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Electrooxidation of glycine and α -alanine on platinum

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Abstract

Methods of cyclic linear voltammetry, coulometry and potential-modulated in situ reflective IR spectroscopy have been used to investigate the processes of the anodic oxidation of glycine and α -alanine anions on platinum. Potential ranges of electrochemical transformation of amino acids have been determined. It has been shown that the oxidation of both Gly and α -Ala are "gentle" and proceed with the detachment of four electrons, thus the current efficiency is close to 100%. The basic products of the anodic oxidation of amino acid anions are HCOO⁻, CO₂, NH₃; there are also CO, CN⁻, and such particles as $-CH_x$ (x = 1; 2 or 3). It has been established that the anodic oxidation of glycine and α -alanine proceeds from the adsorbed state, and the first single-electron stage of ionization is limiting.