

Catalyst Design Strategies for Photo- and Electrochemical Fuel Synthesis (ECAT25)

Madrid, Spain, 2025 February 10th - 11th

Conference organizers: Marta Liras and Claudio Ampelli

Conference Program

February 10th - Day 1 (Monday) 1	
09:20 - 09:50	Registration
09:50 - 10:00	Opening
	Session 1A Chair: Marta Liras
10:00 - 10:30	<u>María Escudero-Escribano</u> (ICREA, 08010 Barcelona, Catalonia, Spain)
1A-I1	Tailored electrocatalytic interfaces for renewable fuels production
10:30 - 10:45	<u>Miguel García-Tecedor</u> (Photoactivated Processes Unit IMDEA Energy Institute, Av. Ramón de la Sagra 3, 28935 Móstoles, Madrid, Spain),
1A-O1	Mariam Barawi, Alejandro García-Eguizábal, Miguel Gómez-Mendoza, Freddy E. Oropeza, Ignacio J. Villar-García, Camilo A. Mesa, Sixto Giménez, James R. Durrant, Marta Liras, Víctor A. de la Peña O'Shea
	Efficient Strategies for Boosting the Water Oxidation Performance of BiVO ₄ Photoanodes
10:45 - 11:00	<u>Marcus Einert</u> (Technical University of Darmstadt), Qingyang Wu, Arslan Waheed, Stefan Lauterbach, Maximilian Mellin, Marcus Rohnke,
1A-O2	Lysander Wagner, Julia Gallenberger, Chuanmu Tian, Bernd Smarsly, Wolfram Jaegermann, Franziska Hess, Helmut Schlaad, Jan Philipp Hofmann
	Photoelectrochemical and Electrocatalytic Water Oxidation Performance of Sol-gel-derived Mesoporous High-Entropy Spinel Oxide Thin Films
11:00 - 11:30	Coffee Break
	Session 1B Chair: María Escudero-Escribano
11:30 - 12:00	<u>Sixto Giménez</u> (Institute of Advanced Materials (INAM), Universitat Jaume I, Av. Vicent Sos Baynat, s/n, Castelló de la Plana, 12071 Spain)
1B-I1	(Photo)electrocatalytic approaches for the production of added-value chemicals
12:00 - 12:15	<u>Kasper Wenderich</u> (Photocatalytic Synthesis Group, MESA+ Institute for Nanotechnology, University of Twente, P.O. Box 217, 7500 AE
1B-O2	Enschede, The Netherlands), Yibin Bu, Kaijian Zhu, Nathália Tavares Costa, Kees-Jan Weststrate, Anuradha Meena, Annemarie Huijser, Guido Mul
	The promise of photothermal catalysis for efficient CO ₂ reduction to CH ₄ using Ru/TiO ₂ catalysts
12:15 - 12:30	<u>Soranyel Gonzalez</u> (Institute of Molecular Science, University of Valencia, 46980 Paterna, Valencia, Spain)
1B-O3	Polymer nanoparticles for solar-driven fuel generation
12:30 - 12:45	<u>Tania Mazuelo</u> (Photoactivated processes unit, IMDEA Energy, 3, Av. Ramón de la Sagra, Madrid, 28935, Spain), Teresa Naranjo, Miguel
1B-O1	Gomez-Mendoza, Alejandro Herrero, Laura Collado, Mariam Barawi, Felipe Gándara, Manuel Souto, Marta Liras, Víctor de la Peña O'Shea
	Covalent Organic Frameworks Based on BOPHY and BODIPY Hybrids for Solar Hydrogen Production
12:45 - 13:15	<u>Sebastian Sprick</u> (Department of Pure and Applied Chemistry, University of Strathclyde)
1B-I2	Processing polymer photocatalysts for solar fuels generation
13:15 - 14:30	Lunch Break
	Session 1C Chair: Sebastian Sprick
14:30 - 15:00	<u>Michele Melchionna</u> (Department of Chemical and Pharmaceutical Sciences, University of Trieste, Via L. Giorgieri 1, 34127 Trieste, Italy)
1C-I1	Managing metal atom economy in electrocatalysis by means of carbon nanostructures
15:00 - 15:15	<u>Menny Shalom</u> (Department of Chemistry, Ben Gurion University, Beer-Sheva, 8410501 Israel)
1C-O1	Binder-free carbon nitride panels for continuous-flow photocatalysis
15:15 - 15:30	<u>Clément Maheu</u> (Nantes Université, CNRS, Institut des Matériaux de Nantes Jean Rouxel, IMN, F-44000 Nantes, France), Florian Chabanaïs,
1C-O2	Mohammed Boujtit, Pierre-Yves Jouan, Marie-Paule Besland, Mireille Richard-Plouet
	TiO ₂ -based thin film photocatalysts for the photoconversion of sugars in H ₂ and high value-added co-products
15:30 - 16:00	<u>Fernando Fresno</u> (Instituto de Catálisis y Petroleoquímica (ICP), CSIC, Madrid, Spain), Daniel Jiménez-Gómez, Elena Alfonso-González,
1C-I2	Ignacio J. Villar-García, Giovanni Agostini, Juan M. Coronado, Ana Iglesias-Juez
	Photothermal catalytic CO ₂ hydrogenation over metal/semiconductor heterojunctions
16:00 - 16:15	<u>Guguloth Venkanna</u> (Indian Institute of Technology Delhi), Kamal Kishore Pant, Sovan Kumar Patra, Gajanan U. Kapure
1C-O3	Titania-based photoelectrodes to reduce the carbon dioxide to chemical fuels
16:15 - 16:45	<u>Sara Garcia Ballesteros</u> (Department of Applied Science and Technology, Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 - Turin,
1C-I3	Italy), Noemi Pirrone, Lorenzo Sibella, Anna Mangini, Federico Bella
	Challenges and Advancements in Sustainable Ammonia Production via Electrochemical Nitrogen and Nitrate Reduction
16:45 - 17:15	Break
	Flash Talk Session Chair: Claudio Ampelli
17:15 - 17:20	<u>Carlos Hurtado</u> (Leitat Technological Center), Ainhoa Cots
Session-T1	PHOENIX: solar fuel technologies for a tandem solar-to-high energy density fuel generation
17:20 - 17:25	<u>Javier Llorente-López</u> (IMDEA ENERGIA), Mariam Barawi, Miguel García-Tecedor, Víctor A. de la Peña, Ignacio J. García-Villar
Session-T2	MOOH (M = Fe, Ni) as effective cocatalysts over BiVO ₄ photoanodes for water oxidation
17:25 - 17:30	<u>Freddy E. Oropeza</u> (IMDEA ENERGIA)
Session-T3	Elucidation of the dynamic reconstruction of nickel chalcogenide catalysts for the hydrogen evolution reaction
17:30 - 17:35	<u>Veronica Costantino</u> (Department of Chemical, Biological, Pharmaceutical and Environmental Sciences (ChiBioFarAm), University of
Session-T4	Messina, ERIC aisbl and CASPE/INSTM, Messina, Italy), Daniele Giusi, Siglinda Perathoner, Claudio Ampelli
	Design of novel copper sulphide-based gas-diffusion electrodes for enhanced selectivity to formate in CO ₂ electrocatalytic reduction

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17:35 - 18:00	Discussion
19:30 - 21:00	Social Dinner

February 11th - Day 2 (Tuesday) 2

Session 2A

Chair: Sixto Gimenez Julia

- 09:30 - 10:00
2A-I1 Francesco Tavella (*Department of Chemical, Biological, Pharmaceutical and Environmental Sciences (ChiBioFarAm), University of Messina, ERIC aisbl and CASPE/INSTM, Messina, Italy*), Claudio Ampelli
Electrode and cell engineering for advancing photo-electrochemical (PEC) solar fuel production.
- 10:00 - 10:30
2A-I2 F. Pelayo García de Arquer (*ICFO - Institut de Ciències Fotoniques, The Barcelona Institute of Science and Technology, 08860 Castelldefels, Spain*)
Advancing water and CO₂ electrolysis by environment manipulation
- 10:30 - 10:45
2A-O1 Gomez-Mendoza Miguel (*Photoactivated processes unit, IMDEA Energy, 3, Av. Ramón de la Sagra, Madrid, 28935, Spain*), Mazuelo Tania, Palenzuela-Rebella Sandra, Barawi Mariam, Liras Marta, De la Peña O'Shea Víctor A.
Unravelling the Charge Transfer Pathway in Multifunctional Inorganic-Organic Hybrid Catalysts by Transient Absorption Spectroscopy
- 10:45 - 11:00
2A-O2 Ewan McQueen (*Department of Pure and Applied Chemistry, University of Strathclyde*)
Hybrid Photocatalysts Based on Conjugated Polymers and Molecular Catalysts for Quantitative Conversion of CO₂ to Highly Concentrated Formate Using Visible Light

11:00 - 11:30 Coffe Break

Session 2B

Chair: Marco Favaro

- 11:30 - 12:00
2B-I1 Nicolas D. Boscher (*Luxembourg Institute of Science and Technology (LIST)*), Drialys Cardenas-Morcoso, Deepak Bansal, Hadi Ghahramanzadehasl
Engineering Metallo-Porphyrin Conjugated Polymer Thin Films for Heterogeneous Electrocatalysis
- 12:00 - 12:15
2B-O1 Zahra Abdi (*Material Research and Technology Department, Luxembourg Institute of Science and Technology, 28 Avenue des Hauts-Fourneaux, 4362 Esch-sur-Alzette, Luxembourg*), Nicolas D. Boscher, François Loyer, Amr A. Nada
Engineered Donor-Acceptor Copolymers via Chemical Vapor Deposition: Water Reduction with Benzo[1,2-b:3,4-b':5,6-b'']trithiophene and 4,7-Dithien-2-yl-2,1,3-Benzothiadiazole
- 12:15 - 12:30
2B-O2 Wahid Ullah (*Institut de Chimie Physique, UMR8000 CNRS, Université Paris Saclay, Orsay, France*), Amine Slasi, Jérôme Cornil, Mohamed-Nawfal Ghazzal
Optimizing Graphdiyne Photophysical Properties via Defects and Heteroatom Doping for Photocatalytic Hydrogen Generation.
- 12:30 - 12:45
2B-O3 Idan Hod (*Department of Chemistry, Ben-Gurion University of the Negev, Beer-Sheva, 8410501, Israel.*)
Molecular Manipulation of Heterogeneous Electrocatalysis Using Metal-Organic Frameworks
- 12:45 - 13:15
2B-I2 Teresa Andreu (*Sustainable Electrochemical Processes - IN2UB, Departament de Ciència deMaterials i Química Física, Universitat de Barcelona, Barcelona, Spain.*), Martí Molera, Mohamed Amazian, Maria Sarret
Electrodeposition as a versatile tool for the fabrication of electrocatalysts CO₂ electroreduction and glycerol oxidation.

13:15 - 14:30 Lunch Break

Session 2C

Chair: F. Pelayo Garcia de Arquer

- 14:30 - 15:00
2C-I1 Jose Aleman (*Universidad Autonoma de Madrid, ES*)
Exploring Photo- and Electro-catalysis for Sustainable Synthesis
- 15:00 - 15:15
2C-O1 Ronen Gottesman (*Institute of Chemistry, The Center for Nanoscience and Nanotechnology, Casali Center for Applied Chemistry, The Hebrew University of Jerusalem, 91904, Israel*)
High Entropy Oxides for Photo- and Electrochemical Fuel Synthesis
- 15:15 - 15:30
2C-O2 Eran Edri (*Ben-Gurion University of the Negev, Ilse Katz Institute for Nanoscale Science and Technology*)
Stabilizing Halide Perovskites In Polar Electrolytes for Photoelectrochemical Solar Fuel Production
- 15:30 - 16:00
2C-I2 Favaro Marco (*Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany*)
Charge Separation Mechanisms and Electrolyte Effects in Photoelectrochemistry: From Chemical Potential Gradients to Enhanced Performance
- 16:00 - 16:15
2C-O3 Charles Brown (*Department of Chemistry, University of Bath, Claverton Down, Bath BA2 7AY, United Kingdom*), Andrew Johnson, Frank Marken, Cameron Bentley
Aerosol-Assisted Chemical Vapour Deposition of α -Fe₂O₃, BiFeO₃, and BiVO₄ as effective Photoanodes for Photoelectrochemical Water Splitting
- 16:15 - 16:45
2C-I3 Mariam Barawi (*Photoactivated Processes Unit IMDEA Energy Institute, Av. Ramón de la Sagra 3, 28935 Móstoles, Madrid, Spain*), Javier Llorente, Nicolò Tonelli, Miguel Gomez-Mendoza, Miguel Garía-Tecedor, Freddy Oropeza, Ignacio J. Villar-García, Marta Liras, Víctor de la Peña O'Shea
The Potential of Hybrid Systems in Photoelectrochemical Solar Energy Conversion

16:45 - 17:00 Closing