

Book of Abstracts of the  
7th Spring Meeting  
of the  
International Society of  
Electrochemistry

Szczyrk, Poland  
22-25 March, 2009



International Society of Electrochemistry  
Rue de Sébeillon 9b  
1004 Lausanne  
Switzerland

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# Sunday 22 March 2009 – PM

## Welcome Session

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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

Ohmimicroscopy

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** (*LMSPG-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

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**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 Zamlynnny, 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<sub>2</sub>O<sub>2</sub>-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

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**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 Buřar

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

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### 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, Sanyo Onoda-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

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**Ludwig Kibler** (*Institute of Electrochemistry, University of Ulm, Ulm, Germany*)  
Tailoring 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** (*Département 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 Aciyach, 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 dissymmetric 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  $\text{Lx}_{0.6}\text{Sr}_{0.4}\text{CoO}_{3-\delta}$  cathodes and  $\text{Ni-Ce}_{1-x}\text{Gd}_x\text{O}_{2-\delta}$  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

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**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 Nanocrystals as 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 nanostructured 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<sub>2</sub> 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

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

Electrochemical Oxygen Reduction at UHV-prepared Pt<sub>x</sub>Ru<sub>1-x</sub> / 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<sub>2</sub> 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. Wisler  
 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

11:20 to 11:40 Invited page 77

**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<sub>2</sub> Reduction on Carbon Supported PtWO<sub>3</sub> 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. Likhnietskii  
 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 electrooxidation 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<sub>x</sub> 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 Tsyppin  
 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, Dübendorf, Switzerland*), Bruce Alexander, Jan Augustynski, Artur Braun, Thomas Graule, Michael Stiefel  
 Modeling of Porosity and Transparency of WO<sub>3</sub> 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 Photoelectrocatalysis on Bicomponent W/WO<sub>3</sub>/TiO<sub>2</sub> Electrodes
- 16:00 to 16:20 page 136  
**Sachio Yoshihara** (*Graduate School of Engineering, Utsunomiya University, Utsunomiya, Japan*)  
 Preparations of Visible Light Sensitive TiO<sub>2</sub> 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

**Hidegori 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  $\alpha$ -methylstyrene over Titanium Dioxide Supported on Zeolites

19:00 to 19:20

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**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<sub>2</sub>/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

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**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, Włodzimierz 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 Electroquímica, 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 Health 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

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**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

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**Hendrik Schulenburg** (*Paul Scherrer Institut, Villigen, Switzerland*), Helmut Bönnemann, Guram Khelashvili, Elisabeth Müller, Thomas Roser, Günther G. Scherer, Alexander Wokaun  
Heat-treated PtCo<sub>3</sub> nanoparticles as oxygen reduction catalyst

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**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

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**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

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**Vladimir Komanicky** (*Faculty of Sciences, P. J. Šafárik University, Kosice, Slovakia*), Kee-Chul Chang, Daniel Hennesy, Hakim Iddir, Goran Karapetrov, Andreas Menzel, Hoydoo You, Peter Zapol  
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12:30  Lunch



# Poster Presentations

## Electrocatalysis

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**Helmut Baltruschat** (*University of Bonn, Bonn, Germany*), Hanchun Wang
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**Piotr Barczuk** (*Department of Chemistry, University of Warsaw, Warsaw, Poland*), Pawel J. Kulesza, Adam Lewera, Krzysztof Miecznikowski
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**Maryam Bayati** (*University of Louis Pasteur, Strasbourg, France*), Elena Savinova
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**Maciej Chotkowski** (*Faculty of Chemistry, University of Warsaw, Warsaw, Poland*), Andrzej Czerwinski, Zbigniew Rogulski
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**Alessandra Colombo** (*Department of Physical Chemistry and Electrochemistry, University of Milan, Milan, Italy*), Edoardo Guerrini, Sergio Trasatti
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**Beata Dembinska** (*Department of Chemistry, University of Warsaw, Warsaw, Poland*), Pawel Kulesza
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Enhanced Electro-oxidation of Formic Acid at Manganese Oxide Nanorod-Modified Pt Electrodes  
**Mohamed El-Deab** (*Institute of Electrochemistry, Ulm, Germany*), Ludwig Kibler, Dieter Kolb



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**Zahra Fattahi** (*Chemistry Department of K.N.T. University of Technology, Tehran, Iran*), Iman Danaee, Majid Jafarian, Mohammad Ghasem Mahjani
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**Stefano Frasca** (*Institute for Biochemistry and Biology, University of Potsdam, Golm, Germany*), Markus Antonietti, Bernd Smarsly, Arne Thomas, Ulla Wollenberger
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**Renato Garcia Freitas** (*DQ - UFSCar, Sao Carlos, Brazil*), Luis Fernando Quintino Marchesi, Robson Tadeu Sousa Oliveira, Ernesto Chaves Pereira, Mauro Coelho Santos
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**Michal Grden** (*Faculty of Chemistry, University of Warsaw, Warsaw, Poland*), Gregory Jerkiewicz
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**Edoardo Guerrini** (*Department of Physical Chemistry and Electrochemistry, University of Milan, Milan, Italy*), Alessandra Colombo, Sergio Trasatti
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**Isaac Herraiz-Cardona** (*Universidad Politecnica de Valencia. Dpto. Ingenieria Quimica y Nuclear, Valencia, Spain*), Emma Ortega, Valentin Perez-Herranz
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**Ivar Kruusenberg** (*Institute of Chemistry, University of Tartu, Tartu, Estonia*), Mati Arulepp, Jaan Leis, Kaido Tammeveski
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**Joo-Yul Lee** (*Department of Surface Technology, Korea Institute of Materials Science, Changwon, Korea*)

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**Adam Lewera** (*Department of Chemistry, University of Warsaw, Warsaw, Poland*), Piotr Barczuk, Ralf Hunger, Wolfram Jaegermann, Pawel Kulesza, Krzysztof Miecznikowski, Andrzej Wieckowski
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**Grigore Munteanu** (*Centre for Research In Electroanalytical Technologies (CREATE), Department of Science, Institute of Technology Tallaght, Dublin, Ireland*), Eithne Dempsey, Tim McCormac
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**Ali Naeemy** (*Department of Chemistry, K. N. Toosi University of Technology, Tehran, Iran*)
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**Jun-ichi Nambu** (*Faculty of Science, Kochi University, Kochi, Japan*), Gianluca Bernardini, John Boas, Alan Bond, Si-Xuan Guo, John Pillbrow, Tadaharu Ueda
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**Odysseas Paschos** (*Department of Physics E19, Technische Universität München, Garching, Germany*), Rainer Buřar, Ulrich Stimming, Holger Wolfschmidt
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**Elena Pastor** (*Dpto. Química Física, Universidad de La Laguna, La Laguna, Spain*), Olmedo Guillén-Villafuerte, M<sup>a</sup> Jesús Lázaro, William H. Lizcano-Valbuena, José Luis Rodríguez, David Sebastián
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**Paola Quaino** (*Institute of Theoretical Chemistry, Ulm University, Ulm, Germany*), Kay Pötting, Paola Quaino, Elisabeth Santos, Wolfgang Schmickler
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**Mehdi Rashvand Avie** (*Department of Chemistry, K. N. T. University of Technology, Tehran, Iran*), Iman Danaee, Majid Jafarian, Mohammad Ghasem Mahjani
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**Holger Wolfschmidt** (*Department of Physics E19, Technische Universität München, Garching, Germany*), Tine Brülle, Ulrich Stimming

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**Lin Xu** (*Dept. of Chemistry, Northeast Normal University, Changchun, China*), Weihua Guo, Bingbing Xu, Yanyan Yang
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**Youngmi Yi** (*Department of Environmental Science and Engineering, Gwangju, Korea*), Jae Kwang Lee, Joungmin Lee
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**Sylwia Zoladek** (*Department of Chemistry, University of Warsaw, Warsaw, Poland*), Pawel Kulesza, Iwona A. Rutkowska
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**Artur Zurowski** (*Department of Chemistry, University of Camerino, Camerino, Italy*), Sonia Dsoke, Aneta Kolary - Zurowska, Pawel J. Kulesza, Roberto Marassi

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**Clarissa Baumanis** (*Institut für Technische Chemie, Leibniz Universität Hannover, Hannover, Germany*)
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**Gábor Bencsik** (*Institute of Physical Chemistry, University of Szeged, Szeged, Hungary*), Zsófia Lukács, Csaba Visy
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**Claire Bertoia** (*Research Group Electrochemical and Surface Engineering, Vrije Universiteit Brussel, Brussels, Belgium*)
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**Bartosz Maranowski** (*Department of Chemistry, Warsaw University, Warsaw, Poland*), Krzysztof Bieńkowski, Marcin Strawski, Marek Szklarczyk
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**Ulrich Stimming** (*Department of Physics E19, Technische Universität  
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**Urszula E. Wawrzyniak** (*Faculty of Chemistry, University of Warsaw,  
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