Thesis Entitled

Ternary Complexes of Some Transition Metals with Curcumin and Some Nitrogen Containing Compounds: Synthesis, Characterization and Biological Studies

Presented

By

HUDA MAHDI YOUNIS

A Thesis Submited

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APPROVAL SHEET FOR SUBMISSION

Title of M.Sc. Thesis

Ternary Complexes of Some Transition Metals with Curcumin and Some Nitrogen Containing Compounds: Synthesis, Characterization and Biological Studies

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Statement

This thesis is submitted in partial fulfillment of the M.Sc Degree, Faculty of Science, Ain Shams University

In addition to the work carried out in this thesis the candidate, **Huda Mahdi Younis**, has attended postgraduate studies in the following topics and passed successfully in the final examination in the academic year 2009-2010:

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ABSTRACT

Student Name: Huda Mahdi Younis
Title of the Thesis: Ternary Complexes Of Some Transition Metals With Curcumin And Some Nitrogen Containing Compounds: Synthesis, Characterization And Biological Studies
Degree: M. Sc. (Inorganic Chemistry)

The present study interested in synthesis and characterization of ternary complexes of some transition metals (Ni(II), Co(II), Cu(II), and Zn(II)) with curcumin in presence of secondary ligand such as 1,10-phenanthroline (phen), 2,2'-bipyridine (bpy) and 8-hydroxyquinoline (HQ).

The new series of mixed-ligand metal complexes of Ni(II), Co(II), Cu(II), and Zn(II) with curcumin using phen, bpy and HQ as secondary ligands were characterized and their structures were confirmed by elemental analysis, molar conductivity, FTIR, Uv-Vis, and ^{1}H-NMR spectroscopy and magnetic moments as well as thermal analysis. The resulted ternary complexes were tested for the biological activity against some bacteria and fungi and anti-cancer activity towards the liver line cells.

Keywords: curcumin, ternary complexes, 1,10-phenanthroline, 8-hydroxyquinoline, FT-IR and anticancer

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Huda Mahdi Younis

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AIM OF THE STUDY

The present work aimed to fulfill the following objectives:

1. Synthesis of ternary complexes of some transition metals with curcumin as primary ligand and some nitrogen containing compounds as secondary ligands.

2. Characterization of the newly synthesized complexes using elemental analysis, FT-IR, mass spectroscopy, Uv-Visible spectra, magnetic susceptibility, thermal analysis.

3. Study of the biological activity of the resulting complexes as antimicrobial and anticancer agent.

Summary

Curcumin, an extract of turmuric, Curcuma longa L., has been used for centuries in a variety of pharmaceutical applications, including as a treatment for arthritis, as an anti-inflammatory agent and as an orally available treatment for diabetes. Curcumin is well absorbed, both in vitro and in vivo, and has an exceedingly low toxicity index. This study interested in synthesis and characterization of ternary complexes of some transition metals (Ni(II), Co(II), Cu(II), and Zn(II)) with curcumin in presence of secondary ligand such as 1,10-phenanthroline (phen), 2,2'-bipyridine (bpy) and 8-hydroxyquinoline (HQ) and study the biological activity and anti-cancer activity towards the liver line cells.

This thesis is divided into three chapters as following:

Chapter One: gives a general introduction and literature survey about curcumin and its binary complexes with some transition elements and lanthanides. Ternary complexes using secondary ligands used in the study and ternary complexes of curcumin also surveyed.

Chapter Two: deals with the practical methods the ternary complexes and description of the different physicochemical methods of analysis and characterization such as elemental analysis, molar