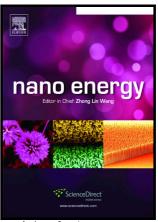
Author's Accepted Manuscript

Iron Oxide Embedded Titania Nanowires - an Active and Stable Electrocatalyst for Oxygen Evolution in Acidic Media

Lili Zhao, Qing Cao, Aili Wang, Jiazhi Duan, Weijia Zhou, Yuanhua Sang, Hong Liu



www.elsevier.com/locate/nanoenergy

PII: S2211-2855(17)30804-2

DOI: https://doi.org/10.1016/j.nanoen.2017.12.029

Reference: NANOEN2410

To appear in: Nano Energy

Received date: 3 November 2017 Revised date: 27 November 2017 Accepted date: 17 December 2017

Cite this article as: Lili Zhao, Qing Cao, Aili Wang, Jiazhi Duan, Weijia Zhou, Yuanhua Sang and Hong Liu, Iron Oxide Embedded Titania Nanowires - an Active and Stable Electrocatalyst for Oxygen Evolution in Acidic Media, *Nano Energy*, https://doi.org/10.1016/j.nanoen.2017.12.029

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Iron Oxide Embedded Titania Nanowires - an Active and Stable Electrocatalyst for Oxygen Evolution in Acidic Media

Lili Zhao^{a,b}, Qing Cao^a, Aili Wang^a, Jiazhi Duan^b, Weijia Zhou^{a*}, Yuanhua Sang^{b*}, Hong Liu^{b,c*}

- ^a Guangzhou Key Laboratory for Surface Chemistry of Energy Materials, New Energy Research Institute, School of Environment and Energy, South China University of Technology, Guangzhou Higher Education Mega Center, Guangzhou, Guangdong, 510006, P. R. China
- ^b State Key Laboratory of Crystal Materials, Center of Bio & Micro/Nano Functional Materials, Shandong University, 27 Shandanan Road, Jinan, Shandong 250100, P. R. China
- ^c Institute for Advanced Interdisciplinary Research (IAIR), University of Jinan, Jinan, 250022, China
- * Corresponding author. E-mail: eszhouwj@scut.edu.cn (W. Zhou), sangyh@sdu.edu.cn (Y. Sang), hongliu@sdu.edu.cn (H. Liu)

Abstract

The hydrogen evolution reaction (HER) catalysts with high activity and stability in acid electrolyte are widely reported. However, the abundant, active and acidic stable catalysts for the oxygen evolution reaction (OER) are scarce to build the two-electrodes for water splitting. Fe-based materials are promising candidate electrocatalysts for OER in alkaline electrolyte, but unstable in acid electrolyte. Herein, some amount of iron oxides are incorporated into titanium dioxide nanowires (Fe-TiO_x LNWs/Ti) by ion substitution and followed calcination process. The obtained Fe-TiO_x LNWs/Ti lead to a moderate improved stability (81.3% vs. 33.3% for Fe₂O₃ loaded on Ti foam at the same potential of 1.9 V vs. SCE for 20 h), and remain high activity for OER (a low onset potential of 1.49 V vs. RHE at 1 mA cm⁻²) in acid electrolyte. This study opens up the possibility and universality of active and abundant nonprecious metal oxides for OER utilized in acid electrolytes.

Download English Version:

https://daneshyari.com/en/article/7952859

Download Persian Version:

https://daneshyari.com/article/7952859

<u>Daneshyari.com</u>