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

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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

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