عنوان مقاله:

Electrochemical behavior of an anicancer drug and its determination in pharmaceutical formulation by cyclic and differential-pulse voltametric techniques at glassy carbon electrode

محل انتشار:

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خلاصه مقاله:

Tamoxifen (Tam) is an anticancer drug used in the treatment breast cancer. In this work, the electrochemical behavior of (Tam) were investigated by cyclic (CV) and differential-pulse anodic adsorptive striping (DPAAS) voltammetric techniques at different electrodes such as glassy carbon (GC), Au and Pt electrode in H_2SO_4 at different concentration. It was observed that at GCE electrocatalytic behavior for the oxidation of Tam was excellent. It was evidenced by the enhancement of oxidation peak current and shift in the oxidation potential to less positive values. Cyclic voltammetry (CV) and chronoamperometry were used to understand the electrochemical characteristics of Tam. A chronoamprograms gave fundamental electrochemical parameter including the electroactive surface coverage (), the diffusion coefficient (D) and the heterogeneous rate constant (ks). Based on the results of the recorded CV, the electrodeposition and anodic striping behavior of the Tam were investigated at the surface of GCE. The primary experiments demonstrated that the DPAASV presents a sufficient oxidation peak current at approximately 1.03 V vs Ag/AgCl. Therefore, to find the best conditions for taking a sharp analytical peak concerning the electro-oxidation of Tam, the effects of different factors such as scan rate, deposition potential, deposition time and concentration of H_2SO_4 on anodic peak have been studied and optimized. A DPV method with good precision and accuracy was developed for the determination of Tam in pharmaceutical formulations. The calibration curve showed linearity in the range of 0.5 to 80 µM and the limits of detection (LOD) and quantitation (LOQ) were calculated to be 0.12 and 0.4 µM, respectively. The mean, standard error and relative standard deviation (RSD) for 4 replicates of 15 µM were found to be 15.57 µM, 3% and 4%, respectively.

کلمات کلیدی:

Tamoxifen, DPAASV, Striping voltammetry, deposition

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