



**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**

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

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for the degree of Master of Science (M.Sc., Physical Chemistry)  
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## **APPROVAL SHEET**

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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  $\lambda=575$  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  $\text{NaIO}_4$  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 50°C.

## **Keywords**

Kinetics, substitution, Chelation, Complexaion  
Oxidation, Ionic strength, Dielectric constant, Temperature,  
Order, Rate constant, Initial rate, Mechanism.

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