

M.Sc.(FINAL) CHEMISTRY, 2008-2009

PRACTICAL, GROUP-C

Duration: 18 Hrs. (spread over three days) M.M. 200

Distribution of Marks

| | |
|------------------------------|------------------|
| 1. Experiment-I | 50 Marks |
| 2. Experiment-II | 50 Marks |
| 3. Experiment-III | 25 Marks |
| 4. Seminar | 20 Marks |
| 5. Report on Industrial Tour | 15 Marks |
| 6. Viva-Voce | 20 Marks |
| 7. Record/Sessional | 20 Marks |
| Total | 200 Marks |

Exercises :

1.T hermodynamics

- (i) Determination of partial molar volume of solute (e.g. KCl) and solvent in a binary mixture.
- (ii) Determination of the temperature dependence of the solubility of a compound in two solvents having similar intermolecular interactions (benzoic acid in water and in DMSO- water mixture) and calculation of the partial molar heat of solution.

2.S pectroscopy

- (i) Determination of pK_a of an indicator (e.g. methyl red) in (a) aqueous and (b) micellar media.
- (ii) Determination of stoichiometry and stability constant of inorganic (e.g. ferric-salicylic acid) and organic (e.g. amine-iodine) complexes.
- (iii) Characterization of the complexes by electronic and IR spectral data.
- (iv) Estimate P as P_2O_5 in given sample of rock phosphate.
- (v) Estimate iron in given sample of lime, dolomite, etc.

3.P olarography

Determination of dissolved oxygen in the aqueous solution of organic solvents.

4.Chemi cal kinetics

- (i) To study primary salt effects in oxidation of iodide ion by persulphate ion.
- (ii) The effect of solvent on alkaline hydrolysis of crystal violet.
- (iii) Reduction of aqueous solution of ferric chloride by stannous chloride.
- (iv) To study the kinetics of reaction between persulphate and iodide.

(v) To study the kinetics of potassium dichromate and oxalic acid reaction.

(vi) Determination of activation energy and entropy of activation.

5. Conductivity

(i) Conductometric titration of a mixture of KCl and KI.

(ii) Determination of hydrolysis constant of aniline hydrochloride

(iii) To verify Debye-Huckel-Onsager limiting law

(iv) Determination of solubility and solubility product of sparingly salts (e.g. PbSO_4 , BaSO_4)

6. Photochemistry :

(i) Kinetics of photohydration of pyridine in aqueous solution

(ii) Photochemical reduction of Fe(III) by citrate ion

(iii) A Chemiluminescence clock reaction

(iv) Chemical Actinometry

Books Recommended :

1. Practical Physical Chemistry, Alexander and Findlay.

2. Experimental Physical Chemistry, Berman and Tipper

3. Practical Physical Chemistry, Arthur M. James.

4. Advanced Physical Chemistry Experiments, J. Rose.

5. Experiments in Physical Chemistry, Wilson, New Cowrbe, Denaro, rickert and Wincent.

6. Practical Physical Chemistry, J.B. Yadav.

7. Experiments in Physical Chemistry, J.C. Ghosh.

8. Findlay's Practical Physical Chemistry, Revised, B.P. Levitt.

9. Experimental Physical Chemsitry, D.P. Shoemaker, C.W Garland and J.W Niber.