Faculty of Science

Preparation and Application of Some Metallic Nanoparticles Capped by Surfactants as Corrosion Inhibitors for Carbon Steel

Submitted by

Marwa Yehia Ahmed Mohamed

(M. Sc. Inorganic)

For the Award of the Ph.D. Degree in Physical Chemistry

To

Chemistry Department

Faculty of Science

Ain Shams University

Cairo, Egypt

2016

Preparation and Application of Some Metallic Nanoparticles Capped by Surfactants as Corrosion Inhibitors for Carbon Steel

Ph.D. Thesis
(Chemistry)

Supervised by

Prof. Dr. Sayed S. Abd El Rehim
Prof. of Physical Chemistry
Faculty of Science
Ain Shams University

Prof. Dr. Abdel Fattah M. Badawi
Prof. of Applied Organic Chemistry
Egyptian petroleum Research Institute

Assoc. Prof. Dr. Mohamed Abd El- Azim Hegazy
Assoc. Prof. of physical Chemistry
Egyptian petroleum Research Institute

APPROVAL SHEET

Preparation and Application of Some Metallic Nanoparticles Capped by Surfactants as Corrosion Inhibitors for Carbon Steel

By

Marwa Yehia Ahmed Mohamed

(M. Sc. Inorganic)

This thesis for Ph.D. Degree has been approves by:

1. Prof. Dr. Sayed S. Abd El Rehim

Prof. of Physical Chemistry

Faculty of Science – Ain shams University

2. Prof. Dr. Abdel Fattah M. Badawi

Prof. of Applied organic chemistry

Egyptian petroleum Research Institute

3. Assoc. Prof. Dr. Mohamed Abd El- Azim Hegazy

Assoc. Prof. of physical Chemistry

Egyptian petroleum Research Institute

Prof. Dr. Hamed Ahmed younis Derbala

Head of Chemistry Department

Faculty of Science- Ain Shams University

Signature:……………………………………………..

QUALIFICATION

Name	**:**	Marwa Yehia Ahmed Mohamed
Scientific Degree	**:**	M.Sc.
Department	**:**	Chemistry
College	**:**	Faculty of Science
University	**:**	Cairo University
M.Sc. Graduation Year	**:**	2012

Acknowledgment

First of all, I would like to express my full respectful thanks and sincere gratitude to **Prof. Dr. Sayed S. Abd El Rehim**, Professor of Physical Chemistry, Faculty of Science, Ain Shams University for his kind supervision, continuous and valuable help, fruitful criticism and encouragement during the execution of this work. I would like also to express my most sincere gratitude to **Prof. Dr. Abdelfatah M. Badawi**, Professor of Applied Organic Chemistry, Egyptian Petroleum Research Institute (EPRI), for his kind advices, supervision and encouragement throughout this piece of research work. Great many thanks also go to **Dr. Mohamed Abd El-Azim Hegazy**, Assoc. Professor of Physical Chemistry, Egyptian Petroleum Research Institute (EPRI), for suggesting the problem and his continuous advice, talented supervision and valuable criticism during the progress of the work. Most of all, I am indebted and grateful to the unflinching and unfailing help, encouragement, and support of my family to whom I dedicate every success.

Dedication

*To my **mother** with my deep and sincere appreciation for their great efforts during my life and my studies.*

*To my **husband** with my great thanks for their help and to my **daughters** and my **sons**.*

*To my **sisters** sincere appreciation for their great efforts my studies.*

*Specially thanks to my **uncle usama***

Marwa yehia

List of contents

Topics	**Page**

Topics	**Page**

Topics **Page**

List of Tables

Table No.	Title	Page

List of Figures and photographs

Figure No.	Title	Page
	Section B	