**PROJECT CO-FUNDED BY EUROPEAN REGIONAL DEVELOPMENT FUNDS (ERDF)**

**Lead Researcher:** Dr. Flaviano García Alvarado

**Reference**: MAT2016-78362-C4-1-R

**Title**: ‘Materials for lithium and post lithium batteries and fuel cells: from the laboratory to the prototype’ (Materiales para baterías de litio, post litio y pilas de combustible: Del laboratorio al prototipo)

**Financing Entity:** Spanish Ministry of Economy, Industry and Competitivity (Ministerio de Industria, Economía y Competitividad), European Regional Development Fund (ERDF) and Spanish State Research Agency (Agencia Estatal de Investigación).

**Total amount**: 151. 250 €

**Start date**: 30/12/2016

**End date**: 29/12/2019

**Summary:**

The project will address the study of electroactive materials for two types of electrochemical energy storage and generation devices (lithium and post-lithium batteries and fuel cells respectively) in order to make these technologies more efficient and safer. The advanced materials under study will also contribute to the implementation, as Enabling Technologies, of other energy technologies such as renewable energies and their combined use in stationary and sustainable applications. On the other hand, the aim is to contribute to the improvement of health (reduction of chemical and acoustic pollution) and containment of climate change by directing the new materials towards the implementation of electric vehicles and energy generation based on the hydrogen vector.

The main objective of the project is the development and characterisation of new components for lithium and post-lithium battery electrodes and fuel cells. The synthesis, characterisation and properties of new materials and the assembly and performance study of single cells and prototypes will be addressed. The first aspect focuses on more basic research into materials (crystalline structure and microstructure, chemical and thermal stability, etc.), essential for understanding the properties that give added value to these materials in batteries and fuel cells, such as: electrical and ionic conductivity and their mechanisms, intercalation capacity and reversibility, etc., and their evaluation for their subsequent application in devices. The second aspect, based on the results of the first, is aimed at assembling the materials with the best properties in single cells and prototypes, as well as determining their performance and technological feasibility. In the case of batteries, with the experience of having already developed lithium ion prototypes, prototypes of prismatic sodium ion and polymeric sodium metal batteries of high interest given their low cost and high safety will be developed.