E2-12 Polyaniline as an electrocatalyst for L-ascorbic acid oxidation

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L-Ascorbic acid is a common constituent in many physiological samples and its electrochemistry on conventional electrode surfaces is well studied. L-Ascorbic acid undergoes oxidation on many electrode surfaces such as Pt, Au, glassy carbon etc., to form 2,3-dioxogulonic acid and as such it interferes with electrochemical detection of other components present in biological samples such as glucose and neurotransmitters. In this communication the electro - catalytic activity exhibited by polyaniline for the oxidation of L-Ascorbic acid, is described.

The CV of L-ascorbic acid on bare glassy carbon electrode in 0.1 mol dm^{-3} NaCl at pH 2 consists of only one oxidation peak centred at +0.55 V with respect to the S.C.E. Electrodeposition of a thin film of polyaniline onto the glassy carbon surface results in a 0.22 V decrease in the oxidation potential. The latter peak appearing at +0.33 V under otherwise identical conditions is due to the oxidation of L-ascorbic acid as the peak current is directly proportional to the concentration of L-ascorbic acid. The scan rate (V) dependence of peak current (I_p) on polyaniline modified electrode, shows the I_p x V confirming that the adsorption of L-ascorbic acid on polyaniline is rate determining. The adsorption isotherms obey the Langmuir adsorption behaviour showing the monolayer coverage of L-ascorbic acid on polyaniline. It is proposed that this strong adsorption of L-ascorbic acid on polyaniline is responsible for the above mentioned electrocatalytic activity.