

演講題目

Tuning solid acids and their supported nanocatalysts for target reaction processes

演講摘要

Due to impending depletion of fossil-based energy resources and strict environmental law, people are looking for new energy resources and greener processes, where heterogeneous catalytic systems play an increasingly important role. Solid-acids and their supported metal nanocatalysts, which are characteristic of cleaner and much highly selective, have been regarded as the most promising potential to replace toxic and corrosive liquid catalysts in most of chemical processes. However, how to improve activities and selectivity of solid catalysts for the desired products still remains a serious challenge. There is close interaction between reactants and catalytically active sites, which determines the ultimate performance of the latter. Based on understanding the catalytically active species and their functions, it is possible to design and control catalytic properties of catalysts at the nanoscale level for desired reactions. This more strategic approach will promote catalyst development and provide an alternative to the classical trial-and-error approach, with prospects for viable pre-design. In addition, in-situ spectroscopic techniques can provide specific information about working catalysts, reaction pathways, and kinetics, offering the essential parameters for reactor and process design and modulation. It bridges the gap between fundamental molecular-scale studies and realistic chemical processes, and will realise chemical engineering design from atomic level to macro level.

Short bio 簡歷

Research in Jun Huang's group is focused on solid acid based nanocatalysts for clean fuel production, CO₂ capture and conversion, waste-to-chemical, and biorefining. They are particularly interested in the development of emerging catalytic technologies for more attractive, practical, and cleaner processes using in situ spectroscopy, coupled with new catalyst design and innovative reaction engineering. He received his PhD from University of Stuttgart, Germany in 2008 and worked as a postdoctoral fellow at Georgia Institute of Technology, USA and ETH Zürich, Switzerland, respectively. He was appointed as a Lecturer at the University of Sydney in 2010 and promoted to Senior Lecturer in 2012 and Associate Professor in 2015. He has published more than 80 papers in high-rank journals such as *Science*, *Nature Comm.*, *JACS*, *AngewChem*, *J. Catal*, *ACS Catal*. He has granted more than \$3m research funds in the past 7 years and awarded several prizes such as [Sydney Accelerator Fellowship Awards](#) in 2018 and the Vice-Chancellor's Awards for Excellence, Outstanding Research in 2017.