

CA P 517: ANALYTICAL CHEMISTRY PRACTICALS-I

(A minimum of twelve experiments are to be carried out)

Course Outcomes

- Student will be able to analyze the common and rare cations in a mixture by different volumetric, complexometric and gravimetric techniques.
- The students will have practical experience in the determination of COD, DO and BOD.
- The students will have hands on experience in the Analysis of Brass, Cu-Ni alloy, Stainless Steel.
- This course also train the students in separation and determination of cations and anions by Ion-Exchange Chromatography and ion exchange capacity of a resin.
- Students can study the applications of electrogravimetry, flame photometry, nephelometry and fluorimetry.

1. Analysis of Na_2CO_3 and NaHCO_3 in baking soda by acid base titration.
2. Analysis of chloride in natural and polluted water samples by argentimetric titration.
3. Analysis of copper in ore/alloy by iodometric titration.
4. Analysis of DO, BOD and COD of a waste water sample by titrimetry.
5. Determination of 1,2-glycols or glycerol by periodate oxidation.
6. Determination of Calcium in limestone by redox titration.
7. Determination of total hardness of water by EDTA titration.
8. Analysis of Calcium and lead-using EDTA.
9. Determination of aluminium and magnesium in antacids by EDTA Titration.
10. Assay of calcium in milk powder by EDTA titration.
11. Assay of Vitamin-C by iodine titration and by bromination using KBrO_3 .
12. Assay of iron in pharmaceutical preparation by titration with $\text{Ce}(\text{SO}_4)_2$.
13. Quantitative analysis of mixtures: a) Chloride and iodide; b) iodide volumetrically using KIO_3 & ii) total halide gravimetrically.
14. Analysis of Copper-Nickel alloy i) Copper volumetrically using KIO_3 and ii) Nickel Gravimetrically using DMG.
15. Analysis of Brass-Cu gravimetrically using α -benzoin oxime and Zn complexometrically.
16. Analysis of Stainless steel-Ni gravimetrically using DMG, Fe volumetrically using $\text{Ce}(\text{IV})$, Cr volumetrically by persulphate oxidation.
17. Separation and determination of chloride and bromide on anion-exchanger.
18. Estimation of total cation concentration in water by ion-exchange method.
19. Determination of nickel in Cu-Ni alloy by electrogravimetry.
20. Analysis of ores-Hematite and Pyrolusite.
21. Determination of sodium and potassium in soil by flame photometry.

22. Estimation of potassium in agricultural water supplies by flamephotometry.
23. Nephelometric determination of barium and phosphate in domestic waste water.
24. Nephelometric determination of sulphate in ground water samples.
25. Nephelometric determination of chloride in brackish waters.
26. Fluorimetric determination of Quinines, cadmium aluminium and zinc.

References

1. A Text-Book of Quantitative Inorganic Analysis, 3rd edn., A. I. Vogel, Longman (1961).
2. Vogel's text book of quantitative inorganic analysis, 4th edn., G. H. Jeffery, J. Bassett, J. Mendham and R. C. Denney, ELBS (1978).
3. Colorimetric Determination of Traces of Metals, 3rd edn., E. D. Sandell, John Wiley & Sons (1959).
4. Vogel's Textbook of Quantitative Chemical Analysis, 6th edn., J. Mendham, R.C. Denney, J. D. Barnes and M.J.K. Thomas, Third Indian Reprint, Pearson Education Pvt. Ltd., New Delhi (2007).
5. Quantitative Analysis, 6th edn., R.A. Day and A. L. Underwood, Prentice Hall India Learning Pvt. Ltd., New Delhi(2009).
6. Quantitative analysis, C. T. Kenner and K. W. Busch, Macmillan (1979).

