

## S Y N O P S I S

The dissertation entitled, "Spectrophotometric determination of thiosemicarbazone complexes", consists of four chapters and embodies accounts of : Chapter I, an introduction to the subject; Chapter II, Spectrophotometric determination of Copper(II) by 2 chloroquinoline-3-carbaldehyde thiosemicarbazone (QAT); Chapter III and Chapter IV, spectrophotometric determination of nickel(II) and iron(II) with 2 chloroquinoline-3-carbaldehyde thiosemicarbazone respectively.

An introduction describes thiosemicarbazones as fascinating class of compounds having wide ranging applications in medicines, industries and analytical chemistry. As far as present study is concerned the review of thiosemicarbazones used in analytical chemistry is given in this chapter. Depending upon the type of aldehyde or ketone used for condensation, thiosemicarbazones acts as bidentate, unidentate or multidentate ligands and forms highly coloured chelates with metals (usually from transition group). In case of unidentate ligands, bonding occurs only through the sulphur atom. These chelates are then used in selective and sensitive determination of the metals. The co-ordination of the ligands to the metal is through the hydrazino nitrogen atom to give a five membered ring.

The synthesis of 2 chloroquinoline-3-carbaldehyde thiosemicarbazone and its application in spectrophotometric determination of copper(II) is discussed in Chapter II. Copper(II) forms 1:1 complex with QAT, in aqueous medium. The Sandell sensitivity for copper(II) is  $0.005 \mu\text{g cm}^{-2}$  at 415 nm.

Chapter III and IV encounters spectrophotometric determination of nickel(II) and iron(II) with QAT respectively. Both metals form 1:2 complex with QAT. The Sandell sensitivity for nickel(II) at 420 nm is  $0.039 \mu\text{g cm}^{-2}$  and for iron(II) is  $0.016 \mu\text{g cm}^{-2}$  at 418 nm.

The simplicity is the major advantage of the reported method in the present work. The time limit has not made it possible to characterise 2 chloro quinoline-3-carbaldehyde thiosemicarbazone. Therefore further plan includes characterisation and medicinal uses of the compound.

The summary of the results is given below :

Reagent	Metal ion studied	pH	Composition of the complex (metal to reagent )	$\lambda$ max	Molar extinction coefficient	Sandell sensitivity	Interference
QAT	Cu(II)	6.0	1:1	415	$1.144 \times 10^4$	0.005	Zn(II), Fe(III), Pd(II) fluoride and tartrate strongly interfere.
QAT	Ni(II)	6.0	1:2	420	$1.504 \times 10^3$	0.039	Cd(II) and Pd(II) interfere seriously.
QAT	Fe(II)	6.0	1:2	418	$0.3463 \times 10^4$	0.016	Tin(II) is seriously interfere.

