

SEMINAR SERIES

HIGHLIGHTS IN ENERGY RESEARCH

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Modulation of adsorptive and catalytic properties of metal organic frameworks by deliberate introduction of defects

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Metal organic frameworks have blossomed as an amazing class of easily engineered crystalline porous materials with properties overcoming, in some aspects, those of classical adsorbents and catalysts. The wise introduction of functional groups into the pore structure can be used to further improve the properties of these materials. In this regard, one of the features that determine the adsorptive and catalytic properties of a porous materials is the presence of defects in the pore surface.¹

In this seminar, I will give a critical overview of some topics that have been addressed in our research group and the knowhow that we have achieved on ion conductivity², catalytic³ and gas separation^{4,5} properties of MOFs by means of the wise control of pore functionalization and deliberate introduction of defects. Examples of the utility of these materials for air purification purposes, namely, capture and degradation of environmentally relevant (CO₂, SO₂, NO, NH₃) and toxic gases (CWAs) will be given.

[1] Fang, Z. et al, *Angew. Chem. Int. Ed.* **2015**, 54, 7234.

[2] C. Montoro et al. *Chem. Eur. J.* **2016**, 22, 1646

[3] E. López-Maya, et al. *Angew. Chem. Int. Ed.*, **2015**, 54, 6790

[4] L. M. Rodríguez-Albelo et al. *Nature Commun.*, **2017**, DOI:10.1038/ncomms15171.

[5] E. Barea, C. Montoro, J. A. R. Navarro, *Chem. Soc. Rev.* **2014**, 43, 5419.

CV: Prof. Jorge A. R. Navarro

Born in 1969 is Full Professor of Inorganic Chemistry at the University of Granada since 2010. His research is focused on the synthesis and applications of discrete and extended polygonal coordination assemblies with molecular recognition properties suitable for applications in the fields of environmental and biomedical chemistry. Specifically, he is interested in the use of metal organic frameworks for separation of challenging gas mixtures as well as capture and catalytic degradation of toxic compounds (including highly toxic chemical warfare agents). He is also interested in the use of porous materials as platforms for the controlled delivery of drugs. He is the author of ca. 100 publications with >3,500 citations and Hirsch index 34 and frequent invitations to Plenary and Invited Lectures at International Conferences, Universities and Research Centers. The quality of his research has been distinguished by the Excellence Research Award of the University of Granada (2002, 2009) and the RSEQ-Sigma-Aldrich Young Researcher Award (2006). He is also a member of the editorial board of ICA Journal

