Ti Foil Supported Three-Dimensional Porous Silver Film as a High Performance Catalyst for Hydrazine Electrooxidation in KOH Solution

Ran Liu^{1,*}, Jinling Yin², Dianxue Cao²

¹ Department of Chemistry, School of Food Engineering, Harbin University, Harbin, 150086, P.R.China

² Key Laboratory of Superlight Materials and Surface Technology of Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin, 150001, P.R.China

*E-mail: liuran7907@163.com

doi: 10.20964/2017.12.45

Received: 17 May 2017 / Accepted: 30 September 2017 / Published: 12 November 2017

An efficient electrocatalyst for hydrazine electrooxidation is beneficial for elevating the cell performance of direct hydrazine fuel cells (DHFCs). Electrocatalysts with a highly porous structure have been extensively studied in the field of electrochemistry, owing to their large catalytically active area and favorable mass transfer. Therefore, in this thesis, a one-step galvanostatic electrodeposition method related to the hydrogen evolution reaction is adopted to deposit a porous silver film on Ti foil (Ag/Ti). Electrochemical measurements are introduced to estimate the ability of the resultant Ag/Ti electrode to catalyze hydrazine electrooxidation. Ag/Ti displays an evident peak at approximately -0.2 V due to hydrazine electrooxidation. The correspondent peak current density reaches 7.7 mA cm⁻² in 0.02 M N₂H₄·H₂O and 1.0 M KOH. This good electrocatalytic capacity may have a bearing on the micropore structure, which offers facile access of the electrolyte to the Ag/Ti surfaces and enables gases to diffuse away from the electrode surfaces promptly to vacate the activated sites.

Keywords: Silver; Porous film; Electrodeposition; Hydrazine electrooxidation

[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/>).