

M.Sc. Semester -IV
Physical Chemistry Practicals
CHNN-706-(P) & CHNN-707-(P)

Section-1 Minimum 04

1. Determine effect of Cl^- , Br^- or I^- ions on alkaline hydrolytic constant of n-butyl acetate conductometrically
2. Determination of mixture of acids and relative strength of weak acids in mixture conductometrically
3. Determination of CMC and ΔG of sodium dodecyl sulphate conductometrically
4. Investigate effect of substitution of chloride ions on rate constant of inversion of cane sugar by using mono, di and trichloro acetic acid as catalyst (Polarimetry)
5. Study the adsorption of acetic acid or oxalic acid from aqueous solution by activated charcoal. Examine validity of Freundlich and Langmuir's adsorption isotherm
6. Verify law of refraction of mixtures (Glycerol and water) using Abbe's refractometer.
7. Determine the heat capacity of the colorimeter and concentration of unknown solution of benzoic acid by measuring heat changes during dilution.
8. Gas chromatographic analysis of tertiary mixture of Pentane, Hexane and Heptane
9. Estimation of insecticides in water using HPLC.
10. To determine the amount of riboflavin in given B-complex tablet by Fluorimetry.
11. To study the complexation of Ni^{+2} with EDTA by conductometrically.
12. To determine the Amount of aspirin content in a given Tablet by conductometrically.
13. To determine the dissociation constant (K_a) of weak organic acid [Benzoic Acid] by conductometrically.

Section-2 Minimum 05

1. Determine mol. Wt. of polymer by viscosity measurement/turbidity measurement.
2. Investigate autocatalytic reaction between oxalic acid and potassium permanganate.
3. Separation by TLC.

Phenyl butazene

Aspirin

Phenazone

Glycine

Caffeine

Phenacetin

Paracetamol

Glutamic Acid

4. Determination of ΔG , ΔH and ΔS of silver benzoate by solubility product method.
5. Determine partial molar volume by intercept using density measurement.
6. Study the variation solubility of calcium hydroxide in presence of sodium hydroxide and hence determine the solubility product of calcium hydroxide at room temperature.
7. Determine adiabatic compressibility and intermolecular free length for interaction between DMSO and acetone for binary mixtures.
8. Determine ultrasound velocity for addition of NH_4Cl solution in water and acetone binary mixture at room temperature.
9. Study the kinetics of oxidation of propanol using an oxidant.
10. To determine the capacity of anions/cation exchange resin by column method.
11. To determine the standard electrode potential of silver/ copper/ lead electrode.
12. Potentiometric titration of halide-mixture of $\text{KCl}+\text{KBr}+\text{KI}$ against given std. AgNO_3 Solution
13. To determine rate constant and order of reaction between acetone and iodine catalysed by mineral acid.

Section-3 Minimum 05

1. Study effect of ionic strength on activity coefficient and mean activity coefficient of silver ion in 0.01M silver nitrate solution by potentiometer.
2. Determine solubility of Ag_2CrO_4 potentiometer.
3. Discuss the primary salt effect in a reaction between $\text{K}_2\text{S}_2\text{O}_8$ and KI .
4. To study the complex formation between Fe (III) and salicylic acid and find instability constant and free energy change by spectrophotometer.
5. Determine partial molar volume by intercept using density measurement.
6. To estimate the amount of D-glucose in given solution calorimetrically.
7. Determine the dissociation constant of indicator (Methyl red/O-nitrophenol/Phenolphthalein) by spectrophotometer.
8. Simultaneous spectrophotometric determination of Cr^{+6} , Mn^{+7} .
9. Ultraviolet spectrophotometric determination of Aspirin, Phenacetin & in APC table using solvent extraction.

10. Determine the heat of solution of a solid compound (CaCl_2 , MgCl_2 or synthesized/ Schiff's base) and also lattice energy of CaCl_2 using Bron-Haber cycle.
11. To study the effect of electrolytes on water structure by viscosity method.
12. To determine the molar refraction and refractive index of a given salt.
13. To study the variation of refractive index with composition of mixture of carbon tetra chloride and ethyl acetate.
14. To determine parachor/density/ refractive index of binary solutions.