Abstract

In this thesis, it was for the first time studied the electrochemical behaviour of cinchona alkaloids quinine and cinchonidine by cyclic voltammetry and differential pulse voltammetry using boron doped diamond (BDD) thin film as an electrode material. Cyclic voltammograms did not exhibit any significant anodic signals corresponding to a simple electrode reaction. However, current increase with indistinctive maxima compared to the basic electrolyte was recorded in Britton – Robinson buffers with pH 2,0 − 12,0 medium. Accordingly, insignificant signals observable in the cathodic area at far negative potential close to the potential of decomposition of the supporting electrolyte , presumably to the reduction of quinoline skeleton. It was found by means of differential pulse voltammetry that the number of those observable current maxima varies for quinine and cinchonidine in different supporting electrolytes. Quinine provided the best developed anodic peaks in the medium of BR buffer pH 5,0 and 6,0 and cinchonidine in pH 7,0, 9,0 and 12,0. The calibration dependence of anodic peak of quinine in BR buffer pH 5,0 is linear in the concentration range $6 \cdot 10^{-6}$ mol·l^{-1} − $1 \cdot 10^{-4}$ mol·l^{-1} with limit of quantitation $4{,}39 \cdot 10^{-6}$ mol·l^{-1}. In the cathodic area the limit of quantitation is $4{,}33 \cdot 10^{-5}$ mol·l^{-1}. The attempts to develop an analogical method for quantitation of cinchonidine have failed due to its decreased peak current repeatabilities.