

1. Interested institution:

The Spanish National Research Council (CSIC)

C/ Serrano 117, 28006, Madrid (Spain)

www.csic.es

2. Brief Description of the Institution

The Spanish National Research Council (CSIC) is the largest public institution dedicated to research in Spain and the third largest in Europe. Belonging to the Spanish Ministry of Economy and Competitiveness through the Secretary of State for Research, Development and Innovation, its main objective is to develop and promote research that will help bring about scientific and technological progress, and it is prepared to collaborate with Spanish and foreign entities in order to achieve this aim. It has a staff of more than 13,000 employees, among these about 3,300 are permanent researchers and about 4,300 are pre- and post-doctoral researchers. The CSIC has 70 fully own institutes or centres distributed throughout Spain. In addition, it has 53 Joint Research Units with universities or other research institutions. There is also a delegation in Brussels and Rome.

CSIC has considerable experience in both participating and managing R&D projects and training of research personnel. Under the 7th Framework Programme CSIC has signed approximately 700 actions (including 97 coordinated by CSIC and 47 ERC projects). Funding wise, CSIC is listed the 1st organisation in Spain and the 5th in Europe in the 7th Framework Programme, with a total FP7 contribution of over 260 million euros. During the first calls of H2020, CSIC has had an intense participation in all programmes. It has been remarkable the participation in certain calls, such as ERC and Marie Curie, as well as in ICT, NMBP and Societal Challenges. In March 2015 CSIC has obtained 90 projects with a total financial contribution of 40 million euros.

3. Please tick the areas of research (as established in Marie Skłodowska Curie Actions)

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| <input checked="" type="checkbox"/> Chemistry (CHE) | <input type="checkbox"/> Environmental Sciences and Geology (ENV) |
| <input type="checkbox"/> Social Sciences and Humanities (SOC) | <input type="checkbox"/> Life Sciences (LIF) |
| <input type="checkbox"/> Economic Sciences (ECO) | <input type="checkbox"/> Mathematics (MAT) |
| <input type="checkbox"/> Information Science and Engineering (ENG) | <input type="checkbox"/> Physics (PHY) |

4. Research / Project Description

Activation and Formation of σ Bonds Promoted by Late Transition-Metals: Dehydrogenation of Ammonia-borane and Borylation of Organic Molecules. The goal of this research project is to generate knowledge in two complementary areas: hydrogen technology and the use of fossil fuels as a source of raw materials. Keeping this in mind, we will design complexes of metal groups 8 (Fe, Ru, Os) and 9 (Rh, Ir) able to activate and form sigma bonds, with the aim of promoting the catalytic dehydrogenation of ammonia-borane and to develop new efficient methods for the formation of C-B bonds. The study of the intimate steps of the dehydrogenation process of ammonia-borane and related molecules will allow us to control the formation of polyaminoborane at our convenience. This will facilitate the trapping of the resulting monomer, aminoborane, before its polymerization or oligomerization and to prepare heterogeneous catalysts supported on polyaminoborane. The heterogeneous catalysts thus prepared will be used for the hydrogenation of aromatic substrates, among other reactions of interest. The B-C bond formation reactions will include alkane, arene and heterocycle borylations and C-C and C-heteroatom bond formation processes with bis(borylation) and borylation, respectively, of the coupled product. The latter will be performed via borylvinylidene intermediates. The activation reactions of sigma bonds are elementary steps in many processes. Its control will allow us to reach other side goals. The B-H bond activation will facilitate the trapping and transformation of CO₂ by borylation. The C-H bond activation reactions will bring us closer to the design of emissive materials for OLEDs. The N-H and O-H bond activation reactions, among others, together with the rupture of C-H bonds will make possible the preparation of organic molecules with pharmacological interest or intermediates in material science.

The applicant will be incorporated into the research group of Organometálicos y Catálisis of the Instituto de Síntesis Química y Catálisis Homogénea (ISQCH), a joint CSIC – University of Zaragoza research institute, which is lead by Prof. Miguel A. Esteruelas. He is co-author of around 320 international publications, of which around 80% are published in ACS journals, including 200 *Organometallics*, 24 *Inorg. Chem.* and 22 *J. Am. Chem. Soc.*, 6 patents and the book *Homogeneous Hydrogenation*, Kluwer Academic Publisher: Dordrecht, The Netherlands, 1994. According to the ISI Web of Knowledge on January 20th 2015, the publications have been cited 11901 times (37.66 citations per paper; *h*-index = 57).

For more information, see: <http://www.isqch.unizar-csic.es/ISQCHportal/grupos.do?id=2>
http://www.unizar.es/icma/depart/g2_oc.htm?menu=oc

5. Who can apply?

At the deadline for the submission of proposals (10/09/2015), researchers (*):

- shall be in possession of a PhD in Chemistry or have at least four years of full-time equivalent research experience in organometallic, organic chemistry, and catalysis.
- must not have resided or carried out their main activities in the country of Spain for more than 12 months in the 3 years immediately prior to the abovementioned deadline.

6. *Contact person*

Miguel A. Esteruelas, master@unizar.es

7. *Applications: documents to be submitted and deadlines*

- CV
- Letter of motivation
- Three letter of recommendation
- Deadline: June, 30th 2015.

Please note that:

- Deadline of the next call for proposals for Marie Skłodowska – Curie Individual Fellowships is **September, 10th 2015**.
- Oficina Europea is only responsible for the display of the expressions of interests received by the institutions; further contact and information requests will take place directly between the host institutions and the interested researchers.

(*) Further details on the Call and additional eligibility criteria can be found at the [Participants' Portal](#)