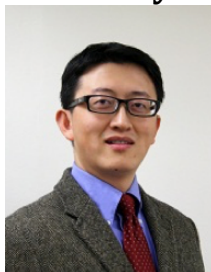




Nanostructure-Controlled Heterogeneous Catalysts with Superior Catalytic Properties



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Abstract:

Catalysis—the essential science for accelerating and directing chemical transformation—is the key to realizing environmentally friendly and economical processes for the conversion of fossil energy feedstocks. Catalysis is also the key to developing new technologies for converting alternative feedstocks, such as biomass, carbon dioxide, and water to chemicals and fuels.¹ The two grand challenges of heterogeneous catalysis, understanding mechanisms and dynamics of catalyzed reactions as well as the design and controlled synthesis of catalyst structures, require an atomic and electronic-level understanding of catalysts and catalytic processes. Due to their structural complexity, especially under reaction conditions, the catalytic active site and the molecule-catalyst interaction are often difficult to describe. In this presentation, I will discuss the synthesis, characterization, reaction study, and modeling of heterogeneous catalysts that are precisely synthesized at atomic level using intermetallic compounds^{2,3} and metal-organic frameworks,⁴⁻⁶ which provide the means for meeting the two grand challenges of heterogeneous catalysis. The synthesis of these heterogeneous catalysts is based on nanoscience and nanotechnology.

Bio:

Wenyu Huang received his B.S. and M.S. in Chemistry from Nanjing University, China, and a Ph.D. from Georgia Institute of Technology in 2007 under the supervision of Prof. Mostafa A. El-Sayed. Dr. Huang then took a postdoctoral position with Prof. Gabor A. Somorjai at the University of California at Berkeley and Lawrence Berkeley National Laboratory before joining the faculty at Iowa State University in 2011 as an assistant professor.

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