

S Y N O P S I S

The dissertation entitled SPECTROPHOTOMETRIC DETERMINATION OF SOME METALS WITH THIOSEMICARBAZONE comprises of five Chapters and gives the account of Chapter I - Introduction of Thiosemicarbazones, Chapter II - Synthesis of ligand (6-Methoxy, 2-Chloroquinoline, 3- Carbaldehyde thiosemicarbazone), Chapter III - Spectrophotometric determination of Copper (II), Chapter IV - Spectrophotometric determination of Cobalt (II) and Chapter V - Spectrophotometric determination of Nickel(II) with the ligand 6-Methoxy, 2-Chloroquinoline, 3-Carbaldehyde thiosemicarbazone (6-MeO-QAT).

An introduction describes thiosemicarbazones as an important class of compounds having wide ranging applications in industries, medicines and analytical chemistry. As far as present study is concerned the review of thiosemicarbazones used in analytical chemistry is given in this Chapter. Thiosemicarbazone acts as a multidentate ligand and forms coloured chelates with metals (usually from transition metal groups). These chelates are then used in selective and sensitive determination of the metals. The Co-ordination of ligand to the metal is through nitrogen atoms either alone or in competition with other electronegative atoms such as oxygen or sulphur.

The synthesis of 6-Methoxy, 2-Chloroquinoline 3-Carbaldehyde thiosemicarbazone and its application in spectrophotometric determination of Cu(II), Co(II) and Ni(II) is discussed in Chapters II, III, IV and V respectively.

Copper (II) forms 1:1 yellow coloured complex with 6-Methoxy, 2-Chloroquinoline 3-Carbaldehyde thiosemicarbazone. For Cu(II) the optimum pH is 6 and λ max. is 380 nm. Beer's law is obeyed upto 4 ppm for Cu(II). The effect of pH, effect of reagent concentration and diverse ions effect have been studied. The molar absorptivity and Sandell sensitivity are $0.4382 \times 10^3 \text{ L Mole}^{-1} \text{ Cm}^{-1}$ and $0.8158 \mu\text{g cm}^{-2}$ respectively. The dissociation constant of complex is 1.579×10^{-4} .

Cobalt (II) forms 1:1 pink yellow coloured complex with 6-Methoxy 2-Chloroquinoline 3-Carbaldehyde thiosemicarbazone. For Co(II) the optimum pH is 6 and λ max. is 390 nm. Beer's law is obeyed upto 3 ppm for Co (II). The effect of pH, effect of reagent concentration and diverse ions effect have been studied. The molar absorptivity and sandell sensitivity are $0.3056 \times 10^3 \text{ L Mole}^{-1} \text{ Cm}^{-1}$ and $1.154 \mu\text{g Cm}^{-2}$ respectively. The dissociation constant of complex is 1.105×10^{-4} .



Nickel (II) forms 1:1 yellow coloured complex with 6-Methoxy 2-Chloroquinoline 3-Carbaldehyde thiosemicarbazone. For Ni (II) the optimum pH is 4 and λ max. is 380 nm. Beer's law is obeyed upto 4.5 ppm for Ni(II). The effect of pH, effect of reagent concentration, and diverse ions effect have been studied. The molar absorptivity and Sandell sensitivity are $0.4880 \times 10^3 \text{ L Mole}^{-1} \text{ Cm}^{-1}$ and $0.7124 \mu\text{g cm}^{-2}$ respectively. The dissociation constant of complex is 0.9433×10^{-4} .

Author wants to propose the new techniques for determination of metal complexes of Cu(II), Co(II) and Ni(II) with 6-Methoxy 2-Chloroquinoline 3-Carbaldehyde thiosemicarbazone. This work has not been done until now.

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