

European Hydrogen Energy Conference 2022



**PROGRAM
18-20 MAY**



European Hydrogen Energy Conference

Conference Program

18-20 MAY

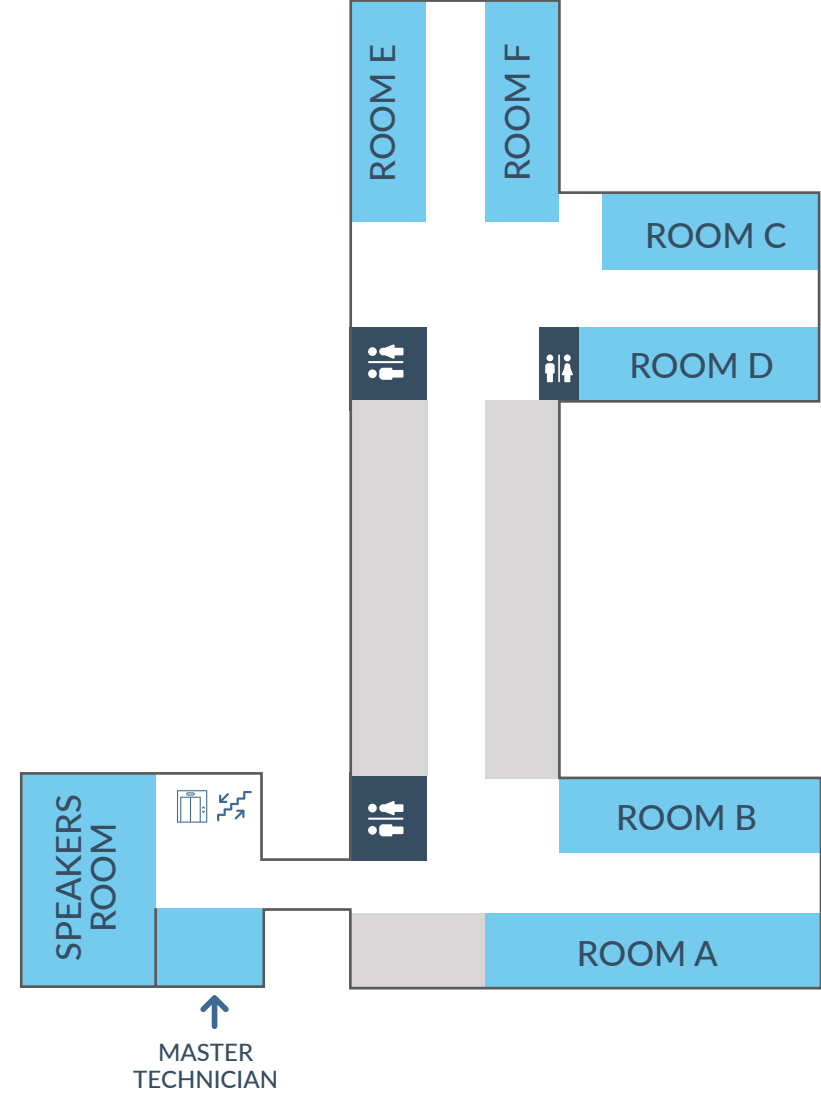


Parallel Sessions Schedule

	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E	ROOM F
Parallel Session 1 Wed 18	13:00-14:00 Environmental Impact & Transportation Applications	Aerospace Applications	Other Hydrogen Applications	Fuel Cell Components & Modelling	Purification & Safety	Codes & Standards
Parallel Session 2 Wed 18	15:30-17:30 Hydrogen Production: Renewable	Electrocatalysts/ Electrodes	Safety	Fuel Cell Components	Transportation Applications	Pipelines and Hydrogen infrastructure
Parallel Session 3 Wed 18	18:00-20:00 Hydrogen Production: Renewable	Electrocatalysts/ Electrodes	Hydrogen Storage	Fuel Cell Components	Transportation Applications	Pipelines and Hydrogen infrastructure
Parallel Session 4 Thu 19	15:00-17:00 Hydrogen Production: Renewable	Hydrogen Production: Renewable/ Electrolysis	Hydrogen Storage	Fuel Cells & Hydrogen Systems Modelling	Stationary Applications	Hydrogen Production: Catalysts
Parallel Session 5 Thu 19	17:30-19:30 Hydrogen Production: Renewable	Hydrogen Production: Renewable/ Electrolysis	Hydrogen Storage	Fuel Cells & Hydrogen Systems Modelling	Stationary & Other Applications	Hydrogen Production: Catalysts
Parallel Session 6 Fri 20	15:30-17:30 Hydrogen Production: Renewable/ Electrolysis	Hydrogen Production: Bio Hydrogen / Bio Gasification	Hydrogen Storage	Fuel Cells & Hydrogen Systems Modelling	Commercialization Codes and Standards	Associations, Countries & Assessments



Parallel Sessions Map





Oral Presentations

Wednesday, 18th May. Parallel Session 1 (13:00-14:00)

Room A. Environmental Impact & Transportation Applications

13:00 **The role of circularity and criticality indicators in the eco-design of fuel cells and hydrogen technologies**

Eleonora Bargiacchi, Felipe Campos-Carriedo, Gonzalo Puig-Samper, Diego Iribarren, Laurent Rey, Emmanuelle Cor, Javier Dufour

IMDEA-Energy (Spain); Rey Juan Carlos University (Spain); SYMBIO (France); Université Grenoble Alpes, CEA (France)

13:20 **Life-Cycle Global Warming Impact of Hydrogen Production by Photovoltaic Powered Electrolysis Imported from Africa compared to Hydrogen Production in Germany**

Olga Kanz, Franka Brüggemann, Karsten Bittkau, Kaining Ding, Uwe Rau, Angèle Reinders

Forschungszentrum Jülich GmbH (Germany); Eindhoven University of Technology (The Netherlands); University of Twente (The Netherlands)

13:40 **Green hydrogen for emission reduction by vehicles for transport and civil works**

Daniël Bakker, Ron Bol, Walter Corsten

KWR Water Research Institute (The Netherlands); Hysolar (The Netherlands); Aannemingsbedrijf Jos Scholman (The Netherlands)

Room B. Aerospace Applications

13:00 **A review of fuel cell unmanned aerial vehicles and their fuel storage**

Gema Montaner Ríos

German Aerospace Center DLR (Germany)

13:20 **Hydrogen system for small and nano satellite propulsion**

Tamara Guerrero, J. Javier Brey

Universidad Loyola Andalucía (Spain)



Oral Presentations

Room B. Aerospace Applications

13:40 **Hybrid catalyst for the direct CO₂ and H₂ conversion into jet fuels**

Vanesa Gil, Javier Sánchez-Lainez, Kiyoharu Tadanaga, Harald Gröger, Stefan Wuttke, Jonas Gurauskis, Pedro Camargo, Reinaldo Giudici, Francesca Bonino, Joke Hadermann

Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón (Spain); ARAID Foundation (Spain); Hokkaido University (Japan); Bielefeld University (Germany); UPV/EHU Leioa (Spain); Ikerbasque (Spain); Institute of Nanoscience and Materials of Aragon (Spain); Helsinki University (Finland); University of São Paulo (Brazil); University of Turin (Italy); University of Antwerp (Belgium)

Room C. Other Hydrogen Applications

13:00 **Impact of hydrogen impurities measured on PEMFC stacks in conditions representative of the automotive application**

Sylvie Escribano, Laurent Jacqmin, Nicolas Mariage

Université Grenoble Alpes, CEA (France)

13:20 **Recent progresses in the design of a hydrogen PEMFC for portable applications**

M. Antonia Folgado, Luis Duque, Juan José Martínez Morales, José Miguel Barcala, Juan Carlos Oller, Antonio Molinero, Antonio Martínez Chaparro

CIEMAT (Spain)

13:40 **Potential uses of the heat released in hydrogen fuel cells: Overview and case-study analysis**

Antonio Atienza-Márquez, Joan Carles Bruno, Alberto Coronas

Universitat Rovira i Virgili (Spain)

Room D. Fuel Cells Components & Modelling

13:00 **eCoCell: An improved Gas Diffusion Layer for PEM fuel cells and electrolyzers**

Andrés Jerez Navarro, Modesto Aguirre Gómez, Javier López Cascales

Universidad Politécnica de Cartagena (Spain)



Oral Presentations

Wednesday, 18th May. Parallel Session 1 (13:00-14:00)

Room D. Fuel Cells Components & Modelling

- 13:20 **Synergetic effect of major landfill contaminants on a LSGM electrolyte-supported SOFC with Ni-Ce based anode fed by biogas**
María José Escudero Berzal, Esperanza Ruiz, Isabel Ortiz
CIEMAT (Spain)
- 13:40 **Ammonia as fuel in a combined electricity and heat production system with PEMFC and SOFC as electric generators**
Cristina Escriche, Jorge Martínez, Enrique Romero, Jaime Soler
Aragon Institute of Engineering Research, University of Zaragoza (Spain)

Room E. Purification & Safety

- 13:00 **Metal-Organic Framework/Graphene Oxide Hybrid Adsorbents for Hydrogen Separation and Storage at Ambient Temperature**
Anish Mathai Varghese, K. Suresh Kumar Reddy, Georgios N. Karanikolos
Khalifa University (UAE)
- 13:20 **Pure H₂ generation in water gas shift or low temperature steam reforming membrane reactors over Ce-Zr and Zr based catalysts**
Francesco Basile, Salvatore Abate, E. Orfei, Andrea Fasolini, Gabriele Centi
University of Bologna (Italy); University of Messina (Italy)
- 13:40 **Effect of fuel-air ratio on combustion of hydrogen released from a fuel cell moving vehicle in free air**
Farhad Farajimoghadam, Matteo Testi, Luigi Crema
Full Fondazione Bruno Kessler (Italy)



Oral Presentations

Room F. Hydrogen Distribution, Codes & Standards

- 13:00 **How clean is your hydrogen? An overview of metrological developments underpinning hydrogen-fuel quality assurance**
Sam Bartlett, Thomas Bacquart, A. Murugan, A. Morris, N. Moore, R. Wilmot, O. Omoniyi, Y. Hristova
National Physical Laboratory (UK)
- 13:20 **Energetic Analysis and Optimization of Decentral Micro Hydrogen Refuelling Stations Using Electrochemical Compression**
Linda Schorer, Sven Schmitz, Thomas von Unwerth
DHBW Mannheim (Germany); Technical University Chemnitz (Germany)
- 13:40 **Assessment of the Hydrogen Regulatory Framework for Hydrogen Underground Storage**
Sara Martínez Casanovas, Jesús Simón Romeo, Arnaud Réveillère, Flore Ostapoff
Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón (Spain); Geostock (France)

Wednesday, 18th May. Parallel Session 2 (15:30-17:30)

Room A. Hydrogen Production: Renewable

- 15:30 **Green or Blue Hydrogen: (much) more than a matter of colors!**
Joris Proost
Université Catholique of Louvain (Belgium)
- 15:50 **Hex-generation system from seawater and air. Seed for decarbonization on the island of Gran Canaria**
Antonio Pulido Alonso, G. Winter Althaus, L. Trujillo Castellano, E. Rosales Asensio
Las Palmas de Gran Canaria University (Spain)



Oral Presentations

Wednesday, 18th May. Parallel Session 2 (15:30-17:30)

Room A. Hydrogen Production: Renewable

- 16:10 **Green Hysland: Deployment of a hydrogen ecosystem on the Island of Mallorca**
María Jaén, B. Ángela Sánchez
Enagás S.A. (Spain)
- 16:30 **HOASIS - Green Hydrogen and Circular Economy**
Francisco Mario Gómez Rodríguez, Carolina Pérez Bermúdez
TCl Gecomp S.L. (Spain)
- 16:50 **SoHyCal: Renewable hydrogen production for transportation in California**
J. Javier Brey, Delia Muñoz, Manuel Rodríguez, Africa Castro, Pablo Molina
H2B2 Electrolysis Technologies (Spain)
- 17:10 **Macroeconomic analysis of power-to-hydrogen technology in Switzerland using Input-Output analysis**
Ruchi Gupta, Thomas MM Guibentif, Markus Friedl, Martin Kumar Patel, David Parra
University of Geneva (Switzerland); Institut für Energietechnik (Switzerland)

Room B. Electrocatalysts / Electrodes

- 15:30 **Noble metal-free catalysts for reactions in fuel cells and electrolyzers**
Sergio Díaz Coello, Stephanie José Martínez, José Luis Rodríguez; Gonzalo García, Elena María Pastor Tejera
Universidad de La Laguna (Spain)
- 15:50 **Effect of transition metals on the electrocatalytic activity of N-doped carbon composites derived from polydopamine for oxygen evolution and oxygen reduction reactions**
Jesús Cebollada Borao, David Sebastián del Río, María Jesús Lázaro Elorri, María Victoria Martínez Huerta
ICB-CSIC (Spain); ICP-CSIC (Spain)



Oral Presentations

Room B. Electrocatalysts / Electrodes

- 16:10 **Effect of nitrogen doping method on the activity of Fe-N-C catalysts based on carbon xerogels for fuel cells**
Laura Álvarez Manuel, Cinthia Alegre, Pedro Napal, David Sebastián, María Jesús Lázaro
ICB-CSIC (Spain)
- 16:30 **Imine-Based Framework as Key Precursor for Highly Active Fe/N/C Catalysts for Oxygen Reduction Reaction**
Álvaro Tolosana-Moranchel, Álvaro García, Laura Pascual, Pilar Ferrer, María Retuerto, Sergio Rojas
ICP-CSIC (Spain); Diamond Light Source (UK)
- 16:50 **In-situ Electrochemical Characterization of the Oxygen Reduction Reaction in Ionomer Tailored Catalyst Layers with a Gas Diffusion Electrode (GDE)**
Vicent Lloret, Paskal Kaiser, Marc Ayoub, Konrad Ehelebe, Simon Thiele, Karl Mayrhofer, Serhiy Cherevko
Helmholtz Institute Erlangen-Nürnberg for Renewable Energy (Germany); Friedrich-Alexander University (Germany)
- 17:10 **Investigation of the Behaviour of Gold Mesh Electrodes in Electrically Controllable Membrane Electrode Assemblies**
Carsten Cosse, Marc Schumann, Daniel Becker, Detlef Schulz
Helmut Schmidt University / University of the Bundeswehr Hamburg (Germany)

Room C. Safety

- 15:30 **The European Hydrogen Safety Panel: key role in the safe deployment of hydrogen technologies in Europe**
Iñaki Azkarate, Alberto Garcia-Hombrados, Thomas Jordan, Stuart Hawksworth, Jennifer Wen, Trygve Skjold; Marta Maroño
European Hydrogen Safety Panel, Fuel Cells and Hydrogen Joint Undertaken EHSP (Spain)



Oral Presentations

Wednesday, 18th May. Parallel Session 2 (15:30-17:30)

Room C. Safety

- 15:50 **Updated HIAD 2.0 database and the harmonised analysis procedure**
Jennifer Wen, Marta Marono, Pietro Moretto, Ernst-Arndt Reinecke, Pratap Sathiah, Etienne Studer, Elena Vyazmina, Daniele Melideo, Iñaki Azkárate
University of Warwick (UK); CIEMAT (Spain); EC Joint Research Centre JRC (The Netherlands); Forschungszentrum Juelich GmbH (Germany); Shell India Markets Private Limited (India); Université Paris-Saclay (France); Air Liquide R&D (France); Università di Pisa (Italy); European Hydrogen Safety Panel, Fuel Cells and Hydrogen Joint Undertaken EHSP (Spain)
- 16:10 **Modular Power Distribution Unit for Fuel Cell Based Electrical Systems**
David Marroquí, Carlos Cortes, Ausías Garrigós, José M. Blanes, Cristian Torres, Pablo Casado
Miguel Hernandez University of Elche (Spain)
- 16:30 **Formation of isolated flame cells propagating in ultra-lean hydrogen-air mixtures in narrow gaps**
Fernando Veiga, Daniel Martínez Ruiz, Mike Kuznetsov, Eduardo Fernández Tarrazo, Mario Sánchez Sanz
University Carlos III of Madrid (Spain); Polytechnic University of Madrid (Spain); Karlsruhe Institut für Technologie (Germany)
- 16:50 **Flash back predictions in flames in horizontal devices: the case of hydrogen flames**
Carmen Jiménez, Vadim Kurdyumov
CIEMAT (Spain)
- 17:10 **Numerical simulation of lean H₂-air premixed flames in narrow gaps**
Josué Melguizo-Gavilanes, Daniel Fernández-Galisteo, Anne Dejoan, Mario Sánchez-Sanz, Vadim N. Kurdyumov
Institute Pprime, CNRS (France); CIEMAT (Spain); Universidad Carlos III de Madrid (Spain)



Oral Presentations

Room D. Fuel Cells Components

- 15:30 **Qualitative and quantitative determination of liquid water distribution in a PEM fuel cell**
Dajana Benkovic, Clemens Fink, Alfredo Iranzo
AVL-AST d.o.o. (Slovenia); AVL List GmbH (Germany); Universidad de Sevilla (Spain)
- 15:50 **Investigation of aging effects of gas diffusion layers for high temperature PEM fuel cell application**
Nadine Pilinski, Tanja Zierdt, Nina Bengen, Peter Wagner
German Aerospace Center DLR (Germany)
- 16:10 **Multi-stabilized hybrid membranes for fuel cell and electrolyzer**
Evelise Ferri, C. Tougne, M. Daoudi, F. Gouanvé, O. Gain, L. Gonon, V.H. Mareau, H. Mendil-Jakani, A. El Kaddouri, J.C. Perrin, J. Dillet, O. Lottin, V. Dufaud, E. Espuche
Université de Lyon 1 (France); Université Grenoble Alpes, CEA (France); Université of Lorraine (France)
- 16:30 **Innovative and sustainable recycling of materials in polymer electrolyte membrane fuel cells and electrolysis cells**
Mikkel Juul Larsen
IRD Fuel Cells A/S (Denmark)
- 16:50 **Metal-Organic Frameworks as novel electrolytes for proton exchange membrane fuel cells**
Catalina Biglione, Pablo Salcedo-Abraira, Nieves Ureña, Fabrice Salles, Alejandro Várez, Patricia Horcajada
IMDEA-Energy (Spain); Universidad Carlos III de Madrid (Spain); University of Montpellier (France)
- 17:10 **Experimental investigation of a novel bioinspired PEM fuel cell**
Christian Suárez, Alfredo Iranzo, Baltasar Toharias, Francisco Javier Pino, Felipe Rosa
University of Seville (Spain); Andalusian Association for Research & Industrial Cooperation (Spain)



Oral Presentations

Wednesday, 18th May. Parallel Session 2 (15:30-17:30)

Room E. Transportation Applications

- 15:30 **Hydrogen Mobility - Key Enabler of a renewable Transport System**
Juergen Rechberger
AVL List GmbH (Austria)
- 15:50 **The BMW iX5 Hydrogen – Fuel Cell Electric Driving Pleasure as a New Element of the BMW i Brand**
Klaas Kunze, Jürgen Guldner, Robert Halas
BMW AG (Germany)
- 16:10 **Renewable hydrogen based solution for refueling the logistic sector**
África Castro, Delia Muñoz, Manuel Rodríguez, J. Javier Brey, Pablo Molina
H2B2 Electrolysis Technologies (Spain)
- 16:30 **Hydrogen on-board storage options for rail vehicles**
Mathias Boehm
German Aerospace Center DLR (Germany)
- 16:50 **Putting rail at the center of national infrastructure: a wholistic view on hydrogen trains**
Luke Johnson, Ian Spencer, Tim Burleigh, Mike Muldoon
H2 Green (UK); Eversholt Rail (UK); Alstom (UK)
- 17:10 **Progress in the development of LNG and Diesel-fueled SOFC systems for maritime applications**
Jan Hollmann, Marco Fuchs, Elmar Pohl, Oliver Heymann, Carsten Spieker, Ulrich Gardemann, Michael Steffen
Leibniz University Hannover (Germany); OWI Science for Fuels gGmbH (Germany); Zentrum für BrennstoffzellenTechnik (Germany)



Oral Presentations

Room F. Pipelines and Hydrogen Infrastructure

- 15:30 **Hybrid Energy Networks – a Concept for Large Renewables and Hydrogen Utilization**
Evgueniy Entchev, Libing Yang, Wahiba Yaici, Lia Kouchachvili
CanmetENERGY Research Centre (Canada); University of Waterloo (Canada)
- 15:50 **Introduction to Hydrogen Energy: from applications to technical solutions**
Laurent Allidières
Air Liquide S.A. (France)
- 16:10 **Enabling Hydrogen Refuelling Station Networks**
Bill Ireland
Logan Energy Limited (UK)
- 16:30 **Hydrogen precooling in refueling stations**
Agustín Torralba
Alfa Laval (Spain)
- 16:50 **Effect of hydrogen partial pressure and degraded environmental conditions on the service behavior of a X65 pipeline steel not designed for hydrogen transport**
Christophe Mendibide, Flavien Vucko, Jean Kittel, Mickael Martinez, Gaurav Joshi
Institut de la Corrosion RISE (France); French Petroleum Institute Energies Nouvelles (France)
- 17:10 **Effect of high-pressure hydrogen environment on the physical and mechanical properties of elastomers**
Karabi Halder, Geraldine Theiler, Winoj Balasooriya
Federal Institute for Materials Research and Testing (Germany); Polymer Competence Centre Leoben GmbH (Germany)



Oral Presentations

Wednesday, 18th May. Parallel Session 3 (18:00-20:00)

Room A. Hydrogen Production: Renewable

- 18:00 **H₂ generation using CPV resources (CPV4H2 Project)**
María Martínez, Daniel Sánchez, Oscar de la Rubia, Rafael Cervantes, Goulven Quéméré, Ignacio Luque-Heredia, Delia Muñoz, Covadonga García
Institute of Concentration Photovoltaic Systems (Spain); BSQ Solar (Spain); H2B2 Electrolysis Technologies (Spain)
- 18:20 **Solar hydrogen and fuels production with concentrated solar energy**
Nathalie Monnerie, Andreas Rosenstiel, Martin Roeb, Christian Sattler
German Aerospace Center DLR (Germany)
- 18:40 **The CSP Role in the Spanish Green Hydrogen and Ammonia Industry**
Carlos Mata-Torres, Giorgio Ceresoli, Xavier Lara
Pacific Green Solar Technologies (Spain)
- 19:00 **The commercial opportunity for hydrogen as a route to market for wind projects in Europe: Generating and transporting hydrogen at scale at an economic cost)**
Molly Lliffe, Annette Nienhaus
ERM (UK); ERM (Germany)
- 19:20 **LIFE CABEZO GREENH₂: MW-scale green hydrogen production plant to decarbonize the treatment of meat residuals**
Mónica Sánchez, José Luis Casarrubios, José Luis Martínez Sande, Emilio Bayón
Enagás S.A. (Spain); Falck Renewables SpA (Italy)
- 19:40 **Modular Automation Concepts for Clean Hydrogen and eFuel Production**
Hubertus Böhm, Bernd Kalusche, Fernando Trucharte-Artigas
Siemens AG (Germany); Siemens S.A. (Spain)



Oral Presentations

Room B. Electrocatalysts / Electrodes

- 18:00 **A tanks-in-series model for high-temperature PEM Fuel Cell**
Valerii Danilov, Gunther Kolb, Cartsten Cremers
Fraunhofer Institute for Microengineering and Microsystems (Germany); Fraunhofer Institute for Chemical Technology (Germany)
- 18:20 **Low Pt loading GDEs for PEMEC developed by magnetron sputtering technology**
Villamayor, Eva Gutierrez Berasategui, L. Mendizabal, J. Barriga
Tekniker (Spain)
- 18:40 **Pyrochlores with low content of Ru as efficient and stable electrocatalysts for oxygen evolution reaction in acid media**
Dmitry Galyamin, I. Rodríguez, M. A. Salam, J. Torrero, L. Pascual, M. Mokhtar, D. G. Sánchez, A. Gago, M.A. Peña, P. Ferrer, M. Retuerto, S. Rojas
ICP-SIC (Spain); King Abdulaziz University (Saudi Arabia); German Aerospace Center DLR (Germany); Diamond Light Source (UK)
- 19:00 **OER Catalysts derived from Ir double perovskites for Proton Exchange Membrane Water Electrolyzer**
María Retuerto, Laura Pascual, Jorge Torrero, M. A. Salam, M. Mokhtar, Daniel García Sánchez, Aldo S. Gago, J.A. Alonso, K. A. Friedrich, P. Ferrer, M.A. Peña, S. Rojas
ICP-CSIC (Spain); German Aerospace Center DLR (Germany); King Abdulaziz University (Saudi Arabia); Diamond Light Source (UK)
- 19:20 **A MEA based on Reinforced short-side-chain Aquivion® membrane for proton exchange membrane water electrolysis**
Stefania Siracusano, S. Tonella, C. Oldani, Antonino S. Aricò
CNR-ITAE (Italy); Solvay Specialty Polymers (Italy)
- 19:40 **Performance evaluation and modelling of electrocatalytic CO₂ reduction in a tubular protonic membrane reactor**
Imanol Quina García, D. Catalán, S. Escolástico, L. Almar, A.M. Dayagui, C. Vigen, José Manuel Serra Alfaro
Universitat Politècnica de València (Spain); Centre for Materials Science and Nanotechnology SMN (Norway); CoorsTek Membrane Sciences AS (Norway)



Oral Presentations

Wednesday, 18th May. Parallel Session 3 (18:00-20:00)

Room C. Hydrogen Storage

18:00 **Hydrogen - heat storage system based on metal hydride and phase change material**

Jussara Barale, Giovanni Capurso, Thorbjorn Stühff, Federico Nastro, Bettina Neumann, José Bellostá von Colbe, Paola Rizzi, C. Luetto, H. Stühff, M. Baricco

University of Turin (Italy); Helmholtz-Zentrum Hereon (Germany); Stühff Maschinen- und Anlagenbau GmbH (Germany); Tecnodelta S.r.l (Italy); GKN Sinter Metals Engineering GmbH (Germany)

18:20 **Innovative study of the by-product of NaBH₄ hydrolysis**

Diogo Silva, Hélder Nunes, Cármen Rangel, Alexandra Pinto

University of Porto (Portugal); National Laboratory of Energy and Geology (Portugal)

18:40 **Metal - decorated activated carbon - based adsorbents for hydrogen storage at ambient temperature: A comparative study using Pt, Pd, and Li**

Anish Mathai Varghese, K. Suresh Kumar Reddy, Georgios N. Karanikolos

Khalifa University (UAE)

19:00 **Hydrogen storage in nanostructured graphene-based materials**

Gotthard Seifert

TU Dresden (Germany)

19:20 **New metal-organic frameworks based on Co/Ni mixed-metals in URJC-materials to improve hydrogen storage**

Isabel Aguayo Whelan, Gisela Orcajo Rincón, Carmen Martos Sánchez, Guillermo Calleja Pardo

Rey Juan Carlos University (Spain)

19:40 **Economic Analysis of LN₂/LNG Precoolings in Hydrogen Liquefaction Process**

Sarng Woo Karng, Hyun Ji Kim, Seo Young Kim, Seong Hoon Kim, Choong-Hyun Choi, Sang Jun Park, Jun Hee Lee, Y. T. Yoon

Korea Institute of Science and Technology (Republic of Korea); Seoul National University (Republic of Korea); Hylium Industries, Inc. (Republic of Korea); NxMD, Hanwhasolutions (Republic of Korea); Korea Gas Technology Corporation (Republic of Korea)



Oral Presentations

Room D. Fuel Cells Components

18:00 **Improved performance of cobalt-free, SrFeO_{3-δ}-based IT-SOFC cathode using highly scalable spray pyrolysis**

Víctor Zapata-Ramírez, Ulises Amador, Clemens Ritter, Glenn C. Mather, Domingo Pérez-Coll

ICV-CSIC (Spain); Universidad San Pablo-CEU (Spain); Institut Laue-Langevin (France)

18:20 **Processing and characterisation of BaZr_{0.8}Y_{0.2}O_{3-δ} proton conductor densified at 1200°C**

Ángel Triviño Peláez, D. Pérez-Coll, M. Aparicio, D.P. Fagg, J. Mosa, G. C. Mather

ICV-CSIC (Spain); University of Aveiro (Portugal)

18:40 **Advanced microtubular SOFC cells and their integration in a 5 cell-bundle for portable applications**

Miguel A. Laguna-Bercero, Antonio García-Girón, Alodia Orera, Angel Larrea, Jorge Silva, Francisco J. Ester

Institute of Nanoscience and Materials of Aragon (Spain); BSH Electrodomésticos (Spain)

19:00 **Phyllosilicate minerals as sealants for Molten Carbonate Fuel Cell stacks**

Jaroslav Milewski, Arkadiusz Szczesniak, Aliaksandr Martynchik

Warsaw University of Technology (Poland)

19:20 **Integration of an intermediate-temperature fuel cell based on a CsH₅(PO₄)₂-doped polybenzimidazole membrane with a CuZn-based methanol reformer**

Konstantinos Kappis, Yifan Li, Haibin Li, George Avgouropoulos

University of Patras (Greece); Shanghai Jiao Tong University (China)

19:40 **Development of exacerbated load cycles as AST for PEMFC stacks and validation by in-situ and ex-situ characterizations**

Sylvie Escribano, Fabrice Micoud, Laure Guetaz

Université Grenoble Alpes, CEA (France)



Oral Presentations

Wednesday, 18th May. Parallel Session 3 (18:00-20:00)

Room E. Transportation Applications

18:00 **State Machine-Based Architecture to Control PEMFC System Processes in a Fuel Cell Electric Vehicle**

Ali Molavi, Attila Peter Husar, María Serra Prat, Hampus Hjortberg, Niclas Nilsson, Markus Kogler, Juan Sánchez Monreal, Yousif Eldigair

IRI-CSIC-UPC (Spain); PowerCell (Sweden); China Euro Vehicle Technology AB (Sweden); AVL (Austria); German Aerospace Center DLR (Germany); Brose Fahrzeugteile (Germany)

18:20 **Using Absorption Refrigerator and Metal Hydrides in Hydrogen Fuel Cell Trains: Draft Design Process and Feasibility**

Markus Kordel, Kevin Knetsch, Florian Heckert, Lutz Boeck

German Aerospace Center DLR (Germany); Faiveley Transport Leipzig GmbH (Germany)

18:40 **High-Power Ultra-Efficient Hybrid Cycle Composed of a Fuel Cell, an Internal Combustion Engine and Thermochemical Recuperation**

David Diskin, Leonid Tartakovsky

Technion - Israel Institute of Technology (Israel)

19:00 **Online model adaption for energy management in Fuel Cell Electric Vehicles (FCEV)**

Ricardo Novella, Benjamín Pla, Pau Bares, Douglas Pinto

Universitat Politècnica de València (Spain)

19:20 **Assessment of liner-based thermal management strategies in hydrogen tank fast-filling via Computational Fluid Dynamics**

Ricardo Blanco-Aguilera, Manex Martínez-Agirre, Joanes Berasategi,

Markel Penalba, Mounir Bou-Ali, Valentina Shevtsova

Mondragon Unibertsitatea (Spain); Ikerbaske (Spain)

19:40 **Use of H₂, CH₄, CO and their mixtures in a commercial automotive spark-ignition engine adapted to run on gaseous fuels**

Pedro M. Diéguez, José Carlos Urroz, Miguel Arana, Luis M. Gandía

Universidad Pública de Navarra (Spain)



Oral Presentations

Room F. Pipelines and Hydrogen Infrastructure

18:00 **Enabling the injection of hydrogen in high-pressure gas grids: investigation of the impact on materials and equipment, legal, regulatory and technical aspects**

Javier Sánchez-Laínez, Vanesa Gil, Alberto Cerezo, Maria Dolores Storch de Gracia, Agustín Pascual, Michael Walter, Virginia Madina

Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón (Spain); ARAID Foundation (Spain); Redexis S.A. (Spain); German Technical and Scientific Association for Gas and Water (Germany); Tecnalia (Spain)

18:20 **Quantifying the impact of hydrogen content on the thermodynamic properties for natural gas transportation by an accurate molecular model**

Ismail I. I. Alkhatib, Lourdes F. Vega

Khalifa University (EAU). National Physical Laboratory (UK); Cadent Gas Ltd (UK)

18:40 **Distributing hydrogen to fuel cell vehicles using the gas grid: an assessment of contaminant levels**

Oluwafemi Omoniyi, Thomas Bacquart, Abigail Morris, Niamh Moore, Arul Murugan, David Jones

National Physical Laboratory (UK); Cadent Gas Ltd (UK)

19:00 **Design of transport, systems ashore, storage in port and supply of hydrogen, in the framework of the OCEANH2 project**

Eduardo García-Rosales, Beatriz Nieto, M. Dolores Storch de Gracia, Roberto Morales Burgos, Enrique Saborit, Pablo Martínez Fondón, Alberto Abánades

Redexis S.A. (Spain); National Hydrogen Center (Spain); Universidad Politécnica de Madrid (Spain)

19:20 **Practicalities of the use of hydrogen in sector shifting: experience from two islanded networks**

Bill Ireland

Logan Energy Ltd. (UK)

19:40 **Review of Ammonia Technologies as a Green Hydrogen Storage Carrier**

Pablo Molina, J. Javier Brey, Carlota Ríos, Celia Martínez de León

Universidad Loyola Andalucía (Spain)



Oral Presentations

Thursday, 19th May. Parallel Session 4 (15:00-17:00)

Room A. Hydrogen Production: Renewable

15:00 **Production of hydrogen by solar photocatalytic treatment of wastewaters**

Alberto Puga

Universitat Rovira i Virgili (Spain)

15:20 **Transforming the world's waste into renewable hydrogen for onsite power generation and vehicle fueling**

Jean-Louis Kindler, Angelica Gyllen

Ways2H (USA)

15:40 **Multi-Fuel Compact Renewable Hydrogen Generator for Mobility Applications**

Elisa Alcolea, Jorge Carrero, Juan Manuel Sánchez, Diego Ubeda, Carmen Jimenez-Borja, Ana Nieto, Ernesto Simón, G. Monjas, A. Escobar, J.L. Carreras, C. Fernández-Caballero, M.A Vega

Técnicas Reunidas, S.A. (Spain)

16:00 **MnFe₂O₄-Na₂CO₃ thermochemical cycle for H₂ production: investigating material modification strategies for performance improvement**

Francesco Torre, T. Aguilar, S. Doppiu, M. Oregui, J. Udaeta, N. Uranga, M. Hernaiz, P. Luis, E. Palomo

CIC energiGUNE (Spain); Euskal Herriko Unibertsitatea (Spain); Tekniker (Spain); Ikerbasque (Spain)

16:20 **Comparison of hydrogen production via microwave assisted water splitting in doped-ceria materials**

Aitor Domínguez Saldaña, Laura Navarrete Algaba, María Balaguer Ramírez, Joaquín Santos Blasco, Pedro José Plaza González, José Manuel Catalá Civera, José Manuel Serra Alfaro

ITQ-CSIC-UPV (Spain); Universitat Politècnica de València (Spain)



Oral Presentations

Room A. Hydrogen Production: Renewable

16:40 **Hydrogen production by thermochemical water splitting using La_{0.8}Ca_{0.2}BO_{3-δ} (B=Co, Ni, Cu and Fe) perovskites**

Alejandro Pérez Domínguez, María Orfila del Hoyo, María Linares Serrano, Raúl Sanz Martín, Javier Marugán Aguado, Raúl Molina Gil, Juan Ángel Botas Echevarría
Rey Juan Carlos University (Spain)

Room B. Hydrogen Production: Electrolysis

15:00 **Toward an overall optimization of the anion exchange membrane water electrolysis cell**

Ester López Fernández, Celia Gómez Sacedón, Jorge Gil-Rostra, Juan Pedro Espinós, Agustín R. González-Élipe, Francisco Yubero, Antonio de Lucas Consuegra
University of Castilla-La Mancha (Spain); ICMS-CSIC-Univ. Sevilla (Spain)

15:20 **Development of a new alkaline electrolyser associated to a renewable offshore plant**

Rodrigo Pérez, David Solera, Rafael Luque
ARIEMA Energía y Medioambiente S.L. (Spain)

15:40 **Alkaline electrolysis at sea: water purification strategies to reduce the levelized cost of hydrogen**

Rafael d'Amore-Domenech, Vladimir Luis Meca, Antonio Villalba-Herreros, Teresa J. Leo
Universidad Politécnica de Madrid (Spain)

16:00 **Modeling the effect of electrolyte recirculation rate in the liquid-gas separators of an AWE on the purity of the gas produced**

Héctor González, E. Amores, D. Abad, M. Sánchez
National Hydrogen Center (Spain)

16:20 **Green hydrogen production based on high efficiency and low degradation pulsed-current electrolysis**

Francisca Segura, José Manuel Andújar, Julio José Caparrós Mancera, Rocío García, Francisco José Vivas
University of Huelva (Spain)



Oral Presentations

Thursday, 19th May. Parallel Session 4 (15:00-17:00)

Room B. Hydrogen Production: Electrolysis

16:40 [Simultaneous surface structuring and alloying of titanium fiber material for porous transport layers in PEM-Electrolysis](#)

Dorian Hüne, B. Bensmann, L. Stein, R. Reineke-Koch, A. Dittrich, W. Schade, T. Gimpel

Clausthal University of Technology (Germany); University Hannover (Germany); Institute for Solar Energy Research (Germany); Fraunhofer Heinrich Hertz Institute (Germany)

Room C. Hydrogen Storage

15:00 [Compressed hydrogen, the most efficient way to store energy. A comparison between compressed hydrogen and liquid hydrogen as energy storage system](#)

Daniel Ballorca Juez

Hiperbaric (Spain)

15:20 [Thermal management of Cryo-adsorbed hydrogen storage system](#)

Daniel Tsukerman, Nir Tzabar

Ariel University (Israel)

15:40 [TCD based real-time measurement of Ortho-Para hydrogen fraction](#)

Hyun Ji Kim, Yong Tae Yoon, Sarn Woo Karng

Korea Institute of Science and Technology (Republic of Korea); Seoul National University (Republic of Korea)

16:00 [Methanation of CO₂ on Cu in a tubular co-ionic SOEC](#)

Esperanza Ruiz Martínez, Juan Aldecoa, Ángel Morales, Meryem Farchado, José María Sánchez

CIEMAT (Spain); Sisener Ingenieros S.L. (Spain)



Oral Presentations

Room C. Hydrogen Storage

16:20 [CO₂ methanation over Ni catalysts supported on sol-gel prepared Pr-doped CeO₂](#)

Anastasios I. Tsiotsias, Nikolaos D. Charisiou, Christos Zotos, Victor Sebastián, Kyriaki Polychronopoulou, María A. Goula

University of Western Macedonia (Greece); Nanoscience Institute of Aragón and Materials Science Institute of Aragón, University of Zaragoza-CSIC (Spain); Khalifa University of Science and Technology (UAE)

16:40 [Advanced materials and Reactors for ENergy storage tHrough Ammonia \(ARENHA\)](#)

José Luis Viviente Viviente, F. Gallucci, R. Campana, X. Sun, S. Megel, W.I.F. David, G. van Zee, S. Pylypko, J.A. Medrano, C. Dumand, C. Rouselle, A. Ramirez-Santos

Tecnalia (Spain); Eindhoven University of Technology (The Netherlands); National Hydrogen Center (Spain); DTU (Denmark); Fraunhofer IKTS (Germany); Rutherford Appleton Laboratory (UK); Proton Ventures BV (The Netherlands); Elcogen AS (Estonia); Hydrogen Onsite, S.L. (Spain); Stellantis, Centre Technique Vélizy (France); University of Orléans (France); ENGIE Lab CRIGEN (France)

Room D. Fuel Cells & Hydrogen Systems Modelling

15:00 [Uncertainty quantification of production cost for a wind power-to-hydrogen system](#)

Sajjad Yousefian, Tubagus Aryandi Gunawan, Parisa Javadi, Rory F. D. Monaghan

National University of Ireland (Ireland); SFI Centre for Energy, Climate and Marine Research (Ireland); Princeton University (USA)

15:20 [Modeling and simulation of integrated hydrogen - solar PV systems](#)

Fernando Gutiérrez Martín, José A. Díaz López, Ángel Caravaca Huertas, Antonio J. Dos Santos García

Polytechnic University of Madrid (Spain)

15:40 [Optimisation of Green Hydrogen Production Facilities](#)

Andrew Campbell, Raúl Mateos

Advisian (Australia); Advisian (Spain)



Oral Presentations

Thursday, 19th May. Parallel Session 4 (15:00-17:00)

Room D. Fuel Cells & Hydrogen Systems Modelling

16:00 **The hydrogen storage challenge: How does storage size and cost affect the techno-economic performance of hydrogen production?**

Cian Moran, Rory F.D. Monaghan

National University of Ireland (Ireland); SFI Centre for Energy, Climate and Marine Research (Ireland)

16:20 **Data analysis and parametrization for modelling a regenerative hydrogen storage with application in a regional housing sector**

Steffen Schedler, Stefanie Meilinger, Tanja Clees

University of Applied Sciences Bonn-Rhein-Sieg (Germany)

16:40 **Digital Twin technologies to optimize the planification and exploitation of hybrid plants with Power-to-Hydrogen**

Jesús La Parra Albaladejo, Cristina Corrales Quirós

Tecnatom, S.A. (Spain)

Room E. Stationary Applications

15:00 **Implementation of renewable hydrogen-based systems for the decarbonization of the stationary sector**

Víctor Manuel Maestre Muñoz, Alfredo Ortiz Sainz de Aja, I. Ortiz

University of Cantabria (Spain)

15:20 **Integration of Combined Cooling, Heating and Power Microgrids in Zero Energy Public Buildings with High Power Quality and Continuity Requirements**

Javier Tobajas, Félix García, Jesús Martín, Íñigo Ubierna

National Hydrogen Center (Spain); University of Córdoba (Spain)

15:40 **Increasing Combined Cycle Gas Turbines Flexibility via Power to Gas to Power Systems**

José García, Linus Engstam, Rafael Guédez

Royal Institute of Technology, KTH (Sweden)



Oral Presentations

Room E. Stationary Applications

16:00 **Hydrogen a storage solution of renewable energy of habitable mobile modules. LIFE ZEROENERGYMOD Project**

Carlos Arié, Pedro Casero

Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón (Spain)

16:20 **Solenco Powerbox: sustainable world's electrification by the mass uptake of wind and solar PV**

Hugo Vandendorpe, Francisco López

Solenco Power (Belgium)

16:40 **Grasshopper: A Modular and Flexible Hydrogen PEM Power Plant for Grid Balancing Services**

María Tejada Valderrama, Germán Nieto Cantero, Belén Sarmiento Marrón

Abengoa Innovación (Spain). Solenco Power (Belgium)

Room F. Hydrogen Production: Catalysts

15:00 **Production of hydrogen by dry reforming of methane over Ni/Al₂O₃ catalysts derived from sub-stoichiometric NiAl₂O₄ spinels**

Andoni Choya, Beatriz de Rivas, José Ignacio Gutiérrez-Ortiz,

Rubén López-Fonseca

University of the Basque Country (Spain)

15:20 **CO₂-free hydrogen production by catalytic methane decomposition over rice husk-derived silica**

Gema Gómez-Pozuelo, Inés Moreno, Patricia Pizarro, Juan A. Botas,

David P. Serrano

Rey Juan Carlos University (Spain); IMDEA-Energy (Spain)

15:40 **Catalytic behavior of transition metal carbide of group 5 in the methanol steam reforming**

Arturo Pajares, Pilar Ramírez de la Piscina, Narcis Homs

University of Barcelona (Spain); Catalonia Institute for Energy Research (Spain)



Oral Presentations

Thursday, 19th May. Parallel Session 4 (15:00-17:00)

Room F. Hydrogen Production: Catalysts

- 16:00 **Ammonia cracking with Pd-based membrane technology**
Igor Egaña, José Antonio Medrano, Jon Melénez, Andrés Galnares
H2SITE (Spain)
- 16:20 **Titanium dioxide electrodes for water photo-electrolysis: modelling of photoelectrochemical processes**
Alejandro Ansón-Casaos, José Carlos Ciria, Carlos Martínez-Barón, Ana M. Benito, Wolfgang K. Maser
ICB-CSIC (Spain); Universidad de Zaragoza (Spain)
- 16:40 **LOHC dehydrogenation on bimetallic Pt-Ni and Pt-Co catalysts**
Kevin Alconada, Pedro Luis Arias, Victoria Laura Barrio
University of the Basque Country (Spain)

Thursday, 19th May. Parallel Session 5 (17:30-19:30)

Room A. Hydrogen Production: Renewable

- 17:30 **Solar photocatalytic H₂ production by highly efficient laser engineered Au/TiO₂ photocatalysts**
Roberto Fiorenza, Marcello Condorelli, Stefano Andrea Balsamo, Luisa D'Urso, Giuseppe Compagnini, Salvatore Scirè
University of Catania (Italy)
- 17:50 **Hydrogen production from photoreforming of biomass using conventional and unconventional photocatalysts**
Stefano Andrea Balsamo, Roberto Fiorenza, Marcello Condorelli, Salvatore Scirè
University of Catania (Italy)



Oral Presentations

Room A. Hydrogen Production: Renewable

- 18:10 **SUNRGYZE: Photoelectrochemical Production of hydrogen**
Luis Villalba Trol, Mónica Sánchez Delgado, Maria Dolores Hernández Alonso, Ana Martínez González
Sunrgyze (Spain); Enagás S.A. (Spain); Repsol (Spain)
- 18:30 **IMDEA-Energy Frameworks as promising next-generation materials for green hydrogen production**
Sergio Carrasco, Pablo Salcedo-Abraira, Eva Montero-Lanzuela, María Cabrero-Antonino, Sergio Navalón, Hermenegildo García, Patricia Horcajada
IMDEA-Energy (Spain); ITQ-CSIC-UPV (Spain); Polytechnic University of Valencia (Spain)
- 18:50 **Role of Zr Doping in Pt/TiO₂ Photocatalysts for Hydrogen Production**
Irene Barba-Nieto, Uriel Caudillo-Flores, María Natividad Gómez-Cerezo, Anna Kubacka, Marcos Fernández-García
ICP-CSIC (Spain)
- 19:10 **Innovation in green hydrogen production**
Ron Bol, S. Drissen, W. Corsten
Hysolar (The Netherlands); Aannemingsbedrijf Jos Scholman (The Netherlands)

Room B. Hydrogen Production: Electrolysis

- 17:30 **Novel Coatings and Resistance Measurement Methods for Bipolar Plates**
Sigrid Lædre, Corneliu M. Craciunescu, Thulile Khoza, Nicolae Vaszilcsin, Aurel Ercuta
Sintef Industry (Norway); Politehnica University of Timisoara (Romania)
- 17:50 **PGM-free sustainable coating alternatives for anodic bipolar plates and porous transport layers in polymer electrolyte membrane water electrolyzers**
Lucía Mendizabal, E. G-Berasategui, S. Laedre, N. Rojas
Tekniker (Spain); Sintef Industry (Norway); National Hydrogen Center (Spain)



Oral Presentations

Thursday, 19th May. Parallel Session 5 (17:30-19:30)

Room B. Hydrogen Production: Electrolysis

- 18:10 **The Challenges of Green Hydrogen from Renewable Energy Sources**
Albert Bos, R. van Dongen
XINTC Global (The Netherlands)
- 18:30 **Reducing costs by using technology ready safety solutions**
Fernando Sánchez, Ignacio Astigarraga
Roxtec S&P (Spain)
- 18:50 **Experimental strategies of operation and preventive maintenance in electrolyzers for efficient hydrogen production**
Julio José Caparrós Mancera, Francisca Segura, José Manuel Andujar, Eduardo López
Spanish National Institute of Aerospace Technology (Spain); University of Huelva (Spain)
- 19:10 **H2BASQUE – Technologies for boosting the Hydrogen economy in the Basque Country: Green hydrogen production**
Ekain Fernández, Beatriz Calleja, Francisco Alcaide, Stefania Doppiu, Mikel Oregui-Bengochea, Eva G-Berasategui, Elías Unzueta, J. Irigoyen
TECNALIA (Spain); TUBACEX INNOVACION AIE (Spain); CIDETEX (Spain); CIC energiGUNE (Spain); UPV/EHU (Spain); TEKNIKER (Spain); PETRONOR INNOVACION (Spain); BASQUE ENERGY CLUSTER (Spain)

Room C. Hydrogen Storage

- 17:30 **Development of novel filler strategies and reinforced elastomeric grades to be used in high-pressure hydrogen gas conditions**
Clara Clute, Annika Lenger, Winoj Balasooriya, Andreas Hausberger, Geralt Pinter, Sandra Schlögl
Polymer Competence Center Leoben GmbH (Austria); Montanuniversität Leoben (Austria)



Oral Presentations

Room C. Hydrogen Storage

- 17:50 **New Fastcure 2 Towpreg for Hydrogen 70 MPa On-board type IV Composite Pressure Vessel Manufacturing**
Stéphane Villalonga, Christophe Magnier, Frédéric Démaret, Martin Jégou, Sébastien Livi, Jannick Duchet-Rumeau, Jean-François Gérard
Central Commission of Nuclear Energy CEA (France); VITECH COMPOSITES (France); National Institute of Applied Sciences of Lyon (France)
- 18:10 **Advanced Hydrogen Storage System for a High-Performance Fuel Cell Powertrain**
Klaas Kunze, Andreas Pelger, Thomas Gruber
BMW AG (Germany)
- 18:30 **Large-scale storage of green hydrogen in concrete Gravity Based Structures (GBS) associated to renewable offshore plants**
Irene Sevilla de la Llave, Natividad Sánchez López, José Manuel González Herrero, Manuel Biedma García
Acciona Ingeniería (Spain)
- 18:50 **Selection of LOHC and reactor configuration for the optimization of the hydrogenation step in chemical hydrogen storage**
Adrián García, Pablo Marín, Salvador Ordóñez
University of Oviedo (Spain)
- 19:10 **Large scale hydrogen distribution via Liquid Organic Hydrogen Carriers (LOHC)**
Rafael Schmidt
Hydrogenious LOHC Technologies GmbH (Germany)



Oral Presentations

Thursday, 19th May. Parallel Session 5 (17:30-19:30)

Room D. Fuel Cells & Hydrogen Systems Modelling

- 17:30 **SOC-based microgrid: development of medium level controls in a multilevel algorithm framework**
Marco Califano, Fabiana Califano, Marco Sorrentino, Marc Allen Rosen, Cesare Pianese
University of Salerno (Italy); University of Ontario Institute of Technology (Canada)
- 17:50 **A Hybrid 1D-CFD Numerical Framework for Hydrogen-based Fuel Cell and Electrolysers**
Markel Peñalba, Joanes Berasategi, Ricardo Blanco-Aguilera, Manex Martínez, Mounir Bou-Ali, Valentina Shevtsova
Mondragon Unibertsitatea (Spain); Ikerbasque (Spain)
- 18:10 **Parameter fitting of a reversible Solid Oxide stack model**
Ignasi Lleonsi, Lucile Bernadet, Marc Torrell, María Serra
IRI-CSIC-UPC (Spain); Catalonia Institute for Energy Research (Spain)
- 18:30 **Green liquid hydrogen supply chains for future aviation – A techno-economic well-to-tank assessment**
Lucas Sens, Fabian Carels, Ulf Neuling, Martin Kaltschmitt
Hamburg University of Technology (Germany)
- 18:50 **Risk Assessment and Ventilation Modelling of Hydrogen Installation and Generation Units**
Daniel Prasetyo, Alberto Costilla Álvarez, Aurora García Jiménez
CIRCE Foundation (Spain)
- 19:10 **Power to Gas and distribution strategy: Technoeconomic assessment for an MSW biogas upgrading plant**
Francisco Luño, Andrés Sanz-Martínez, Paúl Durán, Eva Francés, Javier Herguido, José-Angel Peña
Aragon Institute of Engineering Research, University of Zaragoza (Spain)



Oral Presentations

Room E. Stationary & Other Applications

- 17:30 **AVL's Solid Oxide Cell System Solutions for a Hydrogen Based Energy System**
Martin Hauth, Bernd Reiter
AVL List GmbH (Austria)
- 17:50 **The future of power generation starts today - the stationary fuel cell system by Bosch**
Wayne-Daniel Kern, Sebastian Budischin
Robert Bosch GmbH (Germany)
- 18:10 **Decarbonization of the Steelmaking Industry via Hydrogen based Technologies**
Itsaso Auzmendi Murua, Juan Blanco Requesens
Sarralle Engineering (Spain)
- 18:30 **Biogas upgrading by intensified methanation (SESaR): reaction - desorption cycles with Ni-Fe/Al₂O₃ catalyst and zeolite**
Víctor Daniel Mercader Plou, Mar Rincón, Andrés Sanz Martínez, Paúl Durán, Eva Francés, Javier Herguido, José Ángel Peña
Aragon Institute of Engineering Research, University of Zaragoza (Spain)
- 18:50 **Activity of bi-metallic hydrotalcite derived materials for photocatalytic CO₂ methanation**
Rafael Canales Larrazabal
University of the Basque Country (Spain)
- 19:10 **Ni supported on Ferrierite and ITQ-6 zeolites for catalytic methanation of CO₂. Effect of delamination on the catalytic performance**
Raul da Silva, Antonio Chica
ITQ-CSIC-UPV (Spain)



Oral Presentations

Thursday, 19th May. Parallel Session 5 (17:30-19:30)

Room F. Hydrogen Production: Catalysts

17:30 **Dry reforming of ethane over Ni catalysts supported on Al₂O₃ modified with MgO, CaO and La₂O₃**

Anastasios I. Tsiotsias, Nikolaos D. Charisiou, Víctor Sebastián, Safa Gaber, Steven J. Hinder, Mark A. Baker, K. Polychronopoulou, María A. Goula

University of Western Macedonia (Greece); Nanoscience Institute of Aragón and Materials Science Institute of Aragón, University of Zaragoza-CSIC (Spain); Khalifa University of Science and Technology (UAE); University of Surrey (UK)

17:50 **Hydrogen production by oxidative steam reforming of acetic acid on Ni catalysts: Influence of the support and La addition**

Anabel Morales Cabezas, Pedro Julio Megía Hervás, José Antonio Calles Martín, Arturo Javier Vizcaíno Madríguez, Alicia Carrero Fernández

Rey Juan Carlos University (Spain)

18:10 **Kinetic modelling for the dehydrogenation of formic acid on Pd/C catalysts considering the deactivation**

Celia Martín, Asunción Quintanilla Gómez, José Antonio Casas

Universidad Autónoma de Madrid (Spain)

18:30 **Ni⁰/Mg(Al)O catalysts derived from layered double hydroxides for H₂ production by cellulose aqueous phase reforming**

Andrea Fasolini, E. Orfei, Francesco Basile

University of Bologna (Italy)

18:50 **Influence of catalysts, temperature and gasifying agent on H₂ production from palm kernel shell**

Juan C. Acevedo, Erika Arenas, Fausto Posso, Carlos Imbachi

Universidad de Santander (Colombia); Universidad Pontificia Bolivariana (Colombia); Universidad Nacional de Litoral (Argentina)



Oral Presentations

Room F. Hydrogen Production: Catalysts

19:10 **Role of catechols and guaiacols on the deactivation of NiAl₂O₄ catalyst in bio-oil steam reforming**

L. Landa, Aingeru Remiro Eguskiza, N. García-Gómez, G. Elordi, B. Valle, A. Gayubo, J. Bilbao

University of the Basque Country (Spain)

Friday, 20th May. Parallel Session 6 (11:30-13:30)

Room A. Hydrogen Production: Renewable / Electrolysis

11:30 **Optimal Coupling of Solar Electrolysis Systems. Multi-Objective Optimization of Component Relative Sizing**

Felipe Gallardo, José García, Andrea Monforti Ferrario, Justin NW Chiu, Gabriele Comodi

Royal Institute of Technology, KTH (Sweden); Marche Polytechnic University (Italy); ENEA (Italy)

11:50 **Modelling and Performance Analysis of a SOE System integrating PV, Concentrating Solar Heat and Thermal Energy Storage**

Beatriz Herrero, José González-Aguilar, Manuel Romero

IMDEA-Energy (Spain)

12:10 **Green hydrogen production by means of solar heat and power in high temperature solid oxide electrolyzers**

A. Giaconia, M. Della Pietra, P. Moreno, M. Testi, C. Pellegrini, S. Diethelm, M. Romero, José González-Aguilar, M. Robino, J. van Herle, B. Morico, J. Dobrée

ENEA (Italy); Capital Energy S.L. (Spain); Fondazione Bruno Kessler (Italy); SOLIDpower S.A. (Switzerland); IMDEA-Energy (Spain); Snam SpA (Italy); Ecole Polytechnique Federale de Lausanne (Switzerland); NextChem Srl (Italy); Stamicarbon BV (The Netherlands)

12:30 **Optimal Integration of Co - Electrolysis in a Power-to-Liquid Industrial Process**

Angel Molina-García, José Javier López-Cascales, José Sánchez-Luján

Polytechnic University of Cartagena (Spain)



Oral Presentations

Friday, 20th May. Parallel Session 6 (11:30-13:30)

Room A. Hydrogen Production: Renewable / Electrolysis

12:50 [Measures to improve electrolyser's competitiveness](#)

Luis Manuel Santos Moro, Luis Del Barrio Castro, Ana Márquez Altemir

EDP España (Spain); Arthur D. Little S.L. (Spain)

13:10 [VITALE PROJECT, One of the first mass green hydrogen production plants in Europe becomes a reality](#)

Fernando Román, Ricardo Izquierdo, Philippe Guinot

pHYnix Iberia (Spain); pHYnix SAS, Paris (France)

Room B. Hydrogen Production: Bio Hydrogen / Bio Gasification

11:30 [Clean syngas as precursor to green hydrogen from a versatile commercial-scale two-stage gasification and plasma refining](#)

M. Bacon, S. Saberi, Jordi Gallego

OMNI Conversion Technologies (Canada); OMNI Conversion Technologies (Spain)

11:50 [Process simulation of renewable hydrogen production by Sorption Enhanced Steam Reforming \(SESR\) of Biogas](#)

Alma Capa, Yongliang Yan, Fernando Rubiera, Covadonga Pevida, María Victoria Gil, Peter Clough

INCAR-CSIC (Spain); Cranfield University (UK); Newcastle University (UK)

12:10 [H₂ production via Glycerol Sorption Enhanced Steam Reforming](#)

Gemma Grasa, Claudia Navarro, José Manuel López, Isabel Martínez, Ramón Murillo

ICB-CSIC (Spain)

12:30 [Analysis of the integration of bioethanol production plants with bioethanol steam reforming processes to produce hydrogen](#)

Elena Castilla, D. Sopeña, H. Olmedo, A. Horrillo

CIDAUT (Spain); University of Valladolid (Spain)



Oral Presentations

Room B. Hydrogen Production: Bio Hydrogen / Bio Gasification

12:50 [Numerical simulation of ethanol thermal partial oxidation in a mesochannel-based reactor to produce hydrogen-rich syngas](#)

Daniel Fernández-Galisteo, Eduardo Fernández-Tarrazo, Carmen Jiménez, Vadim N. Kurdyumov

CIEMAT (Spain); Universidad Carlos III de Madrid (Spain)

13:10 [Integrated Membrane Reactor for hydrogen separation](#)

Jon Meléndez, José A. Medrano, Igor Egaña, Andrés Galnares

Hydrogen Onsite S.L. (Spain)

Room C. Hydrogen Storage

11:30 [Analysis of potential strategies to improve hydrogen recovery from LOHC systems](#)

José María Sánchez-Hervás, Carla Pravos Gonzalo, Marta Maroño Bujan, Esperanza Ruiz Martínez

CIEMAT (Spain); Complutense University of Madrid (Spain)

11:50 [Decalin-naphthalene as promising chemical hydrogen carrier: optimization of dehydrogenation steps](#)

Pablo Rapado-Gallego, Eva Díaz, Salvador Ordóñez

University of Oviedo (Spain)

12:10 [Accelerating global demonstration and commercialization of large-scale underground hydrogen storage under IEA's Hydrogen Technology Collaboration Programme](#)

Serge van Gessel, Remco Groenenberg, Maartje Boon, Carla Robledo, Maarten Huijgen, Marina Holgado, Hadi Hajibeygi

TNO (The Netherlands); Technical University of Delft (The Netherlands); Ministry of Economic Affairs and Climate Policy (The Netherlands); Ariema Energía y Medio Ambiente (Spain)



Oral Presentations

Friday, 20th May. Parallel Session 6 (11:30-13:30)

Room C. Hydrogen Storage

12:30 [Techno-economic requirements for underground renewable hydrogen storage in porous media](#)

Jan Michalski

Ludwig-Bölkow-Systemtechnik GmbH (Germany)

12:50 [A novel methodology to estimate dispersivity in Underground Hydrogen Storage](#)

Marco Maniglio, Alberto Pizzolato, Paola Panfili, Alberto Cominelli

Eni S. p. A. (Italy)

13:10 [Hystories project: technical developments and deployment outlooks for pure hydrogen storage in depleted fields and aquifers](#)

Arnaud Réveillère, Jan Michalski, Bernd Löder, Ceri Vincent, Martin Wagner, Jesús Simón, Katarzyna Luboń

Geostock (France); Ludwig-Boelkow-Systemtechnik GmbH (Germany); Montanuniversitaet Leoben (Austria); Co2geonet (France); MicroPro GmbH (Germany); Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón (Spain); Mineral and Energy Economy Research Institute of the Polish Academy of Sciences (Poland)

Room D. Fuel Cells & Hydrogen Systems Modelling

11:30 [Levelized Costs of Storage \(LCOS\) for a Green Hydrogen System](#)

Celia Martínez de León, J. Javier Brey, Carlota Ríos

Universidad Loyola Andalucía (Spain)

11:50 [Multizone thermodynamic model to design piston compressors for hydrogen at high pressures](#)

Diego Fernández Chéliz, Miguel Castaños Calleja, Daniel Ballorca Juez, Alfonso Horrillo Güemes

CIDAUT (Spain); Hiperbaric (Spain); University of Valladolid (Spain)



Oral Presentations

Room D. Fuel Cells & Hydrogen Systems Modelling

12:10 [A Simulation Toolchain for the Refueling of Hydrogen Vehicles](#)

Klaus Esser, Julius Rauh, Nejc Klopčič, Markus Sartory, Alexander Trattner

HyCentA Research GmbH (Austria)

12:30 [Hydrogen substitution potentials inside the energy systems of aviation industry sites](#)

Lars Baetcke, Piyush Rangani, Fabian Carels, Lucas Sens, Ulf Neuling, Adrian Herberger, Daniel Holsten, J. Jepsen, K. Taube, T. Klassen

Helmholtz-Zentrum Hereon GmbH (Germany); Hamburg University of Technology (Germany); Airbus Operations GmbH (Germany)

12:50 [Integration of hydrogen into the energy infrastructure of aviation industry sites - The determination of a cost-optimized ramp-up](#)

Fabian Carels, Lucas Sens, Lars Baetcke, Piyush Rangani, Ulf Neuling, Martin Kaltschmitt

Hamburg University of Technology (Germany); Helmholtz-Zentrum Hereon GmbH (Germany)

13:10 [Analysis of production cost under uncertainty for an integrated wind power-to-hydrogen-to-methanol system](#)

Sajjad Yousefian, Parisa Javadi, Tubagus Aryandi Gunawan, Rory F. D. Monaghan

National University of Ireland (Ireland); National University of Ireland (NUI) (Ireland); SFI Centre for Energy, Climate and Marine Research (Ireland); Princeton University (USA)

Room E. Commercialization, Codes and Standards

11:30 [Status of Regulations on the use of Fuel Cells and Hydrogen in the Merchant Fleet](#)

Antonio Villalba-Herrerros, Vladimir L. Meca, Rafael d'Amore-Domenech, Teresa J. Leo

Polytechnic University of Madrid (Spain)



Oral Presentations

Friday, 20th May. Parallel Session 6 (11:30-13:30)

Room E. Commercialization, Codes and Standards

11:50 [Advances in fuel cells standardization from the National Committee CTN 222](#)

Jesús Martín Pérez, Ana M. Mariblanca Sánchez, Antonio Martínez Chaparro

Centro Nacional del Hidrógeno (Spain); UNE (Spain); CIEMAT (Spain)

12:10 [Development of integrated renewable hydrogen value chain at national level](#)

Tomás Malango

Repsol (Spain)

12:30 [Gaps and opportunities across hydrogen end-uses: a bottom-up analysis of the existing business activities in Europe](#)

Davide Tonelli, Simone Braccio, Daniele Proverbio, Paolo Pino, Piera Della Porta

Engineer College Italy (Italy); Catholic University of Louvain (Belgium); Grenoble Alpes University CEA (France); University of Luxembourg (Luxembourg); Politecnico di Torino (Italy)

12:50 [Present and future scenarios of Hydrogen storage in microgrids: A techno-economic assessment](#)

Ander Martínez Alonso, Daniele Costa, Fatma Zahra Sallawi, Guillermo Matute, Lieselot Vanhaverbeke, Maarten Messagie, Thierry Coosemans

Vrije Universiteit Brussel (Belgium); Instrumentación y Componentes S.A. (Spain)

13:10 [SEAFUEL; green hydrogen production from solar and seawater](#)

Pau Farràs Costa

National University of Ireland (Ireland)



Oral Presentations

Room F. Associations, Countries & Assessments

11:30 [The International Energy Agency's Hydrogen Technology Collaboration Programme](#)

Paul Lucchese, Marcel Weeda, E. Ohira, Marina Holgado

CEA (France); TNO (The Netherlands); NEDO (Japan); ARIEMA Energía y Medioambiente S.L (Spain)

11:50 [LIFE3H: Maing Hydrogen Valleys a reality](#)

Chiara Barchiesi, Iris Flacco, Giovanni Cinti, Enrico Bocci, Gabriele Giustiniani, Raffaele Alfonsi, Antonino Tripodi

Regione Abruzzo, Service of the President's Cabinet (Italy); University of Perugia (Italy); Guglielmo Marconi University (Italy); UNeed.IT Srl (Italy)

12:10 [H24NEWAGE – Development of advanced technologies for hydrogen production, storage and distribution, and technology transfer to Industry for the new era of hydrogen in Spain](#)

Ekain Fernández, Carmen Bartolomé, Gonzalo G. Fuentes, Ismael Lozano

TECNALIA (Spain); University Institute of Mixed Research CIRCE (Spain); AIN (Spain); CARTIF Technology Center (Spain)

12:30 [Prospects for renewable Hydrogen in the implementation of the EU hydrogen strategy in Sweden and Spain – An analysis of current and future projects](#)

Sergi Contelles, Karl Hillman, Katja Tasala Gradin, María Cabrelles

DEKRA Process Safety Spain (Spain); University of Gävle (Sweden)

12:50 [Integrated modelling for supporting long-term energy and climate planning. The role of hydrogen in the decarbonisation of the Basque industry](#)

Diego García-Gusano, Eneko Arrizabalaga, Joan Manuel F. Mendoza, Iñaki Arto

TECNALIA (Spain); Mondragon Unibertsitatea (Spain); IKERBASQUE (Spain); Basque Centre for Climate Change (Spain)

13:10 [A framework for evaluating hydrogen export potential: Hydrogen Competitiveness Index](#)

Dawood Hjeij, Yusuf Bicer, Muammer Koc

Hamad Bin Khalifa University (Qatar)



Poster presentations

Hydrogen Production: Solar Hydrogen / Renewable Hydrogen

Poster 1 **Where is Golden Hydrogen in the current clean hydrogen momentum?**

M. Júlia Terra Miranda

National University of Ireland (Ireland)

Poster 2 **Green Hydrogen Viability from Off-peak Grid Periods for Fuel Cell Vehicles: The Dominican Republic Case Study**

Junior Alexis Villanueva-Rosario, Angel Molina-García,
José Javier López-Cascales

Universidad Politécnica de Cartagena (Spain)

Poster 3 **Production of renewable or low-carbon hydrogen from an industrial perspective by TECNICAS REUNIDAS**

Miguel Angel Vega Pacho, Ernesto Simón Camacho, Carmen Jiménez-Borja,
Ana Nieto Prado, Elisa Alcolea Coronel

Técnicas Reunidas, S.A. (Spain)

Poster 4 **Understanding photo-catalysts performance for green hydrogen generation from H₂S splitting**

Lourdes Vega, Yuting Li, Daniel Bahamon, Ismail I. I. Alkhatib,
Mutasem Sinnokrot, Khalid Al-Ali, Lourdes Vega

Khalifa University of Science and Technology (UAE)

Poster 5 **Structure and Activity of Pt-loaded B-doped g-C₃N₄ Catalysts for Sunlight-driven Production of Hydrogen**

Uriel Caudillo-Flores, Irene Barba-Nieto, María Natividad Gómez-Cerezo,
Enrique Rodríguez-Castellón, Marcos Fernández-García, Anna Kubacka

ICP-CSIC (Spain); University of Málaga (Spain)

Poster 6 **Hydrogen photoproduction of TiO₂-based systems through co-deposition of Pt and SnS₂**

Irene Barba-Nieto, Konstantinos C. Christoforidis, Marcos Fernández-García,
Anna Kubacka

ICP-CSIC (Spain); Democritus University of Thrace (Greece)



Poster presentations

Hydrogen Production: Solar Hydrogen / Renewable Hydrogen

Poster 7 **Thermo-photo production of hydrogen using ternary Pt-CeO₂-TiO₂ catalysts**

Uriel Caudillo-Flores, Irene Barba-Nieto, Mario J. Muñoz-Batista, Debora Motta Meira, Marcos Fernández-García, Anna Kubacka, Konstantinos C. Christoforidis,
Marcos Fernández-García, Anna Kubacka

ICP-CSIC (Spain); National Autonomous University of México (México); University of Granada (Spain); Argonne National Laboratory (USA); Canadian Light Source Inc. (Canada)

Poster 8 **Reticulated porous ceramic (RPC) structures of La_{0.8}Al_{0.2}Ni_{0.3}-δ perovskite for H₂ production by thermochemical water splitting**

Alejandro Pérez Domínguez, María Orfila del Hoyo, María Linares Serrano,
Raúl Sanz Martín, Javier Marugán Aguado, Raúl Molina Gil,
Juan Ángel Botas Echevarría

Rey Juan Carlos University (Spain)

Poster 9 **Scaling up and demonstration of a compact bioethanol processor for renewable hydrogen production and purification**

Elisa Alcolea Coronel, Carmen Jiménez-Borja, Diego Ubeda, Ana Nieto Prado,
Jorge Carrero, Juan Manuel Sanchez, J.L. Carreras, D. Blanco, A. Escobar,
Alejandro Correal, G. Monjas, Y. Remírez, M.A. Vega

Técnicas Reunidas, S.A. (Spain)

Hydrogen Production: Electrolysis / Electrolyzers

Poster 10 **Methanol electrolyser and direct methanol fuel cell test bench**

Vladimir L. Meca, Óscar Santiago Carretero, Antonio Villalba-Herreros,
Rafael d'Amore Domenech, Teresa J. Leo Mena

Polytechnic University of Madrid (Spain); University of Bremen (Germany)

Poster 11 **Waste heat from electrolyzers to produce fresh water**

Agustín Torralba

Alfa Laval (Spain)



Poster presentations

Hydrogen Production: Electrolysis / Electrolyzers

Poster 12 **Challenges and strategies for large-scale hydrogen production by alkaline water electrolysis using wind energy**

Ernesto Amores Vera, Nuria Rojas, Margarita Sánchez-Molina, Gema Sevilla, David Abad, Gonzalo Manjavacas, Luis Diego García, F. J. Ramírez, J. Fernández de Manzanos

NORDEX Energy Spain (Spain)

Poster 13 **HANNEL-progress towards development of a cost-efficient hydrogen production unit based on anion exchange membrane (AEM) electrolysis**

Thulile Khoza

Sintef Industry (Norway)

Hydrogen Production: Bio Hydrogen / Bio Gasification

Poster 14 **Techno-economic assessment of manure to hydrogen plants: a real case study based on a cattle farm in an isolated location**

Filippo Racanella, Guillermo Matute, Marta Gandiglio, Julio Guillén Angel

Politecnico di Torino (Italy); Instrumentación y Componentes S.A. (Spain); CIRCE – Research Center for Energy Resources and Consumption (Spain)

Poster 15 **Long-term biohydrogen production from soft drink industry non-conforming products**

Santiago Barreiro-Vescovo, Mónica Figueroa, Angela Rodríguez Abald

EnergyLab (Spain)

Poster 16 **Utilizing the sewage sludge as a zero emissions energy source for production of hydrogen**

Andelina Bubalo, Dražen Vouk, Danica Maljković

University of Zagreb (Croatia); Dok-Ing Energo Ltd. (Croatia)



Poster presentations

Hydrogen Production: Bio Hydrogen / Bio Gasification

Poster 17 **H₂ production by sorption enhanced steam reforming (SESR) of biogas containing H₂S**

Alma Capa, Roberto García, María Pilar González-Vázquez, De Chen, Fernando Rubiera, María Victoria Gil, Covadonga Pevida

INCAR-CSIC (Spain); Norwegian University of Science and Technology (Norway)

Poster 18 **Modeling and experimental study on the H₂ production from biomass gasification in a bubbling fluidized bed**

María del Pilar González Vázquez, Roberto García Fernández, María Victoria Gil Matellanes, Fernando Rubiera González, Covadonga Pevida García

INCAR-CSIC (Spain)

Hydrogen Production: Catalysts

Poster 19 **Hydrogen production by aqueous phase reforming of glycerol**

Raquel Raso Roka, L. García, J. Ruiz, M. Oliva, J. Arauzo

Aragon Institute for Engineering Research, University of Zaragoza (Spain)

Poster 20 **Methanol steam reforming in a membrane reactor for high purity hydrogen production**

Alejandro Cifuentes López, R. Torres, J. Llorca

Polytechnic University of Catalunya (Spain)

Poster 21 **Production of hydrogen over CuZnOx-based methanol reformers for fuel cell applications**

Konstantinos Kappis, Joan Papavasiliou, Marcin Kuśmierz, Grzegorz Słowik, Wojciech Gac, George Avgouropoulos

University of Patras (Greece); Foundation for Research and Technology-Hellas (Greece); Maria-Curie Skłodowska University (Poland)



Poster presentations

Hydrogen Production: Catalysts

- Poster 22 **Low temperature steam reforming of methanol over hydrothermally prepared CuZn oxide catalysts**
Konstantinos Ar. Papageorgiou, Marcin Kuśmierz, Grzegorz Słowik, Wojciech Gac, Joan Papavasiliou
University of Patras (Greece); Maria-Curie Skłodowska University (Poland)
- Poster 23 **“Hydride cycle” as an Effective Method for Synthesizing Hydrogen-storage Alloys in Ti-V, Ti-V-Mn and Ti-V-Cr Systems**
Anahit Aleksanyan, Seda Dolukhanyan, Davit Mayilyan, Ofelya Ter-Galstyan, Nune Mnatsakanyan
A.B. Nalbanyan Institute of Chemical Physics of Armenian (Armenia)
- Poster 24 **TiFe alloys produced by “Hydride Cycle” method**
Davit Mayilyan, Anahit Aleksanyan
A.B. Nalbanyan Institute of Chemical Physics of Armenian (Armenia)
- Poster 25 **Chemically reduced graphene oxide as a promising candidate for hydrogen storage**
Rodolfo Fernández-Martínez, María Belén Gómez-Mancebo, César Augusto Maffiotte, Laura Jiménez Bonales, Natalia Brea, Antonio Molinero, J. M. Barcala, S. Fernández, N. González, J. Cárabe, A. Boscá, J. Pedrós, G. Conte, A. Policicchio, J. Martínez, F. Calle, A.J. Quejido, Isabel Rucandio
CIEMAT (Spain); Astrobiology Center CSIC-INTA (Spain); Institute of Optoelectronic Systems and Microtechnology (Spain); Polytechnic University of Madrid; University of Calabria (Italy)
- Poster 26 **Dehydrogenation of the LOHC perhydro-dibenzyltoluene in a microstructured reacto**
Ellen Gapp, J. Thönnissen, P. Pfeifer
Karlsruhe Institute of Technology (Germany)



Poster presentations

Hydrogen Storage: Gas / Liquefaction

- Poster 27 **Feasibility of cryoadsorption on Metal-Organic Frameworks for large-scale hydrogen storage: construction and operation costs comparison with compressed gas technology**
José Antonio Villajos Collado
Federal Institute for Materials Research and Testing (Germany)
- Poster 28 **A study of temperature and flow measurement using fiber optic sensor in cryogenic environment**
Michael Lee, Joseph Chul Chung
CyToniQ (USA); CyToniQ (Korea)
- Poster 29 **Different ways to store massive quantities of hydrogen**
Louis Londe, Arnaud Réveillère
Geostock (France)
- Poster 30 **Large-scale hydrogen storage methods: a reasoned comparison**
Carlota Ríos, Celia Martínez de León, Tamara Guerrero, J. Javier Brey
Universidad Loyola Andalucía (Spain)

Electrocatalysts / Electrodes (Fuel Cells and Electrolyzers)

- Poster 31 **Structure optimized Catalyst Coated Membranes for PEM-FC and PEM-WE applications**
Nadine Zimmerer, Philipp Quarz, Philip Scharfer, Wilhelm Schabel
Karlsruhe Institute of Technology (Germany)
- Poster 32 **Surface and bulk analysis of electrosprayed catalyst layers for PEMFC**
Susana Merino, Esmeralda Muñoz, Gonzalo de Diego, M Antonia Folgado Martínez, Luis Duque, Antonio Martínez Chaparro
CIEMAT (Spain)



Poster presentations

Electrocatalysts / Electrodes (Fuel Cells and Electrolyzers)

- Poster 33 **Boosting hydrogen technologies with femtosecond laser structured catalysts**
V. Hoffmann, D. Hüne, L. Hoffmann, L. Lentz, W. Schade, T. Turek,
Thomas Gimpel
Clausthal University of Technology (Germany); Fraunhofer Heinrich Hertz Institute (Germany)
- Poster 34 **Facile synthesis of nitrogen-doped carbon decorated NiFe₂O₄ with enhanced OER performance**
Gebrehiwet Abrham Gebreslase, María Victoria Martínez-Huerta, David Sebastián, María Jesús Lázaro
ICB-CSIC (Spain); ICP-CSIC (Spain)
- Poster 35 **Oxygen reduction reaction at 2D electrocatalysts**
Sergio Fajardo, Stefan Delgado, Yapci Remedios Díaz, Carmen Arévalo, Gonzalo García, Elena María Pastor Tejera
University of La Laguna (Spain)

Fuel Cells Components & Stacks

- Poster 36 **Proposal of a new technique to obtain some fuel cell internal parameters using polarization curve tests and EIS results**
Guillermo Gómez, Jesús Maellas Benito, Pilar Argumosa, Adrián Corro
National Institute of Aerospace Technology (Spain)
- Poster 37 **A study of the eCoCell diffusion layer with different graphene content in the MPL**
Andrés Jerez Navarro, Modesto Aguirre Gómez, Carol Anne Mateau Ortín,
Ángel Molina García, José Javier López Cáscales
Universidad Politécnica de Cartagena (Spain)



Poster presentations

Fuel Cells Components & Stacks

- Poster 38 **Sol-gel organic-inorganic acid blends based on styrene-ethylene-butylene-styrene block copolymer SEBS and (MPTMS-GPTMS) for PEMFCs**
Carmen del Río, Faber Díaz, Enrique Morales, Mario Aparicio, Jadra Mosa
ICTP-CSIC (Spain); ICV-CSIC (Spain)
- Poster 39 **Process parameters influencing the membrane direct coating of catalyst coated membranes (CCM)**
Philipp Quarz, Nadine Zimmerer, Philip Scharfer, Wilhelm Schabel
Karlsruhe Institute of Technology (Germany)
- Poster 40 **Feasibility of using titanium-based materials for PEMFC bipolar plates**
Carlos Romero, Elena Gordo
Universidad Carlos III de Madrid (Spain)
- Poster 41 **Application of bipolar HiPIMS to enhance the durability performance of carbon coatings in metallic bipolar plates**
José Antonio Santiago Varela, I. Fernández, P. Díaz-Rodríguez, M. Panizo, M. Morales, C. Molpeceres, J.C. Sánchez-López, L. Mendizabal, G. Sevilla, M. Sánchez-Molina, N. Rojas
Nano4Energy (Spain); Polytechnic University of Madrid (Spain); ICMS-CSIC-University of Seville (Spain); IK4-Tekniker (Spain); National Hydrogen Center (Spain)
- Poster 42 **Water management and component selection for alkaline membrane fuel cells - an optimisation study**
Claudia Käding, Kevin Obermann, Henrike Schmies, Corinna Harms
German Aerospace Center DLR (Germany)
- Poster 43 **Multi-scale modeling of anode-supported solid oxide fuel cells**
Dong Hyup Jeon, Sangwon Kim
Dongguk University (Republic of Korea); Korea Institute of Science and Technology Europe (Germany); Saarland University (Germany)



Poster presentations

Fuel Cells Components & Stacks

Poster 44 **Increasing the Electrical Power of a Carbon-Air Solid Oxide Fuel Cell through the Fabrication of Mesoporous Mo-doped CeO₂ Anodes**

Isaac Díaz-Aburto, Carola Montecino Bacigalupo

Universidad Tecnológica Metropolitana (Chile); Universidad de las Américas (Chile)

Poster 45 **Operation of 2 kW solid oxide fuel cell using anode-supported planar cells**

Tomás González-Ayuso, M José Escudero Berzal, José Luis Serrano

CIEMAT (Spain)

Fuel Cell & Hydrogen Systems Modelling

Poster 46 **A Dynamic Model for Air-breathing Polymer Electrolyte Fuel Cell**

Fatma Calili-Cankir, Mohammed S. Ismail, Derek B. Ingham, Lin Ma, Kevin Hughes, Mohamed Pourkashanian

University of Sheffield (UK)

Poster 47 **Full Range Dynamic Equivalent Circuit Model for PEM Fuel Cell Stacks**

Lukas Baum, Florian Grumm, Marc Schumann, Detlef Schulz

Helmut Schmidt University/University of the Bundeswehr Hamburg (Germany)

Poster 48 **Application of PEMFC and SOFC to a combined electricity and heat production system powered by bioethanol**

Pablo Sánchez, Diana Puchol, Enrique Romero, Jaime Soler

Aragon Institute of Engineering Research, University of Zaragoza (Spain)

Poster 49 **Optimal power dispatch model of hybrid power-to-power hydrogen storage systems for isolated microgrids: A case study**

Ander Martínez Alonso, Guillermo Matute, José Maria Yusta, Maarten Messagie, Thierry Coosemans

Vrije Universiteit Brussel (Belgium); Instrumentacion y Componentes S.A. (Spain); University of Zaragoza (Spain)



Poster presentations

Fuel Cell & Hydrogen Systems Modelling

Poster 50 **Prospects for the price of renewable hydrogen and evolution of its value in the world context and its implication for industrial revamping**

Francisco Carro de Lorenzo, Raúl Rodríguez Parra

Tresca (Spain)

Poster 51 **Feasibility study of a hydrogen generation facility for use in a southern European home**

Modesto Aguirre Gómez, Andrés Jerez Navarro, Paula López Marchante, Ángel Molina García, José Javier López Cáscales

Polytechnic University of Cartagena (Spain)

Transportation and Aerospace Applications

Poster 52 **Compliance of a fuel cell based EPU with aeronautical regulations**

A. Correro Ricard, J. Maellas, Pilar Argumosa Martínez, G. Gómez

National Institute of Aerospace Technology (Spain)

Poster 53 **Improving the Air Supply and Hydrogen Dilution Control of a Fuel Cell Electric Vehicle with Explicit MPC**

Maximilian Karl Eisner, Zheng Zhou, Volker Formanski, Ralph M. Kennel

Technical University of Munich (Germany); BMW Group (Germany)

Poster 54 **Fuel cell power systems based on green hydrogen and methanol for cargo ships: techno-economic insight**

Rafael d'Amore-Domenech, Vladimir Luis Meca, Antonio Villalba-Herrerros, Teresa J. Leo

Polytechnic University of Madrid (Spain)

Poster 55 **Performance, cradle-to-grave emissions and durability evaluation of fuel cell vehicle architectures for passenger car applications**

José M. Desantes, Ricardo Novella, Benjamin Pla, Marcos López-Juárez

Polytechnic University of València (Spain)



Poster presentations

Applications of Hydrogen as fuel

- Poster 56 **Demonstrating the whole value chain of producing synthetic fuels using CO₂ and renewable hydrogen as raw materials**
Alfonso García de las Heras
Repsol Technology Lab. (Spain)
- Poster 57 **Presentation of the H₂ Combustion HUB Madrid: Intelligent, decarbonized and low emissions power and heat generation**
Mario Sánchez Sanz, Eduardo Fernández Tarrazo, César Huete, Daniel Martínez Ruiz, Víctor Muntean, Carmen Jiménez, Vadim Kurdyumov, D. Fernández-Galísteo, R. Gómez Miguel, José Hermida
Universidad Carlos III de Madrid (Spain); CIEMAT (Spain); Universidad Politécnica de Madrid (Spain); Instituto Nacional de Técnicas Aeroespaciales (Spain)
- Poster 58 **Combustion assessment of low carbon fuels in a spark ignition engine with CFD**
Rafael Ortiz-Imedio, Víctor Manuel Maestre Muñoz, Alfredo Ortiz Sainz de Aja, Daniel Gorri Cirella, Inmaculada Ortiz Uribe
University of Cantabria (Spain)
- Poster 59 **Hydrogen distribution for agricultural and construction machinery**
Steffen Wieser, Mathias Böhm, Michael Halfen, Florian Heckert
German Aerospace Center DLR (Germany); Deutz AG (Germany)
- Poster 60 **Biogas upgrading through CO₂ methanation in a polytropic - distributed feed fixed bed reactor**
Paúl Durán, Andrés Sanz-Martínez, Eva Francés, Javier Herguido, José- Angel Peña
Aragon Institute of Engineering Research, University of Zaragoza (Spain)
- Poster 61 **Air temperature effect in steady state regime ammonia combustion by diffusion**
Marcos Sánchez, A. Pérez, J.I. Domínguez, Miguel Castaños Calleja, A. Horrillo
CIDAUT (Spain); University of Valladolid (Spain)



Poster presentations

Other Applications

- Poster 62 **Grasshopper: A Modular and Flexible Hydrogen PEM Power Plant for Grid Balancing Services**
María Tejada Valderrama, Germán Nieto Cantero, Belén Sarmiento Marrón
Abengoa Innovación (Spain)
- Poster 63 **A performance comparison of different configurations of a Fuel Cell mCHP system in terms of energy, emissions and costs**
F.V. Tinaut, M. Reyes, P. Gabana, J.I. Domínguez
Polytechnic University of València (Spain); University of Valladolid (Spain); CIDAUT (Spain)
- Poster 64 **Fuel cell based range extender for cargo bikes in inner city transportation**
Markus Kordel, Inga Bürger, Julian Käß, Torsten Knöri, Tilo Maag, Mathias Schulze, Jörg Weigl
German Aerospace Center DLR (Germany); Unicorn Engineering GmbH (Germany)

Hydrogen Infrastructure & Environmental Impact

- Poster 65 **Cost of decarbonizing an aviation manufacturing site by green hydrogen**
Piyush Rangani, Lars Baetcke, Fabian Carels, Lucas Sens, Ulf Neuling, Adrian Herberger, Daniel Holsten, J. Jepsen, K. Taube, T. Klassen
Helmholtz-Zentrum Hereon GmbH (Germany); Hamburg University of Technology, (Germany); Airbus Operations GmbH (Germany)
- Poster 66 **Prospective carbon footprint of hydrogen from grid-powered electrolysis in different countries**
Antonio Valente, Zaira Navas-Anguila, Diego Iribarren, Javier Dufour
IMDEA-Energy (Spain); Rey Juan Carlos University (Spain)
- Poster 67 **Hydrogen Economy and Impact on Chilean health**
Carola Montecino Bacigalupo, Isaac Diaz Aburto
Universidad de las Américas (Chile); Universidad Tecnológica Metropolitana (Chile)



Poster presentations

Safety & Commercialization

Poster 68 **H₂LDAR – Hydrogen Leak Detection Tests and Results**

Víctor del Coso, Raúl Oliveira, Luis Carlos Gutierrez

EHS Techniques, S.L. (Spain); Enagás, S.A. (Spain)

Poster 69 **Monitoring system definition for optimizing alkaline electrolyzers O&M within the framework of OCEANH2 Project**

S. Alvarez-Buylla, Luis Piqueras González-Tejero, Alfonso Jurado Fuentes, Rodrigo Pérez, Roberto Yubero

TSI Técnicas y Servicios de Ingeniería (Spain); ARIEMA Energía y Medioambiente S.L (Spain)

Poster 70 **Development of a new spot online analysis method to control H₂ quality on Hydrogen Refueling Station**

Etienne Basset, Mathilde Rizand, E. Bulot, C. Panel, S. Quesnel, Quentin Nouvelot

ENGIE (France)

Hydrogen Infrastructure & Environmental Impact

Poster 71 **Innovative plastic materials for the green hydrogen economy**

Vicente B Vert, Marta Pérez, Begoña Galindo, Alicia Monleón, Joaquín Castán, Eva Verdejo, Laura Martí, A. Crespo, F. Martí

Plastics Technology Centre (Spain)



Poster presentations

Strategies & Assessments

Poster 72 **Deployment of hydrogen mobility in Europe: a comparative assessment of the approaches followed in six reference countries**

Guillermo Matute, Julio Guillén Angel, Luis Correas

Instrumentación y Componentes S.A. (Spain); CIRCE – Research Center for Energy Resources and Consumption (Spain); Walqa Technology Park (Spain)

Poster 73 **Comparison of deployment policies for the use of hydrogen as an alternative fuel in road transport**

Abel Rosales-Tristancho, Ana Fernández Carazo, Raúl Brey, J. Javier Brey

Universidad de Sevilla (Spain); Universidad Pablo de Olavide de Sevilla (Spain); Universidad Loyola Andalucía (Spain)



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