سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

سامية محمد مصطفى

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

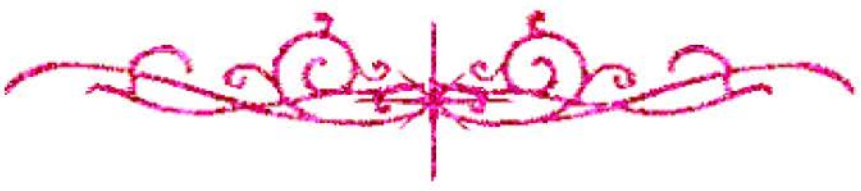
يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

سامية محمد مصطفى

شبكة المعلومات الجامعية

بعض الوثائق الأصلية تالفة



سامية محمد مصطفى

شبكة المعلومات الجامعية

بالرسالة صفحات لم ترد بالأصل

THERMODYNAMIC FUNCTIONS OF ELECTROLYTE SOLUTIONS

A THESIS

SUBMITTED TO THE FACULTY OF SCIENCE (Qena)
SOUTH VALLEY UNIVERSITY
FOR THE DEGREE OF DOCTOR OF
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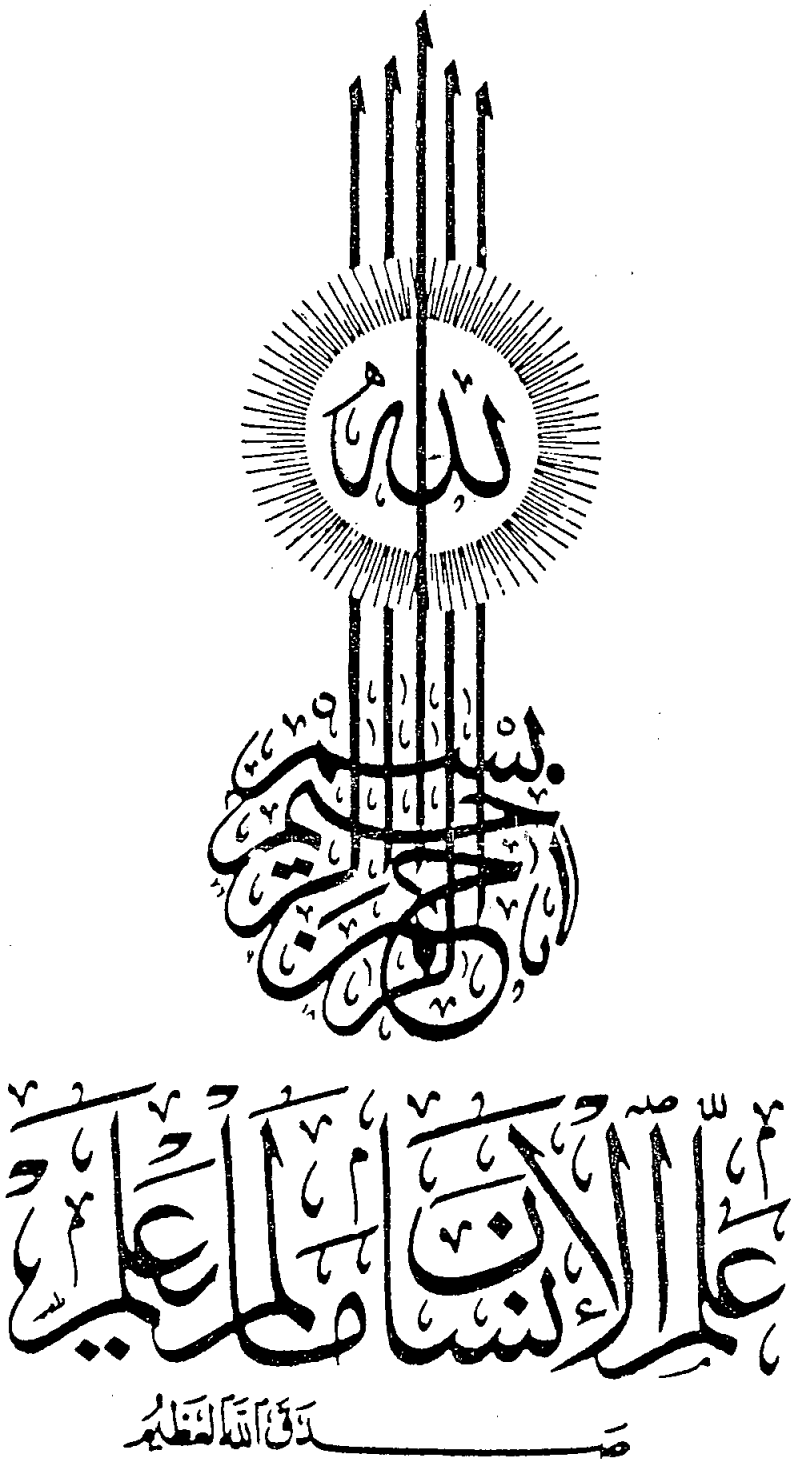
الله
بسم الله الرحمن الرحيم
علم الإنسان ما لم يعلم
صدق الله العظيم

To : *My Family*

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CHAPTER 1

INTRODUCTION

INTRODUCTION

The ionic solution basis lies in the Debye-Hückel theory[1] of electrolyte solution. This theory is exact in the limit of small concentrations. Many theoretical research have been made to explain the difficulties of the Debye-Hückel theory and extend it to more general models or higher concentrations. The modern statistical theory of dilute electrolytes goes back to the work of Kirkwood and Poirier,[2] Bogoliubov,[3] Mayer,[4] Haga,[5] Poirier,[6] Meeron,[7,8] Falkenhagen,[9] and Kelbg[10] and, last but not least, to the work of McMillan-Mayer.[11] The McMillan Mayer theory provides a clear framework for developing approximate calculations of the thermodynamic properties of solutions, and electrolyte solutions in particular.

The complexity of the subject of the thermodynamic functions necessitated a study of both dilute and concentrated solutions.[12] The treatment of concentrated solutions had been made first by Debye and Hückel. The modern theory of ionic solutions which describes the properties of electrolytes has been developed under the law of force of attraction between ions and by specialized application of the fundamental concepts of electrostatics, hydrodynamics and statistical mechanics. Many simplified models are used to discuss the theoretical structure of electrolyte solutions with mathematical approximations in the treatment of these models.[13,14]

The primitive model (PM) is a commonly used model for