Electropolymerization of Indole and Its 5- Position-Substituted Derivatives in the Mixed Electrolytes of Acetic Acid and Boron Trifluoride Diethyl Etherate

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doi: 10.20964/2019.06.57

Received: 5 February 2019 / Accepted: 9 April 2019 / Published: 10 May 2019

The mixed electrolyte of acetic acid and boron trifluoride ethyl ether (BFEE), containing poly(ethylene glycol) with a molar mass of 1000 (PEG1000), was employed for the electrochemical synthesis of indole and its 5-position-substituted derivatives, such as 5-cyanoindole, 5-nitroindole, indole-5-carboxylic acid, and 5-hydroxyindole. The introduction of acetic acid into BFEE increased both the solubility of PEG1000 and the ionic conductivity of the well mixed electrolyte. In this medium, high-quality polyindole (PIN) and its derivatives were successfully electrodeposited via anodic oxidation of their corresponding monomers. The as-formed PINs exhibited good electrochemical behavior and good fluorescence properties.

Keywords: Mixed electrolyte, Polyindoles, Electrochemical polymerization, Boron trifluoride ethyl ether, Fluorescence

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