Preparation and Characterization of Polyaniline / Glassy Carbon Modified Electrode as an Electrocatalyst for the Production of Hydrogen from $\text{Et}_3\text{NHCl}/[\text{Bu}_4\text{N}][\text{BF}_4]\text{-CH}_3\text{CN}$ Solution

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doi: 10.20964/2017.11.71

Received: 9 July 2017 / Accepted: 12 September 2017 / Published: 12 October 2017

Crystalline, porous and fibril-like structure polyaniline film is electrodeposited on glassy carbon electrode from acidic solution. The electrochemical behaviour of polyaniline/glassy carbon modified electrode in $[\text{Bu}_4\text{N}][\text{BF}_4]\text{-CH}_3\text{CN}$ solution is investigated using cyclic voltammetry technique. It shows a stable electroactive region which is related to the semiconducting state of polyaniline in nonaqueous medium. The electro-catalytic performance of the modified electrode toward Hydrogen Evolution Reaction (*HER*) from $\text{Et}_3\text{NHCl}/[\text{Bu}_4\text{N}][\text{BF}_4]\text{-CH}_3\text{CN}$ solution shows a positive shift in the direct proton reduction potential as well as a higher catalytic reduction current density compared to the unmodified electrode with a good stability of 73.7 % current retention after 25 repetitive cycles. The electrocatalytic activity of the modified electrode is correlated to its morphology.

Keywords: polyaniline, Hydrogen Evolution Reaction, electrocatalysis, cyclic voltammetry, surface characterization

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