THE ELECTROCHEMICAL BEHAVIOR OF Co(II) HISTIDINE COMPLEX ON CARBON PASTE ELECTRODE

Sinem Ortaboy, Gülten Atun

Istanbul University, Faculty of Engineering, Chem. Dept., 34320 Istanbul, Turkey.
E-mail: ortaboy@istanbul.edu.tr

Transition metal complexes with amino acids in proteins and peptides are used in a great number of biological processes [1, 2]. To elucidate electron and proton transfer mechanisms of these complexes may provide evidence regarding the mechanisms of biological processes due to similarities between electrochemical and biological reactions concerning electron transfer.

Histidine exists widely in living organisms, especially in muscular and nervous tissue and constitutes the brain nervous peptide. Organometallic complexes of histidine have been showed antibacterial, antitumoral and antifungal activity [3, 4].

In this study, electrochemical equilibria of cobalt (II) complex with the α-L-Histidine (His) was investigated in aqueous solutions in deaerated solutions to clarify its electron and proton transfer mechanisms. The electrochemical response of colored Co(His)2(H2O)2 complex was studied using square-wave voltammetry (SWV) technique using carbon paste electrode (CPE). The mechanism of the electrode process was elucidated by examining effects of pH and frequency on voltammograms of the complex. Acetate, phosphate and borate buffers were used for pH adjustments in the range of 4-10 for 0.5 mM Co(II) complex. The numbers of proton (p), electron (n) and transfer coefficient (α) in electrode process were estimated from the change of peak potentials (Ep) depending on pH and frequency (25–200 Hz). The rate constants of electrode processes were calculated by changing Ep with scan rate.

References