Catalysis engineering for sustainable technologies

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Abstract

Heterogeneous catalysis is quite possibly the most relevant discipline in the chemical industry, spearheading improvements in process sustainability by improving the exploitation of raw materials, enabling the transition from fossil to renewable feedstocks, reducing energy consumption, and minimizing the environmental footprint. To confront these challenges head on, this vibrant discipline is becoming increasingly design-driven, a shift which is facilitated by the availability of increasingly powerful tools that enable the continued development of fundamental knowledge over different time and length scales. The design of a heterogeneous catalyst, a dream not long ago, is becoming a reality. In this talk, I will discuss recent examples from my laboratory to illustrate how this intellectual growth in the understanding of catalyzed processes can kindle revolutionary technological advancements.

Biography

Javier Pérez-Ramírez studied Chemical Engineering at the University of Alicante and received his PhD degree at Delft University of Technology in 2002. Following a period in industry at Norsk Hydro and Yara International (2002-2005), he joined the Institute of Chemical Research of Catalonia as an ICREA Professor before being appointed at the Swiss Federal Institute of Technology in Zurich as the Professor of Catalysis Engineering in 2010. His research focuses on the design of catalytic materials tackling current and future energy, resource, and environmental challenges of society. The main topics of interest include the valorization of renewables, carbon dioxide, and natural gas using tailored nanostructured materials. He has published over 350 articles and is co-inventor of 17 patents. He has been recognized by several awards, most recently the Otto-Roelen-Medal (2012), the EFCATS Young Researcher Award (2013), the Beilby Medal and Prize (2014), and the RSC Sustainable Energy Award (2017). He serves as Associate Editor of Catalysis Science and Technology and as President of SwissCat, the Catalysis section of the Swiss Chemical Society.