APPENDIX
APPENDIX - I

GENERAL CONCLUSION

This project was designed to develop new organic reagent. The literature survey revealed that potentiality of amidines as a derivative of imidoyl halide has not been much explored hence, a study was made to use them as analytical reagent in analysis of metals like gold(III), rhenium(VII) and ruthenium(III).

Chapter I contains the introductory part of the thesis. A survey of literature has been made which shows that there is a wide scope for the determination and separation of metal ions using amidine as an extracting reagent. A brief description of the recent research work being carried out using this reagent has also been narrated at the end of this chapter.

In chapter II the study regarding a precious metal gold has been carried out. A highly selective procedure is described in which gold is quantitatively extracted with amidine solution into chloroform over an acidity range of 0.01-11 M HCl followed by its selective spectrophotometric determination by interaction of the extract with methylene blue in the pH range 3.0-9.0. The colour reaction is fairly sensitive and the value of molar absorptivity with 10
different amidines lie in the range of \((1.10-6.50) \times 10^4\) \(1\text{mol}^{-1} \text{cm}^{-1}\) at \(\lambda_{\text{max}}\) 650 nm. The procedure is highly selective as most of the common metal ions do not interfere in the determination of the metal. A survey of literature has been made for the various spectrophotometric reagents used for the determination of gold and their references have been reviewed in the beginning of the chapter. The method has successfully been applied to the recovery of the metal from low grade geological ore obtained from Sonakhan Mines, Raipur, (M.P.) India.

In chapter-III a new sensitive and selective determination of rhenium with amidines has been carried out. The method is based on the reaction of rhenium with thiocyanate in the presence of tin(II) chloride and its selective extraction with chloroform solution of amidine in presence of a cationic surfactant cetyltrimethylammonium bromide (CTAB). The sensitivity of the complex with 10 different amidines lie in the range \((2.68-3.65) \times 10^4\) \(1\text{mol}^{-1} \text{cm}^{-1}\) at \(\lambda_{\text{max}}\) 435 nm in chloroform. The basic and the most sensitive reagent \(N,N'\)-diphenylbenzamidine (DPBA) having molar absorptivity \(3.65 \times 10^4\) \(1\text{mol}^{-1} \text{cm}^{-1}\) has been chosen for the detailed studies. Various analytical parameters like optimum acidity for extraction, choice of solvent, effect of different reagents and stoichiometry of the complex have been investigated. The method has been successfully applied to the recovery of the metal from an ore sample obtained from Indian Bureau of Mines Nagpur, India.
Chapter IV describes a new extraction-spectrophotometric determination of ruthenium(III), a platinum group metal. It is based on the reaction of ruthenium(III) with thiocyanate and amidines in isobutyl methyl ketone (IBMK). The sensitivity with 10 different amidines lie in the range $(0.53-1.11) \times 10^4$ mol$^{-1}$ cm$^{-1}$ at $\lambda_{\text{max}}$ 570 nm. Various analytical parameters like effect of acidity, volume ratio of organic to aqueous phase, composition of the complex etc. have been studied. The survey of the various spectrophotometric reagents used for the determination of the metal has been carried out. The references have been reviewed in the beginning of the chapter along with their analytical usefulness. The proposed method has also been compared with other established spectrophotometric methods in the end of the chapter. The survey shows that the present method is superior to most of them and free from the rigid control of various analytical variables.
APPENDIX - II

AUTHOR'S PUBLISHED WORK

(A) PAPER PUBLISHED IN JOURNAL -

(1) EXTRACTION OF GOLD(III) FORM LOW-GRADE ORES WITH AMIDINES FOLLOWED BY ITS SPECTROPHOTOMETRIC DETERMINATION WITH METHYLENE BLUE.

(1) EXTRACTION - SPECTROPHOTOMETRIC DETERMINATION OF URANIUM(VI) WITH 4-(2-PYRIDYLazo)RESORCINOL AND N-PENTYLACETAMIDE


77th Indian Science Congress, February, 1990 Cochin.