POSTDOCTORAL RESEARCH FELLOW – DESIGNING ENZYME-LIKE CARBON CAPTURE TRAPS IN

Company Description

BCMaterials, Basque Center on Materials, Applications and Nanostructures, is an autonomous research center launched in June 2012 by Ikerbasque, the Basque Foundation for Science and the University of the Basque Country (UPV/EHU) as a research center for Materials, Applications and Nanostructures. The Center is included in the BERC's (Basque Excellence Research Centers) Network, and its mission is to generate knowledge on the new generation of materials, turning this knowledge into (multi)functional solutions and devices for the benefit of society.

Information

Deadline: 2022-06-12
Country: Basque Country
Category: Business
City: Leioa
Province: Bizkaia

Company

BCMaterials

Main functions, requisites & benefits

Main functions

Carbon capture technology is crucial to reduce industrial emissions even after renewable energy alternatives are widely adopted. "Reaching net-zero will be virtually impossible without carbon capture, utilization and storage," says the autonomous International Energy Agency. What's more, the world must become carbon negative in the latter half of this century, reports the Intergovernmental Panel on Climate Change (IPCC). Nature has achieved great success in CO_2 capture and can convert into bicarbonates. However, the transfer of the enzyme environments to chemically and thermally stable hosts that could be use for industrial applications only has had limited success so far.

This project is about using metal-organic frameworks (MOFs) to precisely install the key functional groups of molecules in apposition to each other, to produce a pore environment spatially decorated with multiple functional groups usually found in enzymes. The synthetic scaffold offers a tremendous diversity of chemical functionality; specific MOF structures that mimic a wide range of enzyme active site geometries that can lead to CO_2 capture function. Work program / Duties / Resposibilities: First task will be the synthesis of different MOF structures by using already synthesised linkers that have special functional groups. Second taks is the complete characterization of those structures (single crystal, PXRD, SEM, NMR) and advanced MOF characterization such as topology determination, analysis of pore size and void fraction. The third step of this project will be the measurement and study of the MOF samples for direct capture of CO_2 from air. This step provides crucial feedback for optimising the MOF structures in the following (step one and two) and test them again (step three)

Requisites

PhD in Chemistry. Robust knowledge and experience in synthesis of MOFs and coordination compounds. Material characterization techniques such as single crystal and PXRD, IR, SEM, NMR. Robust knowledge and experience in CO_2 capture Knowledge of coordination chemistry and non-covalent interactions Fluent in English.