Electrochemical System for Determination of Esmolol Hydrochloride Using Square Wave Adsorptive Stripping Voltammetry

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A simple, validated, sensitive and reliable electrochemical method for determination of esmolol hydrochloride (ESM) has been described. The cathodic behavior of ESM onto a hanging mercury drop electrode (HMDE) was evaluated using phosphate buffer of pH 7.2. The square wave adsorptive stripping voltammetric (SW-AdSV) method exhibited a peak current over a concentration range of 1.0×10^{-8} – 1.0×10^{-4} mol L⁻¹ ($r = 0.9992$). The low limits of detection and quantification were evaluated as 5.0×10^{-9} mol L⁻¹ and 1.0×10^{-8} mol L⁻¹, respectively. Method applications were concerned with the detection of ESM in its injections and biological samples. The recoded results were calculated in the term of percentage recoveries and they were 99.8 ± 0.2 for ESM injection, while for spiked serum and urine was found to be 98.8 ± 0.7 and 98.9 ± 1.1 , respectively. The introduced method was validated and the data were assessed using t-student's test and F-test. Compatible results were recorded with those obtained from other published methods.

Keywords: Esmolol hydrochloride; Voltammetric determination; Pharmaceutical preparations; Biological fluids; Adsorptive stripping voltammetry

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