



MSCA Postdoctoral Fellowships

HORIZON MSCA PF 2023

EXPRESSION OF INTEREST



Deadline for submission of documents
15th of July 2023



MSCA Postdoctoral Fellowships

HORIZON MSCA PF 2023

EXPRESSION OF INTEREST



Contact Persons/ Scientists in charge

Patricia Pizarro - patricia.pizarro@imdea.org

Brief description of the Research Group

The Thermochemical Processes Unit (TCPU) aims to develop catalysts and active materials for promoting some of the chemical transformations which are likely to play a relevant role in the production of more sustainable fuels and chemicals from a number of sources (biomass residues, plastic wastes, biogas and CO₂).

Project description

The development of chemical cycles with oxygen-carrying solids for the conversion of methane to syngas ($\text{CO} + \text{H}_2$) by dry reforming has attracted considerable interest in recent years because of the high purity of the product syngas. The process is based on the use of solids with redox capacity in reduction-oxidation cycles in the following way: (a) reduction stage, where the solid is thermally reduced, releasing oxygen that partially oxidizes methane to generate H_2 and CO ; (b) reoxidation of the oxide for its regeneration and reuse in the next cycle. The co-feeding of CH_4 and CO_2 in stage (a) gives rise to the variant called Chemical Looping Dry Reforming of Methane (CL-DRM).

This alternative has the advantages of simultaneously using two greenhouse gases as raw material and obtaining syngas as product with H_2/CO ratios close to 2, which are optimal for the synthesis of methanol and hydrocarbons by Fischer-Tropsch. In this sense, preliminary results have shown the potential of biogas as feedstock, without the need to separate its constituents, for the CL-DRM process. However, further insights into the role of solid oxygen carrier properties on the overall process performance are still needed. The project will focus on the application of characterization techniques and search for other advanced ones for the investigation of the relationship between the physical-chemical properties of perovskites and other redox oxides and their performance as oxygen carriers in CL-DRM.

The activities may include the synthesis of perovskites or other oxides, as well as their testing in CL-DRM under different reaction conditions in order to compare and critically analyse their performance in terms of their properties.

Research Area

Chemistry (CHE)

Information Science and Engineering (ENG)

Applications



Deadline for submission of documents **15th July 2023**.

Documents to be submitted:

- ✓ Complete curriculum vitae stating background and skills
- ✓ Letter of motivation including research interests
- ✓ Two recommendation letters