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Elaboration and characterization of ITO electrode modi?ed bytransition metal dispersed into polyaniline thin ?lms

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Abstract: This work presents the characteristics of composite materials thin ?lms of polyaniline (PAni) andnickel (Ni) particles deposited onto indium tin oxide (ITO) substrate. The electropolymerizationof aniline was performed in acidic medium by potentiodynamic methods. The nickel particleswere electrochemically deposited on the surface of PAni/ITO by reducing metal ions (Ni) usinga potentiostatic method from a separate solution. The e?ect of applied potential as well as immersingtime of complexation on the amount of nickel dispersed was investigated. Di?erentcharacterization techniques were employed to study the electrochemical behavior and surfacecharacteristics of the Ni-PAni/ITO thin ?lms such as Electrochemical Impedance Spectroscopy(EIS), Cyclic Voltammetry, Fourier Transform Infrared Spectroscopy (FTIR), UV–visSpectroscopy, Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM).The morphology of the obtained composites shows a uniform dispersion of nickel particlesonto the polyaniline matrix and reveals that the immersing times of complexation has a signi?cante?ect on the amount of incorporated particles. The impedance spectroscopy study revealsthat the conductivity of the composite ?lm increases with the amount of nickel incorporated.UV–vis and FTIR results con?rm the presence of PAni and Ni particles on theelectrode surface.

Keywords : polyaniline, Electro-polymerization, Nickel particles, Chronoamperometry, Materials composites