

LESSON PLAN

Name of Assistant Professor: Sahil

Class: B.Sc II N.M

Chemistry Lesson Plan: 16 Week (From Feb 2023 to May 2023) 21/01/23

Week 1: 31/01/2023 to 04/02/2023 Chapter 1: Chemistry of Lanthanides 1.1 Introduction 1.2 Electronic structure 1.3 Physical properties of lanthanides 1.4 Oxidation states 1.5 Magnetic properties
Week 2: 06/02/2023 to 11/02/2023 1.6 Ionic radii and lanthanide contraction 1.7 Complex formation 1.8 Occurrence and isolation 1.9 Lanthanide compounds
Week 3: 13/02/2023 to 18/02/2023 Chapter 2: Chemistry of Actinides 2.1 General features and chemistry of actinides 2.2 Chemistry of separation of Np, Pu and Am from U
Week 4: 20/02/2023 to 25/02/2023 2.3 Comparison of properties of lanthanides and actinides and with transition elements Problems from chapter 1 & 2
Week 5: 27/02/2023 to 04/03/2023 Chapter 3: Theory of qualitative and quantitative inorganic analysis 3.1 Introduction 3.2 Basic Principles of Inorganic qualitative analysis Assignment I
Week 6: 06/03/2023 to 11/03/2023 3.3 Chemistry of analysis of various acidic radicals 3.4 Chemistry of identification of acidic radicals in typical combinations
Week 7: 13/03/2023 to 18/03/2023 3.5 Chemistry of interference of acid radicals including their removal in the analysis of basic radicals



<p>Week 8: 20/03/2023 to 25/03/2023</p> <p>3.1 Systematic analysis of basic radicals 3.2 Chemistry of various reaction 3.3 Identification of cations of group I</p>
<p>Week 9: 27/03/2023 to 01/04/2023</p> <p>3.4 Identification of cations of group II A and separation of group II B 3.5 Identification and separation of group III</p>
<p>Week 10: 03/04/2023 to 08/04/2023</p> <p>3.6 Identification and separation of group IV</p>
<p>Week 11: 10/04/2023 to 15/04/2023</p> <p>3.7 Schematic flow chart of group V cations</p>
<p>Week 12: 17/04/2023 to 22/04/2023</p> <p>3.8 Test of Ni^{2+} in the presence of Co^{2+} 3.9 Principle of gravimetric analysis 3.10 Theory of precipitation</p>
<p>Week 13: 24/04/2023 to 29/04/2023</p> <p>3.11 Factors affecting solubility of precipitates 3.12 Particle size of the precipitates</p>
<p>Week 14: 01/05/2023 to 06/05/2023</p> <p>3.13 Formation of precipitates 3.14 Desirable properties and contamination of precipitates</p>
<p>Week 15: 08/05/2023 to 13/05/2023</p> <p>3.15 Treatment of the precipitates 3.16 Fractional precipitation Assignment I</p>
<p>Week 16: 15/05/2023 to 19/05/2023</p> <p>Revision</p>

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Class: B. Sc II

Chemistry lesson Plan: 16 weeks (From Feb 2023 to May 2023) * 21/01/23

Week 1: 31/01/2023 to 04/02/2023 Chapter 1 Organometallic Chemistry 1.1 Definition 1.2 Nomenclature and classification of Organometallic compounds
Week 2: 06/02/2023 to 11/02/2023 1.3 Preparation, properties and bonding of alkyls of lithium 1.4 Preparation, properties and bonding of alkyls of Aluminium
Week 3: 13/02/2023 to 18/02/2023 1.5 Preparation, properties and bonding of alkyls of Mercury
Week 4: 20/02/2023 to 25/02/2023 1.6 Preparation, properties and bonding of alkyls of Sn 1.7 Nature of bonding in Metal Carbonyls
Week 5: 27/02/2023 to 04/03/2023 1.8 A brief account of metal Ethylenic complexes 1.9 Mononuclear Carbonyls Assignment I
Week 6: 06/03/2023 to 11/03/2023 Chapter 2 Acid & Bases, HSAB Concept 2.1 Arrhenius concept of Acid & Bases 2.2 Advantages & Limitations of Arrhenius concept
Week 7: 13/03/2023 to 18/03/2023 2.3 Bronsted Lowry concept of Acid and Bases 2.4 Lux – flood concept of Acid and Bases 2.5 Solvent system concept of Acid and Bases 2.6 Lewis system concept of Acid and Bases
Week 8: 20/03/2023 to 25/03/2023 2.7 Relative strength of Acid and Bases 2.8 Concept of Hard and soft Acids and Bases

<p>Week 9: 27/03/2023 to 01/04/2023</p> <p>Chapter 3 Bio Inorganic Chemistry</p> <p>3.1 Essential and Trace elements in biological processes</p> <p>3.2 Metalloporphyrin's with special reference to haemoglobin and myoglobin</p> <p>3.3 Myoglobin and Haemoglobin functions</p> <p>3.4 Carbon dioxide transport and Bohr effect</p>
<p>Week 10: 03/04/2023 to 08/04/2023</p> <p>3.5 Biological role of alkali & alkaline earth metals ions with special reference to Ca^{2+}</p> <p>3.6 Nitrogen Fixation Metalloproteins</p>
<p>Week 11: 10/04/2023 to 15/04/2023</p> <p>Silicones & Phosphazenes</p> <p>4.1 Silicones as an example of Inorganic polymers</p> <p>4.2 Silicones fluids & oils, silicones elastomers</p>
<p>Week 12: 17/04/2023 to 22/04/2023</p> <p>4.3 Silicones Resins, Polysiloxane copolymers</p>
<p>Week 13: 24/04/2023 to 29/04/2023</p> <p>4.4 Introduction to Phosphazene, method of preparation of phosphazenes</p>
<p>Week 14: 01/05/2023 to 06/05/2023</p> <p>4.5 Structure and bonding in Phosphazenes</p>
<p>Week 15: 08/05/2023 to 13/05/2023</p> <p>4.6 Bonding in Triphosphazenes</p> <p>4.7 Uses of Phosphazenes</p> <p>Assignment – II</p>
<p>Week 16: 15/05/2023 to 19/05/2023</p> <p>Revision</p>

LESSON PLAN

Name of Assistant Professor: Sahil

Class: B. Sc I Organic Chemistry

Chemistry lesson Plan: 16 weeks (From Feb 2023 to May 2023) & 21/01/23

<p>Week 1: 31/01/2023 to 04/02/2023 Chapter 1: Alkenes</p> <ul style="list-style-type: none">• 1.1 Nomenclature of alkenes• 1.2 mechanisms of dehydration of alcohol• 1.3 mechanisms of dehydrohalogenation of alkyl halides• 1.4 saytzeff rule, Hoffmann elimination
<p>Week 2: 06/02/2023 to 11/02/2023</p> <ul style="list-style-type: none">• 1.5 physical properties and relative stabilities of alkenes• 1.6 chemical reactions of alkenes – mechanisms involved in hydrogenation• 1.7 electrophilic and free radical addition
<p>Week 3: 13/02/2023 to 18/02/2023</p> <ul style="list-style-type: none">• 1.8 Markownikoff's rule• 1.9 hydroboration – oxidation
<p>Week 4: 20/02/2023 to 25/02/2023</p> <ul style="list-style-type: none">• 1.10 oxymercuration reduction• 1.11 ozonolysis• 1.12 hydration• 1.13 hydroxylation and oxidation with KMnO_4
<p>Week 5: 27/02/2023 to 04/03/2023 Chapter 2: Arenes and Aromaticity</p> <ul style="list-style-type: none">• 2.1 Nomenclature of benzene derivatives : Aromatic nucleus and side chain• 2.2 Aromaticity: Huckel rule
<p>Week 6: 06/03/2023 to 11/03/2023</p> <ul style="list-style-type: none">• 2.3 aromatic ions, annulenes upto 10 carbon atoms• 2.4 aromatic, anti- aromatic and non – aromatic compounds
<p>Week 7: 13/03/2023 to 18/03/2023</p> <ul style="list-style-type: none">• 2.5 aromatic electrophilic substitution• 2.6 mechanism of nitration. Halogenation and sulphonation
<p>Week 8: 20/03/2023 to 25/03/2023</p> <ul style="list-style-type: none">• 2.7 Friedal – craft reaction• 2.8 energy profile diagram• 2.9 activating, deactivating substituents and orientations
<p>Week 9: 27/03/2023 to 01/04/2023</p> <ul style="list-style-type: none">• problems of chapter 1 & 2 <p>Test Assignment I</p>
<p>Week 10: 03/04/2023 to 08/04/2023 Chapter 3: Dienes and Alkynes</p> <ul style="list-style-type: none">• 3.1 Nomenclature and classification of dienes• 3.2 Structure of butadiene
<p>Week 11: 10/04/2023 to 15/04/2023</p> <ul style="list-style-type: none">• 3.3 chemical reactions – 1,2 & 1,4 additions

<ul style="list-style-type: none"> • 3.4 Diels – alder reaction
<p>Week 12: 17/04/2023 to 22/04/2023</p> <ul style="list-style-type: none"> • 3.5 nomenclature, structure and bonding in alkynes • 3.6 methods of formation & chemical reaction of alkynes, acidity of alkynes
<p>Week 13: 24/04/2023 to 29/04/2023</p> <ul style="list-style-type: none"> • 3.7 mechanism of electrophilic and nucleophilic addition reactons • 3.8 hydroboration – oxidation of alkynes
<p>Week 14: 01/05/2023 to 06/05/2023</p> <p>Chapter 4: Alkyl and aryl halides</p> <ul style="list-style-type: none"> • 4.1 Nomenclature and classes of alkyl halides • 4.2 methods of formation, chemical reactions
<p>Week 14 Day1, Date: 2/4/2018</p> <ul style="list-style-type: none"> • 4.3 Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides • 4.4 S_N^1 & S_N^2 reactions with energy profile diagrams
<p>Week 15: 08/05/2023 to 13/05/2023</p> <ul style="list-style-type: none"> • 4.5 Methods of formation & chemical reactions of aryl halides • 4.6 Addition elimination and the elimination addition mechanisms of nucleophilic aromatic substitutions reactions
<p>Week 16: 15/05/2023 to 19/05/2023</p> <ul style="list-style-type: none"> • 4.7 Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides <p>problems of chapter 3 & 4 Assignment II and Revision</p>





Lesson Plan

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Class: B. Sc II Organic Chemistry

Chemistry lesson Plan: 16 weeks (From Feb 2023 to May 2023) & 31/01/23

Week 1: 31/01/2023 to 04/02/2023 Chapter 1: Infrared Absorption Spectroscopy <ul style="list-style-type: none">o 1.1 Molecular Vibrationo 1.2 Hooke's Lawo 1.3 Selection Rule
Week 2: 06/02/2023 to 11/02/2023 <ul style="list-style-type: none">o 1.4 Intensity and Position of IR Bandso 1.5 Measurement of IR Spectrumo 1.6 Fingerprint Reasono 1.7 Characteristics Absorption of Various Functional Groups
Week 3: 13/02/2023 to 18/02/2023 <ul style="list-style-type: none">o 1.8 Interpretation of IR Spectrao 1.9 Application of IR Spectroscopy
Week 4: 20/02/2023 to 25/02/2023 Chapter 2: Amines <ul style="list-style-type: none">o 2.1 Structure of Amineso 2.2 Nomenclature of Amineso 2.3 Separation of Primary, Secondary and Tertiary Amineso 2.4 Physical Properties
Week 5: 27/02/2023 to 04/03/2023 <ul style="list-style-type: none">o 2.5 Basic Charactero 2.6 Factor effecting the Basic Charactero 2.7 Preparation of Alkyl Amineo 2.8 Preparation of Aryl Amine
Week 6: 06/03/2023 to 11/03/2023 <ul style="list-style-type: none">o 2.9 Gabriel Phthalimide Reactiono 2.10 Hofmann Bromamide Reaction
Week 7: 13/03/2023 to 18/03/2023 <ul style="list-style-type: none">o 2.11 Electrophilic Substitution of Aryl Amineo 2.12 Reaction of Amine with Nitrous Acido Test from Chapter 1
Week 8: 20/03/2023 to 25/03/2023 Chapter 3: Diazonium Salts <ul style="list-style-type: none">o 3.1 Mechanism of Diazotizationo 3.2 Structure of Benzene Diazonium Chlorideo 3.3 Various Reaction of Diazonium Salts
Week 9: 27/03/2023 to 01/04/2023 <ul style="list-style-type: none">o 3.4 Reduction of Diazonium Salts to Hydrazineo 3.5 Coupling Reactionso 3.6 Synthesis Application of Diazonium Salts

<p>Week 10: 03/04/2023 to 08/04/2023</p> <p>Chapter 4: Nitro Compounds</p> <ul style="list-style-type: none"> ○ 4.1 Preparation of Nitro Alkane ○ 4.2 Preparation of Nitro Arenes ○ 4.3 Chemical Reactions ○ 4.4 Mechanism of Electrophilic Substitution Reactions ○ 4.5 Reduction in Acidic Neutral and Alkaline Medium
<p>Week 11: 10/04/2023 to 15/04/2023</p> <p>Chapter 5: Aldehyde and Ketone</p> <ul style="list-style-type: none"> ○ 5.1 Nomenclature of Carbonyl Group ○ 5.2 Structure of Carbonyl Group ○ 5.3 Synthesis of Aldehyde and Ketone
<p>Week 12: 17/04/2023 to 22/04/2023</p> <ul style="list-style-type: none"> ○ 5.4 Synthesis of Aldehyde from Acid Chloride ○ 5.5 Advantage of Control Oxidation of Alcohol ○ 5.6 Physical Property ○ 5.7 Comparison of Reactivity of Aldehyde and Ketone
<p>Week 13: 24/04/2023 to 29/04/2023</p> <ul style="list-style-type: none"> ○ 5.8 Mechanism of Aldol Reaction ○ 5.9 Mechanism of Perkin Reaction ○ 5.10 Mechanism of Knoevenagel Reaction ○ 5.11 Condensation with Ammonia and its Derivatives
<p>Week 14: 01/05/2023 to 06/05/2023</p> <ul style="list-style-type: none"> ○ 5.12 Wittig Reaction ○ 5.13 Mannich Reaction ○ 5.14 Oxidation of Aldehyde ○ 5.15 Baeyer Villiger Oxidation ○ 5.16 Cannizzaro Reaction
<p>Week 15: 08/05/2023 to 13/05/2023</p> <ul style="list-style-type: none"> ○ 5.17 Clemmensen Reduction ○ 5.18 Wolf Kishner Reduction ○
<p>Week 16: 15/05/2023 to 19/05/2023</p> <ul style="list-style-type: none"> ○ 5.19 LiAlH_4 and NaBH_4 Reduction ○ Assignment II ○ Revision