Short Communication

Bimetallic Nitride NiWN₂/ Nitrogen-doped Reduced Graphene Oxide Nanocomposites as High-Performance Counter Electrode Materials for Dye-Sensitized Solar Cells

Jihong Jiang¹, Zuquan Jin^{1,*}, Jianhua Yao², Xiuli Yang³, Chuansheng Xiong¹, Yong Yu¹, Ning Li¹ and Xiaoying Zhang^{1,*}

¹ Engineering Research Center of Concrete technology in marine environment, Ministry of Education, Qingdao University of Technology, Qingdao, 266033, P. R. China

² Qingdao Institute of Bioenergy and Bioprocess Technology, Chinese Academy of Sciences, Qingdao, 266101, P. R. China

³ Qingdao Pony Test Co., Ltd., Jinshui Road 36, Qingdao, 266101, P. R. China

*E-mail: jinzquan@126.com; zhangxy@qibebt.ac.cn

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Inspired by bimetallic sulfides and oxides, bimetallic nitride NiWN₂/ Nitrogen-doped reduced graphene oxide (NiWN₂/N-RGO) nanocomposites were prepared successfully through the hydrothermal method, and employed as high performance platinum-free counter electrodes (CEs) for dye-sensitized solar cells (DSCs). In the NiWN₂/N-RGO CEs, NiWN₂ nanoparticles were anchored on the surface of N-RGO. Benefiting from the synergistic effects of the high electrocatalytic activity from NiWN₂ and the efficient electronic/ionic mixed conducting network provided by N-RGO, DSCs with NiWN₂/N-RGO achieved an efficiency of 7.04%, which was up to 95% of that of a Pt CE (7.48%). Such an effective and versatile strategy may be extended to other bimetallic nitrides for use as inexpensive platinum-free CEs.

Keywords: bimetallic nitrides; NiWN₂/N-RGO; counter electrode; dye-sensitized solar cells; platinum-free

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