

Lesson Plan

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

Academic Session : January to April (2023-24)

Class : B.Sc 2nd (4th 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	Organic Chemistry -Infrared (IR) absorption spectroscopy Molecular vibrations, Hooke's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region,.		
	08-15January	characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds. Applications of IR spectroscopy in structure elucidation of simple organic compounds.		
	16-23January	Amines -Structure and nomenclature of amines, physical properties. Separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines.		
	24-31January	Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles, reductive amination of aldehydic and ketonic compounds. Gabrielphthalimide reaction, Hofmann bromamide reaction. Electrophilic aromatic substitution in aryl amines, reactions of amines with nitrous acid.	Science Exhibition	
February	01-07Febrary	Inorganic Chemistry -Chemistry of f-Block elements- Lanthanides: Electronic structure, oxidation states, magnetic properties, complex formation, colour, ionic radii		Written Test-1
	08-15Febrary	lanthanide contraction, occurrence, separation of lanthanides, Lanthanide compounds.		
	16-23Febrary	Actinides: General characteristics of actinides, chemistry of separation of Np, Pu and Am from uranium, Transuranic elements, comparison of properties of Lanthanides and actinides with transition elements		Assignment-1
	24-29Febrary	Physical Chemistry-Thermodynamics -Second law of thermodynamics, need for the law, statements of the law, Carnot's cycles and its efficiency, Carnot's theorem, Thermodynamics scale of temperature. Concept of entropy – entropy as a state function, entropy as a function of V & T, entropy as a function of P & T, entropy change in physical change, entropy as a criteria of spontaneity and equilibrium.	Commented [1]:	
March	01-07March	Third law of thermodynamics: Nernst heat theorem, statement of concept of residual entropy, evaluation of absolute entropy from heat capacity data.		
	08-15 March	Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, G as criteria for thermodynamic equilibrium and spontaneity, its advantage over entropy change, Variation of G with P, V and T.		
	16-23 March	Diazonium Salts -Mechanism of diazotisation, structure of benzene diazonium chloride, Replacement of diazo group by H, OH, F, Cl, Br, I, NO ₂ and CN groups, reduction of diazonium salts to hydrazines, coupling reaction and its synthetic application.		
	24-31 March	Aldehydes and Ketones - Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, advantage of oxidation of alcohols with chromium trioxide (Sarett reagent) pyridinium chlorochromate (PCC) and pyridinium dichromate. Physical properties,		Assignment -2
April	01-07April	Comparison of reactivities of aldehydes and ketones. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction. Mannich reaction. Oxidation of aldehydes, Baeyer– Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, WolffKishner, LiAlH ₄ and NaBH ₄ reduction.		

Iqbal Singh

	08-15 April	Theory of Qualitative and Quantitative Analysis -Chemistry of analysis of various groups of basic and acidic radicals, chemistry of identification of acid radicals in typical combination.		Written Test-2
	16-23 April	Chemistry of interference of acid radicals including their removal in the analysis of basic radicals, common ion effect, solubility product, theory of precipitation, co-precipitation, post precipitation, purification of precipitates.	Departmental activity-on occasion of Earth Day -22 nd April 2024	
	24-30 April	Revision via sample papers		

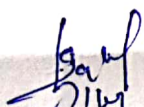
Course Objectives:

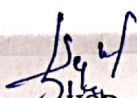
- To understand the Infrared Spectroscopy and their application in molecular structure determination.
- To verify the theory of precipitation, Co-precipitation and Post precipitation.
- To differentiate the Primary ,Secondary and Tertiary Amines .
- To understand thermodynamics laws such as Second and Third law of thermodynamics.
- To understand the chemistry of aldehydes and ketones.
- To know the utility of Diazonium salt for the preparation of other compounds.

Course Outcomes:

Upon successful completion students should be able to:

- Apply the fundamental principles/ laws of Infrared Spectroscopy for determination of molecular structure.
- Able to utilise the knowledge of acid and basic radicals in practical.
- Able to differentiate Aldehyde and Ketones.
- Able to understand the concepts and laws of thermodynamics .


Teacher's Sign


HOD

Principal