

学术报告

报告题目: **Core-shell Metal Oxide Nanostructured Electrodes.**
Nanostructured photoelectrode for solar water splitting

报告人: 范红金 新加坡南洋理工大学数理学院副教授

报告时间: 2014年12月12日 (周五) 下午3:00

报告地点: 中科院固体所三号楼221会议室

报告内容简介:

Inorganic nanostructured materials (oxides and sulfides) are being extensively studied for their application potential in energy storage and generation (e.g., batteries, supercapacitors, solar cells, photocatalysts). High performance of these devices relies largely on scrupulous design of nanoarchitectures and smart combination of active materials.

Our group has been actively working on core-shell integrated electrode materials directly on various conductive substrates for both supercapacitors and batteries. In the 1st half of my talk, I will present our recent results on vanadium oxide nanorods that are direct grown onto 3D graphene foams. To further enhance their electrochemical performance, the nanorods are surface engineered by coating a thin layer of conductive polymers or carbon nanostructures dots. Demonstration will be made to supercapacitors, Li-ion and Na-ion battery electrodes, all exhibiting improved capacity, fast (up to a few min) charging and discharging capability, and ultrahigh cycling stability (up to 40 000 cycles).

In the 2nd part, I will introduce our research on photoelectrochemical (PEC) electrode materials fabricated based on atomic layer deposition and ion exchange reaction. Typical examples are TiO₂ 3D inverse opals sensitized by chalcogenides (CdSe) nanodots. I will also introduce on behalf of all co-authors our recent breaking result on perovskite solar cell enabled photolysis water splitting.

报告人简介:

范红金, 新加坡南洋理工大学数理学院副教授。1999年获吉林大学学士学位, 2003年获新加坡国立大学博士学位, 其后分别在德国马普研究所和英国剑桥大学任博士后研究员。2008年8月加盟南洋理工大学。曾经做过ZnO纳米线的有序阵列合成和发光性质, 柯肯达尔效应 (Kirkendall effect) 运用于纳米管的合成和固相反应, 三维纳米树枝状构造和应用于赝电容。目前主要从事氧化物纳米材料在光解水和电池方面的应用, 和半导体纳米线光学性质方面。已发表SCI收录论文120多篇, 他引5000多次, H因子39。现任Nanotechnology, Scientific Reports 编委, Materials Research Bulletin 副主编。