

Ain Shams University
Faculty of science
Department of Chemistry

ELECTROPOLYMERIZATION OF SOME AROMATIC AMINE DERIVATIVES AND THE APPLICATION OF THE OBTAINED POLYMERS AS CORROSION INHIBITORS

Thesis

Submitted By
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M. Sc. chemistry (2000)

To

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For the Degree of Ph.D. of Science
(Chemistry)

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Title

**ELECTROPOLYMERIZATION OF SOME
AROMATIC AMINE DERIVATIVES AND THE
APPLICATION OF THE OBTAINED POLYMERS
AS CORROSION INHIBITORS**

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Acknowledgement

ACKNOWLEDGEMENT

No words can ever express my sincere gratitude to **ALLAH** who guided and aided me to bring forth this thesis to light

All words fail to express my thanks and sincere gratitude to Prof. Dr./ **Sayed Sabet Abd EL Rehim**, Professor of physical chemistry, Faculty of Science, Ain Shams University, Prof. Dr./ **El-Saied Mahmoud Sayyah**, Professor of physical chemistry, Faculty of Science, Beni-Suef Branch, Cairo University and Dr./ **Magdy Ahmed Mahmoud**, Assistant Professor of physical chemistry, Faculty of Science, Ain Shams University, for suggesting the point of research, their continuous supervision, advice, fruitful discussions, indispensable help to write down this work in its final form.

Also, I wish to express my thanks to all the staff members of Chemistry Department, Faculty of Science, Ain Shams University and the staff members of Electrochemistry Lab. Faculty of Science, Beni-Suef University for their cooperation.

I owe great support and sincere love to my family who stood by me during hard and difficult times.

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International Journal of POLYMERIC MATERIALS

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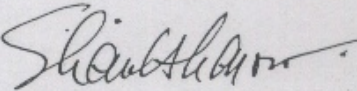
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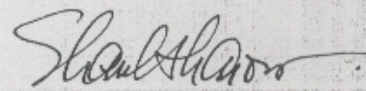
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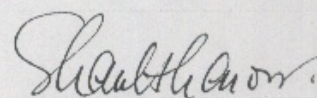
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ARABIC SUMMARY

Arabic summary

ABSTRACT

NAME : Soha Mohammed Kamal
TITLE OF THESIS : Electropolymerization of some aromatic amine derivatives and the application of the obtained polymer as corrosion inhibitors
DEGREE : Ph.D. in Science (Physical Chemistry – Electrochemistry)

Electropolymerization of 2-amino-4-(4-methoxyphenyl) thiazole, 2-Chloroaniline, 3-methoxyaniline and a binary mixture of (2-amino-4-(4-methoxyphenyl) thiazole with 2-Chloroaniline) on platinum foil electrode from aqueous acid medium solution were carried out under different reaction parameters such as duration time, current density, temperature, acid and monomer concentrations. The initial rate of the electropolymerization reaction for each polymerization system was calculated from the yield-time curves. The orders of the electropolymerization reactions with respect to current density, acid and monomer concentrations for each polymerization system were determined from the double logarithmic relationship between the initial rates and the concentration of the investigated parameters.

The effect of temperature on the electropolymerization reaction rate for each system was investigated and the initial rate was calculated. The apparent activation energy (E_a) for each electropolymerization system was determined using Arrhenius equation, Also the thermodynamic activation parameters (ΔS^* and ΔH^*) were calculated using Eyring equation. From the above kinetic studies, the reaction rate law for each electro-copolymerization system is given. The mechanism of the electropolymerization reaction for each system is discussed.

The obtained polymer samples were characterized by cyclic voltammetry, elemental analysis, UV-visible ir, ^1H -NMR spectroscopy, GPC and thermal analysis. The surface morphology