

学术报告

Transition metal phosphide electrocatalysts for use in electrochemical and photoelectrochemical water splitting

报告人: Professor Lifeng Liu

International Iberian Nanotechnology Laboratory (INL), Portugal

时 间: 2019年7月25日(星期四) 14:00~15:00

地 点: 化学馆 120

邀请人: 黄智鹏

报告人简介

Lifeng Liu (Researcher ID: A-2522-2012, Orcid ID: 0000-0003-2732-7399) is currently Staffer Researcher (tenured) and Research Group Leader at the International Iberian Nanotechnology Laboratory (INL) – the first international research organization worldwide in the field of nanoscience and nanotechnology. He is also Honorary Senior Research Fellow at Swansea University, UK. He obtained his B. S. degree in Applied Physics from Beijing Jiaotong University (2001), and both his MS (2004) and PhD (2007) degrees in Condensed Matter Physics from the Institute of Physics, Chinese Academy of Sciences (IOP-CAS). He joined Max Planck Institute of Microstructure Physics – Halle (MPI-Halle), Germany in 2007, first working as a postdoctoral researcher and then as a staff scientist. He started his independent research career in 2008 and became a Group Head in 2009. In 2011, he moved to INL and set up a research group there. Lifeng Liu has been actively



working on nanomaterials and nanostructures since 2002, with particular emphases on fabrication and characterization of complex nanostructures, nanoscale solid-state reactions, ferroelectric nanostructures and nano-electrocatalysts. His present interest mainly focuses on nanomaterials for electrochemical energy storage and conversion. So far, he has been granted 2 PCT patents and authored/coauthored 140+ peer-reviewed papers in major international journals, which have been collectively cited 7600+ times (Google Scholar, as of July 2019), leading to an H-index of 52. Honors and awards he was granted recently include: FCT Investigator Grant 2014, Young Researcher Award 2015 by the Portuguese Electrochemical Society, and the Scientist Medal by the International Association of Advanced Materials (IAAM) 2018.

报告摘要

Splitting water into hydrogen and oxygen is an ecofriendly way to produce high-purity hydrogen fuels and has shown substantial promise as a means for renewable energy storage. To enable widespread deployment of water electrolyzers, it is of paramount importance to develop efficient, durable and inexpensive water splitting catalysts so that the electrolyzed hydrogen fuels can become economically competitive and viable. In this presentation, I will show our recent efforts to developing transition metal-based electrocatalysts, in particular transition metal phosphides [1-6]. I will first show self-supported transition metal phosphide electrodes and their electrocatalytic performance for the hydrogen evolution reaction (HER), the oxygen evolution reaction (OER) as well as overall water splitting. Moreover, I will show that the electrocatalytic activity of transition metal phosphides can be improved by rational microstructural and compositional engineering. Furthermore, recent attempts to coupling transition metal-based electrocatalysts to semiconductor photoelectrodes for solar-driven water splitting will also be presented [7,8].

References

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