Facile Construction of MoS₂/CNFs Hybrid Structure for a Hydrogen Evolution Reaction

Jiang Li, WeiWei Wu, Meng Wan, Li Gu, Juan Wang, Tao Li, Han Zhu, Ming Zhang, MingLiang Du^{*}

College of Materials and Textiles, Zhejiang Sci-Tech University, Hangzhou, 310018, P. R. China

^{*}E-mail: du@zstu.edu.cn

doi: 10.20964/2017.05.84

Received: 16 June 2016 / Accepted: 11 January 2017 / Published: 12 April 2017

Development of high-efficiency electrocatalysts for a hydrogen evolution reaction (HER) is of great importance for the sustainable production of hydrogen that is necessary to relieve the energy crisis. Construction of a non-noble metal organic-inorganic hybrid structure with excellent HER activity is the key issue in electro-catalytic fields. Here, we demonstrate a facile synthetic route to prepare a flower-like MoS₂/CNFs hybrid structure with a high concentration of active edges sites using a hydrothermal method. The hybrid structure exhibits brilliant electro-catalytic performance in the HER process with an overpotential of 45 mV and the lower Tafel slope of 58 mV dec⁻¹, as well as a remarkable durability. The excellent HER activity of the MoS₂/CNFs hybrid structure is attributed to the high number of exposed active edges sites, high conductivity of carbon nanofibers (CNFs) and the high surface area of the CNFs mat.

Keywords: molybdenum disulfide; hydrothermal; carbon nanofibers; electrospinning; hydrogen evolution reaction

[FULL TEXT](#)

© 2017 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).