Ain Shams University
Faculty of Science
Chemistry Department

Corrosion behaviour of some copper alloys in LiBr solutions used in refrigeration absorption systems

Submitted to Chemistry Department
Ain Shams University
In Fulfillment of the Requirements For
The Degree of

Ph. D. in Chemistry

By

Shaimaa Esmat Abd Elhamid Abd Elaziz

M.Sc. (Chemistry), (2013)

Supervised By

Prof. Dr. S. Abdel Wahab

Prof. Dr. Ali Abd El Fattah El Warraky

Dr. Abeer Esmat El Meleigy

2020

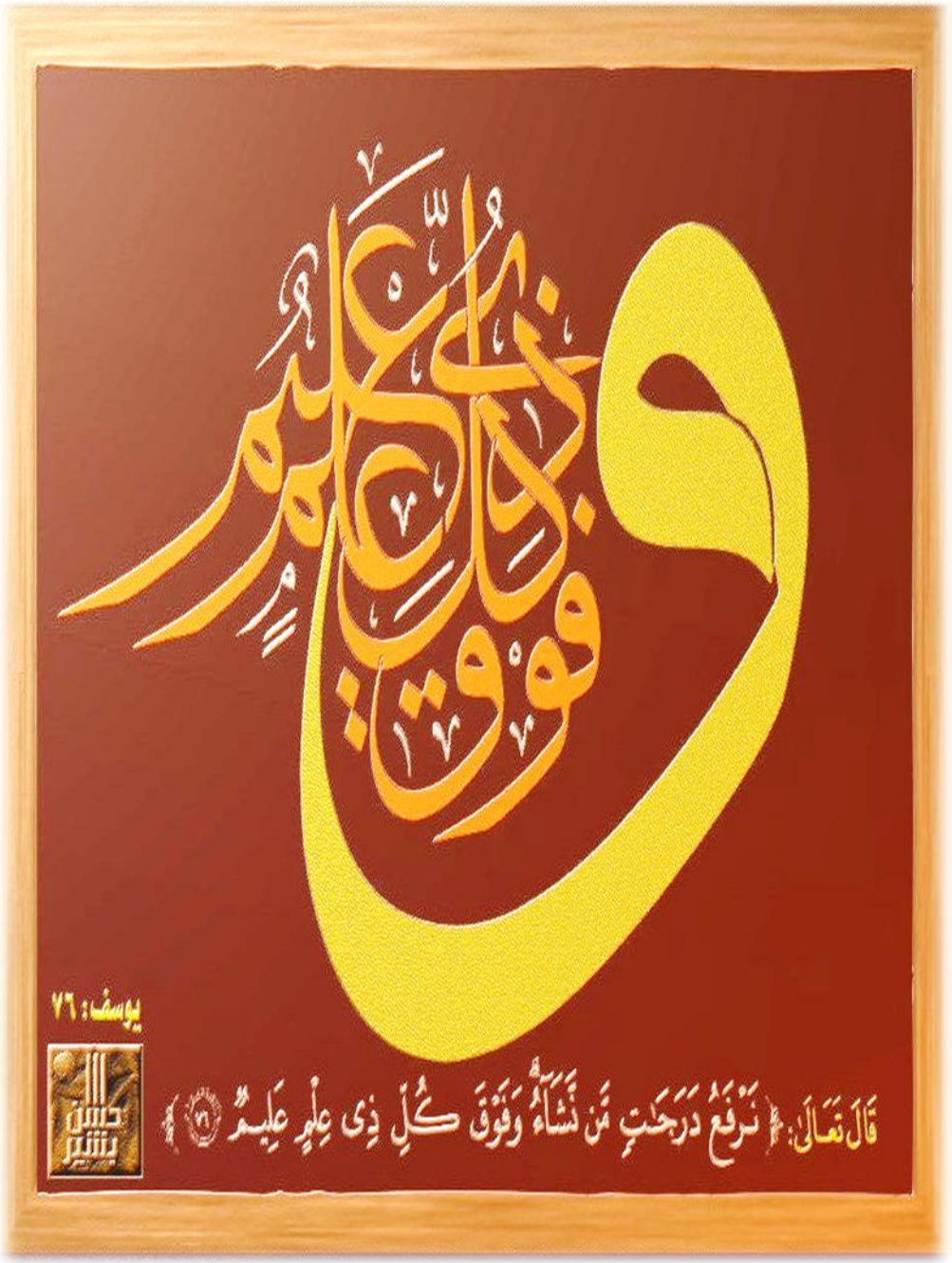
Ain Shams University
Faculty of Science
Chemistry Department

Corrosion behaviour of some copper alloys in LiBr solutions used in refrigeration absorption systems

Thesis Approved	Thesis Advisors
Prof. Dr. S. Abdel Wahab	**……**
Prof. Dr. A. A. El Warraky	**……**
Dr. A. E. El Meleigy	**……**

Head of Chemistry Department

Prof. Dr. Ayman Ayoub Abdel-Shafi


وفوق كل ذي علم عليم
يوسف: ٧٦
قال تعالى: ﴿ نَرْفَعُ دَرَجَاتٍ مَّن نَّشَاءُ وَفَوْقَ كُلِّ ذِي عِلْمٍ عَلِيمٌ ﴿٧٦﴾ ﴾
حسن بشير

Acknowledgement

First, all thanks and praise are to ***Allah*** *for giving me prosperity and strength to fulfill this work.*

The author wishes to express his thanks to ***Prof. Dr. S. Abdel Wahab,*** *professor of physical chemistry, Faculty of Science, Ain Shams University, for his interest in the work and sponsoring the thesis to the university.*

Special thanks are due to ***prof. Dr. A. A. El Warraky****, professor of physical chemistry department, National Research Center, Cairo for suggesting the research subject, supervision and valuable discussion.*

Thanks, are also due to both ***Dr. A. E. El Meleigy and Dr. A. Badawy****, Researcher assistance professor of physical chemistry, National Research Center, Cairo, for valuable help and assistance during the work.*

The author wishes also to thank her colleges in the laboratory of electrochemistry and corrosion, National Research Center for their unfailing assistance and help.

CONTENTS

LIST OF FIGURES

Page

LIST OF TABLES

Page