

**JOB OFFER**

# JUNIOR RESEARCHER

**Position: Junior researcher on development of sorption systems for thermal energy storage**  
**Offer date: WEB publication**  
**Project: CIIAE -Refª IJ- SORCIÓN (ALMACENAMIENTO DE ENERGÍA TÉRMICA)**  
**Department: Thermal Energy Storage**  
**Estimated starting date: First quarter of 2024**

<b>Workplace:</b>	Campus University of Extremadura, 10003 Cáceres (Spain).	
<b>Tasks to be developed:</b>	<p>One of the key technologies to boost the use of renewable energy and develop more efficient energy systems is thermal energy storage (TES), which contribute to overcoming the existing mismatch between energy production from intermittent renewable sources and variable demand/loads. In addition to sensible heat and latent heat systems, the use of thermochemical materials (TCM), based on the reversible adsorption of gas molecules in a solid, is one of the most efficient technologies for long-term storing of heat (e.g., CSP plants or intensive industries). The adsorbate can be water, ammonia, methanol, CO<sub>2</sub>, etc., whereas the solid can be a nano/microporous material (e.g., zeolites, MOFs, activated carbons, etc.) that binds gas molecules to its internal surface. Energy is released when the gas binds to the solid and is stored through the reverse reaction.</p> <p>The main advantages of TES systems based on TCM are, among others, high energy density, low thermal loss during storage, low investment costs and strategic operating temperature in the range 25-200 °C. Research activities for long-term thermal energy storage have increased considerably in recent years, making it necessary to delve deeper into the preparation, characterization and validation techniques for searching new materials and systems' designs. The selected candidate must perform the following tasks (in collaboration with other research colleagues and supervisors):</p> <ul style="list-style-type: none"> <li>- Design and synthesis of new TCMs optimized for long-term storage of solar or waste heat.</li> <li>- Characterization of thermal, electrical, mechanical, structural and chemical properties of the prepared materials.</li> <li>- Scaling of TCM for additional testing in heating/cooling storage systems.</li> <li>- Ensure robust and durable systems by studying degradation mechanisms and developing mitigation measures.</li> <li>- Explore opportunities to expand and make systems competitive for practical applications by identifying strategies to reduce costs and optimize preparation processes.</li> <li>- Ensure an appropriate collaboration and knowledge dissemination strategy by publishing research results in relevant journals, presenting at conferences, participating in research events and fostering collaborations with industrial partners, academic institutions and research organizations.</li> <li>- Support, supervision and mentoring of doctoral and master's students.</li> <li>- Acquisition of competitive fundings, both private and public, project management and project administration.</li> </ul> <p>Challenges:</p> <ul style="list-style-type: none"> <li>- To develop new thermochemical materials with the desired thermal and physical properties</li> <li>- To guarantee the cyclical stability of the developed materials</li> </ul>	
<b>Duration of the contract and salary (per annum):</b>	Fixed-term contract. End: September 2025. Possibility of extension.	Gross Salary Range: 35,000 € - 38,000 €

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<b>Academic background required:</b>	<p>A PhD in Materials Science, Chemical Engineering, Chemistry, Industrial Engineering, Environmental Sciences, Physics or similar.</p> <p>Note: Candidates about to finish the thesis can submit the application. The PhD certificate will be required by the time of signing the contract.</p>	
<b>Other education:</b>	<p>Valuable master's degree in</p> <ul style="list-style-type: none"> <li>- Materials for Energy Storage and Conversion.</li> <li>- Chemical engineering.</li> <li>- Materials Science.</li> <li>- Nanophysics and advanced materials.</li> <li>- Physics/Chemistry of Interfaces.</li> <li>- Inorganic chemistry.</li> <li>- Renewable Energies, Energy Management and Efficiency.</li> </ul>	
<b>Professional experience:</b>	<p>Post-doctoral experience not required</p>	
<b>Job requirements (have to be fulfilled):</b>	<b>Specific techniques (analytical, software, calculations, prototyping, etc.)</b>	<ul style="list-style-type: none"> <li>- To be valued, experience in synthesis and functionalization techniques of porous materials, e.g.; zeolites, mesostructured materials, carbonaceous materials, etc.</li> <li>- Experience in characterization techniques: gas adsorption, porosimetry, X-ray diffraction (XRD), microscopy (TEM, SEM, AFM, XPS), FTIR, Raman, differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), distribution particle size (PSD), etc.</li> <li>- To be valued, Research experience in high temperature thermochemical storage systems or closely related area.</li> </ul>
	<b>Participation and/or collaboration in R&amp;D&amp;I/business projects</b>	<p>Demonstrated experience in participation and/or collaboration in R+D+i projects.</p>
	<b>Languages</b>	<p>English. Valuable: Spanish and Portuguese.</p>
	<b>Cross-cutting competences</b>	<ul style="list-style-type: none"> <li>- Communication skills</li> <li>- Ability work in a team</li> <li>- Experience in collaborations inside and outside the own department</li> </ul>
	<b>Willingness to travel and stay abroad</b>	<p>This position requires occasional participation in events outside of Extremadura.</p>
	<b>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.</b>	<p>The number and relevance of scientific publications / congresses related to the main topic of the position (PCMs, TES) will be valued.</p>
<b>To be evaluated (adds points to the final evaluation)</b>		
<ul style="list-style-type: none"> <li>- Knowledge of the principles and applications of energy storage technologies, especially those related to thermochemical energy storage.</li> <li>- Have completed specific training courses, relevant to the position offered.</li> <li>- Experience in modelling/simulations activities either directly or through collaborations.</li> <li>- Be the first author or corresponding author on scientific articles.</li> </ul>		

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- Experience in scaling laboratory systems to prototypes or pilot plants.
- Experience in industrial collaborations and/or previous experience working in the industry
- Demonstrated experience in supervising work teams.
- Supervision of final degree projects (TFGs), final master's projects (TFMs).
- Number and relevance of research projects (national or international) in which the candidate has participated.
- Principal investigator (IP) in R&D&I projects.
- Funding or competitive research contracts, such as FPU, FPI, Torres Quevedo, Juan de la Cierva, Ramón y Cajal, Marie Skłodowska Curie, or equivalent
- Experience in writing proposals to raise R&D funds in competitive calls (national or international).
- Patents.
- Awards, mentions or other achievements.
- Motivation Letter: Include a motivation letter describing the qualities that the candidate considers suitable for the position, as well as a proposed work plan for the next 2 years.
- Reference Letters: Include two professional reference letters (from employers and/or professors, with their contact information, email and telephone number) that highlight the technical and transversal qualities that have been identified in the candidate and that are relevant for the position.

Note: To facilitate the evaluation process, it is recommended to include a list or table, itemizing the merits you consider that should be evaluated for each of the requirements (Ex: Requirement: Experience in thermal analysis. Candidate: brief description of experience in thermal analysis reflected in scientific articles, theses, courses, projects, etc.)

**TECHNIQUES: Oral knowledge test YES  NO X**

**LANGUAGE: ORAL YES X NO**

**It will be evaluated during the interview.**

**JOB INTERVIEW: YES X NO**

### Interested candidates

Please, send all the documents requested by the terms and conditions of the call for proposals, together with all the documents requested by this job offer, and the Application Form. Deadline is 15 calendar days from the day following the publication in the CIAE web, and indicating the following reference: **Ref<sup>a</sup> IJ-SORCION (ALMACENAMIENTO DE ENERGÍA TÉRMICA)** to:

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