ABSTRACT

The presented Bachelor Thesis deals with a study of electrochemical behavior of 5-nitroindazole (5-NI) with the search of optimal conditions for its determination using techniques of DC voltammetry (DCV) and differential pulse voltammetry (DPV) at hanging mercury drop electrode (HMDE) and polished silver solid amalgam electrode (p-AgSAE), and with the comparison of reached limits of quantification (L_Q).

The optimal conditions found for determination of 5-NI in deionized water using DPV at HDME were as follows: Britton-Robinson (BR) buffer of pH 8.0 and inital potential of +100 mV. The calibration dependences were measured in the concentration range from $1{\cdot}10^{-7}$ to $1{\cdot}10^{-5}$ mol·dm^{-3} with the L_Q of $1.8{\cdot}10^{-7}$ mol·dm^{-3}.

Moreover, the posibility of using adsorbtion stirring voltametry (AdSV) for determination of 5-NI in BR buffer of pH 8 was investigated. The method was ineffective due to rising baseline.

The mechanism of electrochemical reduction and oxidation in BR buffer of pH 8 at HMDE was investigated. It was found that the reduction of 5-NI was controlled by diffusion and the following oxidation was controlled by adsorbtion.

For determination of 5-NI in deionized water using DVP at p-AgSAE, optimal conditions seemed to be as follows: BR buffer of pH 8.0 and initial potential of +100 mV. Optimal regeneration potentials for pH 8 were found as $E_{reg,1}$ = 0 mV a $E_{reg,2}$ = −1200 mV. The calibration dependencies were measured in the concentration range from $1{\cdot}10^{-6}$ to $1{\cdot}10^{-5}$ mol·dm^{-3} with the $L_Q = 1{\cdot}10^{-6}$ mol·dm^{-3}.

Objective Words:

Analytical chemistry
Electrochemistry
Voltammetry

Key Words:

5-Nitroindazole
DC Voltammetry
Differential Pulse Voltammetry
Hanging Mercury Drop Electrode
Silver Solid Amalgam Electrode