

Practical Course Semester III

INORGANIC CHEMISTRY

1. Gravimetric estimations of complex mixtures involving two or three constituents, Analysis of alloys and minerals.
2. Volumetric estimations:
 - (i) EDTA titrations - Determination of Zn, Ca, Mg and Fe, Hardness of water.
 - (ii) KBrO_3 and KIO_3 titrations –Determination of As_2O_3 and $[\text{Fe}(\text{CN})_6]^{4-}$.
 - (iii) Chloramine T – titrations - Determination of NO_2 in a sample.
 - (iv) Ceric Sulphate titrations - Determination of Fe and Organic acids.

ORGANIC CHEMISTRY

1. Systematic, separation, purification & identification of the components of a mixture of three organic compounds.
2. Multi step synthesis of organic compounds.
3. Extraction of organic compounds.

PHYSICAL CHEMISTRY

General Experiments:

1. To verify Freunlich Adsorption Isotherm.
2. To determine enthalpy of given salt solution.
3. To determine molecular weight of a given electrolyte by elevation in boiling point method and also find out its Van't Hoff factor.
4. Determine molecular weight of a given polymer by viscosity method.
5. Find out surface tension, molecular energy and Parachor of a given liquid at room temprature.
6. Determine molecular weight of a given electrolyte by depression in freezing point method.
7. Characterization of the complexes by spectroscopic (Vis./IR) measurements.
8. Measurement of e.m.f. with thermocouple.

Kinetics Experiments:

9. Study reaction kinetics between KI and $\text{K}_2\text{S}_2\text{O}_3$ by fractional change method and find out its order of reaction at room temprature.
10. Study reaction kinetics between acetone and iodine by isolation method and determine it order of reaction at room temprature.

Thermodynamics Experiments:

11. Determine partial molar volume of solute (eg. KCl) in binary mixture of solvents/ mixed solvents system.

12. Determine temperature dependence of solubility of a compound in two solvents having similar intermolecular interaction – (Benzoic Acid in water and in DMSO-water mixture) and calculate the partial molar heat of solution.

Electronics

Theory Lab. Course Lectures to be conducted in Semester – III only.

Basic Electronics

Notations used in an electric circuit, study of electronic components and colour codes, conversion of chemical quantities into electrical quantities. Transducer, illustration with electrodes, thermocouples and thermistors.

Passive components: Resistors, capacitors and inductors. Net works of resistors. Thevenin's theorem, superposition theorem, loop analysis, R C circuits, L R circuits, LCR circuits. Illustration of the use of the circuits in NQR spectroscopy, Mossbauer spectroscopy, cyclic voltametry and in power supplies as filter circuits.

Active Components

Introduction to ordinary diodes and Zener diodes with some emphasis on p-n junction as a solid state property. Use of diodes as rectifiers, Power supplies.

Transistors: p-n-p and n-p-n transistors. Characteristics of transistors, hybrid parameters; transistor circuits as amplifiers.