Seminar

Friday, August 24, 2018
2:00 pm
Room 66-360

"Discovery and Commercialization of a New Family of Catalysts"

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The development of intracrystalline mesoporosity within zeolites has been a long-standing goal in catalysis as it greatly contributes to alleviate the diffusion limitations of these widely used microporous materials [1]. I will present unprecedented insights on the formation of intracrystalline mesoporosity in zeolites obtained by advanced gas adsorption, in situ synchrotron X-ray diffraction, and liquid cell transmission electron microscopy [2,3]. All these new insights, obtained by combining a number of time-resolved techniques, are an example of the enormous potential of current in situ characterization methods for the rational design of hierarchical zeolites with superior properties and optimal catalytic performance as it has been proved at lab, pilot plant, and industrial scales. The efforts to scale-up and commercialize this technology by Rive Technology and its application in catalytic cracking will be discussed. Finally, I will present some refinery data to illustrate the superior catalytic performance of mesostructured zeolites in oil refining, ending with a personal view of the new directions and opportunities of this field.

References:

1. J. García-Martínez et al., *Crystal Growth & Design* 2017, 17 (8), 4289-4305, *Chem Mater* 2017, 29 (9), 3827-3853, *ChemCatChem* 2014, 6, 3110; *ChemCatChem* 2014, 6, 46; *Chem. Commun*. 2015, 51, 8900; US Patents No. 20080138274 (2008), 20100021321 and 20100190632 (2010)
2. KA Cychosz, R G. Nicolas, J García-Martínez, M Thommes, *Chemical Society Reviews* 2017 46, 389-414
3. N. Linares, A. Sachse, J. García-Martínez et al., *Chem. Mater*, 2016, 28 (24), 8971

CV: Prof. Javier García-Martínez

Professor of Inorganic Chemistry and Director of the Molecular Nanotechnology Laboratory of the University of Alicante (UA). Published extensively in the areas of nanomaterials and energy and is the author of more than twenty five patents. His latest books are "Nanotechnology for the Energy Challenge" (Wiley, 2010), "Chemistry Education" (Wiley 2014), and "Mesoporous Zeolites" (Wiley 2015).

Founder of the technology-based company Rive Technology, which markets the technology he developed during his Fulbright postdoctoral stay at the Massachusetts Institute of Technology (MIT).

In 2007, MIT's Technology Review magazine selected him as one of the top innovators of his generation and in 2009 the World Economic Forum recognized him as Young Global Leader. In the summer of 2017, Javier was recognized by the American Chemical Society with the Kathryn C. Hach Award as the best chemistry entrepreneur in the USA. Javier is a member of the Emerging Technologies Council of the World Economic Forum, of the Executive Committee of the IUPAC, and Fellow of the Royal Society of Chemistry.