بسم الله الرحمن الرحيم

جامعة عين شمس
Ain Shams University Information Network
شبكة المعلومات الجامعية
@ ASUNET

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

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

MONA MAGHRABY

Ain shams University
Faculty of Science
Chemistry Department

"Loading of some Radionuclides on Nano-sorbents for Nuclear Applications"

A Thesis

Submitted to Chemistry Department, Faculty of Science,

Ain shams University

By

Alaa Farid Mohamed El-Daoushy

(B. Sc., Chemistry 2008)

(M. Sc., Inorganic Chemistry 2016)

Assistant Lecturer at Radioactive Isotopes and Generator Dept.

Atomic Energy Authority

In Partial Fulfillment of the Requirements for the Degree of

PHD of SCIENCE

(Inorganic and Analytical Chemistry)

Under Supervision of

Prof. Dr. Wagiha Hamed Mahmoud

Prof. of Analytical Chemistry – Chemistry Department – Faculty of Science – Ain Shams University

Prof. Dr. Khalid Mohamed Saleh El-Azony

Prof. of Radiochemistry – Hot Labs Center – Atomic Energy Authority

Prof. Dr. Sami Abu-Bakr El-Bayoumy

Prof. of Radiochemistry – Hot Labs Center – Atomic Energy Authority

Dr. Tamer Mostafa Mohamed Hafez

Assist. Prof. of Radiopharmaceutical Chemistry– Hot Labs Center – Atomic Energy Authority

2020

“Loading of some Radionuclides on Nano-sorbents for Nuclear Applications”

By

Alaa Farid Mohamed El-Daoushy

Assistant Lecturer at Radioactive Isotopes and Generator Dept.
Atomic Energy Authority

Supervisors	**Approval**
1- Prof. Dr. Wagiha Hamed Mahmoud Prof. of Analytical Chemistry, Chemistry Department, Faculty of Science, Ain Shams University	-------------------------------------
2- Prof. Dr. Sami Abu-Bakr El-Bayoumy Prof. of Radiochemistry, Hot Labs Center, Atomic Energy Authority	-------------------------------------
3- Prof. Dr. Khalid Mohamed Saleh El-Azony Prof. of Radiochemistry, Hot Labs Center, Atomic Energy Authority	-------------------------------------
4- Dr. Tamer Mostafa Mohamed Hafez Assist. Prof. of Radiopharmaceutical Chemistry, Hot Labs Center, Atomic Energy Authority	-------------------------------------

بسم الله الرحمن الرحيم

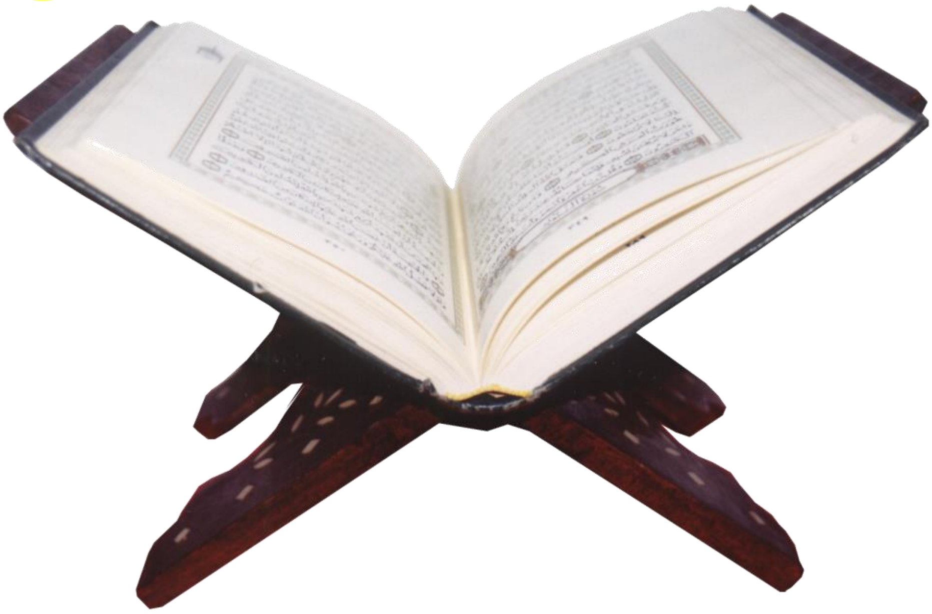
بسم الله الرحمن الرحيم

وعلمك ما لم تكن تعلم

وكان فضل الله عليك عظيما

سورة النساء / آية 113

صدق الله العظيم



Dedication

This thesis is dedicated to my father, my mother, my husband, my daughter, my brother and my sisters

Acknowledgments

My first and most important acknowledgement goes to **Allah** for enlightening my way and strengthening my well to produce this work, asking **Allah** to increase **His** Grace and Generosity.

If one were to consider the significant milestones in their own lives, it would become necessary to also consider those who have made these milestones possible. Who does not thank people does not thank God. So here, I will do my best to acknowledge the people who have made this thesis a reality.

I would like to express my deep gratitude and appreciation to **Prof. Dr. Sami Abu-Bakr El-Bayoumy,** Professor of Inorganic Radiochemistry, Chemistry, Hot Labs. Center, Atomic Energy Authority, for his direct supervision, keen interest, valuable guidance and continuous help throughout the completion of the thesis.

I would like to express my great thanks to **Prof. Dr. Wagiha Hamed Mahmoud,** Prof. of Analytical Chemistry, Chemistry Department, Faculty of Science, Ain Shams University, for her valuable scientific supervision, kind and careful revision of this work. She has always been and will represent to me supervisor, whom I respect and I am honored to be now one of her students.

I would like to express my sincere appreciation to **Prof. Dr. Khalid Mohamed Saleh El-Azony**, Prof. of Inorganic Radiochemistry, Hot Labs. Center, Atomic Energy Authority, for planning of the experimental work, giving me all the scientific and moral support, cooperation, encouragement and kind help in the practical part of this thesis.

I would like to offer my deepest gratitude and appreciation to **Assist. Prof. Tamer Mostafa Mohamed Hafez,** Assist. Prof. of

Radiopharmaceutical Chemistry, Hot Labs Cener, Atomic Energy Authority, for suggesting the point of the research, for his valuable supervision, instructions, advises and indispensable help during the course of this work.

I cannot find words to thank **Dr. Mohammed Ismaeal Mohammed Mohammed,** Lecturer of Inorganic Radiochemistry, Hot Labs. Center, Atomic Energy Authority, for his continuous advice and kind support during the course of the thesis.

I cannot find suitable words to thank my beloved family, **my father** and **my mother** I thank them for the values that they have instilled in me. From them, I have learned what it means to set goals and to work hard to achieve them. I would like to thank them for their kind encouragement and confidence.

I would like to express my love before thanks to my husband **Mohamed Fawzy Nawar** who was beside me along the way and share me the most difficult moments in my progress, and I hope that we will remain together throughout my life and will always be witness for his success and I will be beside him.

I cannot find words to thank my beloved **daughter; Malika, my brother; Ahmed** and **my sisters; Nada & Esraa.** I would like to thank them for their encouragement and support.

My final thanks devoted to all members of radioactive isotope and generators department, Atomic Energy Authority and chemistry department, Benha University for their nice cooperated interaction.

Alaa Farid El-Daoushy

2020

Table of contents

Chapter One: Introduction

Chapter Two: Experimental

Chapter Three: Results and Discussion

Part I: Preparation & Characterization

Part II: $^{34}Cs(I)$ and $^{60}Co(II)$ Sorption Study & Sealed Source Preparation

Part III: I-131