

Company Description

CIC energiGUNE is the Research Center for electrochemical and thermal energy storage, a member of the Basque Research and Technology Alliance- BRTA, and, a strategic initiative of the Basque Government. CIC energiGUNE was created in 2011 to generate excellent research in materials and systems for energy storage, maximizing the impact on results to the Basque Business Network, through collaboration with universities, research centers, and companies. CIC energiGUNE has a dynamic research team of more than 100 researchers and is extremely well equipped with a wide range of up-to-date facilities that are fully available for all its researchers. Also, the European Commission has recently awarded CIC energiGUNE with the 'HR Excellence in Research' which reflects its commitment to achieving fair and transparent recruitment and appraisal procedures and certifies the existence of a stimulating and favorable work environment for researchers in the institution. For more details on CIC energiGUNE's research activities please visit our website at: <http://www.cicenergigune.com>

Information

 Deadline: 2021-06-18
 Category: Business
 Province: Araba / Álava
 Country: Basque Country
 City: VITORIA-GASTEIZ

Company

CIC energiGUNE



Main functions, requisites & benefits

Main functions

Energy storage is critical to meeting the needs of modern societies, and batteries represent a predominant technology. While Na-oxygen batteries offer much higher energy density than current Metal-ion systems, the selection of suitable electrolytes remains a major hurdle which has yet to be overcome. This project aims to meet this challenge by exploring recently discovered hybrid electrolytes by CIC energiGUNE researchers to generate rational design principles; then from these (using careful selection of constituents; i.e., solvent(s), salt, and additive) develop a new generation of advanced electrolytes (i.e., solid electrolytes). The objective of the project is to establish, for the first time ever, the design principles for the electrolyte requirements for Na-oxygen batteries that improve stability, performance and lifetime, to ultimately achieve a solid-state Na-oxygen battery. The outcome of the project will not only lead to advances in system technologies, but also provide a framework for future progress in this field. Keywords: Non-aqueous chemistry, Ionic solvation, Electrolyte, Batteries, Na-oxygen batteries. PROJECT DESCRIPTION: CIC energiGUNE is seeking a researcher to work on the development of electrolytes for sodium-oxygen batteries. Job functions: Preparation of selected solvents (e.g., ether-functionalized cations, salt metathesis reactions). High-purity characterization and purification of the developed solvents (e.g., NMR, FTIR, Raman spectroscopy). Electrolyte formulations and characterization of the bulk properties, solvation and oxygen solubility. Validation of electrolyte formulations in full Na-oxygen cell prototypes (cyclic voltammetry, RRDE voltammetry, electrochemical impedance spectroscopy, galvanostatic experiments). Post-mortem characterization of the electrodes (NMR, Raman, FTIR, XRD, SEM, etc.). Proof of concept of a solid-state Na-oxygen battery based on the best performing electrolyte formulation (e.g., synthesis and characterization of solid electrolytes, electrochemistry. Techniques to be used: The following techniques will be used through the Project: Structural, microstructural and physicochemical characterizations: Solid and liquid NMR, X-ray diffraction, electron microscopy, Raman and FTIR spectroscopies. Electrolyte preparation according to different synthetic routes. Advanced electrochemical characterizations (CVs, galvanostatic experiments, cycling).

Requisites

PhD in chemistry, chemical-physics, physic-chemistry or related fields. Research experience in organic chemistry and/or polymers will be highly valued. Experimental skills in electrochemical and physicochemical characterization (such as Raman and infrared spectroscopy, nuclear magnetic resonance) are sought. A team player who can collaborate with other groups, technical centers, and industries. Very good verbal and written communication skills in English. MSCA Postdoctoral Fellowship Specific Requirements: Applicants should have recently completed their postgraduate studies (between 15/09/2013 and 14/09/2021). Applicants must have a strong publication record. It will be valuable that applicants have papers published with no contribution of the PhD supervisor and papers published as first corresponding author... Once the candidate is selected by CIC energiGUNE, in order to apply for MSCA PF funding, applicants need to prepare a research proposal together with the host organization that will be submitted to the European Commission. The position is linked to the approval by the EC.