Book of Abstracts of the

7th Spring Meeting of the International Society of Electrochemistry

Szczyrk, Poland
22-25 March, 2009

International Society of Elecrtochemistry
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Switzerland

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University of Warsaw, Warsaw, Poland

Sunday 22 March 2009 – PM

Welcome Session

12:00 Lunch

Location: Room F

Chair: P.J. Kulesza, R. Hillman

13:00 to 13:40 Abstract on page 36

Michael Grätzel *(Laboratory for Photonics and Interfaces, Swiss Federal Institute of Technology, Lausanne, Switzerland)*

Electrochemistry and Energy, Power from the Sun by Mesoscopic Solar Cells

13:40 to 14:20 page 37

Dieter M. Kolb *(Institute of Electrochemistry, University of Ulm, Ulm, Germany)*

Preparation and Characterization of Reactive Surfaces

14:20 to 15:00 page 38

Richard McCreery *(Department of Chemistry, University of Alberta, Edmonton, Alberta, Canada)*, Sudip Barman, Adam Bergren, Andrew Bonifas, Jing Wu, Haijun Yan

Electron Transport and Redox Reactions in Molecular Electronic Junctions

15:00 to 15:30 Keynote page 39

Daniel Scherson *(Department of Chemistry, Case Western Reserve University, Cleveland, USA)*, Youjiang Chen

Ohmicroscopy

15:30 to 16:00 Keynote page 40

Shelley Minteer *(Department of Chemistry, Saint Louis University, St. Louis, USA)*, Robert Arechederra

Direct Bioelectrocatalysis of Glycerol for Biofuel Cell Applications

16:00 to 16:30

Coffee Break

Chair: M. Mastragostino, Z. Stojek

16:30 to 17:10 page 41

Joachim Lewerenz *(Division of Solar Energy, Helmholtz Center Berlin for Materials and Energy, Berlin, Germany)*

Photoelectrocatalysis: Principles, Nanoemitter Applications and Envisaged Biomimetic Structures

17:10 to 17:50 page 42

Krishnan Rajeshwar *(The University of Texas at Arlington, Arlington, USA)*

Materials Chemistry in the Service of Solar Energy Conversion and Fuel Cells

17:50 to 18:30 page 43

Andrzej Wieckowski *(Department of Chemistry, Urbana, USA)*, Hung Duong, Adam Lewera, Matt Rigsby

Oxygen reduction (ORR) on fuel cell catalytic electrodes

18:30 to 19:00 Keynote page 44

Vito Di Noto *(Department of Chemical Sciences, University of Padova, Padova, Italy)*, Enrico Negro

Development of Plurimetallic Nano-electrocatalysts based on Carbon Nitride Supports for the ORR Processes in PEM Fuel Cells

19:00 to 19:30 Keynote page 45

Elena Savinova *(LMSPC-UMR 7515 du CNRS-ULP, Ecole de Chimie, Polymères, Matériaux de Strasbourg, Université Louis Pasteur, Strasbourg, France)*, Matthieu Houllé, Cuong Pham Huu, Pavel S. Ruvinsky, Pavel A. Simonov

Carbon Materials as Supports for Electrocatalysis

19:30 to 19:50 page 46

Pawel Kulesza *(Department of Chemistry, University of Warsaw, Warsaw, Poland)*, Piotr J. Barczuk, Beata Dembinska, Aneta Kolary-Zurowska, Adam Lewera, Roberto Marassi, Krzysztof Miecznikowski, Iwona A. Rutkowska, Sylwia Zoladek, Artur Zurowski

Activation of Reactive Sites in Electrocatalysis by their Modification with Ultra-Thin Films of Metal Oxides and Related Polyoxometallates

20:00 Welcome Reception – Dinner

Monday 23 March 2009 – AM

Dedicated to Prof. Galus

Location: Room F

8.00 – 08.20

Introduction: P. J. Kulesza and J. Lipkowski

08:20 to 08:40 page 71

Robert Hillman *(Department of Chemistry, University of Leicester, Leicester, United Kingdom)*, Krzysztof Biernacki, Joana Fonseca, Cristina Freire, Steven Gurman, Alexandre Magalhães, Joao Tedim

XAS and Electrochemical Characterization of Cu and Pd salen Type Conducting Polymer Films With Potential Catalytic Application

08:40 to 09:00 Invited page 87

Jacek Lipkowski *(Department of Chemistry, University of Guelph, Guelph, Canada)*, Julia Kunze, Jay Leitch, Vlad Zamlynny, Izabella Zawisza

In situ Polarization Modulation Infrared Reflection – Absorption Spectroscopy of the Electrode – Solution Interface

09:00 to 09:20 page 60

W. Ronald Fawcett *(Department of Chemistry, University of California, Davis, USA)*, Daniel Misicak

Copper deposition and its replacement by Platinum on a Gold electrode surface

09:20 to 09:40 page 97

Marek Orlik *(Faculty of Chemistry, The University of Warsaw, Warsaw, Poland)*, Rafal Jurczakowski, Katarzyna Pekala

Electrocatalysis and Oscillatory Chemical Reactions: the Potentiometric Response of Different Inert Electrodes in the H_2O_2-Containing Media

09:40 to 10:10 Keynote page 113

Galina Tsirlina *(Department of Electrochemistry, Moscow University, Moscow, Russian Federation)*

Tungsten and Platinum Mutual Relations in Electrocatalysis

10:10 to 10:30 Invited page 137

Mikhail Vorotyntsev *(ICMUB - UMR CNRS 5260, DIJON Cedex, France)*, Magdalena Graczyk, Anna Lisowska-Oleksiak, Aleksandra Rajchowska, Magdalena Skompska

Synthesis and Characterization of Hybrids Materials: Conducting Polymer/ Incorporated Ag Nanoparticles

10:30 to 10:50

Coffee Break

Chair: D. Kolb, G. Jerkiewicz

10:50 to 11:20 Keynote page 121

Piotr Zelenay *(Los Alamos National Laboratory, Los Alamos, New Mexico 87545, USA)*, Hoon T. Chung, Gang Wu

New Non-precious Oxygen Reduction Catalysts for Polymer Electrolyte Fuel Cells

11:20 to 11:50 Keynote page 70

Enrique Herrero *(Instituto de Electroquímica, Universidad de Alicante, Alicante, Spain)*, Víctor Climent, Juan M. Feliu, Vitali Grozovski

Intrinsic Activity for Formic Acid Oxidation on Single Crystal Platinum Electrodes

11:50 to 12:20 Keynote page 109

Ulrich Stimming *(Department of Physics E19, Technische Universität München, Garching, Germany)*, Rainer Bußar

Influences of Substrate Material and Particle Morphology on Electrocatalytic Activity

12:20 to 12:50 Keynote page 48

Nicolas Alonso-Vante *(Laboratory of Electrocatalysis, UMR-CNRS 6503, University of Poitiers, Poitiers, France)*

Cathode Materials for Oxygen Reduction Reaction: Metal Center and Substrate Effects

13:00 Lunch

Monday 23 March 2009 – PM
Dedicated to Prof. Galus

Location: Room F

Chair: E. Frackowiak, M. Jouini

14:00 to 14:20 page 73

Gregory Jerkiewicz *(Dept. of Chemistry, Queen's University, Kingston, Canada)*
Analysis of the Origin of Catalytic Activity of Platinum in Electrochemical Reactions Involving Hydrogen

14:20 to 14:40 Invited page 55

Sebastian Fiechter *(Dept. Solare Energetik, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany)*, Peter Bogdanoff, Iris Dorbandt, Iris Herrmann, Gerald Zehl
Chalcogen Modified Ruthenium Catalysts for Fuel Cells and Water Oxidation

14:40 to 15:10 Keynote page 65

Dominic Gervasio *(Center for Applied Nanobioscience, Biodesign Institute, School of Materials, Arizona State University, Tempe, USA)*
Electrochemistry in Ionic Liquid Electrolytes

15:10 to 15:30 Invited page 89

Roberto Marassi *(Department of Chemistry, University of Camerino, Camerino, Italy)*, Andrea Di Cicco, Sonia Dsoke, Giorgia Greco, Aneta Kolary - Zurowska, Pawel J. Kulesza, Emiliano Principi, Agnieszka Witkowska, Artur Zurowski
Pt-doped insoluble salts of Keggin type heteropolyacids as catalysts for ORR, HOR or alcohol oxidation

15:30 to 15:50 Invited page 112

Naoki Toshima *(Department of Materials Science and Environmental Engineering, Tokyo University of Science, Yamaguchi, SanyoOnoda-shi, Japan)*, Hideo Naohara, Takahiro Yoshimoto
Nafion®-Protected Metal Nanoparticles: Preparation, Structure and Electrocatalytic Activity

15:50 to 16:10 Invited page 74

San Ping Jiang *(School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore, Singapore)*, Xin Wang, Shuangyin Wang
Polyelectrolyte-Functionalized Pt/CNTs as Effective Electrocatalysts for Low Temperature Fuel Cells

16:10 to 16:30 Invited page 78

Ludwig Kibler *(Institute of Electrochemistry, University of Ulm, Ulm, Germany)*
Tayloring Bimetallic Electrodes

16:30 to 16:50

Coffee Break

Chair: G. Tsirlina, R. Marassi

16:50 to 17:20 Keynote page 64

K. Andreas Friedrich *(Institute of Technical Thermodynamics, Deutsches Zentrum für Luft- und Raumfahrt, Stuttgart, Germany)*, Elena Aleksandrova, Renate Hiesgen, Matthias Loster, Emil Roduner

Fundamental Aspects of Fuel Cell Technology

17:20 to 17:40 page 84

Andrzej Lasia *(Departement de Chimie, Université de Sherbrooke, Sherbrooke, Canada)*, Daniel Guay, Marie - Lise Tremblay

Cavity Microelectrodes for Fast Screening of the Electrocatalytic Materials

17:40 to 18:00 Invited page 76

Mohamed Jouini *(Interfaces, Traitements, Organisation et Dynamique des Systèmes, UMR 7086, Université Paris Diderot, Paris 7, Paris Cedex 13, France)*, Salah Aeiyach, Christophe Bucher, Sylvie Chardon, François Maurel, Mourad Mechouet, Christian Perruchot

Mixed Valence Compounds: Supramolecular Control of Electron Transfer and Comproportionation Reactions.

18:00 to 18:20 Invited page 83

Alexander Kuhn *(University Bordeaux, Pessac, France)*, Marie-Hélène Delville, Jumras Limtrakul, Valérie Ravaine, Chompunuch Warakulwit

Electrocatalytic dissymetric metal deposition on carbon nanotubes

18:20 to 18:40 Invited page 88

Enn Lust *(Institute of Chemistry, University of Tartu, Tartu, Estonia)*, Indrek Kivi, Rainer Küngas, Priit Möller, Gunnar Nurk, Kadi Tamm

Electroanalysis of Porous $Lx_{0.6}Sr_{0.4}CoO_3$-δ cathodes and Ni-$Ce_{1-x}Gd_xO_2$-δ Anodes for Medium Temperature SOFC

18:40 to 19:00 Invited page 138

Sergey Pronkin *(University of Louis Pasteur, ECPM-ULP-CNRS, LMSPC (UMR-7515), Strasbourg, France)*, Pierre Bernhardt, Antoine Bonnefont, Fernando Godinez, Elena Savinova

Titania-supported Pt nanoparticles: manifestation of metal-support interaction

19:10 to 20:30 **Main Hall**

Chair: E. Lust, A. Lasia, K. Skorupska

Poster Session: Electrocatalysis

s01-P-001 *to* **s01-P-048**

20:30 Dinner

Tuesday 24 March 2009 – AM

I Electrocatalysis

Location: Room F

Chair: D. Kolb, P. Zelenay

08:30 to 08:50 page 52

Abd El Aziz Abd El Salehin *(University of Bonn, Bonn, Germany)*, Helmut Baltruschat

Electrooxidation of Ethanol on Pt (332) and Ru Modified Pt (332) Electrodes: DEMS Study

08:50 to 09:10 Invited page 55

Peter Bogdanoff *(Helmholtz Zentrum Berlin, Berlin, Germany)*, Irmgard Abs-Wurmbach, Sebastian Fiechter, Iris Herrmann, Ulrike Kramm

Structure-Activity Correlation in Pyrolysed Transition Metal Porphyrines for the Oxygen Reduction

09:10 to 09:30 Invited page 82

Petr Krtil *(J. Heyrovsky Institute of Physical Chemistry, Academy of Sciences of the Czech Republic, Prague, Czech Republic)*

Electrocatalysis on Nanocrystalline Oxides with Rutile Structure – The Relationship Between Short Range Order and Electrocatalytic Activity and Selectivity in Oxygen and Chlorine Electrochemistry

09:30 to 09:50 page 58

Mikolaj Donten *(Department of Chemistry, University of Warsaw, Warsaw, Poland)*, Marianna Gniadek, Zbigniew Stojek

Composites of Conductive Polymer with Metal Nanocrystalsas Electrode Materials for Electrocatalysis

09:50 to 10:10 page 62

Elzbieta Frackowiak *(Poznan University of Technology, Poznan, Poland)*, Grzegorz Lota

Role of the Catalyst Support for Fuel Cell Reactions

10:10 to 10:30

Coffee Break

Chair: A. Wieckowski, U. Stimming

10:30 to 11:00 page 90

M.V. Martínez-Huerta *(Instituto de Catálisis y Petroleoquímica (CSIC), Madrid, Spain)*, J.L.G. Fierro, M.A. Peña, N. Tsiouvaras

Electrochemical activation of nanostrutured carbon-supported PtRuMo electrocatalyst for methanol oxidation

11:00 to 11:20 page 98

Elena Pastor *(Dpto. Química Física, Universidad de La Laguna, La Laguna, Spain)*, Jonathan Flórez, Gonzalo García, Gabriel A. Planes, José Luis Rodríguez

Methanol Electrooxidation at Bimetallic PtX Mesoporous Electrodes. CO_2 Efficiency as Studied by TLFC-DEMS

11:20 to 11:40 page 75

Jakub Jirkovsky *(Chemistry Department, University of Liverpool, Liverpool, United Kingdom)*, David J. Schiffrin

Au Nanoparticles Size Effects on the Electrocatalytic Reduction of Oxygen

11:40 to 12:00 Invited page 100

Genady Ragoisha *(Physico-Chemical Research Institute, Belarusian State University, Minsk, Belarus)*, Alexander Bondarenko, Akihiro Iiyama, Shyam Kocha, Nikolai Osipovich, Jianbo Zhang

Analysis of Platinum Potentiodynamic Multi-Frequency AC Response in Solutions of Sulphuric and Perchloric Acids

12:00 to 12:20 page 56

Otavio Brandao Alves *(Institute of Surface Chemistry and Catalysis, Ulm, Germany)*, Rolf - Juergen Behm, Harry Ern Hoster

Electrochemical Oxygen Reduction at UHV-prepared Pt_xRu_{1-x} / Ru(0001) Surface Alloys

12:20 to 12:40 page 86

Jean Lessard *(Département de chimie, Université de Sherbrooke, Sherbrooke, Canada)*, Martin DeBlois, Gregory Jerkiewicz, Maja Obradovic

New Insight into the Electrocatalytic Hydrogenation of Model Unsaturated Organic Compounds

13:00 Lunch

Bioelectrocatalysis

Location: Room E

Chair: S. Minteer, L. Gorton

08:00 to 08:30 Keynote page 103

Wolfgang Schuhmann *(Anal. Chem. - Elektroanalytik & Sensorik; Ruhr-Universität Bochum, Bochum, Germany)*

Scanning electrochemical microscopy in catalyst optimization and development

08:30 to 08:50 page 68

Aurélien Habrioux *(LACCO "Equipe Electrocatalyse" UMR 6503 CNRS-Université de Poitiers, Poitiers, France)*, Boniface Kokoh, Karine Servat, Sophie Tingry

Au_xPt_y nanoparticles as an alternative anode catalyst for glucose oxidation in a membrane-less glucose/O_2 biofuel cell

08:50 to 09:10 page 54

Renata Bilewicz *(Faculty of Chemistry, University of Warsaw, Warsaw, Poland)*, J. F. Biernat, E. Jablonowska, E Nazaruk, K.P. Roberts, K. Sadowska, K. Stolarczyk, R. Wiser

Carbon Nanotubes Derivatized with Mediators for Biofuel Cell Applications

09:10 to 09:30 page 59

Hanna Elzanowska *(Department of Chemistry, Warsaw University, Warsaw, Poland)*, Ersan Abu-Irhayem, Viola Birrs, Amit Jhas, H Sebastian

Nanoparticulate Ir Oxide as a Biosensor Matrix

09:30 to 09:50 page 106

Woonsup Shin *(Department of Chemistry, Interdisciplinary Program of Integrated Biotechnology, and Inorganic and Biological Materials Center of BK21, Sogang University, Seoul, Korea)*, Junghyun Lee, Rajaram Nagarale, Durai Saravanakumar

Copper Complex Containing Polymer Modified Electrode for Oxygen Reduction Reaction in Neutral Aqueous Media

09:50 to 10:10 page 57

Michael Bron *(Analytische Chemie-Elektroanalytik & Sensorik, Ruhr-Universität Bochum, Bochum, Germany)*, Ayodele Okunola, Thorsten Schilling, Wolfgang Schuhmann

Electropolymerised Metalloporphyrines for Electrocatalytic Applications

10:10 to 10:30

Coffee Break

Chair: R. Bilewicz, W. Schuhmann

10:30 to 11:00 Keynote page 66

Lo Gorton *(Dept. of Analytical Chemistry, Lund University, Lund, Sweden)*, Vasile Coman, Dietmar Haltrich, Wolfgang Harreither, Roland Ludwig, Gulnara Safina, Federico Tasca

Cellobiose Dehydrogenase an Interesting Enzyme for Electrochemical and Biosensor/Biofuel Cell Studies

11:00 to 11:20 page 114

Gilbert Van Bogaert *(Separation and Conversion Technologies, VITO - Flemish Institute for Technological Research, Mol, Belgium)*, Mark De Smet, Ludo Diels, Deepak Pant, Karolien Vanbroekhoven

Use of novel permeable membrane and air cathodes in acetate microbial fuel cell

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Arkady Karyakin *(Chemistry Faculty of M.V. Lomonosov Moscow State University, Moscow, Russian Federation)*, Fedor Fedotenkov, Elena Karyakina, Stanislav Trashin, Darya Vinogradova, Oleg Voronin

Limiting characteristics of enzymes in bioelectrocatalysis

11:40 to 12:00 page 110

Katarzyna Szot *(Department of Electrode Processes, Institute of Physical Chemistry, Polish Academy of Sciences, Warszawa, Poland)*, Martin Jönsson-Niedziolka, Frank Marken, Joanna Niedziolka-Jönsson, Wojciech Nogala, Carolina Nunes-Kirchner, Marcin Opallo, Jerzy Rogalski, Günther Wittstock

Hydrophilic Carbon Nanoparticles-Laccase Thin Film Electrode for Mediatorless Dioxygen Reduction: SECM Mapping and Application in Zinc-Dioxygen Battery.

12:00 to 12:20 page 95

Wojciech Nogala *(Institute of Physical Chemistry, Polish Academy of Sciences, Warszawa, Poland)*, Anna Celebanska, Marcin Opallo, Katarzyna Szot, Gunther Wittstock

Bioelectrocatalytic Dioxygen Reduction on Ceramic Carbon Electrode Modified with Bilirubin Oxidase

12:20 to 12:40 page 108

Jukka-Pekka Spets *(Dept. Energy Technology, Helsinki University of Technology (TKK) Espoo, Finland)*, Yohannes Kiros, Maunu Aarne Kuosa, Markku Juhani Lampinen, Jyri Rantanen, Kari Saari

Bioorganic Materials as a Fuel Source for Low-Temperature Direct-Mode Fuel Cells

13:00 Lunch

Tuesday 24 March 2009 – PM

I Electrocatalysis

Location: Room F

Chair: R. McCreery, A. Friedrich

14:20 to 14:40 page 117

Gunther Wittstock *(Faculty of Mathematics and Science, Center of Interface Science (CIS), Department of Pure and Applied Chemistry and Institute for Chemistry and Biology, Carl von Ossietzky University of Oldenburg , Oldenburg,, Germany)*, Wiebke Maier, Yan Shen, Markus Träuble

Detection of Hydrogen Peroxide Produced during Electrochemical Oxygen Reduction Using Scanning Electrochemical Microscopy

14:40 to 15:00 page 116

Maria Wesselmark *(Applied Electrochemistry, KTH School of Chemical Science and Engineering,, Stockholm, Sweden)*, Carina Lagergren, Göran Lindbergh

Activity and Stability of Thin Model Electrodes with Platinum and Metal Oxides for PEMFC Cathode

15:00 to 15:20 page 101

Markus Rauber *(Department of Material- and Geo-Sciences, Darmstadt University of Technology, Darmstadt, Germany)*, Thomas Cornelius, Wolfgang Ensinger, Daniel Huzel, Sven Müller, Reinhard Neumann, Oliver Picht

Controlled Synthesis of 2-D and 3-D Platinum Nanowire Networks by Ion Track Template Electrodeposition

15:20 to 15:40 page 85

Natalia Lebedeva *(Energy Research Centre of the Netherlands (ECN), Petten, Netherlands)*, Gaby Janssen, Victor Rosca

CO Oxidation and CO_2 Reduction on Carbon Supported $PtWO_3$ Catalyst

15:40 to 16:00 page 81

Katrin Kortsdottir *(KTH-Royal Institute of Technology, Dept. of Chemical Engineering and Technology, Applied Electrochemistry, Stockholm, Sweden)*, Göran Lindbergh, Rakel Wreland Lindström

Influence of hydrocarbon impurities on the performance of PEM fuel cells; electro-chemical oxidation of toluene in a fuel cell environment

16:00 to 16:20 page 99

Paola Quaino *(Institute of Theoretical Chemistry, Ulm University, Ulm, Germany)*, Elisabeth Santos, Wolfgang Schmickler

Hydrogen Electrode Reaction: Electrocatalytic Activity of Metal Surfaces

16:20 to 16:40 page 122

Artur Zielinski *(Department of Electrochemistry, Corrosion and Materials Engineering, Gdansk University of Technology, Gdansk, Poland)*, Kazimierz Darowicki, Michael Szocinski

Dynamic impedance spectroscopy in scanning probe microscopy

16:40 to 17:00

Coffee Break

Chair: A. Kuhn, L. Kibler

17:00 to 17:20 page 91

Tetsuya Mashio *(Nissan Research Center, Nissan Motor Co., Ltd., Yokosuka, Japan)*, Kourosh Malek, Atsushi Ohma, Kazuhiko Shinohara, Kouichi Yamaguchi

Molecular Dynamics Study of Catalyst Layers for PEM Fuel Cells

17:20 to 17:40 page 53

V. Barsukov *(Kiev National University of Technologies & Design, Kiev, Ukraine)*, V. Khomenko, K. Likhnitskii

Advanced Non-noble Catalysts for Oxygen Reduction

17:40 to 18:00 page 120

Jong-Sung Yu *(Department of Advanced Materials Chemistry, Jochiwon, Korea)*, Baizeng Fang, Minsik Kim, Minwoo Kim, Jung Ho Kim

Hierarchical Nanostructured Carbon as a Highly Efficient Catalyst Support in Proton Exchange Membrane Fuel Cell

18:00 to 18:20 page 102

Paramaconi Rodriguez *(Leiden Institute of Chemistry, Gorlaeus Laboratories, Leiden, Netherlands)*, Juan Miguel Feliu, Marc T. M Koper

Unusual adsorption state and electroxidation of carbon monoxide on gold electrodes in alkaline media

18:20 to 18:40 page 92

Fabrice Micoud *(LEPMI, UMR 5631, CNRS-Grenoble-INP-UJF, Saint Martin d'Hères, France)*, Antoine Bonnefont, Marian Chatenet, Frédéric Maillard

Unique CO-tolerance of Pt/WO_x materials for PEMFC anodes

18:40 to 19:00 page 139

Georgi Topalov *(Solid State Electrolytes, Institute of Electrochemistry and Energy Systems, Sofia, Bulgaria)*, Gerald Ganske, Evelina Slavcheva

Estimation of the Catalytic Activity of Co-Sputtered Platin-Iridium Catalysts Toward Oxygen Reduction Using Rotating Disc Electrode

20:30 Dinner

Photoelectrocatalysis

Location: Room E

Chair: J. Lewerenz, J. Augustynski

13:50 to 14:20 Keynote page 127

Markus Niederberger *(Laboratory for Multifunctional Materials Department of Materials, ETH Zurich, Zurich, Switzerland)*

Nonaqueous Sol-Gel Routes to Metal Oxide Nanostructures: Formation Mechanisms, Assembly and Applications

14:20 to 14:40 Invited page 133

Svein Sunde *(Department of Materials Science and Engineering, NTNU, Trondheim, Norway)*, Ingrid Anne Lervik, Lars-Erik Owe, Mikhail Tsypkin

Characterisation of Catalysts for the Oxygen Evolution Reaction in PEM Water Electrolysis

14:40 to 15:00 page 131

Katarzyna Skorupska *(Helmholtz Center Berlin for Materials and Energy, Berlin, Germany)*, B. Jaiser, H.J. Lewerenz, T. Vo-Dinh

Semiconductor-Enzyme Interactions at Nanostructured Surfaces

15:00 to 15:20 Invited page 130

Patrik Schmuki *(Uni-Erlangen, Erlangen, Germany)*

Self-Organized Titanium Oxide Nanotube-Layers: Applications in Electrocatalysis and Photoelectrocatalysis

15:20 to 15:40 page 132

Renata Solarska *(Laboratory for High Performance Ceramics, Empa, Dubendorf, Switzerland)*, Bruce Alexander, Jan Augustynski, Artur Braun, Thomas Graule, Michael Stiefel

Modeling of Porosity and Transparency of WO_3 Films with Substitutional Cation Doping

15:40 to 16:00 page 124

Maria Valnice Boldrin Zanoni *(Department of Analytical Chemistry, Institute of Chemistry - UNESP, Araraquara, Brazil)*, Krishnan Rajeshwar, Marly E. Osugi

Degradation of Disperse Dyes by Photoelectrocatalyis on Bicomponent $W/WO_3/TiO_2$ Electrodes

16:00 to 16:20 page 136

Sachio Yoshihara *(Graduate School of Engineering, Utsunomiya University, Utsunomiya, Japan)*

Preparations of Visible Light Sensitive TiO_2 Photocatalytic films by Electrophoretic Sol-Gel Deposition

16:20 to 16:40 page 140

Mihaela-Claudia Tertis *(Babes-Bolyai University of Cluj-Napoca, Faculty of Chemistry and Chemical Engineering, Associated Francophone Laboratory, Cluj-Napoca, Romania)*, Florina Ionescu, Maria Jitaru

Photo-electro Fenton Treatment of Synthetic Wastewater Containing Nitrophenolic Pollutants

16:40 to 17:00

Coffee Break

Chair: K. Rajeshwar, V. Di Noto

17:00 to 17:20 page 126

Andrés G. Muñoz *(Division of Solar Energy, Helmholtz-Centre for Materials and Energy, Berlin, Germany)*, Michael Kanis, Hans-Joachim Lewerenz, Michael Lublow, Katarzyna Skorupska, Thomas Stempel

Early stages of electrodeposition of noble metal nano-islands onto Si(111) surfaces. A synchrotron radiation photoelectron spectroscopy.

17:20 to 17:40 page 125

Yusuf Dilgin *(Science & Arts Faculty, Çanakkale Onsekiz Mart University, Department of Chemistry, Çanakkale, Turkey)*, Delia Maria Gligor, Lo Gorton

Photoelectrocatalysis of NADH with Electropolymerized Modified Electrodes

17:40 to 18:00 page 129

Luca Samiolo *(ISOF-CNR c/o Department of Chemistry, University of Ferrara, Ferrara, Italy)*, Rossano Amadelli, Alexander Velichenko

Photo-(electro)-catalytic Oxidation of Alcohols on Visible Light-Absorbing Semiconductor Materials

18:00 to 18:20 page 134

Ushula Tefashe *(Faculty of Mathematics and Science, Department of Pure and Applied Chemistry and Institute of Chemistry and Biology of the Marine Environment, Carl von Ossietzky University of Oldenburg, Oldenburg, Germany)*, Thomas Löwenstein, Derck Schlettwein, Gunther Wittstock

Incident light intensity and wavelength dependence of the kinetics of redox reactions at dye-sensitized ZnO electrodes investigated by SECM

18:20 to 18:40 page 128

Gilbert Nöll *(Organic Chemistry, Siegen University, Siegen, Germany)*, Bernhard Dick, Günter Hauska, Peter Hegemann, Karin Lanzl, Tanja Nöll, Madlene von Sanden-Flohe

Photochemical Reduction of Flavoproteins

18:40 to 19:00 page 135

Hidenori Yahiro *(Department of Materials Science and Biotechnology, Graduate School of Science and Engineering, Ehime University, Matsuyama, Japan)*, Yamaura Hiroyuki, Asamoto Makiko, Yamaguchi Syuhei, Miyamoto Takaaki, Fukura Tomohiro

Photocatalytic Partial Oxidation of α-methylstyrene over Titanium Dioxide Supported on Zeolites

19:00 to 19:20 page 141

Abdulgalim Isaev *(Department of Chemistry, Daghestan State University, Makhachkala, Russian Federation)*, Naida Adamadzieva, Zazav Aliev, Naida Alieva, Guljanat Magomedova, Shamsiyat Rasulova

Photocatalytic, Photoelectrocatalytic and Electrocatalytic Oxidation of Azodye at High Oxygen Pressure

19:30 to 20:30 **Main Hall**

Chair: P. Schmuki, C. Li, P. Bogdanoff

Poster Session:
Photoelectrocatalysis, Bioelectrocatalysis, General Session
s02-P-001 *to* **s02-P-013**
s03-P-001 *to* **s03-P-013**
s04-P-001 *to* **s04-P-021**

20:30 Dinner

Wednesday 25 March 2009 – AM

I Electrocatalysis

Location: Room F

Chair: G. Wittstock, V. Barsukov

08:20 to 08:40 page 123

Jian Chen *(Dalian Institute of Chemical Physics, Dalian, China)*, Xin Liu, Gang Liu, Yuanwei Ma, Huamin Zhang, Yi Zou

Preparation and Characterization of Supported Pt/TiO_2/C Electrocatalyst for PEMFC Cathode

08:40 to 09:00 page 111

Kaido Tammeveski *(Institute of Chemistry, University of Tartu, Tartu, Estonia)*, Heiki Erikson, Ave Sarapuu

Oxygen reduction on carbon-supported gold catalysts

09:00 to 09:20 page 63

Renato Garcia Freitas *(DQ - UFSCar, Sao Carlos, Brazil)*, Ernesto Chaves Pereira

The Giant Multilayer Electrocatalytic (GME) Effect of Pt/Bi/Pt Nanostructured Metallic Multilayers Towards CO and Methanol Electrooxidation

09:20 to 09:40 page 72

Akimitsu Ishihara *(Yokohama National University, Yokohama, Japan)*, Koichi Matsuzawa, Shigenori Mitsushima, Ken-ichiro Ota

Tantalum Oxide-based Compounds as New Non-precious Cathodes for PEFC

09:40 to 10:00 page 118

Holger Wolfschmidt *(Department of Physics E19, Technische Universität München, Garching, Germany)*, Rainer Bußar, Ulrich Stimming

Electrocatalytic Activity of Pt/Au(111) and Pd/Au(111) Towards HER/HOR, ORR and MOR – Similarities and Differences

10:00 to 10:40

Coffee Break

Chair: S. Fiechter, P. Kysinski

10:40 to 11:00 page 50

Matthias Arenz *(Physikalische Chemie, Technische Universität München, Garching, Germany)*, Katrin Hartl, Viktorija Juhart, Karl Mayrhofer

New insights on the stability of Pt-based high surface area catalysts

11:00 to 11:20 page 67

Geir Martin Haarberg *(Department of Materials Technology, Norwegian University of Science and Technology, Trondheim, Norway)*, Kenji Kawaguchi, Masatsugu Morimitsu

Anodic Behaviour of Iridium and Tantalum Oxides Coated Titanium Electrodes in Sulphate Electrolytes

11:20 to 11:40 page 115

Lourdes Vazquez Gomez *(IENI-CNR, Padova, Italy)*, Sandro Cattarin, Paolo Guerriero, Marco Musiani, Lourdes Vazquez Gomez

Activation of porous Ni electrodes by (co)deposition of noble metals or noble metal oxides

11:40 to 12:00 page 96

Ievgen Obraztsov *(Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw, Poland)*, Francis D'Souza, Wlodzimierz Kutner, Krzysztof Noworyta, Channa A. Wijesinghe

Structural Effects in Electrocatalytic Dioxygen Reduction by the Electrochemically Synthesized Polymer of a Cobalt Porphyrin Derivative

12:30 Lunch

II Electrocatalysis

Location: Room E

Chair: N. Alonso-Vante, J. San Ping

08:00 to 08:20 page 119

Ichizo Yagi *(FC-Cubic, National Institute of Advanced Industrial Science and Technology, Tokyo, Japan)*, Akari Hayashi, Ken'ichi Kimijima, Junichi Miyamoto

Oxygen Transfer and Storage in Mesopores of Pt/Mesoporous Carbon Catalyst Thin Film Electrode

08:20 to 08:40 page 79

Ken'ichi Kimijima *(FC-Cubic, National Institute of Advanced Industrial Science and Technology (AIST), Tokyo, Japan)*, Akari Hayashi, Junichi Miyamoto, Ichizo Yagi

Development of Mesoporous Carbon Materials for Electrode Catalysts and their Electrochemical Properties

08:40 to 09:00 page 107

Jose Solla-Gullon *(Instituto de Electroquimica, Alicante, Spain)*, Antonio Aldaz, Juan M. Feliu, Enrique Herrero, Ana Lopez-Cudero, Francisco J. Vidal-Iglesias

Formic acid electrooxidation on adatom-decorated shape-controlled Pt nanoparticles

09:00 to 09:20 page 93

Fakhradin Mirkhalaf *(Sonochemistry Centre, Faculty of Heath and Life Sciences, Coventry University, Coventry, United Kingdom)*

Electrocatalytic Reduction of Oxygen on Gold Nanoparticles Attached to Glassy Carbon

09:20 to 09:40 page 94

Leandro Moreira de Campos Pinto *(Faculdade de Ciências, UNESP, Bauru, Brazil)*, Antonio Carlos Dias Ângelo

Periodic DFT Studies on Intermetallic Phases of Au and Pt used as Electrocatalysts for Fuel Cells Reactions

09:40 to 10:00 page 105

Elena Shembel *(Enerize Corporation, Coral Springs, USA)*, Timothy Pastushkin, Volodymyr Redko, Oxana Redko

Non-Destructive Test Methods of Initial Materials, Semi- and Final Products in Batteries, Supercapacitors and Solar Cells Industry

10:00 to 10:20

Coffee Break

Chair: E. Savinova, H. Baltruschat

10:20 to 10:40 page 51

Makiko Asamoto *(Department of Materials Science and Biotechnology, Graduate School of Science and Engineering, Ehime University, Matsuyama, Japan)*, Shinji Miyake, Hidenori Yahiro, Hiroyuki Yamaura, Yuka Yonei

Electrochemical Performances of Proton-Conducting SOFC with La-Sr-Fe-O Cathode Fabricated by Electrophoretic Deposition Techniques

10:40 to 11:00 page 104

Hendrik Schulenburg *(Paul Scherrer Institut, Villigen, Switzerland)*, Helmut Bönnemann, Guram Khelashvili, Elisabeth Müller, Thomas Roser, Günther G. Scherer, Alexander Wokaun

Heat-treated $PtCo_3$ nanoparticles as oxygen reduction catalyst

11:00 to 11:20 page 69

Ting He *(Honda Research Institute USA, Columbus, USA)*, Eric Kreidler, Qingmin Xu

The Durability of Pt and Pt Alloys as Fuel Cell Catalysts for Oxygen Electroreduction

11:20 to 11:40 page 49

Catia Arbizzani *(Dipartimento di Scienza dei Metalli, Elettrochimica e Tecniche Chimiche, University of Bologna, Bologna, Italy)*, Sabina Beninati, Marina Mastragostino, Alberto Varzi

New supported electrocatalysts for DMFCs

11:40 to 12:00 page 80

Vladimir Komanicky *(Faculty of Sciences, P. J. Safarik University, Kosice, Slovakia)*, Kee-Chul Chang, Daniel Hennesy, Hakim Iddir, Goran Karapetrov, Andreas Menzel, Hoydoo You, Peter Zapol

Designing Platinum Catalysts and Their Shape-Specific Electro-chemical Reactivity

12:30 Lunch

Poster Presentations

Electrocatalysis

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Keggin-type heteropolyacid salts as a new stable matrix for Pt-based catalyst for oxygen reduction

Aneta Kolary-Zurowska (*Department of Chemistry, University of Warsaw, Warsaw, Poland*), Sonia Dsoke, Pawel J. Kulesza, Roberto Marassi, Artur Zurowski

s01-P-016 page 162

Electrochemical reduction of oxygen on different carbon nanomaterials in alkaline solution

Ivar Kruusenberg (*Institute of Chemistry, University of Tartu, Tartu, Estonia*), Mati Arulepp, Jaan Leis, Kaido Tammeveski

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$RuSe_x$ Nanoparticles with Tungsten Oxide Modified Carbon-Supports as Bifunctional Electrocatalytic Systems for Oxygen Reduction

Miecznikowski Krzysztof (*Department of Chemistry, University of Warsaw,, Warsaw, Poland*), Peter Bogdanoff, Iris Dorbandt, Sebastian Fiechter, Aneta Kolary-Zurowska, Pawel Kulesza, Adam Lewera

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Supported Core-Shell Structures for Electrocatalytic Applications

Christian Kulp (*Analytische Chemie - Elektroanalytik & Sensorik, Ruhr-Universität Bochum, Bochum, Germany*), Michael Bron, Wolfgang Schuhmann

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Fabrication of Fine Metallic Patterns through Potential Pulsation Method

Joo-Yul Lee (*Department of Surface Technology, Korea Institute of Materials Science, Changwon, Korea*), Man Kim

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Formation of $Ce_{0.2}Sm_{0.8}O_{1.9}$ (SDC) Nanoparticles and Electrophoretic Deposition(EPD) on Non-Conducting Substrates for Solid Oxide Fuel Cell Application

Kyeongseop Lee (*Chemical Engineering, Jeonju, Korea*), Sadia Ameen, Yun Kyung Lee

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Investigation on the Electrochemical Characteristics of Ta_2O_5-IrO_2 based Metal Oxide Electrode

Joo-Yul Lee (*Department of Surface Technology, Korea Institute of Materials Science, Changwon, Korea*)

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Bifunctional Electrocatalysis on Iodate and Hydrazine by Polyoxometalate-based Multilayer Films Electrode

Lin Xu (*Dept. of Chemistry, Northeast Normal University, Changchun, China*), Weihua Guo, Bingbing Xu, Yanyan Yang

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Electrodeposited Ni nanostructure for hydrogen evolution reaction in alkaline water electrolysis

Youngmi Yi (*Department of Environmental Science and Engineering, Gwangju, Korea*), Jae Kwang Lee, Joungmin Lee

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Synthesis of Hierarchical Nanostructured Hollow Core, Mesopore Shell Carbon for Electrochemical Hydrogen Storage

Jong-Sung Yu (*Department of Advanced Materials Chemistry, Korea University, Jochiwon, Korea*), Baizeng Fang, Minsik Kim, Minwoo Kim, Jung Ho Kim

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Electrocatalytic Properties of Network Films Utilizing Supports of Gold Nanoparticles Modified with Polyoxometallates and Conducting Polymers

Sylwia Zoladek (*Department of Chemistry, University of Warsaw, Warsaw, Poland*), Pawel Kulesza, Iwona A. Rutkowska

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Insoluble salts of Keggin-type heteropolyacids as a new material for matrix for methanol and ethanol oxidation reaction

Artur Zurowski (*Department of Chemistry, University of Camerino, Camerino, Italy*), Sonia Dsoke, Aneta Kolary - Zurowska, Pawel J. Kulesza, Roberto Marassi

Photoelectrocatalysis

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Preparation and Photo-Electrocatalytic Behaviour of Composite PbO_2-TiO_2 Materials

Rossano Amadelli (*ISOF-CNR, c/o Department of Chemistry, University of Ferrara, Ferrara, Italy*), V.A. Knysh, T.V. Lukynenko, L. Samiolo, A.B. Velichenko

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I-V Properties of a P-N Junction Diode Prepared from PANI/ZnO and PANI/ZnO/TiO_2 Films

Sadia Ameen (*Chemical Engineering, Jeonju, Korea*), Chul Gi Jo, Young Soon Kim, Rizwan Wahab

Bioelectrocatalysis

General Session

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Corrosion Resistance of Sol-Gel coatings deposited on Commercial Carbon Steel

M. A. Domínguez-Crespo (*Instituto Politécnico Nacional, Altamira, Mexico***)**, A. García-Murillo, E. Onofre-Bustamante, C. Yáñez-Zamora and F. J. Carrillo-Romo

s4-P-024 244

Preparation of Ni Nanoparticles and Evaluation of their Electrochemical Performance as Potential Electrode Materials on HER

M. A. Domínguez-Crespo (*Instituto Politécnico Nacional, Altamira, Mexico***)**, E. Ramírez-Meneses, V. Montiel-Palma and A.M. Torres Huerta

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Laccase Encapsulation in Polypyrrole Microcapsules

Agata Krywko-Cendrowska (*Department of Chemistry, University of Warsaw, Warsaw, Poland*) Maciej Mazur, Paweł Krysinski

s4-P-026 246

Tailoring surfaces and supports for enzyme mediation, with application to biosensor and biopower device development

P. Kavanagh (*School of Chemistry, National University of Ireland, Galway, Ireland*) , S. Boland, K. Foster, J. Hajdukiewicz, P. Jenkins and D. Leech

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Impedance studies of nickel oxide based electrode for electrochemical capacitors

Karolina Andrearczyk (*Department of Electrochemistry Corrosion and Materials Engineering, Gdansk University of Technology, Gdansk, Poland*) Kazimierz Darowicki, Katarzyna Lota, Grzegorz Lota, Paweł Slepski