Ain Shams University
Faculty of Science
Chemistry Department

Kinetics of complexation of transition metal ions with some organic acids in various media

A Thesis Submitted by

Mahmoud Abd Elnaby Ahmed Abd Eltwab

B.Sc., Chemistry Department, Faculty of Science,
Ain Shams University (2010)

"A thesis submitted as a partial fulfillment of the requirements for the degree of Master of Science (M.Sc., Physical Chemistry) at Chemistry Department, Faculty of Science, Ain Shams University"

Supervised by

Prof. Dr. Hesham Ahmad Aly Medien
Prof. of Physical Chemistry
Faculty of Science
Ain Shams university

Dr. Hesham Samir Abdel-Samad
Lecturer of Physical Chemistry
Faculty of Science
Ain Shams university

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APPROVAL SHEET

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Thesis Supervisors **Thesis Approved**

Prof. Dr. Hesham Ahmad Aly Medien
Professor. of Physical Chemistry,
Faculty of Science, Ain Shams university

Dr. Hesham Samir Abdel-Samad
Lecturer of Physical Chemistry
Faculty of Science, Ain Shams university

Head of Chemistry Department

Prof. Dr. Ibrahim Housiny Ali Badr
Professor of Analytical Chemistry,
Faculty of Science, Ain Shams university

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Abstract

Kinetic study of formation of 1:2 complex between chromium (III) and nicotinic acid in weak acid aqueous solution was investigated spectrophotometrically at λ=575 nm. Experimental results showed that the reaction took place in multiple steps. Increasing hydrogen ion concentration led to a decreasing in the reaction rate. The rate constants k_{1obs} and k_{2obs} increased with decreasing the dielectric constant of the reaction medium indicating that the reaction is an ion pair type.

The kinetics of oxidation of chromium nicotinate complex by $NaIO_4$ to Cr(VI) have been studied spectrophotometrically. The reactions exhibited biphasic kinetic behavior through which an intra molecular electron transfer process took place.

The kinetics of substitution of aquo-ligand from hydroxopenta-aquo Ferric (III) by N-Phthaloylglycine in aqueous medium has been studied spectrophotometrically. The rate law involving the formation of ion-pair has been established in the pH 2.8 and 50ºC.

Keywords

Kinetics, substitution, Chelation, Complexaion

Oxidation, Ionic strength, Dielectric constant, Temperature,

Order, Rate constant, Initial rate, Mechanism.

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