Wednesday March 19th

10:30 A.M. - 12:30 A.M.

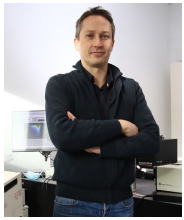
ROOM AB

Program of the session :

Chairs: Sophie CASSAIGNON

HOUR	NAME	TITLE
10:30	**Frederic SAUVAGE LRCS - CNRS**	**In situ characterization techniques for understanding degradation in hybrid halide perovskites**
11:00	Grégoire MAGAGNIN INL - CNRS	Antiferroelectric fluorite-based capacitors for ultra-high energy storage density applications
11:15	Kazimova NARGIZ LCC CNRS	Nanostructured catalysts for active and sustainable fuel cell cathodes
11:30	Fenzi LUIGI CINaM - CNRS	Towards monocrystalline nanowire transparent electrodes for photovoltaics
11:45	Odilon WAMBA-TCHIO LCPME - CNRS	Vertically oriented mesoporous silica film as host of a new polymeric material based on hybrid polyoxometalate for electrocatalytic application
12:00	Eugenie PARIENTE ICMCB/LOMA - Univ. Bordeaux	Design of metal-semiconductor heteronanostructures by laser photodeposition: Elaboration, growth control and modeling

Frédéric SAUVAGE (CNRS - LRCS, Amiens)



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Short biography

Research Director at CNRS. Joined CNRS in 2010 as a Research Scientist, promoted to Research Director in 2019. Founder and head of the Molecular Photovoltaics and Photocatalysis group at LRCS. Recipient of a 2023 ERC Advanced Grant "GEMINI" Coordinator of H2020 IMPRESSIVE (transparent/colorless PV development), several ANR and industrial projects Co-founder and CTO of G-LYTE since 2019 aiming at development / industrialization of high-performance indoor PV cells for powering consumer electronics. Founder and CTO of CRYSTAL Energy in 2024 aiming at industrializing transparent and colourless PV windows Recipient of Le Point's Innovator Award 2025, REV3 award by ADEME and is currently CNRS Innovation Ambassador. Author/Co-author of 110 publications, 9 patents

In situ characterization techniques for understanding degradation in hybrid halide perovskites

Hybrid halide perovskite has established its credibility as high performance thin film photovoltaic technology. In only one-decade, the hybrid organic-inorganic halide perovskite solar cell achieved to compete with all mature crystalline technologies, by reaching a certified 26.7 % power conversion efficiency (PCE) on cells and 20.6 % PCE on small modules. Perovskite's strength stem from their remarkable opto-electronic properties. However, the technology still requires significant attentions regarding stability, in particular rapid structural and electronic degradation can be engendered when exposed to various external stressors (temperature1, humidity2, light3, electrical bias4). To cope with the long-term stability issue, it is a paramount to precisely understand the multiple degradation pathways of the perovskite upon and during the external stressing. To this end, in situ or operando characterization techniques are central tools. In this communication, we will be discussing the degradation of different perovskite composition on the basis of humidity or temperature-controlled in situ x-ray diffraction and corroborated with in situ electron spin resonance spectroscopy and in situ transmission electron microscopy. For example, one key finding which we will discuss is that α-FAPbI3 degradation is substantially accelerated when temperature is combined to illumination and when it is interfaced with the extraction layers, and, second the existence of a temperature gap region which takes place only under illumination involving an intermediate stage between the thermal-induced perovskite degradation and the formation of PbI2 by-product.5

Keywords

Lead halide perovskite, stability, photovoltaic, in situ characterization techniques

Acknowledgement

Horizon Europe "LAPERITIVO" project under the grant agreement number 101147311, ERC AdG 2023 "GEMINI" under grant agreement 101141284 and ANR MINOTAURE project, Grant # ANR-22-PETA-0015

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Wednesday March 19th

4:30 P.M. - 6:30 P.M.

ROOM AB

Program of the session :

Chairs: Valérie KELLER

HOUR	NAME	TITLE
16:30	**Gabriel LOGET ISM - CNRS**	**Matter and materials made from metallic nanoparticles**
17:00	Ali DABBOUS CINaM - CNRS	Bipolar Membranes Electrolyzers with Controlled Nanoparticles Assembly for a Well Compact and Thickness-Controlled Catalytic Layer.
17:15	Gaëlle KHALIL ITODYS - Paris Cité	Synthesis of Ni-based Heterofunctional Catalysts with Ultra-Low PGM content for the Alkaline Hydrogen Evolution Reaction
17:30	Leila HAMMOUD LPCNO - Univ. Toulouse	Size-controlled Au and Pt nanoparticles for enhanced CO2, photoreduction with water under visible light
17:45	Soline BEITONE LMGP - UGA	Self-Supported Cu2O Nanowire Heterojunction Membranes for Photocatalysis and CO2, Reduction
18:00	Liudmila TRATSIUK UTT - Univ Troyes	Effects of heat and hot electron generations in ultrafast regime in plasmon-driven chemical reaction
18:15		

Gabriel LOGET (CNRS - ISM, Bordeaux)

Gabriel LOGET (CNRS - ISM, Bordeaux)

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Short biography

Gabriel Loget is a CNRS researcher. He received his PhD in Physical Chemistry from the University of Bordeaux (Prof. A. Kuhn - 2012). After that, he performed a postdoctoral stay at the University of California, Irvine in the group of Prof. Robert M. Corn. In 2014, he was awarded an Alexander-von-Humboldt postdoctoral fellowship for doing his research at the Friedrich-Alexander Universität of Erlangen-Nürnberg in the group of Prof. Patrik Schmuki. In 2015, he joined the CNRS as a researcher at the Institut des Sciences Chimiques de Rennes (2015-2023) and, then, at the Institut des Sciences Moléculaires (NSysA group, from 2024). He has received several awards including the DCP “Innovation Prize” of the SCF. His research interests are electrochemistry and material sciences for energy conversion.

Nanostructured photoelectrodes for solar H2 production

Although the integration of solar and wind energies in electrical grids is considerably growing worldwide, a major concern in employing these energy sources to a much larger extent is their intermittency and their diffuse geographic distribution. A solution to solve these two issues is the conversion of renewables into a carbon-free energy carrier that would allow the storage of energy and its distribution on-site and on-demand. Hydrogen (H2) has long been considered a highly promising energy carrier to fulfill this challenge. In this view, solar and wind energies can be converted into H2, which would ensure: energy storage as well as distribution and conversion in fuel cells, devices that readily convert H2 into electricity with water being the only by-product.[1] To this goal, H2 needs to be generated by the conversion of renewable energies through a zero-emission process. This is possible by coupling water electrolysis to a renewable source of energy to yield a completely clean and scalable process that generates highly pure H2 only from water.

In this contribution, I will describe the recent progress of our group[2] in the preparation and study of photoanodes for the oxygen evolution reaction (OER) and the urea oxidation reaction (UOR), which are two counter reactions that can be used to obtain electrons for H2 production. This will include approaches based on nanoelectrodeposition[3], electrodissolution[4] and hydrothermal synthesis.[5] I will also discuss the coupling of efficient nanostructured oxidation catalysts with tandem solar cells.

Keywords

Photoelectrocatalysis, Hydrogen, Urea, Photochemistry, Sun

Acknowledgement

ANR, GPR PPM (Univ. Bordeaux), Fondation Grand Ouest, GDR Solar Fuels

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Friday March 21th

10:30 A.M. - 12:30 A.M.

ROOM AB

Program of the session :

Chairs: Lionel SANTINACCI

HOUR	NAME	TITLE
10:30	**Ally AUKAULOO** **ICMMO - Univ. Paris Saclay**	**Nanostructured Organic Semiconductoʁ for the Photocatalytic Water Splitting**
11:00	Mathieu DELOM LRS - Sorbonne Univ.	Cyclable and cheap catalysts for hydrogenB storage and release by organic liquids
11:15	Heliam KLEIN LCC - CNRS	Innovative nanocomposite coatings Ni@DLC : towards H2 delivery from solid chemical storage materials
11:30	Olivier DURUPHTY LCMCP - Sorbonne Univ.	Design and comparison of different oxide based photoanodes for water oxidation using various sol-gel approaches
11:45	Juliana SOUZA Photoactive Nanomaterials - Universidade Federal do ABC	Enhanced (W)BiVO4/g-C3N4 systems forB solar-driven photocatalysis
12:00	Marouane BOUREMAH LPCNO-INSA Toulouse	Homogeneous and HeterogeneousB Photocatalysis using InP/ZnS QuantumBDots
12:15	Jean-Charles ARNAULT NIMBE - CEA	Nanodiamonds: an alternative forB photocatalysis under solar light?

Ally AUKAULOO (Univ. Paris Saclay - ICMMO, Orsay)

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Short biography

Ally Aukauloo obtained his PhD in porphyrin chemistry in 1994. In 1995 he was elected as assistant professor at Université Paris-Sud, where he worked on molecular magnetism. In 2000, after stay in Pr. J. Collman labs at Stanford University to work on Cytochrome c oxidase models, he started his research on Artificial Photosynthesis. He became fullprofessor in 2007 in bioinorganic chemistry. He was elected at the Institut Universitaire de France as a senior member in 2021. He focusses on the chemistry of molecular complexes for water activation, CO2 reduction and organic semiconductors for the water splitting.

Nanostructured Organic Semiconductors for the Photocatalytic Water Splitting

The central theme of research in artificial photosynthesis revolves around capturing sunlight to drive the water splitting reaction (WSR), producing O2 and H2. While inorganic oxides have traditionally dominated the materials used for this purpose, organic semiconductors have now emerged as an important contender. Both types of materials allow for the synthetic adjustment of band gaps and energies to enable the WSR. However, optimizing the photophysical properties of these semiconductors often requires complex and labor-intensive synthetic processes. I will discuss on two new findings: i) A study on a nanostructured semiconducting conjugated polymer, poly(diphenylbutadiyne) (nano-PDPB), and its photocatalytic activity in driving the water oxidation reaction under visible light irradiation when dispersed in water, without the need for sacrificial agents or co-catalysts. Charge recovery, either directly or delayed, was demonstrated through the reduction of quinone, which served as a hydrogen reservoir. In the absence of quinones as electron acceptors, we observed the formation of H2O2, resulting from the partial reduction of O2. ii) When pyrrole dissolved in distilled water is exposed to high-energy radiation, it forms nanostructured spherical polypyrrole (Nano-PPy) particles, which are characterized as overoxidized polypyrrole. Electrochemical measurements and Tauc's plot analysis reveal that the material exhibits semiconducting properties, with a band gap of approximately 1.8 eV. The conduction band is positioned at around -0.5 V, while the valence band is at about +1.3 V vs NHE. When suspended in water and irradiated with light wavelengths above 420 nm, Nano-PPy induces O2 evolution.

Keywords

Artificial Photosynthesis, light capture, charge accumulation, water oxidation , quinone reduction

Acknowledgement

IRS Université Paris-Saclay MOMENTOM program for a postdoctoral grant. Université ParisSud (ERM project) is acknowledged for financial support for the Cobalt-60 panoramic gamma source and LABEX CHARMMMAT and NANOSACLAY for technical support. ANRSCOOPE (2022-2026). A.A thanks Institut Universitaire de France for support.

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Poster Session

NANOCHEMISTRY & NANOPARTICLES/NANOBIOSCIENCES & NANOMEDECINE /NANOMATERIALS FOR ENERGY/ SUSTAINABILITY AND ECO DESIGN OF NANOMATERIALS

N° POSTER	TITLE	NOM	Prénom
31	Plasmon-induced thermo-polymerization of PETA in presence of various thermal initiators	BASTIDE	Mathieu
32	Green synthesis of curcumin based nanoparticle	BASU	Surita
33	Synthesis of Polyvinylpyrrolidone nanocomposite with palygorskite for application in water-based drilling fluids	DALMONEKI	Anna Clara
34	Carbon supported metal oxides nanoparticles and their applications in biomass valorization	DJELLALI	Ali
35	Synthesis of Polyacrylamide/Palygorskite Nanocomposites for Application in Water-Based Drilling Fluids	GOMES	Ana Beatriz
36	Re(CO)-based silica-nanoparticles as multimodal probes for bio-imaging	KAUFFELD	Willem
37	Chiral CdSe/CdS Nanonails	KUZNETSOVA	Vera
38	Towards large-scale production of Cobalt nanorods	LISOIR	Emma
39	Synthesis and Evaluation of PAMAM G0.5 Dendrimer as a Swelling Inhibitor Additive for Clays in Water-Based Drilling Fluids	LOPES/SPINELLI	Grazielle/Luciana
40	Plasmonic nanoclusters synthesized by a multi-step colloidal approach	ROMANUS	Martin
41	Influence of CuInS2 crystalline structure on the synthesis of CuIn1-xFexS2 quantum dot by cation exchange	ROUX-BYL	Céline
42	Chirality in Zinc Oxide nanoparticle synthesis	SARTOR	Valerie
43	Application and evaluation of core-shell nanocomposite using silica nanoparticles and AM/AMPS/DMDAAC/AAC tetrapolymer	SPINELLI	Luciana
44	Design of efficient nanocatalysts for H2 release from boranes and silanes	THIBAULT	Maxime
45	Influence of crystalline structure on the acoustic vibrations of elongated nano-objects	VERNIER	Charles
46	Chemistry and biological effects of germanium oxide nanoparticles	VIKRAMAN	Haribaskar
47	From laser-synthesized nanoparticles to innovative medical devices	AL KATTAN	Ahmed
48	Ultra-small Superparamagnetic Iron Oxide Coated Phosphonate-based Ligand for MRI Application	CHE DJI	Lyns Verel
49	Magnetic hyperthermia tumor ablation and tumor microenvironment modulation monitored by optical imaging	COSTE	Henri
50	Synthesis of iron oxide nanoparticles and magnetic properties tuning by temperature cycling: towards fine control of crystal phase and size distribution	HUEZ	Cecile
51	Hybrid plasmon-semiconductor nanoparticles for charge or resonant energy transfer based dynamic phototherapy	JEFFRIES	Beatrice
52	Re(CO)-based silica-nanoparticles as multimodal probes for bio-imaging	KAUFELD	Willem
53	Force nanosensor development for measuring mechanical stress exerted by living cells	LACROIX	Noemie
54	Combination therapy using nanoheaters and CAR-T immunotherapy on 3D tumor models	LEINEBO	Charlotte Amalie
55	Red-blood-cell-membrane-coated polymer micelles/vesicles as biomimetic nanoassemblies for potential photocatalytic cancer therapy under hypoxia	MA	Yandong
56	Vivoptic, a preclinical optical imaging platform for the evaluation of diagnostic and therapeutic strategies	MORNET	Stéphane
57	On the Roles of Polymer Chemistry, Kinetics, and Mixing in the Assembly of Loaded Polymer Nanoparticles	REISCH	Andreas
58	Digital colorimetric biosensing on gold-DNA origami nanostructures	ZHANG	Zixiao
59	Cu Isotopic Fractionation Following Foliar uptake	CALAS	Aude
60	New process "Multi-Dip Coating" applied for biological statistical analysis of Antimicrobial Surfaces	CHARLIAC	Jérôme
61	One step synthesis using laser pyrolysis of nanostructured carbides molybdenum catalysts for hydrogen production	RIO	Simon
62	Study of the reactivity of Fe(0) nanoparticles towards ammonia	ZAMBLE	Christian Irie
63	Chemical Passivation of GaN Nanowires for the Development of Innovative Photocatalysts	ZORAI	Amel