

Lesson Plan

Name of Assistant Professor: Dr.SUSHMA

Class and section: B.Sc.3rd(N.M. and Med.)

Chemistry Lesson Plan: (From Sept. to Dec. 2022)

Month	Topics
September	Physical Properties and Molecular Structure Optical activity, polarization – (Clausius – Mossotti equation). Orientation of dipoles in an electric field, dipole moment, induced dipole moment, measurement of dipole moment-temperature method and refractivity method, dipole moment and structure of molecules,
October	Magnetic permeability, magnetic susceptibility and its determination. Application of magnetic susceptibility, magnetic properties – paramagnetism, diamagnetism and ferromagnetics
November	Spectroscopy-I Introduction: Electromagnetic radiation, regions of spectrum, basic features of spectroscopy, statement of Born-Oppenheimer approximation, Degrees of freedom. Rotational Spectrum Diatomic molecules. Energy levels of rigid rotator (semi-classical principles), selection rules, spectral intensity distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length, qualitative description of non-rigid rotor, isotope effect.
December	Spectroscopy-II Vibrational spectrum Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effects of anharmonic motion and isotopic effect on the spectra., idea of vibrational frequencies of different functional groups. Raman Spectrum: Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules, Quantum theory of Raman spectra.

Lesson Plan

Name of Assistant Professor: Dr SUSHMA

Class and section: B.Sc 2nd N.M. and Med.

Chemistry Lesson Plan: (From Sept. to Dec. 2022)

	Topics
September	Chemical Equilibrium Equilibrium constant and free energy, concept of chemical potential, Thermodynamic derivation of law of chemical equilibrium. Temperature dependence of equilibrium constant; Van't Hoff reaction isochore, Van't Hoff reaction isotherm. Le-Chatetier's principle and its applications Clapeyron equation and Clausius – Clapeyron equation its applications.
October	Distribution Law Nernst distribution law – its thermodynamic derivation, Modification of distribution law when solute undergoes dissociation, association and chemical combination. Applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride. (ii) Determination of equilibrium constant of potassium tri-iodide complex and process of extraction
November	Carboxylic Acids 1 Nomenclature of Carboxylic acids, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids. Reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction. Reduction of carboxylic acids. Mechanism of decarboxylation.
December	Carboxylic Acids 2 Mechanisms of esterification and hydrolysis (acidic and basic). Structure, nomenclature and preparation of acid chlorides, esters, amides and acid anhydrides. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution

Ch. Bansilal Govt College loharu (Bhiwani)

Lesson plan 2021-2022

Name:- Manjeet

Semester-III

COORDINATION CHEMISTRY AND CHEMICAL KINETICS

(Theory)

(22-30 September)

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.

(01-15 October)

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

(16-30 October)

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,

(01-15 November)

Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, spectrochemical series, Orgel- energy level diagram for d¹ and d¹ states, discussion of the electronic spectrum of [Ti(H₂O)₆]³⁺ complex ion.

(16-30 November)

UNIT-III

Kinetics-I: Rate of reaction, rate equation, factors influencing the rate of a reaction: concentration, temperature, pressure, solvent, light, catalyst. Order of a reaction, integrated rate expression for zero order, first order, second and third order reaction. Half-life period of a reaction.

(01-15 December)

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

(16-31 December)

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.

Lesson Plan-1

Name of the Faculty : **Mr. SUNIL KUMAR**
Class : **B.SC- III**

Semester : **Semester-V**

Subject : **INORGANIC CHEMISTRY**

Lesson Plan duration: **From Aug to Dec2022**

Paper Code :

Week/Month	Name of Topics
4 week August	Metal- Ligand Bonding in Transition Metal complexes.
1 week of September	Limitations of valence bond theory, an elementary idea of crystal field theory.
2 week of September	Crystal field splitting in octahedral, tetrahedral and square planer complexes.
3 week of September	Factors affecting the crystal field parameters.
4week of September	Organometallic Compounds, Organo magnesium compounds: the Grignard reagents-formation, structure and chemical reactions
1 week of October	Organo zinc compounds: formation and chemical reactions. Organo lithium compounds: formation and chemical reactions.
2 week of October	Thermodynamics and Kinetic Aspects of metal complexes A brief outline of thermodynamic stability of metal complexes.
3week of October	factors affecting the stability, Irving William Series, substitution reactions of square planer complexes of Pt[II], Trans effect
1 week of November	Magnetic properties of Transition metal complexes Types of magnetic materials, magnetic susceptibility, method of determining magnetic susceptibility.

2week of November	Spin only formula, L-S coupling correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments.
3week of November	Application of magnetic moment data for 3d metal complexes. Electronic spectra of Transition metal complexes. Selection rules for d-d transition,
4 week of November	Spectroscopic ground states, spectro chemical series different cases of P subshell and D subshell.
	orgel energy level diagram for d^1 and d^9 states, discussion of electronic spectrum of $[\text{Ti}(\text{H}_2\text{O})_6]^{+3}$ complex ion.
Dec1,2	Revision and Class tests.
Dec3,4	Revision and Class tests.

Lesson Plan-1

Name of the Faculty : **Mr. Sunil Kumar**
Discipline : **B.SC- I**
Semester : **Semester-I**
Subject : **Organic Chemistry**
Paper Code :

Week/Month	Name of Topics
4 week July	Structure and Bonding Localized and delocalized chemical bond, Van der Waal's interactions, resonance: conditions,
1 week August	resonance effect and its applications, hyperconjugation, inductive effect, Electromeric effect & their comparison.

2 week August	Stereochemistry of Organic Compounds Concept of isomerism. Types of isomerism. elements of symmetry, molecular chirality, □Optical isomerism enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic center
3 week August	, diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and abso
4 week August	Relative and absolute configuration, sequence rules, R & S systems of nomenclature. determination of configuration of □Geometric isomerism geometric isomers. E & Z system of nomenclature,
1 week of September	conformational analysis of ethane □Conformational isomerism and n-butane, conformations of cyclohexane, axial and equatorial bonds. Newman projection and Sawhorse formulae, Difference between configuration and conformation.
2 week of September	Mechanism of Organic Reactions Curved arrow notation, drawing electron movements with arrows, half-headed and double-headed arrows, homolytic and heterolytic bond breaking.
3 week of September	Types of reagents – electrophiles and nucleophiles. Types of organic reactions. carbocations, carbanions, free radicals, □Reactive intermediates carbenes,(formation, structure & stability).
4 week of September	Alkanes and Cycloalkanes IUPAC nomenclature of branched and unbranched alkanes, classification of carbon atoms in alkanes. Isomerism in alkanes, sources,
1 week of October	methods of formation: Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids
2 week of October	, physical properties. Mechanism of free radical halogenation of alkanes: reactivity and selectivity.nomenclature,
3 week of October	, synthesis of cycloalkanes and their derivatives – □Cycloalkanes - dihalides, ,ω,αphotochemical (2+2) cycloaddition reactions
4 week of October	, dehalogenation of pyrolysis of calcium or barium salts of dicarboxylic acids, Baeyer's strain theory and its limitations., theory of strainless rings
1 week of November	Revision and Class tests.
2 week of November	Revision and Class tests.