

## B.Sc. II Practical

### Inorganic Chemistry

Calibration of fractional weights, pipettes and burettes. Preparation of standard solutions.  
Dilution- 0.1 M to 0.001 M solutions.

### Quantitative Analysis

#### Volumetric Analysis

- (a) Determination of acetic acid in commercial vinegar using NaOH
- (b) Determination of alkali content – antacid tablet using HCl.
- (c) Estimation of calcium content in chalk as calcium oxalate by permanganometry.
- (d) Estimation of hardness of water by EDTA.
- (e) Estimation of ferrous and ferric by dichromate method.
- (f) Estimation of copper using thiosulphate.

#### Gravimetric Analysis

Analysis of Cu as CuSCN and Ni as Ni (dimethylglyoxime).

### Organic Chemistry

#### Laboratory Techniques

##### A. Thin Layer Chromatography

Determination of  $R_f$  values and identification of organic compounds.

- (a) Separation of green leaf pigments (spinach leaves may be used).
- (b) Preparation and separation of 2,4-dinitrophenylhydrazones of acetone, 2-butanone, hexan-2- and 3-one using toluene and light petroleum (40:60).
- (c) Separation of a mixture of dyes using cyclohexane and ethyl acetate (8.5:1.5).

##### B. Paper Chromatography: Ascending and Circular

Determination of  $R_f$  values and identification of organic compounds.

- (a) Separation of a mixture of phenylalanine and glycine. Alanine and aspartic acid. Leucine and glutamic acid. Spray reagent – ninhydrin.
- (b) Separation of a mixture of D, L – alanine, glycine, and L-Leucine using n-butanol:acetic acid:water (4:1:5). Spray reagent – ninhydrin.

- (c) Separation of monosaccharides – a mixture of D-galactose and D – fructose using n-butanol:acetone:water (4:5:1). Spray reagent – aniline hydrogen phthalate.

### ***Qualitative Analysis***

Identification of an organic compound through the functional group analysis, determination of melting point and preparation of suitable derivatives.

### **Physical Chemistry**

#### ***Transition Temperature***

1. Determination of the transition temperature of the given substance by thermometric/dilatometric method (e.g.  $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}/\text{SrBr}_2 \cdot 2\text{H}_2\text{O}$ ).

#### ***Phase Equilibrium***

1. To study the effect of a solute (e.g. NaCl, succinic acid) on the critical solution temperature of two partially miscible liquids (e.g. phenol-water system) and to determine the concentration of that solute in the given phenol-water system.
2. To construct the phase diagram of two component (e.g. diphenylamine -benzophenone) system by cooling curve method.

#### ***Thermochemistry***

1. To determine the solubility of benzoic acid at different temperatures and to determine  $\Delta H$  of the dissolution process.
2. To determine the enthalpy of neutralisation of a weak acid/weak base versus strong base/strong acid and determine the enthalpy of ionisation of the weak acid/weak base.
3. To determine the enthalpy of solution of solid calcium chloride and calculate the lattice energy of calcium chloride from its enthalpy data using Born Haber cycle.