

Ch. Bansilal Govt College Ioharu Bhiwani

Lesson plan 2023-24

Name:- Manjeet  
Semester-V

20UCHE502: CHEMISTRY OF POLYMERS

(03-15 August)

Unit I

Introduction and history of polymeric materials: Different schemes of classification of polymers, Polymer nomenclature,

(16-30 August)

Molecular forces and chemical bonding in polymers, Texture of Polymers.

(1-15 September)

Functionality and its importance: Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization.

(16-30 September)

Unit II

Kinetics of Polymerization: Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic)

(1-15 October)

coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques.

(16-30 October)

Unit III

: structure, properties and application of the following polymers: polyacetylene, polyaniline, poly(p-phenylene sulphide), polypyrrole, polythiophene.

(1-15 November)

Unit IV

Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene, poly(vinyl chloride), poly(vinyl acetate)

(16-31 November)

acrylic polymers, fluoro polymers, formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers.

Lesson Plan (2023-24)

Name of Lecturer:-Mr Manjeet

Class and Section BSc 2nd year 4th semester ( Medical and Non medical)

Subject:-FUNCTIONAL GROUP ORGANIC CHEMISTRY-III and ELECTROCHEMISTRY

Sr. no.	Week/months	Topic / particulars
1	1 <sup>st</sup> / Feb.	Amines: Structure and nomenclature of amines, physical properties. Separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines.
2	2 <sup>nd</sup> /Feb.	Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds).
3	3 <sup>rd</sup> / Feb.	Gabriel phthalimide reaction, Hoffmann bromamide reaction. electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.
4	4 <sup>th</sup> / Feb	Diazonium Salts: Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO <sub>2</sub> and CN groups,
5	1 <sup>st</sup> / March.	reduction of diazonium salts to hydrazines, coupling reaction and its synthetic application.
6	2 <sup>nd</sup> / March	Nitro Compounds: Preparation of nitro alkanes and nitro arenes and their chemical reactions. Mechanism of electrophilic substitution reactions in nitro arenes and their reductions in acidic, neutral and alkaline medium.
7	3 <sup>rd</sup> / march	Electrochemistry-I Electrolytic conduction, factors affecting electrolytic conduction, specific conductance, molar conductance, equivalent conductance and relation among them, their variation with concentration. Arrhenius theory of ionization,
8	4 <sup>th</sup> / March	-----
9	1 <sup>st</sup> / April	Ostwald's Dilution Law. Debye Huckel- Onsager's equation for strong electrolytes (elementary treatment only) Kohlrausch's Law and its application in calculation of conductance of weak electrolytes at infinite dilution. Applications of conductivity measurements: determination of degree of dissociation, determination of K <sub>a</sub> of acids, determination of solubility product of sparingly soluble salts, conductometric titrations. Definition of pH and pK <sub>a</sub> , Buffer solution, Henderson - Hazel equation, Buffer mechanism of buffer action.

10	2 <sup>nd</sup> / April	Electrochemistry-II: Electrolytic and Galvanic cells - reversible & Irreversible cells, conventional representation of electrochemical cells. EMF of cell and its measurement, activity and activity coefficients. Calculation of thermodynamic quantities of cell reaction ( $\Delta G$ , $\Delta H$ & $\Delta S$ ). Types of reversible electrodes - metal-metal ion gas electrode, metal-insoluble salt- anion and redox electrodes.
11	3 <sup>rd</sup> / April	Nernst equation, derivation of cell EMF and single electrode potential. Standard Hydrogen electrode, reference electrodes, standard electrodes potential, sign conventions, electrochemical series and its applications
12	4 <sup>th</sup> / April	Application of EMF measurement i.e., solubility product; potentiometric titration (acid-base). Determination of pH using Hydrogen electrode and glass electrode.

Signature

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Lesson plan 2023-24

Name:- Manjeet

Semester-III

COORDINATION CHEMISTRY AND

CHEMICAL KINETICS

(Theory)

(2-15 August)

UNIT-I

Coordination Chemistry-I: Werner's theory of coordination compounds, nomenclature of coordination compounds, Isomerism in coordination compounds, valence bond theory of transition metal complexes, and its limitations.

(16-30 August)

Crystal field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal field splitting.

(1-15 September)

UNIT-II

Coordination Chemistry-II: Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, orbital contribution to magnetic moments, application of magnetic moment data for 3d-metal complexes,

(16-30 September)

Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series, Orgel- energy level diagram for d<sup>1</sup> and d<sup>1</sup> states, discussion of the electronic spectrum of [Ti(H<sub>2</sub>O)<sub>6</sub>]<sup>3+</sup> complex ion.

(1-15 October)

#### UNIT-III

Kinetics-I: Rate of reaction, rate equation, factors influencing the rate of a reaction: concentration, temperature, pressure, solvent, light, catalyst.

(16-30 October)

Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half-life period of a reaction.

(1-15 November)

Methods of determination of order of reaction, Consecutive Reaction, Series reaction, Parallel reactions (Elementary idea).

(16-30 November)

#### UNIT-IV

Kinetics-II: Effect of temperature on the rate of reaction - Arrhenius equation. Theories of reaction rate Simple collision theory for unimolecular reaction, Transition state theory, Enzymatic reaction: Michaelis - Menton treatment, Acid-Base Catalysed reactions.