

Adsorption enhancement of Pb(II) Ion in the presence of Nicotinic Acid during Cyclic Voltammetry.

ABSTRACT

The solution phase voltammetry employed in the study of metal ion interaction with a selected ligand. Voltammetry behaviours of lead (II) ion in the presence of ligand with N-heterocycle compounds, such as nicotinic acid (pyridine-3-carboxylic acid) were being studied using cyclic voltammetry (CV) on a hanging dropping mercury electrode (HDME). Assessment of the chemical and physical conditions that may favour optimum current enhancement was done by studying the effect of varying pH, concentration of metal ion and scan rate. It was found that in presence nicotinic acid (NA) result in a shift in peak potential (E_p) and peak current (I_p) in the determination of Pb(II). The addition of 1×10^{-2} M nicotinic acid in 0.1 M potassium chloride at pH 4.0 and scan rate of 100 mV/s in CV was required for optimum current enhancement to be observed by about 4.9 fold and 1.6 fold in oxidation and reduction current of Pb(II) respectively. Based on chronocoulometry and chronoamperometry technique the diffusion for Pb(II) were estimated by 9.18×10^{-6} cm²/s and 5.0 μ c/cm² respectively. The procedure was successfully applied to the simultaneous determination of Pb(II) ion in some real samples.

Keyword: Lead(II) ion; Nicotinic acid; Cyclic voltammetry; HMDE.