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Evaluation of electrochemical behavior of the passive film formed on Ni in 1N H3PO4 solution

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Abstract : This paper focuses on electrochemical studies of nickel oxide, formed on metallic Ni electrode in 1N H3PO4 aqueous solution by means of anodic polarization at various temperatures. Open circuit potential (ocp), potentiodynamic polarization, electrochemical impedance spectroscopy (EIS) and capacitance measurements are the principal techniques which are used. Mott–Schottky analysis shows that the passive film formed on nickel is p-type, corresponding to a preponderance of oxygen vacancies and nickel interstitials in the barrier layer. The acceptor density and flat potential, of the semiconductivepassive layer growing on nickel surface in pho5sphoric acid solution, were determined.

Keywords : passive film, nickel oxide, Electrochemical impedance spectroscopy, Mott–Schottky.