



29th Annual Meeting

of the
International Society of Electrochemistry

Mikulov, Monday 19 April to Wednesday 21 April 2021

Symposium 1
Oral presentation program

Monday 19 April 2021 - Morning

Symposium1

Energy: electrochemistry in securing the sustainable society development

07:40 to 08:20 Keynote

Rebeca Marcilla (Electrochemical Processes Unit, IMDEA Energy, MOSTOLES, Spain), Rebecca Grieco, Marta Liras, Antonio Molina

[Redox- Active Conjugated Microporous Polymer as High Performing Electrodes for More Sustainable Batteries](#)

08:20 to 08:40 Invited

Asif Ansar (Electrochemical Energy Technology, German Aerospace Center, Stuttgart, Germany)

[Freestanding electrodes by plasma spraying to maximize performance and cost competitiveness of Alkaline and Anion Exchange Membrane Water Electrolysers](#)

08:40 to 09:00

Ester Lopez Fernandez (Departamento de Ingenieria Que-mica, Universidad de Castilla-La Mancha, Ciudad Real, Spain), Juan Pedro Espinós, Jorge Gil-Rostra, Agustín R. González-Élipe, Francisco Yubero, Antonio de Lucas-Consuegra

[Ionomer-Free Nickel-Iron Electrodes Prepared by Magnetron Sputtering for Extremely Efficient Water Electrolysis](#)

09:20 to 09:40

Coffee Break

09:40 to 10:00

Jakub Wawrzyniak (Physical Aspects of EcoEnergy Department, The Szewalski Institute of Fluid-Flow Machinery PASci, Gdansk, Poland), Emerson Coy, Katarzyna Grochowska, Jakub Karczewski, Katarzyna Siuzdak

[Laser-modified transition metal oxides for water splitting](#)

10:00 to 10:20

Matthew Bird (School of Chemistry, University of Nottingham, Nottingham, United Kingdom), Johannes Biskupek, Lee Johnson, Ute Kaiser, Andrei Khlobystov, Graham Newton, William Townsend, Darren Walsh

[Enhancement of oxygen evolution performance through confinement within single-walled carbon nanotubes](#)

10:20 to 10:40

Akansha Goyal (Leiden Institute of Chemistry, Leiden University, Leiden, Netherlands), Marc Koper

[Interdependent role of key electrolyte parameters in tuning the kinetics of hydrogen evolution reaction in alkaline media](#)

10:40 to 11:00

Benjamin Howchen (Chemistry, University of Bristol, Bristol, United Kingdom)

[Electronic structure descriptors for oxygen evolution activity of \$\text{LaIr}_x\text{Ni}_{1-x}\text{O}_3\$](#)

11:00 to 12:00

Live zoom Q&A – S01 Moderator : Thomas Turek

Monday 19 April 2021 - Afternoon

Symposium1

Energy: electrochemistry in securing the sustainable society development

12:40 to 13:00 *Invited*

Thomas Turek (Chemical and Electrochemical Process Engineering, Clausthal University of Technology, Clausthal-Zellerfeld, Germany), Jörn Brauns, Felix Gäde
[Dynamic Operation of Alkaline Water Electrolyzers](#)

13:00 to 13:20

Rebecca Pittkowski (Chemistry, University of Copenhagen, Copenhagen, Denmark), Spyridon Divanis, Harry Hoster, Mariana Klementova, Petr Krtil, Sanjeev Mukerjee, Shahin Nikman, Jan Rossmeisl
[Enhancing Oxygen Evolution in Prototypical LaNiO₃ Perovskite by Rational Ni Oxidation State Pinning: Theoretical Conception and Synthetic Approach](#)

13:20 to 13:40

DJ Donn Matienzo (New Application Research, Research and Development Division, Industrie De Nora, Milan, Italy), Chiara Di Bari, Spyridon Divanis, Emanuele Instuli, Tugçe Kutlusoy
[Evaluation of La- and Pr-based perovskite OER catalysts as candidate materials for industrial alkaline water electrolysis](#)

13:40 to 14:00

Sreena Thekkoot (Chemistry, York University, Toronto, Toronto, Canada), Rehana Islam, Sylvie Morin, Sreena Thekkoot
[Cobalt based transition metal spinel oxide thin films as efficient water oxidation electrocatalysts](#)

14:00 to 14:20 *Invited*

Jens Oluf Jensen (Department of Energy Conversion and Storage, Technical University of Denmark, Lyngby, Denmark), David Aili, Vanessa Baj, Christodoulos Chatzichristodoulou, Florian Gellrich, Mikkel Rykær Kraglund, Qingfeng Li, Alexander Kappel Reumert
[Perspectives on Alkaline Electrolysis. Catching up with Performance](#)

14:20 to 14:40

Michaela Plevová (Inorganic technology, University of Chemistry and Technology, Prague, Czech Republic), Karel Bouzek, Jaromír Hnát, Martin Paidar, Jan Zitka
[Improvement of the alkaline water electrolysis technology by using a catalyst-coated membrane-electrode assembly with non-platinum catalysts](#)

14:40 to 15:00

Coffee Break

15:00 to 15:20

Nicolas Dubouis (Chimie du Solide et de l'Energie, Collège de France, 75231, France), Roxanne Berthin, Alexis Grimaud, Guillaume Jeanmairet, Benjamin Porcheron, Elodie Salager, Mathieu Salanne, Alessandra Serva
[Tuning the Water Reduction Through Controlled Nanoconfinement Within an Organic Liquid Matrix](#)

15:20 to 15:40

Oriol Gutiérrez-Sánchez (Applied Electrochemistry and Catalysis, University of Antwerp, Antwerp, Belgium), Tom Breugelmans, Metin Bulut, Nick Daems, Willem Offermans, Deepak Pant, Yuvraj Y. Birdja
[The Inhibition of the Proton Donor Ability of Bicarbonate Promotes the Electrochemical Conversion of CO₂ from Bicarbonate Solutions](#)

15:40 to 16:00

Mohammed Azeezulla Nazrulla (Department of Materials Chemistry, National Institute of Chemistry, Ljubljana, Slovenia), Nejc Hodnik
[Towards Designing Suitable Electrocatalysts via Electronic Structure Manipulation of Copper by Doping with Boron](#)

16:00 to 16:20

Matteo Miola (Chemical Engineering, Groningen University, Groningen, Netherlands), Bart C. A. De Jong, Paolo P. Pescarmona
[Scalable Bismuth electrocatalyst for selective CO₂-to-formate conversion](#)

16:20 to 16:40

Kevin Van Daele (Faculty of Applied Engineering, ELCAT Research Group, University of Antwerp, Antwerpen, Belgium), Tom Breugelmans, Nick Daems, Deepak Pant
[Increasing Sn-based Electrocatalyst Stability for the Electrochemical CO₂ Reduction to Formic Acid: a Particle Confinement Strategy](#)

16:40 to 17:00

Miguel Duarte (Faculty of Applied Engineering, ELCAT, University of Antwerp, Wilrijk, Belgium), Tom Breugelmans, Nick Daems, Jonas Hereijgers
[Economic Valorization of CO₂ Electrolyzers with Metal-Nitrogen-Doped Carbons and Reactor Engineering](#)

17:00 to 18:00

Live zoom Q&A – S01 Moderator : Jens Oluf Jensen

Tuesday 20 April 2021 - Morning

Symposium1

Energy: electrochemistry in securing the sustainable society development

07:40 to 08:20 Keynote

Vladimir Matolin (MFF UK, Nanomaterials group, Charles University, Praha , Czech Republic), Peter Kus
[Hydrogen - Fuel for Sustainable Energy](#)

08:20 to 08:40

Petr Vagner (Numerical Mathematics and Scientific Computing, Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany), Juergen Fuhrmann, Clemens Gohlke, Vojtech Milos, Ruediger Mueller, Petr Vagner
[A continuum modeling of ionic charge transport in yttria-stabilized cubic zirconia incorporating triple phase boundary, lattice structure and immobile oxide ions](#)

08:40 to 09:00

Kai Exner (Theoretical Inorganic Chemistry, Duisburg-Essen, Essen, Germany)
[What is the Optimum Binding Energy of Reaction Intermediates in the Hydrogen and Oxygen Evolution Reactions?](#)

09:00 to 09:20

Federico Calle-Vallejo (Materials Science and Physical Chemistry, University of Barcelona, Barcelona, Spain)
[Outlining the Optimization of Electrocatalysts for Water Splitting](#)

09:20 to 09:40

Coffee Break

09:40 to 10:00

Zhong-qun Tian (Chemistry Department, Xiamen University, Xiamen, China)
[SERS Study and Theoretical Simulation of Interfacial Water Structure of Metal Electrodes](#)

10:00 to 10:20

Janis Geppert (Institute for Applied Materials - ET, Karlsruhe Institute of Technology, Karlsruhe, Germany), Ulrike Krewer, Fabian Kubanek, Philipp Röse
[Identifying the Oxygen Evolution Mechanism by Microkinetic Modelling of Cyclic Voltammograms](#)

10:20 to 10:40

Nakkiran Arulmozhi (Chemistry, Leiden University, Leiden, Netherlands), Marc Koper, Grégory F. Schneider, Viorela Tudor
[Three-Way Interactions of Two-Dimensional Crystals](#)

10:40 to 11:00

Nawras Abidi (Department of chemistry, ENS de Lyon, Lyon, France), Audrey Bonduelle-Skrzypczak, Stephan N. Steinmann
[Revisiting the active sites on MoS₂ in aqueous solution via Grand-Canonical DFT: The role of water dissociation](#)

11:00 to 12:00

Live zoom Q&A – S01 Moderator : Asif Ansar

Tuesday 20 April 2021 - Afternoon

Symposium1

Energy: electrochemistry in securing the sustainable society development

12:40 to 13:20 Keynote

Thomas von Unwerth (Advanced Powertrain, Chemnitz University of Technology, Chemnitz, Germany)
[Mobility with Hydrogen and Fuel Cells - challenges in series production for components](#)

13:20 to 13:40

Aikaterini Touni (Chemistry, Aristotle University of Thessaloniki, Thessaloniki, Greece), Athanasios Chatzidakis, Xiaolan Kang, Xin Liu, Sotirios Sotiropoulos, Olga Spyridou
[Platinized Black Titania Nanotube HER Cathodes prepared by the Galvanic Deposition Method at CaH₂-reduced Titania Nanotubes](#)

13:40 to 14:00

Arthur Shih (Leiden Institute of Chemistry, Leiden University, Leiden, Netherlands), Nakkiran Arulmozhi, Marc Koper
[Electrocatalysis Under Cover: Enhanced HER via Defective Graphene Covered Pt\(111\)](#)

14:00 to 14:20

Christine Minke (Chair for Electric Energy Storage Systems, Leibniz University Hannover, Hannover, Germany), Boris Bensmann, Richard Hanke-Rauschenbach, Michel Suermann
[Scarce Metals in Water Electrolysis: the Critical Element Iridium](#)

14:20 to 14:40

Lifeng Liu (Clean Energy, International Iberian Nanotechnology Laboratory, Braga, Portugal)
[Iridium-Based Nanocatalysts for Efficient and Durable Oxygen Evolution in Acidic and Neutral Media](#)

14:40 to 15:00

Coffee Break

15:00 to 15:20

Mark Symes (School of Chemistry, University of Glasgow, Glasgow, United Kingdom)
[Decoupled Electrolysis for Water Splitting and Beyond](#)

15:20 to 15:40

Sergio Diaz-Abad (Chemical Engineering, University of Castilla- La Mancha, Ciudad Real, Spain),
Sergio Diaz-Abad, Justo Lobato, Manuel Andrés Rodrigo
[Composite Polybenzimidazole membranes for Green Hydrogen production by the sulfur dioxide depolarized electrolysis](#)

15:40 to 16:00

Alberto Rodríguez Gómez (Chemical Engineering, University of Castilla-La Mancha , Ciudad Real, Spain), Fernando Dorado, Alberto Rodríguez-Gómez, Antonio de Lucas-Consuegra, Ana Raquel de la Osa
[Boosting the ethanol electro-reforming process through Pt-transition metals alloys: electrochemical performance and products distribution](#)

16:00 to 16:20

Simone Bonizzoni (Materials Science, University of Milano Bicocca, Milano, Italy), Luca Beverina, Simone Bonizzoni, Chiara Ferrara, Felix Lohmann-Richters, Piercarlo Mustarelli, Antonio Papagni, Pietro Stilli
[Aquivion®-Based Anion Exchange Membrane for Fuel Cell and Electrolyzer Applications](#)

16:20 to 16:40

Beatriz Martínez-Sánchez (University Materials Institute of Alicante (IUMA), University of Alicante, Alicante, Spain), Diego Cazorla-Amorós, Emilia Morallón, Javier Quílez-Bermejo, Emilio San-Fabián
[Effect of the Aminophenylphosphonic Acid Isomer on the Electrochemical Functionalization of Different Carbon Nanotubes Structures](#)

16:40 to 17:00

Vladimir Guterman (Chemistry Faculty, Southern Federal University, Rostov-on-Don, Russia), Anastasya Alekseenko, Sergey Belenov, Maria Danilenko, Irina Gerasimova, Igor Leontyev, Alina Nevelskaya, Kirill Parezsh
[Platinum-Carbon Catalysts for PEM FC: Improvement Opportunities Far from Exhausted](#)

17:00 to 18:00

Live zoom Q&A – S01 Moderator : Ann Cornell

Wednesday 21 April 2021 - Morning

07:40 to 08:20 Keynote

Plamen Atanassov (Chemical & Biomolecular Engineering, University of California Irvine, Irvine, USA)
[Electrocatalysis as a Major Enabling Technology for Decarbonization](#)

08:20 to 08:40

Francesc Valls Mascaró (Chemistry, Leiden University, Leiden, Netherlands), Marcel J. Rost, Marc Koper, Francesc Valls Mascaró

Towards Solving Catalyst Degradation: Platinum Stability for Fuel Cell Operation

08:40 to 09:00

Jon Bjarke Valbaek Mygind (Leiden Institute of Chemistry, Leiden University, Leiden, Netherlands), Marc Koper, Francesc Valls Mascaro, Marcel J. Rost

[Tuning the Stability of Platinum by means of Scan Rate](#)

09:00 to 09:20

Milutin Smiljanic (Department of Materials Chemistry, National Institute of Chemistry, LJUBLJANA, Slovenia), Marjan Bele, Miran Gaberscek, Nejc Hodnik, Primoz Jovanovic, Ursa Petek, Francisco Ruiz-Zepeda, Martin Sala

[Electrochemical Stability of Carbon Supported Gold Nanoparticles](#)

09:20 to 09:40

Coffee Break

09:40 to 10:00

Mohammad Javad Eslamibidgoli (Theory and Computation of Energy Materials (IEK-13), Forschungszentrum Jülich GmbH, Jülich, Germany), Michael H. Eikerling, Kourosh Malek

[Deep Learning for Electrochemical Materials Characterization](#)

10:00 to 10:20

Masoomeh Ghasemi (Mechanical engineering, Inha university , Incheon, Korea), Yohan Cha, Jaeyoo Choi, Hyunchul Ju, Eunsoo Kim

[A study on the influence of non-uniform Pt particle size distribution using a full three-dimensional, multi-scale, multi-phase polymer electrolyte membrane fuel cell model](#)

10:20 to 10:40

Hassan Salihi (Department of Mechanical Engineering, Inha University, Incheon, Korea), Hyunchul Ju, Jiseung Lee

Analyzing polymer electrolyte fuel cell impedance via combining transient two-phase fuel cell model and equivalent electric circuit model

10:40 to 11:00

Mireya Carvela (Chemical Engineering Department, University of Castilla-La Mancha, Ciudad Real, Spain), Ismael Fernández, Justo Lobato, María Millán, Manuel Andrés Rodrigo

[New Findings in a Chlor-alkali PEM Reversible Fuel Cell](#)

11:00 to 12:00

Live zoom Q&A – S01 Moderator : Stylianos Neophytides

Wednesday 21 April 2021 - Afternoon

Symposium1

Energy: electrochemistry in securing the sustainable society development

12:40 to 13:00

Fatemeh Hanifpour (Science Institute, University of Iceland, Reykjavík, Iceland), Younes Abghoui, Camila Pía Canales, Helga Dögg Flosadóttir, Emil Gauti Friðriksson, Árni Sigurður Ingason, Kristina Johansson, Erik Lewin, Friðrik Magnus, Egill Skúlason, Arnar Sveinbjörnsson, Tryggvi Kristmar Tryggvason

[A Comprehensive Study on the Mechanism of Electrochemical Nitrogen Reduction Reaction Towards Ammonia Synthesis Using Niobium Oxynitride Catalyst](#)

13:00 to 13:20

Melanie Colet-Lagrille (Chemical Engineering, Biotechnology and Materials, Universidad de Chile, Santiago, Chile), Melanie Colet-Lagrille, Franco Lizama-Valenzuela, Daniel Peña-Torres, Guillermo Valenzuela-Venegas

[Process Analysis as Supporting Tool for Electrochemical Engineering Research. Case Study: Electric City Buses in Chile](#)

13:20 to 13:40 Invited

Stylianos Neophytides (ICE/HT, FORTH, Patras, Greece), Pananagiotis Giotakos

[Elucidation of the O₂ reduction mechanism and energetics by the use of electrochemical impedance spectroscopy](#)

13:40 to 14:00

Yun Wu (Department of Materials Science and Engineering, Guangdong University of Petrochemical Technology, Maoming, China), Azhagumuthu Muthukrishnan, Yuta Nabae, Shinsuke Nagata

[Kinetic rate constant calculations of oxygen reduction reaction pathways over iron-nitrogen-doped carbon catalysts considering the chemical decomposition of H₂O₂](#)

14:00 to 14:20

Xiong Zhang (Institute of Chemistry and Processes for Energy, Environment, University of Strasbourg, Strasbourg, France), Giuliano Giambastiani, Cuong Pham-Huu, Sergey Pronkin, Lai Troung-Phuoc

[Atomic Fe decorated N-doped porous carbon electrocatalysts with high performance in oxygen electroreduction](#)

14:20 to 14:40

Christian Durante (Chemical Sciences, Università degli Studi di Padova, Padova, Italy), Giorgia Daniel, Christian Durante, Gaetano Granozzi, Tomasz Kosmala, Anthony Kucernak, Marco Mazzucato, Asad Mehmood

[Effect of induced Micro- and Meso-porosity on the formation and activity of Fe-N-C active sites for Oxygen Reduction Reaction](#)

14:40 to 15:00

Coffee Break

15:00 to 15:20

Marco Mazzucato (Chemical Science, University of Padova, Padova, Italy), Christian Durante, Gaetano Granozzi, Tomasz Kosmala

[Cooperative effect of Sn precursor on the Fe-N_x site formation and activity in Fe-N-C Catalyst for Oxygen Reduction Reaction](#)

15:20 to 15:40

Giorgia Daniel (Department of Chemical Science, Università di Padova, Padova, Italy)

[Synergism between S doping and porous properties on Fe-N_x active sites for oxygen reduction in acid media](#)

15:40 to 16:00

Riccardo Brandiele (Department of Chemical Sciences, University of Padova, Padova, Italy), Maria Chiara Dalconi, Christian Durante, Gian Adrea Rizzi

[Metal support interaction and catalytic activity for ORR in Pt NPs supported on Mesoporous carbon characterized by different textural properties and tunable density of thiophenic groups](#)

16:00 to 16:20

Ali Riza Ozkaya (Chemistry Department, Marmara University, Department of Chemistry, 34722 Kadikoy, , Istanbul, Turkey), Ozgun Akdag, Zafer Odabas, Efe Baturhan Orman, Safinaz Sahin

[Redox and Electrocatalytic Oxygen Reducing Properties of New Dinuclear Ball-Type Phthalocyanine Complexes Involving Tertiary Butyl and Bis\(methylene\)bis\(oxy\) Bridging Moieties](#)

16:20 to 16:40

Alessandro Facchin (Chemical Sciences, University of Padova, Padova, Italy)

[Oxygen Reduction Reaction at Single Site Catalysts: A combined Electrochemical Scanning Tunnelling Microscope and DFT investigation of Iron Octaethylporphyrin Chloride on HOPG](#)

16:40 to 17:00

Vineesh Thazhe Veetil (Chemistry, Bar Ilan University, Ramat Gan, Israel), Meera Mohankumar, David Zitoun

[Highly Stable Nitrogen Doped Tetragonal ZrO₂ nanoparticles for Oxygen Reduction Reaction in Alkaline Medium](#)

17:00 to 18:00

Live zoom Q&A – S01 Moderator : Plamen Atanassov