SUMMARY

The present thesis comprises five chapters:

1- ***Chapter (I)*** includes an introduction about the azo dye and Schiff base compounds and their analytical applications. Also this chapter includes a literature survey of the previous studies on azo dye and Schiff base compounds and a literature survey on the previous studies on the spectrophotometric determination of copper, cadmium, mercury, silver and zinc ions. Also this chapter contains a literature survey on the physicochemical studies of azo dye and Schiff base complexes which spectrophotometric, conductometric, potentiometric, thermal and biological activity studies.

2- ***Chapter (II)*** includes the experimental part, the materials, the preparation of the azo dyes and Schiff bases under investigation, and their complexes with some transition metal ions. It comprises also information about the instruments and measurements which were used for spectrophotometric, conductimetric, poteniometric, IR, biological activity as well as thermal analyses.

3- ***Chapter (III)*** is divided into four parts:

a- The first part includes the resultes of spectral studies of the prepared organic ligands, where the electronic absorption spectra were studied in different organic solvents of protic and aprotic nature.

b- The second part includes the spectral behaviour of ligands in universal buffer solutions of different pH to determine their ionisation constants using four different methods.

c- The third part includes the IR spectra of the ligands under investigation are studied and the different functional groups are assigned.

d- The 4^{th} part includes the ^{1}H-NMR spectra for different types of hydrogens expected for I_{a-b} and II_{a-d} under study can be numerated determined and correlated to the molecular structure of the ligands.

4- ***Chapter (IV)*** contains studies of complexes in solution where three different points were disscussed:

a- The conductometric titrations which was done to determine the stoichiometric ratio of the complexes formed. Also the conductometric titrations were performed at different temperatures to determine the formation constants and other thermodynamic parameters of copper complexes with the ligands under study.

b- The potentiometric titrations which studied and done by using 0.1M HCl and 1.0M KCl. From the data obtained, the ionization constants of ligands and formation constants of the complexes formed were obtained. Also the effect of ionic strength on the ionization constants was studied.

c- The spectrophotometric studies of metal complexes where a study of the optimum conditions favoring the formation of Cu^{2+}, Cd^{2+}, Hg^{2+}, Ag^{+} and Zn^{2+} complexes in solutions with the azo dye and Schiff base reagents and after that the stability constant of such complex was calculated using two different spectrophotometric methods. Also Beer's low and Ringbom ranges were determined and the effects of foreign ions on the complexes formed were studied. Also analytical applications on some samples such as alloys, garlic, tobacco, waste water of processing of photographic film and water samples were performed for the determination of the metal ions under investigation.

6- ***Chapter (V)*** includes studies of the solid chelates including elemental analysis, molar conductance measurements, TG, DTA, IR, ^{1}H-NMR and electronic absorption spectra in nujol mull and DMF. Also the biological activity studies were performed.

-An Arabic summary is given in addition to the English one and the thesis is ended with the references.