

## Open PhD Position (4-Year Contract + International Research Stays)

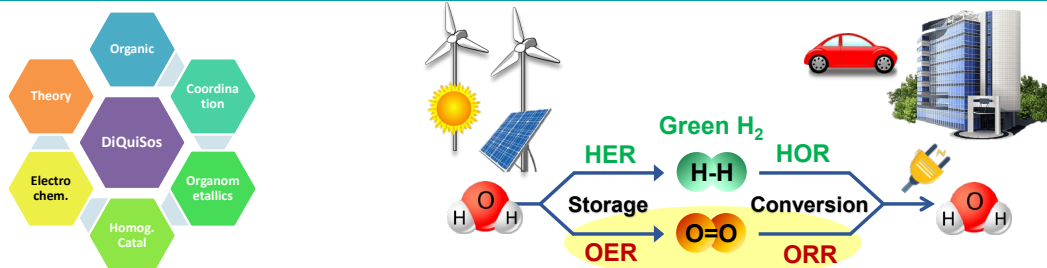
A PhD position is available in the **ARMOIN** group, linked to the project 'Design of Mono- and Multi-metallic Systems for Sustainable Chemistry' (**DIQUISOS**, PID2023-148472NB-I00)

**ARMOIN** is a research group belonging to the ISQCH (CSIC-UZ, Zaragoza) dedicated to the development of catalysts for application to current social challenges. Selected publications: *ACS Cat.* 2023, *13*, 6610 and 3148; *Inorg. Chem.* 2023, *62*, 19421; *J. Am. Chem. Soc.* 2021, *143*, 349; *Angew. Chem. Int. Ed.* 2019, *58*, 3037.

**DIQUISOS** is a multidisciplinary project aimed to develop new catalysts for sustainable chemistry, focusing on three key reactions:

- *Oxygen evolution/reduction reactions (OER, ORR)*
- *E-H bond activation (X = P, N) for C-E bond formation*
- *Oxyfunctionalization (C-O bond formation)*

The first process is crucial in the energy sector because of the global need for sustainable energy by developing novel catalysts in the context of green hydrogen production and storage. The second one focus on incorporating new heteroatoms into organic molecules without waste (100% atom-economy). The third one concerns to the use of molecular oxygen (O<sub>2</sub>) in the preparation of oxygenated species since it is the ideal oxidant (low-cost, abundance, and environmentally friendly nature).



### PhD POSITION

- **Research activities** will focus on designing catalysts, mainly based on Earth-abundant metals, for the oxygen evolution (OER) and reduction (ORR) reactions. Various strategies involving metal-ligand and/or metal-metal cooperation, will be used. A key aspect of this project is its emphasis on enabling the PhD student to gain a deep understanding of fundamental chemical reaction mechanisms, providing a strong foundation for developing innovative catalytic solutions. This may also include the development of new metal-O<sub>2</sub> complexes for selective oxy-functionalization reactions.
- **Training program** encompasses multiple levels: experimental, technical, cognitive, and educational. It also includes opportunities for teaching and presenting research findings at national and international conferences. Additionally, short stays in renowned international laboratories are planned. The PhD student is expected to be fully immersed in scientific work throughout this training.

**CANDIDATES** with a Master in Chemistry are encouraged to apply. Proven experience in Schlenk techniques, dry-box handling, and the characterization of organic and organometallic compounds using spectroscopic methods will be appreciated. Please, submit a CV (including academic transcripts for both Bachelor's and Master's degrees in Chemistry), a motivation letter, and the contact details of one/two previous supervisors to **Cristina Tejel** (ctejel@unizar.es) and/or **Ana M. Geer** (anageer@unizar.es) before 30-October-2024.

Estimated start: **January-March 2025**