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Unlocking catalytic powers of nonprecious nanomaterials

Although the precious metal-based materials are widely recognized as superior catalysts for clean energy applications, their large-scale commercial use has been hindered by their expensive and scarcity nature. The development of high performance, plentiful and cheap nonprecious materials-based catalysts is therefore vital for the commercial viability of clean energy future. Unfortunately, the most of nonprecious materials in their pristine forms possess little or no catalytic activity. As such, unlocking the catalytic activities of nonprecious materials has become an important scientific task, but highly challenging.

This presentation reports a number of broadly applicable approaches to unlock the catalytic activities of nonprecious nanostructured materials. A number of examples from our recent investigations will be used to demonstrate the effectiveness and applicability of such approaches.

Speaker Biography

Huijun Zhao obtained his PhD in Chemistry (1994) from the University of Wollongong, Australia. He held Research Fellow/Senior Research Fellow positions during 1994-1997 in the University of Wollongong and University of Western Sydney. He took a Lecturer position at Griffith University in 1997 and was subsequently promoted to Senior Lecturer (2001), A/Professor (2003), Chair Professor of Griffith Commercialization Laboratory (2005). He currently holds a professorial position in School of Environment and Science and is the Director of the Centre for Clean Environment and Energy at Griffith University. He is also the Director of the Centre for Environmental and Energy Nanomaterials at the Institute of Solid-State Physics, Chinese Academy of Sciences. He has won several awards such as The R.H. Stokes Medal and University Research Leadership Award and is the Fellow of the Royal Society of Chemistry (FRSC) and the Fellow of the Royal Australian Chemical Institute (FRACI). He has expertise in energy and environmental nanomaterials, water source control and management system, field-based sensing technologies and aquatic environmental quality assessment. One of his current pursuits is to explore new means to unlock the catalytic powers of nonprecious materials as high performance catalysts for important catalysis reactions. He has published over 400 refereed journal papers that attracted over 22,000 citations and earned him an H-index of 78. He has also gained 68 international patents within 8 world-wide patent families in functional nanomaterials & nanotechnology, photoelectrocatalysis and environmental monitoring systems.

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