



HydrogenDays 2022

12th International Conference on Hydrogen Technologies
Czernin palace

Programme

23. 3. 2022 (Wednesday)

09:00–09:50 Welcome addresses

- Jan Lipavský, Czech Minister of Foreign Affairs
- Jozef Síkela, Czech Minister of Industry and Trade
- Patrick Graichen, State Secretary of the German Federal Ministry for Economic Affairs and Climate Action
- Karel Bouzek, University of Chemistry and Technology, Prague, HYTEP

09:50–11:00 Overviews

- Stefan Kaufmann, Innovation Commissioner for Green Hydrogen, Federal Ministry of Education and Research: German Hydrogen Strategy
- Petr Mervart, Special Envoy for Hydrogen, Czech Ministry for Industry and Trade: Summary of Czech Hydrogen Strategy
- Bart Biebyuck, CEO Clean Hydrogen Partnership: Implementation of European Hydrogen Strategy

11:00–11:30 Coffee break

11:30–12:30 Panel discussion: The potential of hydrogen technology from Spreewald to Šumava

- Jan Wegener, Team Leader Europe, NOW GmbH
- Aleš Doucek, Chairman of HYTEP and Head of the Department, "Hydrogen Technologies" at ÚJV Řež a.s.
- Stefan Dürr, Head of Technology and Innovation, Zentrum Wasserstoff.Bayern (H2.B)

12:30–13:30 Lunch

13:30–15:00 Regional best practice examples

- Vladmír Maryška, Specialist in New Technologies, Region Moravia – Silesia
- Thomas von Unwerth, Innovation Cluster "HZwo" Saxony and HIC – Hydrogen and Mobility Innovation Center
- Karel Tichý, Project Manager, Economic and Social Council of the Ústí Region
- Alisa Meyer & Alexander Stiehl, Alternative Drives, Regionalverkehr Köln GmbH
- Geert Tjarks, EWE Gasspeicher GmbH, Hydrogen Valley Oldenburg

15:00–15:30 Coffee break

15:30–16:30 Transport and Infrastructure



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- Jörg Bergmann, CEO Open Grid Europe
- Ralph Bahke, Deputy CEO FNB Gas e.V. and CEO Ontras GmbH
- Andreas Rau, CEO Net4Gas Czech Republic

16.30-18:00 **Parallel matchmaking sessions**

- Production and distribution
- Mobility and end-use
- Cross-cutting (e.g. Education, CPD, Normative aspects)

19:00-21:00 **Dinner reception at the German Embassy**
(entrance from 18:30)



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Scientific Programme

24. 3. 2022 (Thursday)

Session 1: Aspects of Fuel Cell Technologies

Chaired by Karel Bouzek

Opening Remarks

- 09:00 **S1/1: Brief Overview of Current French Hydrogen Research Activities, Focus on Electrolyte Development for Proton Ceramic Cells**
Olivier Joubert (Université de Nantes & CNRS, France)
- 09:40 **S1/2: Assessment of Manganese – and Praseodymium – Substituted 5YSZ as Interlayer Materials for Reversible Solid Oxide Cells**
Aleksy Yaremchenko (University of Aveiro, Portugal)
- 10:00 **S1/3: Oxygen Reduction Reaction Activity of Pt and Pt-W Alloy Nanoparticles Synthesized by Spark-Discharge Generator**
Meenakshi Seshadhri Garapati (Czech Academy of Sciences, Czech Republic)
- 10:20 **S1/4: MEA Fabrication Utilizing Direct Deposition of Catalytic Layers by Spark Discharge Generate – Scale-Up to 100 cm² Active Area**
Nina Zábajniková (ÚJV Řež, a. s., Slovak University of Technology, Czech Republic/Slovakia)
- 10:40 **Coffee Break (10:40–11:20)**

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Session 2: PEMFC

Chaired by Harry Hoster

- 11:20 **S2/1: Towards PEM Fuel Cell Systems with Improved Durability**
Daniel Hiess (University of Franche-Comte, FEMTO-ST, CNRS, France)
- 11:40 **S2/2: Stability of Phosphoric Acid Dopant and its Interaction with Catalyst in High-temperature PEM Fuel Cell**
Martin Prokop (University of Chemistry and Technology, Czech Republic)
- 12:00 **S2/3: SteppinWolf – a Pseudo-2D PEM Fuel Cell Model Based on MMM1D**
Jiří Hrdlička (Technical University Chemnitz, Germany)
- 12:20 **S2/4: Designing High-Performance PT-alloy Intermetallics for Application in Proton Exchange Membrane Fuel Cells**
Matija Gatalo (National Institute of Chemistry, Slovenia)

Lunch Break 12:40–13:40

Poster Session 13:40–14:20



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Session 3: Hydrogen Production

Chaired by **Thomas von Unwerth**

- 14:20 **S3/1: Clean Hydrogen Production from Electro-reforming of Bio-sourced Oxygenated Organic Compounds**
Christophe Countanceau (Université de Poitiers, CNRS, France)
- 14:40 **S3/2: PEM Electrolysis: the Potential Role of Paper Factories in Mass Production**
Hary Hoster (The Hydrogen and Fuel Cell Center ZBT, Germany)
- 15:00 **S3/3: Comparison of Ni-W and Ni-Fe Catalysts for Hydrogen Economy**
Jana Záchenská (Slovak University of Technology in Bratislava, Slovakia)
- 15:20 **S3/4: Comparison of Various Anion Selective Materials and Catalysts Used as Components in Membrane-electrode Assembly for Alkaline Water Electrolysis**
Michaela Plevová (University of Chemistry and Technology, Czech Republic)
- 15:40 **S3/5: Utilisation of Process Gases Using Hydrogen Separation Membranes**
Jan Vereš (Energy Research Centre, VŠB TU, Czech Republic)
- 16:00 **Coffee Break (16:00–16:20)**



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Session 4: Industrial Aspects of Hydrogen Implementation

Chaired by Karin Stehlik

- 16:20 **S4/1: Green Hydrogen for Carbon Direct Avoidance in Industrial Processes**
Michael Gallowitz (Fraunhofer Institute für Keramische Technologien und Systems IKTS, Germany)
- 16:40 **S4/2: The Future of Hydrogen in the ORLEN Group**
Adam Giurg (Orlen UniCRE a. s., Czech Republic)
- 17:00 **S4/3: Legal Aspects of Hydrogen in EU – Energy Security and Climate Protection**
Zdeněk Petrášek (Johannes Kepler University Linz, Germany)
- 17:20 **S4/4: The Ruhr Valley: Coal, Steel, High-tech, Hydrogen**
Harry Hoster (The Hydrogen and Fuel Cell Center ZBT, Germany)

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25. 3. 2022 (Friday)

Session 5: Hydrogen in Mobility

Chaired by Jiří Vávra

- 09:00 **S5/1: Hydrogen as Future Energy Carrier for Mobility**
Thomas von Unwerth (Institute for Automotive Research, Technical University Chemnitz, Germany)
- 09:40 **S5/2: A Circular Carbon Economy for Green Transport Fuels**
Robert Steinberger-Wilckens (Centre for Fuel Cell and Hydrogen Research, University of Birmingham, Germany)
- 10:00 **S5/3: Advanced Combustion System as a Means for Decarbonization of Transportation**
Zbyněk Srovák (CTU in Prague, Czech Republic)
- 10:20 **S5/4: Lightweight High-entropy Alloys for Hydrogen Storage**
Dagmara Varcholová (Slovak Academy of Sciences, Slovakia)
- 10:40 **S5/5: Material Characterization of Mg-based Metallic Glasses and their Hydrogen Storage Behaviour**
Katarína Kušnířová (Slovak Academy of Sciences, Slovakia)

Closing Ceremony 11:00–11:30

Lunch Break 11:30–12:30



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Posters

Influence of the Morphology of High Surface Area TiON_x Support on the Performance of the Oxygen

Leonard Moriau¹, M. Bele¹, Živa Marinko², Francisco Ruiz-Zepeda¹, G. Koderman Podboršek¹, Martin Šala¹, Primož Jovanovič⁰, Nejc Hodnik¹, L. Suhadolnik²

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² Jožef Stefan Institute, Slovenia

Reduced Graphene Oxide as a Superior Support for PEM Fuel Cell Electrocatalysts

Luka Pavko¹, Matija Gatalo¹, Francisco Ruiz-Zepeda¹, Angelja Kjara Surca¹, Nejc Hodnik¹, Boštjan Genorio², Miran Gaberšček¹

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² University of Ljubljana, Slovenia

Hydrogen Reduction Reaction on Silicon of Various Types and Dopant Concentrations

Manoj Neergat¹

¹ Indian Institute of Technology Bombay, IND

Kinetics of hydrogen evolution reaction (HER) on Pt

Manoj Neergat¹

¹ Indian Institute of Technology Bombay, IND

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Stability of Aquivion Membranes in Liquid Water at Elevated Temperatures and Pressures

Martin Prokop¹, Tereza Bautkinová¹, Tomáš Bystroň¹, Martin Paidar¹, Karel Bouzek¹

¹ University of Chemistry and Technology, Czech Republic, tel. +420 220 444 272, e-mail: prokopm@vscht.cz

Development of a Reversible Alkaline Fuel Cell

Eliška Kosinová¹, Aleš Doucek¹, Jan Žitka², Jaromír Hnát³

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Tuning Electric Conductivity of Non-platinum Catalysts for Oxygen Reduction Reaction in Alkaline Fuel Cell

Dita Hronová¹, Jaromír Hnát¹, Karel Bouzek¹

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Hydrogen-powered Trains: Risks Related to Railway Engineering Structures

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