**L**esson Plan (2025-26)

Name of the Assistant/ Associate Professor:-Dr. Yogita Yadav

Class and Section: B.Sc 1st Sem.

Subject: chemistry

Paper: Chemistry

|  |  |  |
| --- | --- | --- |
| Week1 | Dates | Topics to be covered |
|  |  | Hydrogen Bonding & Vander Waals Forces Hydrogen Bonding – Definition, , . , types and applications. |
|  | Types, effects of hydrogen bonding on properties of substances |
|  | applicat ion Brief discussion of various types of Vander Waals Forces |
|  | Metallic Bond and Semiconductors |
|  | Metallic Bond- Brie f introduction to meta llic bond, |
|  | band theory of meta llic bond Semiconductors- Introduction |
| Week 2 |  | . s-Block Eleme nts , , |
|  | diagonal relationships |
|  | Comparative study of the elements including salient features of hydrides (methods of preparation excluded) |
|  | solvation and complexation tendencies including their function in biosystems. |
|  | **Chemis try of Noble Gases** Chemical properties of the noble gases with emphasis on their low chemical reactivity, |
|  | chemistry of xenon |
| Week3 |  | structure and bonding of fluorides |
|  | ox ides & oxyfluorides of xenon. |
|  | **p-Block Elements**  , |
|  |  |
|  | Boron family (13th gp):- Diborane – properties and structure (as an example of electron – deficient compound and multicentre bonding) |
|  | Emphasis on comparative study of properties of p-block elements (including diagonal relationship and excluding methods of preparation). |
| Week 4 |  | Borazene – chemical properties and structure |
|  | Trihalides of Boron – Trends in fewis acid character structure of aluminium (III) chloride. |
|  | Carbon Family (14th group) |
|  | carbides, fluorocarbons |
|  | silicates structural aspects), |
|  | Catenation, |
| Week 5 |  | p π– d π bonding (an idea), |
|  | silicons – general methods of preparations |
|  | properties and uses. |
|  | **Nitrogen Family (15th group)**  Oxides – structures of oxides of N,P.. |
|  | oxyacids – structure and relative acid strengths of oxyacids of Nitrogen and phosphorus |
|  | Structure of white, yellow and red phosphorus. |
| Week 6 |  | Oxygen Family (16th group) Oxyacids of sulphur – structures |
|  | acidic strength H2O2 –structure, properties and uses. |
|  | Halogen Fami l y (17th group) Basic prope r ties of ha logen, |
|  | interha logens types propert ies |
|  | hydro and oxyacids of chlorine – structure and compari son of acid strength |
|  | IMPORTANT QUESTIONS |
| Week 7 |  | **Alkenes**  Nomenclatu re of alkenes, , , , , , , |
|  | . The Saytzeff rule, Hofmann elimination |
|  | physical p roperties and relative stabilities of alkenes. |
|  | Chemical reactions of alkenes |
|  | mechanisms involved in hydrogenation |
|  | electrophilic and free radical additions |
| Week 8 |  | Markownikoff’s rule |
|  | hydroboration–oxidation |
|  | oxymercurationreduction, |
|  | , ozonolysis, hydration |
|  | hydroxylation and oxidation with KMnO4, |
|  | mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, |
| Week 9 |  | **Arenes and Aromaticity**  Nomenclatu re of benzene deriva tives:. aromatic ions |
|  | Aromaticity: the Huckel rule |
|  | Aromatic nucleus and side chain., |
|  | annulenes up to 10 carbon atoms, |
|  | Aromatic electrophilic substitution |
|  | general pattern of the mechanism, mechansim of nitration |
| Week 10 |  | halogenation, sulphonation, |
|  | Friedel-Crafts reaction. |
|  | Energy profile diagrams |
|  | Activating , deactivating subs tituents and orientation. |
|  | IMPORTANT QUESTIONS |
|  | ASSIGNMENT |
| Week 11 |  | **Dienes and Alkynes**  Nomenclature and classification of dienes: isolated, , , , |
|  | conjugated and cumulated dienes. |
|  | Structure of butadiene,. |
|  | Chemical reactions 1,2 and 1,4 additions (Electrophilic & free radical mechanism) |
|  | Diels-Alder reaction |
|  | Nomenclature, structure and bonding in alkynes. |
| Week 12 |  | Methods of formation. Chemical reactions of alkynes, acidity of alkynes. |
|  | Mechanism of electrophilic and nucleophilic addition reactions |
|  | hydroboration- oxidation of alkynes |
|  | **Alkyl and Aryl Halides**  Nomenclatu re and classes of alkyl halides |
|  | methods of formation |
|  | chemical reactions |
| Week13 |  | Mechanisms and stereochemistry |
|  | SN2 and SN1reactions with energy profile diagrams. |
|  | Methods of formation and reactions of aryl halides, |
|  | additionelimination |
|  | The Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides. |
|  | nucleophilic substitution reactions of alkyl halides |
| Week 14 | may | elimination-addition mechanisms of nucleophilic aromatic substitution reactions. |
|  | TEST OF EARLIER UNIT |
|  |  |
|  |  |
|  |  |
|  |  |
| Week 15 |  | REVISION |
|  | PROBLEM SOLVING |
|  | ASSIGNMENT AND TEST OF ORGANIC AND INORGANIC |
|  |  |
|  |  |