

JUNIOR RESEARCHER

Position: Junior researcher in low temperature electrolysis
Offer date: WEB Publication
Project: CIAE - REF. IJ- ELECTROLISIS (HYDROGEN and POWER-TO-X)
Department: Hydrogen and Power-to-X
Estimated starting date: 4th quarter 2024

Workplace:	University of Extremadura. Cáceres campus
Tasks to be developed:	<p>Electrochemistry is crucial for studying hydrogen production behaviour and electrochemical reactions, especially in low-temperature electrolysis. This technique allows for a detailed understanding of membrane and catalyst materials structures, which can be fully characterized through traditional and new experimental methods. Researchers can gain insights into fundamental electrolysis processes and explore uncharted territories. Developing new and optimizing existing materials to improve low-temperature electrolysis efficiency is a primary objective. Electrochemical and chemical techniques play a critical role in advancing energy production and storage development.</p> <p>The selected candidate is expected to perform the following tasks:</p> <ul style="list-style-type: none"> – Materials synthesis for electrochemical systems. – Full characterization understanding of HER/OER reactions in acid/alkali media. – Apply electrochemical characterization techniques, such as CV, LSV, impedance measurements IES, RDE, RRDE, among others. – Membrane synthesis of ion exchange membranes (linear or crosslinking polymers, blends, composite) – Physicochemical and electrochemical membrane characterization. – Fibers synthesis through electrospinning – Common chemical characterization such as FTIR, Raman, TG, DSC, SEM, and XRD, among others. – Electrochemical characterization of electrolyzers, polarization curves and EIS. – Start-up of laboratory-scale electrolyzers. – Writing 1.5 papers per year as first author or co-author and high-ranked journal. – Collaborate with other researchers in the team and in interdepartmental projects from CIAE and beyond. – Perform clear and accurate analyses and presentations of the results obtained. Document and present research reports at congresses and scientific publications. – Writing research proposals and contributing towards acquisition of competitive funding, both private and/or public – Daily guidance of PhD and master students. – Efficient time management with respect to tasks. – Identify areas of opportunity and propose innovative projects ideas for the development of new materials and the optimization of existing ones to improve hydrogen production efficiency. – Successful collaboration with universities, research institutes and companies at the national and international level

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	<ul style="list-style-type: none"> – Becoming gradually more independent, in order to conduct, manage and lead an independent project <p>Challenges: Achieve a complete understanding of the new designed materials electrochemical properties to replace commercial materials. Constantly search for strategies to improve the efficiency of electrolyzers.</p>	
Duration of the contract and salary:	Temporary Contract Initial duration: September 2025, with the possibility of extension	Annual Gross Base Salary: 36.775,48 €
Academic background required:	Doctoral degree in materials science, electrochemistry, chemistry, organic chemistry, engineering, or related disciplines	
Other education:	A Master in material sciences, electrochemistry, chemistry, chemical engineering, or similar.	
Professional experience:		
Job requirements (have to be fulfilled):	Specific techniques (analytical, software, calculations, prototyping, etc.)	<ul style="list-style-type: none"> – Experience in electrochemical techniques characterization, such as 4-DC probe, electrochemical impedance spectroscopy, etc. – Solid knowledge of electrocatalyst characterization. – Synthesis, development and characterization of ion exchange membrane or polymeric organic synthesis. – Physicochemical transport knowledge, such as permeabilities, diffusion, ionic transport, etc. – Experience with characterization techniques for structural and microstructural characterization, such as X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), atomic force microscopy (AFM), X-ray energy dispersive microanalysis (EDS), X-ray photoelectron spectroscopy (XPS), Raman and FT-IR spectroscopy. – Experience with characterization techniques for thermal analysis methods such as thermogravimetry analysis (TGA), differential thermal analysis (DTA), differential scanning calorimetry (DSC). – Excellent analytical analyses and presentations of the results obtained, demonstrated by oral congress presentations.
	Participation and/or collaboration in R&D&I/business projects	Participation on at least 1 R&D projects.
	Languages	Excellent oral and written skills in English

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	Cross-cutting competences	<ul style="list-style-type: none"> – Commitment to open science in terms of research methods, data and publications. – Independent but team- and goal-orientated researcher. – Ability to work in multidisciplinary and multicultural teams, flexible, organized and with good communication skills.
	Willingness to travel and stay abroad	The candidate is expected to travel, both nationally and internationally, in the context of projects and conferences
	Publications: scientific articles (in journals indexed in Web of Science and/or Scopus), theses (PhD and/or Master's), presentations at conferences, reports, technical reports, technical guides, etc.	<p>Strong track-record of publications as first author and co-author as the candidate is expected to publish in top journals in the field. At least 3 publications in Scopus indexed journals.</p> <p>Alternatively, a monograph thesis may also be considered, as well as a patent or a patent in the process of verification.</p>

To be evaluated (adds points to the final evaluation):

- Excellent publication record as first author
- Experience with electrospinning or ultrasonic spray coater.
- Experience with electrolyzers characterization.
- Experience in writing project proposals and work plans.
- Experience in material scaling up from lab findings to pre-industrial scale.
- Experience in the direct operation of highly complex characterization equipment, e.g. SEM, Raman, etc.
- Collaboration with modelling and simulation, e.g., atomistic simulations and/or CFD.
- Experience with industrial collaborations and/or previous experience working on industry.
- Proven experience in supervising PhD and/or master students (daily supervisor).
- Oral and written skills in Spanish and Portuguese.
- Motivation letter (maximum 2 pages) included in the application.
- Evaluation provided by 2 references via telephone conversation. The contact details of the references (e-mail and telephone) are provided by the candidates in their application.

Selection process details:

Technical test: NO

Language (English): YES (**will be evaluated during the interview**)

Job interview: YES

Interested candidates:

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Please, send all the documents requested by the terms and conditions of the call for the proposal, with the deadline being 15 calendar days from the day following the publication in the CIAE web, indicating the following reference: **Ref IJ-ELECTROLISIS (HIDRÓGENO Y POWER-TO-X)**

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