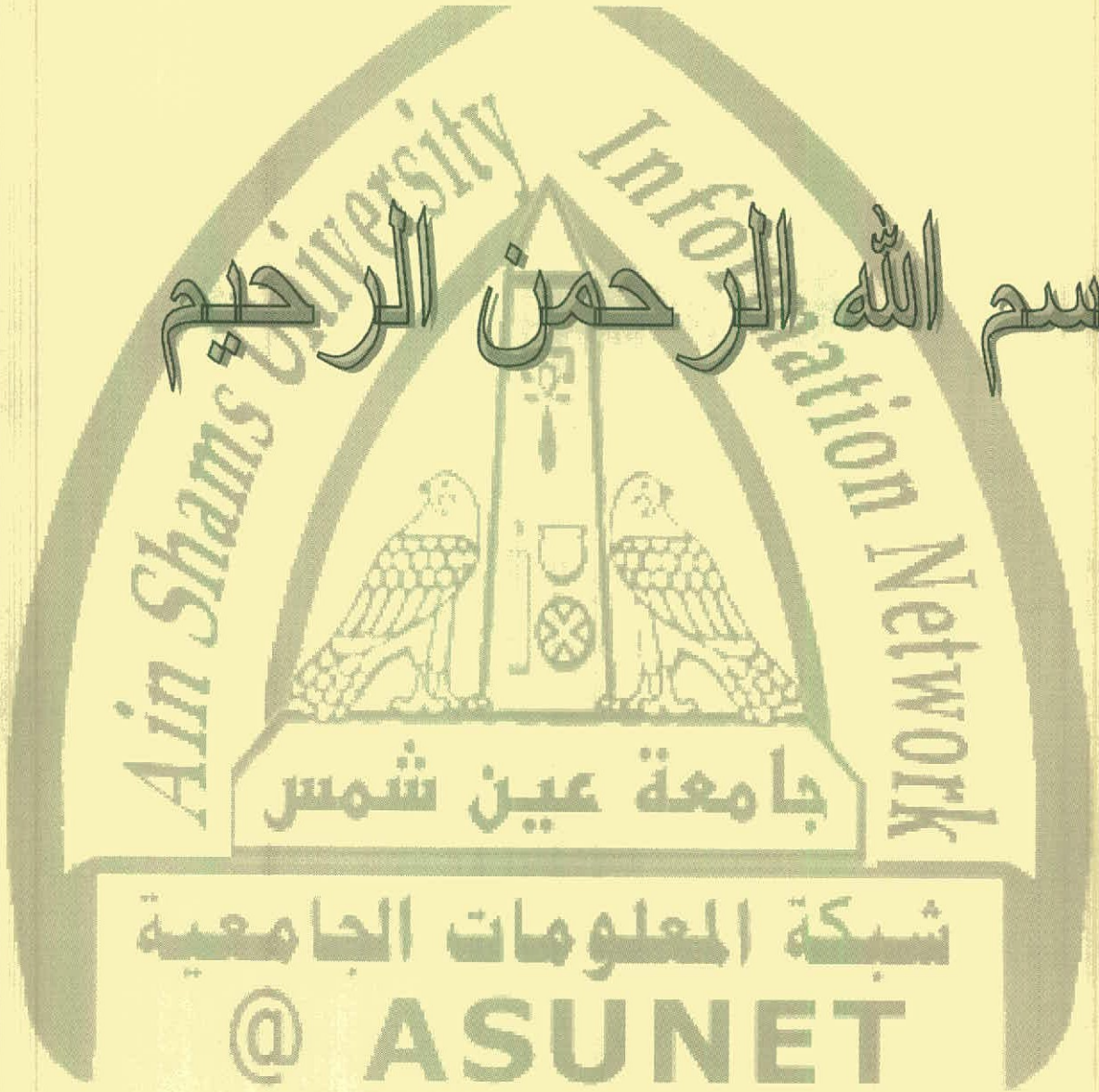
شبكة المعلومات الجامعية



بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالاصل

Electropolymerization of Aminoanthraquinone – Kinetics of the Polymer Film Formation and its Electroanalytical Applications

A Thesis Presented
To
Faculty of Science
Cairo University

By
Shymaa Samir Mohammed Medany
(M. Sc. 2006)
Faculty of Science, Cairo University

For
The Degree of Doctor of Philosophy
(Chemistry)

(2010)

APPROVAL SHEET FOR SUBMISSION

Title of the Ph. D. thesis:

Electropolymerization of aminoanthraquinone - Kinetics of the polymer film formation and its electroanalytical applications.

Name of the candidate: Shymaa Samir Mohammed Medany

This thesis has been approved for submission by the supervisors:

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Abstract

Name : Shymaa Samir Mohammed Medany

Title of thesis: Electropolymerization of aminoanthraquinone- Kinetics of the polymer film formation and its electroanalytical applications.

Degree : Ph. D. Thesis, Faculty of Science, Cairo University, 2010

(Abstract)

Aminoanthraquinone, AAQ, was electropolymerized in mixed solvent to form poly (aminoanthraquinone), PAAQ, films. In order to optimize the conditions for polymer film formation and its electrochemical response in aqueous media, the factors that influence the stability and the electroactivity of the polymer film were subjected to intensive investigation. The kinetics of the electropolymerization of PAAQ prepared from aqueous, non-aqueous and mixed solvents was carried out by determining the change of charge consumed in the polymerization process with time at different concentrations of both monomer and electrolyte. The results have shown that the process follows first order kinetics with respect to the monomer concentration either in aqueous, non-aqueous or mixed solvent. The order of the reaction with respect to the supporting electrolyte in non-aqueous solutions was found to be zero. The order of the reaction with respect to the aqueous or mixed solvent i.e. H_2SO_4 was found to be negative. The polymer films were successfully used as sensor for the electroanalytical determination of many hazardous compounds, e.g. phenols, and biologically important materials like dopamine. The electroanalytical determination was based on the measurements of the oxidation current peak of the material in the cyclic voltammetric measurements and calibration curves were constructed

Keywords: Aminoanthraquinone, Ascorbic acid, catechol, dopamine, electroanalytical applications, hydroquinone, kinetics, polyaminoanthraquinone.

Supervisors:
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