

بسم الله الرحمن الرحيم



HOSSAM MAGHRABY



شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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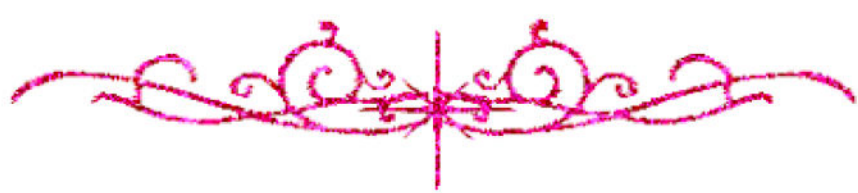
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بعض الوثائق الأصلية تالفة



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بالرسالة صفحات

لم ترد بالأصل



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Ain Shams University
Faculty of Science
Chemistry Department

Synthesis and characterization of some new lanthanide complexes and their applications in various fields

Submitted By

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B.Sc. of Science (Physics - Chemistry) , Faculty of Science ,
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A Thesis submitted in partial Fulfillment

of

The requirement for Master Degree

In

Chemistry

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2019



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For the M.Sc Degree of Science
In
Chemistry

to
Department of Chemistry
Faculty of Science
Ain Shams University

2019



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various fields**

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Dedication

*To God who supporting me in all my life and
providing me the patience and needed power
to achieve this work,*

*To my dear parents and sisters who are for
believing in me and motivating me
throughout my all time.*

*To my beloved husband for his patience,
kind support and continuous encouragement
during this work,*

To my daughter who is enlighting my life.

Yasmin Kamel Kotb Hassan

ACKNOWLEDGEMENT

*First and foremost, I would like to thank **God** for giving me the opportunity and well-power to accomplish this work.*

*I would like to express my sincere gratitude and indebted to **Prof. Dr Fatma Mohamed Eldesouky Elzawawy**, Prof. of inorganic Chemistry, Chemistry Department, Faculty of Science, Ain Shams University. She was always kind enough to suggest the topics of research and to follow up the progress of the work with keen interest.*

*Also, I wish to express my sincere gratitude **Prof. Dr. Ayman Ahmed Abdel Aziz Eldakhakahny**, Prof. of inorganic Chemistry, Chemistry Department, Faculty of Science, Ain Shams University, who has been the inspiration for the whole thesis. He was always kind enough to suggest the topics of research and to follow up the progress of the work with keen interest, guidance and valuable criticism and whose efforts made this humble work as possible. Thanks for bearing up with me.*

Yasmin Kamel Kotb Hassan

Abstract

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New lanthanide complexes of the general formulae $[\text{Ln}(\text{L})(\text{NO}_3)(\text{H}_2\text{O})]$ have been synthesized by reaction of $\text{Ln}(\text{NO}_3)_3 \cdot x\text{H}_2\text{O}$ $\{\text{Ln} = \text{La}, \text{Sm} \text{ and } \text{Yb}\}$ with 2,2'-(((1E,1'E)-thiophene-2,5-diylbis(methaneylylidene))bis(azaneylylidene))diphenol (H_2L). Based on elemental analysis and spectroscopic analysis (UV-Visible, FT-IR, ESI-MS, ^1H and ^{13}C NMR), molar conductance, and magnetic moment, an eight -coordinated structure has been proposed.

The results showed that the Schiff base ligand acted as a pentadentate dibasic donor coordinating through the azomethine nitrogen, deprotonated hydroxyl group, and thiophene sulphur atom. *In vitro* anti microbial studies by well diffusion method expressed as the diameter of the growth inhibition area in millimeters revealed that, the new complexes exhibited higher antimicrobial activity than the free parent Schiff base ligand against the same organisms. The interaction of the synthetic compounds with CT-DNA has been studied to investigate their anticancer and antitumor activities by the electronic spectroscopy, fluorometric competition studies with ethidium bromide and DNA viscosity measurements. Furthermore, due to the

ligand and its Ln(III) complexes exhibit good DNA binding affinity, it is considered worthwhile to investigate their antioxidant activity. The data have shown that, the complexes are more effective inhibitors towards reactive oxygen species (ROS), such as superoxide anion and hydroxyl radical, because of the formation of coordination compounds, the scavenger effect can be enhanced in presence of rare earth metal ions. The activity of test compounds in ascending order La complex > Sm complex > Yb complex > H₂L in terms of IC₅₀ value. The anticancer activities of the complexes have also been studied towards human colon carcinoma cancer (HCT-116) and human breast cancer (MCF-7) cell lines. The % Cell Viability and IC₅₀ values indicates that La(III) complex (1) has higher sensitivity than Sm(III) complex (2), Yb(III) complex (3) and the free ligand.

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