INVESTIGATION OF ELECTROCHEMICAL BEHAVIOUR OF ROSUVASTATIN CALCIUM AND ITS DETERMINATION IN PHARMACEUTICAL PREPARATIONS

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In this study, electrochemical behaviour of rosuvastatin calcium (Scheme 1) which is a hydroxyl methyl glutaryl Co-A inhibitor (a member of statin group) used for the treatment of hypercholesterolemia and dyslipidemia was investigated with cyclic voltammetry (CV) and chronoamperometry (CA) methods [1].

According to these studies it is assumed that the reaction is a diffusion-controlled process and irreversible. The results from the CV and CA were calculated and diffusion coefficient was found as 5.79x10^-5±2.231x10^-6 cm^2 s^-1. It is calculated that 2 electrons were transferred [2]. For the determination of rosuvastatin calcium from the pharmaceutical preparations, square wave voltammetry (OSWV) method is selected and developed because it is more sensitive and faster than the other voltammetric methods. Rosuvastatin calcium’s reduction peak was seen at -1184 mV in pH 5 acetate buffer while hanging mercury drop electrode (HMDE) used as working electrode, an Ag/AgCl with saturated 3M KCl used as reference electrode and a platinum wire used as counter electrode. 70 Hz frequency, 4 mV scan increment and 25 mV pulse amplitude were chosen as optimum parameters.

This method was validated according to the ICH guideline on analytical method validation parameters [3]. Linearity for rosuvastatin calcium was found between 0.20 and 10.00 mg mL^-1. While the limit of detection for rosuvastatin calcium was 0.07 µg mL^-1, the limit of quantification was 0.20 µg mL^-1. As a result of these validation studies, selective, accurate and precise square wave voltammetric method which gives sensitive and repeatable results, was applied to the determination of rosuvastatin calcium from pharmaceutical preparations. The results obtained from developed methods were compared with a spectrophotometric method and a capillary electrophoresis method reported in the literature and no significant difference was found statistically.

References