



PhD Fellowships

The *SelOxCat* Research Group at the Autonomous University of Barcelona (UAB) offers **two PhD Fellowships** starting next September/October 2019.

Our Group focuses its attention on the tailored design of tunable molecular-material hybrids at the nanoscale for the cost-effective generation of H₂ and liquid carbon-neutral fuels. For further information, please visit the website: <http://www.seloxcat.wordpress.com>

PhD Project 1, “Tunable Ligand-capped Nanomaterials for the Hydrogen Evolution Reaction (HER)”: Ru-based nanomaterials has experienced a clear re-birth as potential substitutes for Pt-based cathode materials for water splitting due to their lower cost and higher stability.¹ Following our recent work on ligand-capped Ru-based nanoparticulate systems for the HER,^{2,3} this PhD project will consist on the fundamental understanding of the role of ligands/stabilizers on the nanoparticle surface and their influence on the catalytic properties of the prepared nanomaterials by combining advanced characterization techniques (WAXS, XPS, HRTEM...), theoretical calculations (collaborative work) and electrocatalytic analysis. Candidates interested in combining experimental and computational work are particularly suitable for this project.

PhD Project 2, “Photosensitizer-decorated hybrid nanomaterials for the Hydrogen and Oxygen Evolution Reactions from Water (HER and OER)”: Light-driven oxygen and hydrogen evolution from water are key processes related to artificial photosynthesis, a key technology for the sustainable production of solar fuels such as H₂ or liquid hydrocarbons. Following our recent work on photosensitizer-decorated Co₃O₄ nanomaterials for the OER,⁴ this PhD project focuses on the development of new hybrid nanomaterials containing organic/inorganic photoactive molecules and their photophysical/photochemical analysis for HER and the OER.

The candidates must hold a BSc degree in Chemistry, Nanotechnology or Materials Science and a MSc degree (or be currently pursuing it) in the same fields. Applicants must have a strong background in synthetic organic/inorganic chemistry, electrochemistry, or catalysis. High oral and written communication skills in English are required. The selected students will be awarded a 3/4-years contract and are expected to conduct research, write drafts of scientific papers, teach 60 h/year at undergraduate level and deliver a PhD thesis.

Applications should be addressed to Dr. Xavier Sala (xavier.sala@uab.cat), Dr. Jordi García-Antón (Jordi.garciaanton@uab.cat) or Dr. Roger Bofill (Roger.bofill@uab.cat) before May 10th, 2019 including:

- i. A cover letter highlighting their interest in the position and summarizing previous research.
- ii. Curriculum vitae.
- iii. Names and contact addresses (e-mail) of two academic referees.

¹ Creus, J.; De Tovar, J.; Romero, N.; García-Antón, J.; Bofill, R.; Sala, X. *ChemSusChem* **2019**, DOI: 10.1002/cssc.201900393

² Creus, J.; Drouet, S.; Suriñach, S.; Lecante, P.; Poteau, R.; Philippot, K.; García-Antón, J.; Sala, X. *ACS Catal.* **2018**, *8*, 11094.

³ Drouet, S.; Creus, J.; Collière, V.; Amiens, C.; García-Antón, J.; Sala, X.; Philippot, K. *Chem. Commun.* **2017**, *57*, 11713.

⁴ De Tovar, J.; García-Antón, J.; Philippot, K.; Sala, X. et. al. *Mater. Today Energy* **2018**, *9*, 506.