

Webinar #14



Prof. Hui Pan

*Institute of Applied Physics and Materials Engineering,
University of Macau*

Title: Electrocatalysts for Green Hydrogen
Production: Design, Synthesis, and Industrial
Fabrication

 **8th December 2022, 11.30 am – 1.00 pm IST**
Registration link: <https://tinyurl.com/mpn46vjd>

Biography

Dr. Hui Pan is a professor and the Associate Director of the Institute of Applied Physics and Materials Engineering at the University of Macau. He got his PhD degree in Physics from the National University of Singapore in 2006. From 2006 to 2013, he worked at National University of Singapore as a Research Fellow, Oak Ridge National Laboratory (USA) as a Postdoctoral Fellow, and Institute of High Performance Computing (Singapore) as a Senior Scientist, respectively. He joined the University of Macau as an assistant professor in 2013. In his research, a combined computational and experimental method is used to design and fabricate novel nanomaterials for applications in energy conversion and storage (such as electro-/photo-catalysis, water splitting, N₂/CO₂ reduction, supercapacitors, hydrogen storage, solar cell, and fuel cells), electronic devices, spintronics, and quantum devices. He has published more than 240 papers in international peer-reviewed journals. The total citation is ~ 12000. Additionally, he is the author of 5 book chapters and the inventor of 4 USA and 6 China patents. His present h-index is 55.

Abstract

Our society is facing increasing challenge on various issues. Among them, energy and environment are listed as the top two that need to be solved immediately, where catalysis may play an important role. It has been recognized that “Green Hydrogen” from photo-/electro-catalytic water splitting may be “Our Future” because it is clean and can be used as reactant for production of fertilizer and reduction of pollutants, fuels, etc.. The industrial production of green hydrogen for practical applications on large scale shall bring the harmony between nature and human being. Therefore, electrocatalysis of water has been attracting increasing attention for hydrogen production because of its green, easily adoptable, and scale-up natures. In this talk, we shall present the design, synthesis and possible industrial production of novel electrocatalysts for oxygen and hydrogen evolution reactions (HER and OER), including: (1) the design principles of HER and OER catalysts, (2) the fabrication of electrocatalysts for water splitting, (3) the surface reconstruction and phase transition of electrocatalyst in OER and HER, (4) the role of multi-phase heterostructure on the highly catalytic activity, (5) the in-situ characterization for the active sites in the HER and OER processes, and (6) anodized steel as the most promising electrocatalysts for overall water splitting with high efficiency. Our results demonstrated that multi-metal compound systems were catalytically active for OER and HER in electrochemical energy devices, which may find practical application in hydrogen-energy technologies.

Panelist



Prof. Phan Bach Thang

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Zoom meeting details will be shared with the registered participants

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