

JUNIOR RESEARCHER

Position: Junior researcher on development of thermochemical systems for thermal energy storage

Offer date: WEB publication

Project: CIIAE -Refª IJ-TC (ALMACENAMIENTO DE ENERGÍA TÉRMICA)

Department: Thermal Energy Storage

Estimated starting date: 4th quarter 2024

Workplace:	Campus University of Extremadura, 10003 Cáceres (Spain).
Tasks to be developed:	<p>Energy storage is of paramount importance for future energy transition to sustainable energy with widespread use of renewable energy sources. Storing thermal energy is one of the major milestones on this route, as thermal energy accounts for about 50% of all energy end-use.</p> <p>The emerging field of Thermochemical Energy Storage (TCES) deals with the use of reversible chemical reactions with high heat effect to store thermal energy, for example, dehydration/hydration of salt hydrates with release of water vapor. The crucial advantages of TCES are (a) high energy storage density comparable to Li-ion batteries; (b) theoretically indefinite storage duration; (c) possibility to upgrade the stored heat to higher temperatures and (d) low investment costs. Use of chemical reactions offers the versatile toolbox for storing thermal energy in residential (e.g. domestic heating/cooling) and industrial and energy production sectors. The current research in this field is focused on designing new thermochemical materials and establishing the optimal pathways from the materials to TCES systems for their future integration in sustainable energy networks. At CIIAE we aim to bridge the gap between materials and systems by optimizing material design and solving the problem of materials stability.</p> <p>The position offered will imply involvement into the research in collaboration with the leading groups in this field in Spain and across the EU. The selected candidate will perform the following tasks:</p> <ul style="list-style-type: none"> - Design and synthesis of new TCMS optimized for long-term storage of solar or waste heat. - Characterization of thermal, chemical, structural and mechanical properties of the prepared materials and data analysis. - Ensure robust and durable systems by studying degradation mechanisms and developing mitigation measures. - Explore opportunities to expand and make systems competitive for practical applications by identifying strategies to reduce costs and optimize preparation processes. - 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. - Support, supervision and mentoring of doctoral and master's students. - Acquisition of competitive funding, both private and public, project management and project administration. <p>Challenges:</p>

JOB OFFER

	<ul style="list-style-type: none"> - Developing new thermochemical materials with the desired thermochemical behaviour - Ensuring the stability of the developed materials 	
Duration of the contract and salary (per annum):	Temporary Contract Initial duration: 2025 September, with the possibility of extension	Annual Gross Base Salary: 36.775,48 €
Academic background required:	A PhD in Materials Science, Chemistry, Chemical Engineering, Industrial Engineering, Mechanical engineering, Environmental Sciences, Energy Engineering, Physics or similar. Note: Candidates about to finish the thesis can submit the application. The PhD certificate will be required by the time of signing the contract.	
Other education:	Valuable master's degree in <ul style="list-style-type: none"> - Materials for Energy Storage and Conversion. - Chemical engineering. - Materials Science. - Nanophysics and advanced materials. - Physics/Chemistry of Interfaces. - Inorganic chemistry. - Renewable Energies, Energy Management and Efficiency. 	
Professional experience:	Post-doctoral experience not required	
Job requirements (have to be fulfilled):	Specific techniques (analytical, software, calculations, prototyping, etc.)	Experience in some of the following techniques for thermochemical and structural characterization: <ul style="list-style-type: none"> - Thermogravimetric analysis (TGA); - Differential Scanning Calorimetry (DSC); - Dynamic Vapor Sorption (DVS); - Structural characterization (XRD analysis, FTIR, Raman); - Porosimetry by gas adsorption (BET, BJH, etc.); - Microscopy (HRTEM, SEM); - Particle Size Distribution (PSD). - Knowledge of software or programming languages for data analysis (MATLAB, Origin, Python, R) will be an advantage.
	Participation and/or collaboration in R&D&I/business projects	Demonstrated experience in participation and/or collaboration in R+D+i projects.
	Languages	English, verbal and written. Valuable: Spanish, Portuguese.
	Cross-cutting competences	<ul style="list-style-type: none"> - Communication skills - Ability work in a team - Experience in collaborations inside and outside Spain
	Willingness to travel and stay abroad	This position requires occasional participation in events outside of Extremadura.

JOB OFFER

	<p>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>	<p>The scientific publications/conference abstracts relevant the topic (TES, TCES, TCMs) will be a valuable advantage.</p>
<p>To be evaluated (adds points to the final evaluation)</p> <ul style="list-style-type: none"> - Knowledge of the principles and applications of energy storage technologies, especially those related to thermochemical or sorptive energy storage. - To be valued, experience in synthesis and functionalization techniques of inorganic and/or porous materials. - Have completed specific training courses, relevant to the position offered. - Be the first author or corresponding author of scientific articles. - Demonstrated experience in supervising work (e.g. final bachelor's or master's projects). - 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. - Industrial collaborations and/or previous experience working in the industry <p>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.)</p>		
<p>Selection process details:</p> <p>TECHNIQUES: Oral knowledge test YES <input type="checkbox"/> NO <input checked="" type="checkbox"/></p> <p>LANGUAGE: ORAL YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p> <p>It will be evaluated during the interview.</p> <p>JOB INTERVIEW: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/></p>		

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, with the deadline being 15 calendar days from the day following the publication in the CIAE web, and indicating the following reference indicating: **Ref^a IJ-TC (ALMACENAMIENTO DE ENERGÍA TÉRMICA)** to:

JOB OFFER

FUNDECYT-PCTEX (Edificio Parque Científico Tecnológico), Avda. de la Investigación, s/n, Edificio PCTEX, Campus de la Universidad de Extremadura – 06006 Badajoz (España)

Email: ciae.personal@fundecyt-pctex.es Phone: +34 927 690 042 Ext. 107

www.fundecyt-pctex.es

www.ciae.org