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JUNIOR RESEARCHER

Position: Junior researcher in Solid Oxide Fuel Cells and Electrolysers
Offer date: CIIAE web
Project: CIIAE - Ref IJ-ÓXIDO (HIDRÓGENO Y POWER-TO-X)
Department: Hydrogen and Power-to-X
Estimated starting date: 2023

Workplace:	University of Extremadura. Cáceres campus.	
Tasks to be developed:	In line with CIIAE´s research on sustainable hydrogen technologies with a low carbon footprint, the so-called solid oxide cells (SOCs) have an enormous potential for decarbonizing a wide range of sectors when operated as a fuel cell (Solid Oxide Fuel Cell: SOFC), electrolysis or co-electrolysis cell (Solid Oxide Electrolysis Cell: SOEC), or even in a reversible cell (reversible Solid Oxide Cell: rSOC). All these electrochemical energy converters typically operate with a solid oxide electrolyte at high temperatures and can achieve efficiencies as high as 85% at system level. The aim of this junior researcher position is to investigate on the possibility to improve the competitiveness of SOC devices in various applications by increasing performance, reducing degradation, and minimizing the fabrication costs. The selected candidate is expected to perform the following tasks: – Research activities within the relevant discipline; including synthesis, processing, characterization and testing of different electrodes, electrolytes, cells and stacks for different SOC applications. – Supervision and daily lab-guidance of PhD and master students. – Innovation: i.e. identification of new research paths, participation on the formulation of new research objectives. – Communication and dissemination activities: i.e. write reports and scientific papers, present findings in high-ranked journals and national/international conferences, represent the CIIAE at internal/external events. – Third-party funds acquisition: i.e. identify source of funding, contribute to the preparation of research proposals and submit project applications. – Networking: i.e. collaboration with other research teams (internal and external), industry stakeholders and government agencies. – Writing publications as first author and co-author (e.g., 1.5 paper p.a. in high-ranked journals) – Project management and project administration (internal and external), also towards the department and CIIAE – Becoming gradually more independent, in order to conduct, manage and lead an independent project	
Duration of the contract and salary:	Temporary Contract Initial duration: September 2025, with the possibility of extension	Gross Salary + S.S. Fees Gross Salary Range: 35 000 € - 38 000 €

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Academic background required:	A PhD in material sciences, electrochemistry, chemistry, chemical engineering, or similar.	
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.)**	- Knowledge of the fundamentals and applications of electrochemical methods to the study of SOC-based technologies. - Experience with lab-work and excellent analytical skills; including synthesis and preparation of complex metal oxides, ceramics, and glasses by solid-state reaction and/or other wet chemistry methods. - Experience with some diffraction, microscopic and spectroscopic 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), energy-dispersive analysis (EDS), X-Ray photoelectron spectrometry (XPS). - Experience with some thermal analysis methods such as thermogravimetry analysis (TGA), differential thermal analysis (DTA), differential scanning calorimetry (DSC), dilatometry and thermomechanical expansion. - Experience with some electrical and electrochemical methods such as electrical conductivity (4-DC probe, electrochemical impedance spectroscopy), Seebeck coefficient, transference numbers (e.g. EMF technique), oxygen and hydrogen permeability of ceramic membranes.
	Participation and/or collaboration in R&D&I/business projects	Proven participation on at least 1 R&D projects.
	Languages	Excellent oral and written skills in English.
	Cross-cutting competences	- Commitment to open science in terms of research methods, data, and publications. - Ability to work in multidisciplinary and multicultural teams, flexible, organized and with good communication skills. - Independent but team- and goal-orientated researcher.
	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.	Strong track-record of academic 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. Alternatively, a monograph thesis may also be considered, as well as conference publications.

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

- Knowledge of defect chemistry principles in solids.
- Knowledge of electrochemical reduction of NOx and/or CO_2.
- Knowledge of the fundamentals of oxygen and hydrogen transport membranes (OTMs and HTMs).
- Experience in design and fabrication of experimental setups for high-temperature electrical and electrochemical studies.
- Experience using FullProf for crystal structure refinement and ZView for analysis of EIS data would be an advantage.
- Experience is scaling up from lab-findings to prototypes based on SOCs technology is highly desired.
- Knowledge and/or experience in collaborating with modelling and simulation, e.g., atomistic simulations and/or CFD.
- Experience in supervising PhD and/or master students (for example, as daily supervisor).
- Principal investigator of at least 1 project.
- Grades in Master's degree (to be included in the application).
- Knowledge of Spanish and or Portuguese.
- Experience with industrial collaborations and/or previous experience working on industry
- Motivation letter (maximum 2 pages; to be included in the application).
- Evaluation provided by references via telephone conversation (e-mail and telephone number of 2 references; to be included in the 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 both the terms and conditions of the call for the proposal and the job offer, with the deadline being 15 calendar days from the day following the publication in the CIIAE web indicating the following reference: **Ref IJ-ÓXIDO (HIDRÓGENO Y POWER-TO-X).**

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