Appendix
APPENDIX- I

GENERAL CONCLUSION

The main objective of the present dissertation is to develop new methods for sensitive and selective spectrophotometric estimation of some toxic metals viz. arsenic, chromium, osmium and vanadium in various complex materials at trace levels. For this purpose amidines and hydroxyamidines have been used. These reagents have been proved to be advantageous over other well known reagents like oxine, dithizone, cupferron, etc.

The thesis has been divided into 5 chapters. Chapter I of this thesis comprises the introductory part.

Chapter II of this thesis opens with a discussion on the toxicity and uses of arsenic. A precise literature survey of the concerned metal is also included in it. The chapter then describes the selective extraction and spectrophotometric determination of As(III), with iodide and amidines, in chloroform. The effect of various analytical
parameters such as acidity, solvents, reagents, temperature, dilution, diverse ions, etc. have been studied. The method has been applied for the recovery of As(III) from various environmental samples.

Chapter III contains the uses of chromium in various fields, and its toxic effects on living organisms. A critical literature survey is also done. The chapter describes the selective extraction of chromium(VI) with hydroxyamidine in chloroform at 0.2 - 0.8 M HCl and subsequent spectrophotometric determination by azo-dye formation using 3-fluorophenylhydrazine hydrochloride and N-1-(naphthyl)-ethylenediamine dihydrogenchloride. The effect of various experimental conditions have been examined. The method is free from many limiting factors of solvent extraction methods such as interference of diverse ions, variation in $\lambda_{\text{max}}$ position and absorbance with respect to concentration of reagents, non-linearity of Beer's law, etc. The method has been used for selective as well as sensitive determination of Cr(VI) in different environmental samples.
Chapter IV comprises the uses of Os and its toxic effects. It also includes a literature survey of the metal. It describes a highly sensitive method for spectrophotometric estimation of osmium. The colour reaction of the metal towards catechol in presence of ethanolic solution of hydroxyamidine have been discussed. The effect of experimental variables on the determination of Os have been investigated. The method has been applied successfully for the determination of osmium in ore and synthetic matrices. Chapter V has been separated into two parts. Part A includes the uses of vanadium in various industries and also its toxicity. It also contains a detailed literature survey of the method used for determination of the metal. In this chapter an extractive spectrophotometric method for the determination of vanadium(V) with hydroxyamidine in presence of 100 adduct forming substances has been described. The metal is extracted at low pH. The method is simple, rapid and quite reproducible. The method permits the determination of V in
different environmental samples. Part B of this chapter is the extension of work described in Part A. The colour of the extracted adduct is enhanced remarkably by the reaction of diphenylcarbazide to give dense red-violet colour. The method has been successfully applied for the determination of V at trace levels in various environmental samples.
APPENDIX - II

AUTHOR’S PUBLISHED AND PRESENTED WORK

1. EXTRACTION - SPECTROPHOTOMETRIC DETERMINATION OF ARSENIC IN ENVIRONMENTAL SAMPLES WITH IODIDE AND AMIDINES. 

2. SENSITIVE SPECTROPHOTOMETRIC DETERMINATION OF OSMIUM WITH PYROCATECHOL AND HYDROXYAMIDINE IN LOW GRADE ORE AND SYNTHETIC MATRICES. 
   Analyst (London) accepted.

3. EXTRACTION OF VANADIUM(V) WITH HYDROXYAMIDINE IN PRESENCE OF 100 ADDUCTANTS: FOLLOWED BY A SPECTROPHOTOMETRIC DETERMINATION USING 1,5-DIPHENYLCARBAZIDE. 
   Intern. J. Environ Anal. Chem. (Netherlands) accepted.

4. SELECTIVE EXTRACTION AND SPECTROPHOTOMETRIC DETERMINATION OF BISMUTH(III) EMPLOYING IODIDE AND SOME AMIDINES 

5. SPECTROPHOTOMETRIC DETERMINATION OF PHOSPHORUS USING AMIDINES AS EXTRACTANTS IN VARIOUS ENVIRONMENTAL SAMPLES. 
6. HYDROXYAMIDINES AS SENSITIVE REAGENTS IN THE PRESENCE OF p-NITROPHENOL FOR EXTRACTION AND SPECTROPHOTOMETRIC DETERMINATION OF VANADIUM(V).


7. SIMULTANEOUS SPECTROPHOTOMETRIC DETERMINATION OF VANADIUM AND IRON WITH AZIDE AND HYDROXYAMIDINE IN FERROVANADIUM.

Proc. 77th Ind. Sc. Cong., Cochin, (1990), Abst. No. 4

8. SENSITIVE SPECTROPHOTOMETRIC DETERMINATION OF VANADIUM IN ENVIRONMENTAL SAMPLES AT PPB LEVEL.

Anal. Lett. (USA) accepted

9. SPECTROPHOTOMETRIC DETERMINATION OF CHROMIUM(VI) AS AZO-DYE IN ENVIRONMENTAL SAMPLES

Asian Environment (1990), Published
रविवारक विश्वविद्यालय रायपुर, प्रवासी

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