Electrochemical Oxidation of Sulphite in Neutral Media on Platinum Anode

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In this paper, electrochemical behavior of sulphite ions on platinum in neutral solution ($1 \text{ mol L}^{-1} \text{ Na}_2\text{SO}_4$) has been studied in order to identify the relationship between the sulphite concentration in the electrolyte solution (10^{-3} , 10^{-2} , 10^{-1} , $5 \cdot 10^{-1}$ and 1 mol L^{-1}) and kinetic parameters of the anodic process. Electrochemical behavior of sulphite in the test solutions has been studied by linear and cyclic voltammetry. More information regarding the studied process occurring at electrode/electrolyte interface and kinetic parameters (current density i_0 and anodic transfer coefficient α) were obtained by Tafel plots method. Further, electrochemical impedance spectroscopy was carried out to confirm obtained data on platinum electrode. As well, chrono-electrochemical methods (chronoamperometry, chrono-potentiometry, chronocoulometry) were chosen in order to achieve the optimum parameters (current density, oxidation potential characteristic for sulphite electrooxidation and transformation degree of SO_3^{2-} in the test solution).

Keywords: sulphite anodic oxidation, Tafel plots method, electrochemical impedance spectroscopy, chrono-electrochemical methods

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