

B.Sc. IVth Semester-Industrial Chemistry

Course No: DSC-6D

Course Weightage: 04 Credit

Unit-I: Dyes and Polymers

(16 Contact hours)

Dyes: Introduction and classification with special reference to textile, edible dyes and fabric brighteners. Industrial preparation and uses of methyl orange, malachite green and alizarin.

Polymers: General characteristics, types, functionality concept, necessity of copolymerization, block and graft copolymers. Introductory idea about conducting and biopolymers.

Methods of Polymerization: Bulk, Suspension, Emulsions and Solution

Types of Polymerization: Addition and Condensation.

Mechanism of Polymerization: Free radical, ionic (anionic, cationic), Co-ordination polymerization; initiators and inhibitors.

Synthesis, properties and applications of some thermoplastic and thermosetting polymers (Polyethene, Polystyrene, Polyamides like Nylon 6 and 66), polyurethanes, Phenol formaldehyde, Epoxy resins and neoprene.

Polymer processing:- Compression, moulding, casting, extrusion, fibre spinning, injection moulding, thermofoaming & vulcanization of elastomers.

Unit II: Drugs and Pharmaceuticals

(16 Contact hours)

Historical background and development of pharmaceutical industry in India.

Introduction to pharmacopocias, types of formulations and routes of administration. Aseptic conditions, need and method of sterilization.

Various types of Pharmaceutical excipients: Glidants, Lubricants, diluents, preservatives, emulsifying agents, coating and colouring agents, flavouring agents and viscosity builders.

Evaluation of Crude drugs: Moisture contents, extractive value, volatile oil content, foreign organic matter, Crude fibre content. Various isolation procedures for active ingredients.

Pharmaceutical quality control: Sterility testing, progenic testing, Glass testing and Bulk density of powders.

Unit III: Corrosion and its Control

(14 Contact hours)

Introduction & economic aspects of corrosion. Dry or chemical corrosion, wet or electrochemical corrosion; Mechanism of electrochemical corrosion.

Galvanic Corrosion: Concentration Cell Corrosion, differential aeration corrosion, Pitting corrosion, underground or soil corrosion. Passivity.

Factors influencing corrosion: Microbiological, Galvanic and atmospheric.

Corrosion control: Proper designing, using pure metal, metal alloys, cathodic protection.

Chemical conversion:- Coating, phosphating & chromising, treatment of metal surfaces, hot dipping and use of inhibitors.

Unit IV: Quality Control and instrumental methods of analysis

(14 Contact hours)

Purification and separation, sample preparation (isolation using a suitable solvent, extraction and separation)

Solvent extraction: distillation (simple fractional and vacuum), Crystallization, Chromatographic separation (HPLC, GC, GLC and Ion exchange chromatography).

Electro-analytical techniques:- Potentiometry, Voltametry, Polarography and their industrial applications.

Spectroscopic Methods:- Principle and the industrial applications of UV-Visible spectrophotometers, IR and NMR

Atomic Spectroscopy:- principle and industrial applications of Flame photometry and Atomic absorption spectroscopy.

Books Recommended :

1. Textbook of Polymer Science, Billmeyer , John Wiley ; 2004
2. Polymer Science; Gowarikar, V.R. ; Vishwanathan, N.V and sreedhan , J. Wiley Eastern Ltd. ; 1986
3. Introduction to medicinal chemistry ; Patrick , G.L. ; oxford University Press, UK
4. Medicinal and Pharmaceutical chemistry; Hakishan; Kapoor, V.K. ; Vallabh Prakeshan, Pitampura, New Delhi
5. Industrial Chemistry; Stocchi , E; Vol. I; Ellis Horwood Ltd; UK
6. Handbook of instrumental techniques for analytical chemistry; settle, F.A; Prentice Hall
7. Analytical Chemistry; Christian, G.D. ; 6th ed. ; Wiley, 2010

B.Sc. IVth Semester-Industrial Chemistry

Course No: DSC-6D (Lab)

Course Weightage: 02 Credit

Section A: Polymers

1. Preparation of Thiokol rubber
2. Preparation of urea – Formaldehyde mouldings
3. Preparation of Poly Phenol Formaldehyde
4. Preparation of Poly styrene by free radical mechanism

Section B: Pharmaceuticals

1. To determine the loss of moisture from any drug
2. Estimation of Aspirin by volumetric or instrumental methods
3. Analysis of Ascorbic acid in tablet sample
4. Determination of paracetamol by colorimetry
5. Determination of iron, calcium and phosphorus from a drug sample

Section C : Instrumental Methods of Analysis

1. Determination of sodium in a sample of sodium chloride by flame photometer
2. To determine the SO_4^{2-} ions present in the given amount of ferrous ammonium sulphate by ion-exchange method
3. To determine the wave length of maximum absorption (λ_{max}) and to verify the Beer Lambert's Law
4. To determine the concentration of iron by spectrophotometry using potassium thiocyanate as the complexing agent.

Books Recommended:

1. Practical chemistry; Thomas, A.O.; Scientific book centre ; Cannanore
2. Vogel's text book of practical organic chemistry; Longman
3. Production of synthetic Fibres; Vidya, A.A. ; Prentice Hall ; N. Delhi ; 1988
4. Synthetic Drugs ; Gurdeep, R.C; Himalaya publishing house, Bombay ; 1995
5. Chemical Process Industries, Shreve, R.V; Tata McGraw Hill publishing company; Mumbai