCF Special Issue Series, www.EFCF.com/LIB)** Error! Bookmark not defined.
Mesoporous RuO₂-based Binary Oxide Catalyst for Oxygen Evolution Reaction by Nano-Replication Method
Seung Woo Lee (1), Chae Kyung Baik (1), Sang-Yun Jeon (2), Young-Sang Yoo (2), Chanho Pak (1)
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- B0808 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Performance characteristics of gas-fed CO₂ electrolysis on silver nanoparticles in alkaline exchange membrane electrode assembly
Fatemeh (Parisa) Karimi, Amir Alihosseinzadeh, Sathish Ponnurangam, Kunal Karan*
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- B1001 (Invited Talk, Abstract only)** Error! Bookmark not defined.
Towards Stable Anion Exchange Membranes
Steven Holdcroft (1), Jiantao Fan (1), Thomas J. G. Skalski (1), Wei Li (1), Eric Schibli (2), Barbara Frisken (2)
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(2) *Department of Physics*



- B1003 (Abstract only)**..... Error! Bookmark not defined.
Conductivity and Hydration Behavior of Anion-Exchange Ionomer Thin Films
Udit N. Shrivastava (1), Avital Zhegur (2), Sapir Willdorf-Cohen (2), Viacheslav Freger (2), Dario R. Dekel (2), Kunal Karan (1)
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(2) *The Wolfson Department of Chemical Engineering, Technion – Israel Institute of Technology
Haifa 3200003, Israel*
- B1004 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Quantifying water transport in anion-exchange membrane fuel cells
Göran Lindbergh, Rakel Wreland Lindström, Björn Eriksson, Henrik Grimler, Annika Carlson, Henrik Ekström, Carina Lagergren
*Applied Electrochemistry, School of Engineering Sciences in Chemistry, Biotechnology and Health,
KTH Royal Institute of Technology, SE-100 44 Stockholm, Sweden*
- B1005 (Invited Talk, Abstract only)** Error! Bookmark not defined.
Anion Conducting Membranes for Water Electrolysis: Translating ex-situ Properties into in-situ Performance
Dr. Artjom Maljus, Patrick Borowski, Oliver Conradi
- B1301 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Performance of a photovoltaic integrated electrolyser for water splitting scaled to square decimetre size
Sonya Calnan, Erno Kempainen, Stefan Aschbrenner, Fuxi Bao, Rutger Schlatmann
*Helmholtz Zentrum Berlin,
Schwarzschildstrasse 3, DE-12489 Berlin/Germany*
- B1302 (Abstract only)**..... Error! Bookmark not defined.
Feasibility of using packed bed of ceramic as solar receiver/ reactor for hydrogen production from water
Darfilal Djamel (1), Seladji Chakib (1), Bhandari (2)
(1) *Département de Génie mécanique / Laboratoire Energétique et Thermique Appliquée ETAP,
Abou-Bekr BELKAÏD University, B.P 119, 13000 Tlemcen, Algeria*
(2) *Institute for Technology and Resources Management in the Tropics and Subtropics (ITT) /
Technische Hochschule Köln /University of Applied Sciences Betzdorfer Strasse 2 /50679 Cologne,
Germany*
- B1303 (Abstract only)**..... Error! Bookmark not defined.
Er and W co-doping in BiVO₄ with WO₃ heterojunction formation to achieve the theoretical performance limits for photoelectrochemical water splitting
Arunachala Kannan
- B1304 (Abstract only, published elsewhere)**..... Error! Bookmark not defined.
Two-cell photoelectrochemical water electrolysis demonstration system for large scale hydrogen production
Avigail Landman(1), Rawan Halabi (2), Paula Dias (3), Hen Dotan (2), Gennady Shter (4), Adelio Mendes (3), Gideon Grader (4), Avner Rothschild (2)
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B1308 (Abstract only, published elsewhere)..... Error! Bookmark not defined.
Effect of liquid phase plasma irradiation in hydrogen production by photocatalytic water splitting

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