ICP 408: PHYSICAL CHEMISTRY PRACTICALS-I

Course Objectives:

- To determine physical constants using refractometry, adsorption experiment and viscometry.
- To understand solution chemistry by the way of studying reaction kinetics and energetics.

Any 12 experiments are to be carried out

1. Analysis of a binary mixture and determination of molar refraction of a solid and the composition of chloroform and acetone in its azeotropic mixture byrefractometry.
2. Analysis of a binary mixture of two miscible liquids by viscometry and the relation between viscosity of a solution and the electricalconductivity.
3. Study of variation of viscosity of a liquid withtemperature.
4. Determination of parachor value for CH_2 group by S.T method, the composition of a solution by S.T measurement and the CMC of a soap solution by S.Tmeasurement.
5. Surface tension - concentration correlation for solutions (Gibbsequation).
6. Verification of Fand L adsorption isotherms for acetic &oxalic acids on activatedcharcoal.
7. Analysis of a binary mixture by surface tensionmethod.
8. Adsorption of iodine on charcoal from alcoholicsolution.
9. Study of adsorption of picric acid on charcoal using a calorimeter.
10. Acid catalyzed hydrolysis of methyl acetate and determination of catalytic strength of an acid.
11. Saponification of ethyl acetate by conductivity method.
12. Reaction between potassium persulphate and potassium iodide (including the study of salt effect and catalysis by Ag^{+}, Fe^{2+} and Cu^{2+} ions).
13. Decomposition of diacetone alcohol by NaOH & Hydrolysis of t-Butylchloride.
14. Reaction between hydrogen peroxide and HI.
15. Determination of solubility of lead iodide at different Temperature and hence molar heat ofsolution.
16. Determination of heat of solution of a sparingly soluble solute.

Course Outcome

Students will be able to

- Think critically and analyze chemical problems.
- Present scientific and technical information resulting from laboratory experimentation in both written and oral formats.
- Explain the physical constants using refractometry, adsorption experiment and viscometry.
- Account on hydrolysis, catalytic effect and calculation of thermodynamic parameters.

References

1. B. P. Levitt, Longman, Findlay's Practical Physical Chemistry, J Wiley, London,1954.
2. Experimental Physical Chemistry, Das & Behera, Tata McGraw Hill, New Delhi,1983.
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4. Experiments in Physical Chemistry, J.C. Ghosh, Bharathi Bhavan,1974.
5. D.A.Skoog and D.M.West, Fundamentals of Analytical Chemistry, IV Edition, Old Reinhord& Winston, Publication, 1982.
6. B.K. Sharma, Instrumental methods of Chemical analysis, Goel Publishing House, 24th Edition, 2005
7. Gurdeep R. Chatwal, Sham K. Anand, Instrumental Methods of Chemical Analysis, Himalaya Publication, 1979.