

Lesson Plan

Name of College : Government College for Women, Shahzadpur (Ambala)

Academic Session : January to April (2023-24)

Class : B.Sc 3rd (6th Semester)

Paper : Inorganic, Physical and Organic Chemistry.

Teacher's Name : Iqbal Singh

Month	Dates	Topic to be covered	Academic/ Activity to be organized	Assignments/ Tests
January	01-07January	Inorganic Chemistry-Acids and Bases -Arrhenius, Bronsted-lowry, Lux-flood, solvent system and Lewis concept of acids and bases, relative strength of acids and bases, levelling solvents, hard and soft acids and bases(HSAB), Applications of HSAB principle		
	08-15January	Organometallic chemistry Definition, classification and nomenclature of organometallic compounds, preparation, properties and bonding of alkyls of Li, Al, Hg and Sn, concept of hapticity of organic ligand.		
	16-23January	Structure and bonding in metal-ethylenic complexes, Structure of Ferrocene, classification in metal carbonyls, preparation, properties and bonding in mononuclear carbonyls.		Written Test-1
	24-31January	Physical Chemistry-Introduction to statistical mechanics Need for statistical thermodynamics, thermodynamic probability, Maxwell Boltzmann distribution statistics, Born oppenheimer approximation, partition function and its physical significance. Factorization of partition function.	Science exhibition	
February	01-07Februaury	Photochemistry- Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grothus-Drapper law, StarkEinstein law (law of photochemical equivalence.		
	08-15Februaury	Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes (simple examples).	Commented [i1]:	
	16-23Februaury	Organic Chemistry- Organic Synthesis via Enolates- Acidity of α -hydrogens, alkylation of diethyl malonate and ethyl acetoacetate. Synthesis of ethyl acetoacetate: the Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate.		
	24-29Februaury	Heterocyclic Compounds -Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives.		
	01-07March	Comparison of basicity of pyridine, piperidine and pyrrole. Introduction to condensed five and six- membered heterocycles..		Assignment -2

Iqbal Singh

March	08-15 March	Preparation and reactions of indole, quinoline and isoquinoline with special reference to Fisher indole synthesis, Skraup synthesis and Bischler-Napieralski synthesis. Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline		
	16-23 March	Bio inorganic chemistry- Metal ions present in biological system, classification on the basis of action (essential, non essential, trace, toxic), Metalloporphyrins with special reference to haemoglobin and myoglobin. Biological role of Na ⁺ , K ⁺ , Ca ²⁺ , Mg ²⁺ , Fe ²⁺ ions, Cooperative effect, Bohr effect.		
	24-31 March	Silicones and Phosphazenes- Nomenclature, classification, preparation and uses of silicones, elastomers, polysiloxane copolymers, poly phosphazenes and bonding in triphosphazene		
April	01-07 April	Solutions, Dilute Solutions and Colligative Properties -Ideal and non-ideal solutions, methods of expressing concentrations of solutions, Dilute solutions, Raoult's law.		Written Test-2
	08-15 April	Colligative properties: (i) relative lowering of vapour pressure (ii) Elevation in boiling point (iii) depression in freezing point (iv) osmotic pressure. Thermodynamic derivation of relation between amount of solute and elevation in boiling point and depression in freezing point.. Applications in calculating molar masses of normal, dissociated and associated solutes in solution.		
	16-23 April	Synthetic Polymers -Addition or chain-growth polymerization. Free radical vinyl polymerization, ionic vinyl polymerization, Ziegler-Natta polymerization and vinyl polymers. Condensation or step growth polymerization. Polyesters, polyamides, phenol formaldehyde resins. Natural and synthetic rubbers	Departmental Activity on occasion of Earth Day -22 nd April 2024	
	24-30 April	Revision and practices of Sample Paper		

Course Objectives:

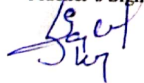
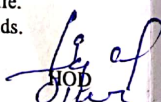
- To understand the concept of acid and bases on the basis of different ideas.
- To verify the laws of photochemistry.
- To differentiate Pyrrole, Furan and Pyridine at the basis of chemical properties.
- To understand the importance of Inorganic ions for living beings.
- To understand the chemistry Polymers.
- To know the utility Colligative properties in daily life.

Course Outcomes:

Upon successful completion students should be able to:

- Apply the fundamental principles/ laws of Photochemistry.
- Able to utilise the knowledge of acid and bases in practical life.
- Able to differentiate different types of heterocyclic compounds.
- Able to understand importance of polymer.

Teacher's Sign

Principal