PRESENT WORK
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The perusal of literature reveals the effectiveness of the ligands having system (A), in the determination of some of the transitional metal ions.

The following two ligands having common effective systems (A) but different electron donor substituents, are selected for the present investigation.

\[ HO-\overset{1}{C}=\overset{1}{C}=N-NH_2 \quad (A) \]

LIGAND

\[ R=CH_3, C_2H_5 \]

CHELATE

(I) 2-hydroxy 5-methyl acetophenone hydrazone
and (II) 2-hydroxy 5-methyl propiophenone hydrazone
The following four aspects have been studied in the thesis:

(I) The 1st aspect deals with the preparation of ligand and their analytical investigation.

Two ligands - (i) 2-hydroxy 5-methyl acetophenone hydrazone (ii) 2-hydroxy 5-methyl propionophenone hydrazone have been prepared from the corresponding o-hydroxy aryl ketones and reacted with metal ions like Ba$^{+2}$, Fe$^{+2}$, Fe$^{+3}$, Cr$^{+3}$, Co$^{+2}$, Ni$^{+2}$, Cu$^{+2}$, Mn$^{+2}$, Ca$^{+2}$, Zn$^{+2}$, Mg$^{+2}$ etc. The ligands have been studied for their sensitivity and the possibility of a reaction at various low dilutions and were examined also to react specifically with the desired ions in the presence of another metal ion under controlled pH condition and concentrations.

The ligands have been investigated for quantitative gravimetric analysis of Cu$^{+2}$, Ni$^{+2}$, Co$^{+2}$, Fe$^{+2}$, and Fe within certain range of pH; qualitative and quantitative estimations
of binary and tertiary mixtures have been investigated. The interference of other cations has also been studied within certain range of pH.

(II) The second aspect deals with the constitutional analysis of the chelates and their composition.

The results of gravimetric determination of $\text{Cu}^{+2}$, $\text{Ni}^{+2}$, $\text{Co}^{+2}$ and $\text{Fe}^{+2}$ using these ligands have been studied by back oxidation method and its molecular weight was also confirmed using Rasch method.

Colourimetric investigation of composition of chelates of $\text{Cu}^{+2}$, $\text{Ni}^{+2}$, $\text{Co}^{+2}$, $\text{Fe}^{2+}$ and $\text{Fe}^{3+}$ ions has been studied on the basis of Beer's law.

The composition of the following chelates obtained from the above ligands have been studied in this aspect.

(i) Copperbis$_2$hydroxy$_5$methyleacetophenone-hydrazone.

(ii) Nickelbis$_2$hydroxy$_5$methylacetophenone-hydrazone.
(iii) Cobaltbis2-hydroxy-5-methylacetophenone-hydrazone.

(iv) Ferrous2-hydroxy-5-methyleacetophenone-hydrazone.

(v) Ferric2-hydroxy-5-methylacetophenonehydrazone

(vi) Copperbis2-hydroxy-5-methylpropiophenone-hydrazone.

(vii) Nickelbis2-hydroxy-5-methylpropiophenone-hydrzone.

(viii) Cobaltbis2-hydroxy-5-methylpropiophenone-hydrazone.

(ix) Ferrous2-hydroxy-5-methylpropiophenone-hydrazone.

(x) Ferric2-hydrox-5-methylpropiophenonehydrazone.

The metal ligand ratio has been colourimetrically determined using the Job's method of continuous variation.

(III) The third aspect deals with the study of absorption spectra of the above ligands and chelates. The absorption spectra in the visible and ultra-violet region were recorded and the I.R. and NMR spectra have also been recorded to get supporting evidence.
The magnetic susceptibility determinations of the chelates have also been carried out to get supporting evidence.

(IV) The forth aspect deals with the study of pharmacological application of the said reagents and their corresponding chelates against

(i) Staphylococcus aureus
    Gram positive Cocci.

(ii) Escherichia Coli
    Gram negative rods.

(iii) Pseudomonas aeruginosa
    Gram negative rods.

(iv) Pseudomonas fluorescens
    Gram negative rods.

(v) Aspergillus niger.