

Fully Exposed Cluster Catalyst for Hydrogen Production Reaction

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Abstract

Increasing attention has been paid to single-atom catalysts (SACs) in heterogeneous catalysis because of their unique electronic properties, maximized atomic utilization efficiency. However, SACs can have limited advantages or even constrained applications for the reactions that require designated metallic states with multiple atoms or surface sites with metal-metal bonds. As a cross-dimensional extension to the concept of SACs, fully exposed cluster catalysts (FECCs) offer diverse surface sites formed by an ensemble of metal atoms, for the adsorption and transformation of reactants/intermediates. In this talk, I will introduce our recent progress on constructing FECCs for dehydrogenation reactions, and how their fully exposed structure and tailored electronic properties overcome the limitations of SACs.

Biography

Ding Ma is currently a professor in the College of Chemistry and Molecular Engineering at Peking University. He obtained his B.S. in Chemistry from Sichuan University in 1996, and Ph.D. (2001) in Dalian Institute of Chemical Physics (DICP), Chinese Academy of Sciences with Prof. Xinhe Bao. After working in University of Oxford and University of Bristol as a postdoctoral researcher (2001–2005), he joined DICP in 2005 as research fellow, and moved to Peking University in 2009. He has published >400 peer-reviewed papers with >33,000 citations (according to Google Scholar), including 5 papers in Science and Nature. His current research interest is focused on designing catalytic processes and efficient catalyst systems for energy and environmental challenges, including C1 chemistry, hydrogen production and transportation, and plastic recycling.

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