Preparation and Characterization of Ti/rGO-RuO₂ Electrode for Hydrogen and Oxygen Evolution Reactions

Xiaoyang Bao, Jiqing Bao^{*}, Jie Xu, Cong Xu

School of Biological and Chemical Engineering, Jiaxing University, Jiaxing 314001, China;

^{*}E-mail: 469784902@qq.com

doi: 10.20964/2018.08.45

Received: 11 May 2018 / Accepted: 15 June 2018 / Published: 5 July 2018

This paper presents a preparation method of a graphene RuO₂ composite electrode. The electrode is obtained via electrochemical reduction of graphene oxide (GO) on a Ti substrate followed by thermal decomposition to prepare RuO₂. According to results from SEM, CA curves, and EIS impedance, Ti/rGO-RuO₂ has many exposed active sites and good electrical conductivity. Ti/rGO-RuO₂ also shows excellent electrocatalytic performance for electrochemical water splitting (hydrogen evolution potential is -1.226 V and oxygen evolution potential is 0.842 V). After 10 h of electrolysis at 250 mA·cm⁻², the activity of Ti/rGO-RuO₂ showed no significant decrease for the hydrogen evolution reaction. In sum, Ti/rGO-RuO₂ contains an intermediate layer of graphene, has excellent application prospects in electrochemical water splitting, and has good application value in the field of hydroelectricity.

Keywords: metal oxide anode; graphene; water splitting

[FULL TEXT](#)

© 2018 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/>).