

polypyrrole coated cellulosic substrate modified by copper oxide.

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Abstract : Firstly, the chemical polymerization of polypyrrole onto cellulosic substrate is conducted by using FeCl_3 as an oxidant and pyrrole as monomer. Different parameters were tested (monomer concentration, duration of the experiment, nature of supporting electrolyte, temperature, etc...) in view to obtain films with different thickness and different morphologies. Thickness and topography of different PPy deposits (films) were estimated by a profilometer apparatus. The electrochemical reactivity of the obtained electrodes was tested by voltamperometry technique (CV) and electrochemical impedance spectroscopy (SIE). Secondly, the modification of the PPy film surface by incorporation of copper oxide nanoparticles is conducted by applying a galvanostatic procedure from a CuCl_2 solution. Surface characterization has been carried out using scanning microscope (SEM) coupled with energy dispersive X-ray analysis (EDX), fourier-transform infrared spectroscopy (FTIR) and X-ray diffraction (XRD). The analysis showed clearly the presence of the copper oxide nanoparticles (CuO and Cu_2O) in the polymer films with dimensions less than 50 nm.

Keywords : modified polypyrrole, copper oxides