

4th International Conference and Exhibition on **Materials Science & Engineering** September 14-16, 2015 Orlando, USA

Preparation of polypyrrole-diamond/Au/Cu₂O nanocomposite modified electrode and study of its electrocatalytic activity for methanol oxidation

H Ashassi-Sorkhabi, B Rezaei-Moghadam, E Asghari, M T Taghizadeh and R Bagheri
University of Tabriz, Iran

This work presents the preparation of the modified electrode based on conducting polypyrrole, PPy, which electrochemically doped by gold/cuprous oxide nanoparticles. Its electrocatalytic properties were studied to use in Direct Methanol Fuel Cells, DMFCs. Herein, decorated PPy-Nanodiamond, PPy (ND), composite films on St-12 steel electrodes was electro-synthesized using in situ polymerization process under ultrasonic irradiation. The potentiostatic and galvanostatic techniques were used to synthesize the Au and cuprous oxide, Cu₂O nanoparticles on the PPy/ND coated electrode, respectively. The morphology of synthesized nanocomposites was characterized by scanning electron microscopy, SEM, and atomic force microscopy, AFM, techniques. Cu₂O particles were synthesized in various shapes including cubic, truncated octahedral, octahedral, and hexapod structures. The results of cyclic voltammetry method showed significantly enhanced catalytic performance of the prepared electrode. Moreover, the chronoamperometric and electrochemical impedance spectroscopy measurements were used to confirm the electro-catalytic enhancement.

Biography

H Ashassi-Sorkhabi has completed his PhD from University of Paris VI and Postdoctoral studies from University School of New Castle-Upon Tyne, England. He is the Academic Staff Member of University of Tabriz, Iran as Full Professor. He has published more than 70 papers in reputed journals.

habib.ashassi@gmail.com

Notes: