

## S Y N O P S I S

The dissertation entitled, 'Photometric determination of some metals', consists of five chapters and embodies accounts of : Chapter I, Theory of Spectrophotometry; Chapter II, an introduction to the subject, synthesis of reagent and its characterization; Chapter III, Spectrophotometric determination of Cobalt (II) by 2-chloroquinoline-3-carbaldehyde thiosemicarbazone (QAT), Chapter IV and Chapter V, spectrophotometric determination of Manganese(II) and Chromium (III) with 2-chloroquinoline-3-carbaldehyde thiosemicarbazone respectively.

### Chapter - I :

It includes the description of theory of spectrophotometry. This chapter describes the laws of absorption and limitation to the applicability of Beer's law.

### Chapter - II :

This chapter covers an account of the 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.

This chapter also includes synthesis of 2-chloroquinoline-3-carbaldehyde thiosemicarbazone and its characterization.

### Chapter-III :

The study of spectrophotometric determination of Cobalt (II) is made in this chapter. Cobalt (II) forms 1:1 complex with QAT. The sandell sensitivity for Cobalt (II) is  $0.01 \mu\text{g cm}^{-2}$  at 415 nm.

### Chapter IV :

In this chapter spectrophotometric procedure for determination of Mn(II) using 2-chloroquinoline-3-carbaldehyde is presented. Mn(II) forms 1:2 complex with QAT. The Sandell sensitivity for Mn(II) is  $0.024 \mu\text{g cm}^{-2}$  at 375 nm.

### Chapter - V :

The study of spectrophotometric determination of Cr(III) is made in this chapter. Chromium (III) forms 1:3 complex with QAT. The Sandell sensitivity for Chromium(III) is  $0.042 \mu\text{g cm}^{-2}$  at 460 nm.

The summary of 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	Co (II)	6.5	1:1	415	$3.211 \times 10^4$	.01 ng cm <sup>-2</sup>	Mn(II), Mg(III), Ni(II), Cu(II), interfere.
QAT	Mn (II)	7.5	1:2	375	$2.471 \times 10^4$	.024 ng cm <sup>-2</sup>	Cu(II), Ni(II), Co(II), interfere
QAT	Cr (III)	9.5	1:3	460	$1.976 \times 10^4$	.042 ng cm <sup>-2</sup>	Fe, V, Ni, Co interfere.