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The Role of Electrolytically Co-Deposited Platinum-Palladium Electrodes On The Electrooxidation of D. Glucose In Alkaline medium: A Synergistic Effect

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Abstract: The electrooxidation of D. glucose was investigated on platinum-palladium alloy electrodes of different compositions in alkaline aqueous solutions. The surface characteristics of the alloys in contact with electrolytic solution were studied using cyclic voltammetry. In particular, a surface enrichment in platinum due to a preferential dissolution of palladium was shown. Enhanced electrocatalytic activity at about 37 at. % in Pd was obtained when compared to pure metals, thus leading to a synergistic effect. The electrocatalytic activity of different alloys for D. glucose oxidation has been characterized by exchange current densities obtained from extrapolation of Tafel lines to calculated equilibrium potential. An explanation of these effects was suggested on the basis of a decrease of strongly bound residue of D. glucose. The present work supports the proposed mechanism of the appearance of a high catalytic activity of Pt-Pd alloy for D. glucose oxidation.

Key Words: Electrocatalysis, electrocodeposition, D. glucose, alloy electrodes, synergistic effect

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