ICP 456: **TECHNIQUES IN QUANTITATIVE ANALYSIS**

Course objectives

- To learn instrumental techniques used in inorganic practical such as colorimetry, flame photometry

1. Colorimetric determination of Ti (IV) and Zr (IV)
2. Simultaneous colorimetric determination of two metal ions – Mn and Cr.
3. Flame photometric determination of Na, K, Li and Ca individually and in mixtures.
4. Solvent extraction of Ni (II)
5. Estimation of iron in cement by colorimetically
6. Determination of composition of complexes: a) Job's method: Fe-1, 10- Phenanthroline complex b) Mole ratio method: Zr-Alizarin red S complex, c) Slope ratio method: Cu ethylenediamine complex, d) Limiting logarithmic method: Uranyl sulphosalicyclic acid complex.
7. Determination of stability constants-Turner Anderson method: Fe-Tiron system,
8. Cement analysis: i) SiO_2-Gravimetrically ii) Calcium, Volumetrically iii) Iron, Volumetrically iv) Magnesium, Complexometrically iv) Aluminium, Gravimetrically.
9. Determination of available chlorine in bleaching powder and residual chlorine in water samples.
10. Determination of Iron present in sulpha- drugs; colorimetrically.
11. Analysis of chalcopyrites, magnetite andilmenite.
12. Ion-exchange chromatography: Separation & determination of Mg^{2+}/Zn^{2+}, Zn^{2+}/Cd^{2+}& Cl^-/Br^-
13. Determination of COD of a water sample and dissolved oxygen (DO) by Winkler'smethod
14. Determination of nitrate & nitrite in water samples and seawater.
15. Analysis of heavy metals in waste water, sea water (Pb, Hg etc.by spectrophotometry).
16. Determination of available NPK in soil and fertilizer.
17. Nephelometric determination of sulphate/phosphate.
18. Determination of alkalinity of water samples.
19. Determination of fluoride in drinking water by spectrophotometry and ion selective electrode.
20. Determination of phosphates in detergents

Course Outcome:

- Instrumental techniques used in inorganic practical such as colorimetry, flame photometry and analysis of ore and minerals.

References

1. Vogel's Text Book of Quantitative Chemical Analysis (5^{th} Ed), G.H.Jeffrey, J.Bassette, J.Mendham and R.C.Denny, Longman, 1999.
2. Sarvesh Kumar Dubey Asha Arora :A Practical Book on Soil Plant Water and Fertilizer Analysis, S.R.Scientific Publication. 2010.
3. Gupta PK, Soil, Plant, Water And Fertilizer Analysis (2nd Ed.), 2017.