**BUDHA DAL PUBLIC SCHOOL PATIALA**

**CLASS – XII**

**SUBJECT- CHEMISTRY**

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| **TOPIC** | **INTEGRATION/EXPERENTIAL LEARNING/INTER-DISCIPLINARY** | **Learning Outcomes** |
| **1.Chapter – Solutions**  • different types of solutions; • concentration of solution in different units • Henry’s law and Raoult’s law; ideal and non-ideal solutions  • Deviations of real solutions from Raoult’s law  • colligative properties of solutions  • Abnormal colligative properties exhibited by some solutes in solutions | • Volumetric Analysis KMnO4 vs. Mohr’s Salt Solution  • Volumetric Analysis KMnO4 vs. Oxalic Acid Solution  Integration with other domain: calculation for the numerical of this chapter can be correlated with mathematics | Students will learn to  • Describe the formation of different types of solutions  • Express concentration of solution in different units  • State and explain Henry’s law and Raoult’s law  • Understand the difference between ideal and non ideal solutions  • Explain the deviations of real solutions from Raoult’s law  • Describe the colligative properties of solutions • Explain abnormal colligative properties and correlate these to association or dissociation of the specific entity |
| **2. Chapter- Electrochemistry** electrochemical cell and difference between galvanicand electrolytic cells  • Nernst equation for calculating the emf of galvanic cell and standard potential of the cell relation between standard potential of the cell  • Gibbs energy of cell reaction and its equilibrium constant  • resistivity , conductivity (k) and molar conductivity m) of ionic solutions  • difference between ionic (electrolytic) and electronic conductivity  • measurement of conductivity of  electrolytic solutions and calculation of theirmolarconductivity  • variation of conductivity and molar conductivity of solutions with change in their concentration (molar conductivity at zero concentration or infinite dilution)  • Kohlrausch law and its applicationsquantitative aspects of electrolysis  • construction of some primary and secondary batteriesand fuel cells  • corrosion as an electrochemical process | • Plotting graphs between molar conductance and concentration, plotting graph for 1 and 2 order reactions conc. vs time  • Observing the galvanic cell and its working in the lab.  Integration with other domains: During the study of the chapter, students have to do calculation for numerical which can be correlated with mathematics | Students will be able to:  • develop insights into the functioning of cells and batteries in everyday life.  • They will develop an insight to enhance the efficiency of the cells and batteries by choosing an appropriate cathode and anode |
| **3.Chapter- Chemical** **Kinetics**  Rate of a reaction ,Rate of a reaction and concentration , Rate law and order of a reaction  • Integrated rate Equations , Effect of temperature on Rate of Reaction  • Effect of catalyst on rate of reaction | Students will be able to  • develop insights wrt importance of speed.  • create a logical approahappenings that take place and the cause that actually leads to the same by studying the collision theory and Arrhenius theory.  • Differentiate between the decaying of fruits in different conditions (temperature) ch to  INTEGRATION WITH OHER DOMAINS ′ Chemical kinetics can be integrated with other domains such as mathematics as many numerical problems are to be calculated. It can be integrated with geometrical designing as many graphs are made | Students will be able  • To describe an average and instantaneous rate of a reaction.  • to apply the rate law to calculate the order of a reaction.  • derive integrated rate equations for zero, first order reactions  . • Analyse the collision theory and explain the effect of temperature satisfactorily for most of the reaction. |
| **4 Chapter-d and f block elements**  •oxidation states of the elements  . •various reactions of the elements and their compounds.  • preparation, properties and uses of the elements and their important compounds electronic configurations of the transition (dblock) and the inner transition (f-block) elements;  • relative stability of various oxidation states in termsof electrode potential values  • preparation, properties, structures and uses of some important compounds such as K2Cr2O7 and KMnO  • properties of the f-block elements and comparative account of the lanthanoids and actinoids with respect to their electronic configurations, oxidation states and chemical behaviour.  • understand the general characteristics of the d– and f–block elements and the general horizontal and group trends in them. | Teacher will demonstrate and the Students will perform the following identifying tests (chemical reactions) under qualitative analysis to study the properties of the compounds.   1. Chromyl chloride test 2. (ii) Nesseler’s reagent test 3. Salt analysis for detection of Mn2+, Zn2+, Cr3+, Co2+, Ni2+ etc. ions   Integration with other domain: In this chapter various structures will be drawn, hence it can be correlated with drawing | • Students will learn about  the process and importance of change (transition) in properties of elements from metallic to non-metallic end and now they can predict the probable properties of elements situated at particular places in the periodic table. They can appreciate and understand the importance of change in life  • Students will learn to understand and explain the trends in properties of d and f block elements and now they can reason the abnormalities, similarities and variation in properties of the elements.  • Students will be able to write various reactions related to preparation & properties of K2Cr2O7 and KMnO4 and deduce their structure.  • Students can appreciate and justify tusing alloys and transition metal compounds in various fields in their surroundings.  • Students can identify transition elements and their compounds on the basis of their characteristics.  • Students can extend their knowledge of using the transition metals & their compounds judiciously, to create awareness about the same. |
| **5.Chapter- Coordination** **Compounds**  • properties of the d and f -block elements and comparative account of the lanthanoids and actinoids with respect to their electronic configurations, oxidation states and chemical behaviour. •postulates of Werner’s theory of coordination compounds;  • coordination entity, central atom/ ion, ligand, coordination number, coordination sphere, coordination polyhedron, oxidation number, homoleptic and heteroleptic; • rules of nomenclature of coordination compounds  • formulae and names of mononuclear coordination compounds;  • different types of isomerism in coordination compounds;  • nature of bonding in coordination compounds in terms of the Valence Bond and Crystal Field theories;  • stability of coordination compounds;  •applications of coordination compounds in our day to day life. | Students will be able to  • develop insights into the functioning ofvital components of biological systems. They will know that Chlorophyll, hemoglobin and vitamin B12 are coordination compounds of magnesium, iron and cobalt respectively. On the same line they will be able to apply the understanding of coordination linkages& entities to the existence & formation of various compounds of industrial, agricultural, medicinal and biological importance.  ART INTEGRATION WITH OTHER DOMAINS: This chapter is related with the following domains: English language Art (drawing isomers of coordination compounds) | Students will learn  to write structure and IUPAC names of coordination compounds and they can explain about all terms used in coordination chemistry for in depth study of complexes.  • They can identify various coordination compounds and can predict some of their properties after carrying out complete analysis of the composition, bonding, structure, geometry and related features of the compounds.  • They can apply VBT and CFT to explain the bonding and related features in coordination entities  . • They have learnt to describe the structural features of the organometallic compounds and their application in everyday life. |
| **6. Chapter- Haloalkanes and Haloarenes**  • Nomenclature of haloalkanes and haloarenes according to the IUPAC system  • reactions involved in the preparation of haloalkanes andhaloarenes.  • correlate the structures of haloalkanes and haloarenes with various types of reactions  • stereochemistry in haloalkanes  •applications of organo-metallic compounds  • environmental effects of polyhalogen. | Qualitative Inorganic analysis  • draw the resonating structure of haloarenes  Integration with other domains: During the study of the chapter, students have to make aromatic structures this could be integrated with geometrical pattern design. Hence it is a mathematical concept of comparison. | Students will be able to  • name haloalkanes and haloarenes according to the IUPAC system of nomenclature from their given structures  • describe the reactions involved in the preparation of haloalkanes and haloarenes and understand various reactions that they undergo  • correlate the structures of haloalkanes and haloarenes with various types of reactions • use stereochemistry as a tool for understanding the reaction mechanism  • highlight the uses and environmental effects of polyhalogen compounds |
| **7. Chapter- Alcohols,Phenols and** **Ethers**  Nomenclature of alcohols, phenols and ethers according to the IUPAC system reactions involved in the preparation of alcohols from (i) alkenes (ii) aldehydes, ketones and carboxylic acids;  • reactions involved in the preparation of phenols from (i) haloarenes (ii) benzene sulphonic acids (iii) diazonium salts and (iv) cumene; • reactions for preparation of ethers from (i) alcohols and (ii) alkyl halides and sodium alkoxides/aryloxides; • physical properties of alcohols, phenols and ethers with their structures; • chemical reactions of the three classes of compounds onhe basis of their functional groups | , Use of phenol as fungicide and bactericide,use of alcohol as a fuel, as an antiseptic in hospitals, as  a preservative for biological specimen  . • Students will appreciate the use of phenol in manufacture of drugs like Aspirin, Salol, Phenacitin  • use of diethyl etheras a refrigerant and an inhalation anaesthetic in surgery as it produces unconsciousness without affecting lungs and heart,  • use of methanol in the preparation of dyes, medicines and perfumes, use of ethanol in manufacture of beverages.  • Students will be sensitized about the harmful effects of consumption of ethanol on human health and will be aware how consumption of alcohol leads to addiction and lack of control and coordination in the body which may result in accidents.  • To recognize the drunken person by performing acidified K 2Cr 2 O7 solution test. • Appreciate the use of polymers in daily life.  Integration with other domains: During the study of the chapter, students have to make aromatic structure this could be integrated with geometrical pattern design. Hence it is related with mathematical concept of comparison. | To name alcohols, phenols and ethers according to the IUPAC system of nomenclature The reactions involved in the preparation of alcohols from  • alkenes (ii) aldehydes, ketones and carboxylic acids  • phenols from • (i) haloarenes (ii) benzene sulphonicacids (iii) diazonium salts and (iv)cumene  • ethers from • (i) alcohols (ii) alkyl halides and sodium |
| **8.Chapter-** **Aldehydes,Ketones and Carboxyllic Acids**  common and IUPAC names of aldehydes, ketones and carboxylic acids;  • structures of the compounds containing functional groups namely carbonyl and carboxyl groups;  • important methodsof preparation and reactions of these classes of compounds; •physical properties and chemical reactions of aldehydes,ketones and carboxylic acids, with their structures;  • mechanism of a few selected reactions of aldehydesand ketones;  • factors affecting the acidity of carboxylic acids and their reactions  • uses of aldehydes, ketones and carboxylic acids | Integration with other domains- ′ Since during studying this chapter,students have to make many aromatic structures ,this domain could be integrated with geometrical pattern designing.Moreover comparing various compounds integrates with mathematical concept of comparision. | IUPAC names of aldehydes, ketones and carboxylic acids  • structures of the compounds containing functional groups namely carbonyl and carboxyl groups • understand and become aware of important methods of preparation and reactions of these classes of compounds • know physical properties and chemical reactions of aldehydes,ketones and carboxylic acids, with their structures  • mechanism of a few selected reactions of aldehydes and ketones  • factors affecting the acidity of carboxylic acids and their reactions  • uses |
| **9 Chapter – Amines**  Method of preparation of amines and their properties, distinguishing tests for primary , secondary and tertiary amine  Diazonium salts,preparation and properties | ′ Students would be able to Predict and compare basic nature of amines. · Appreciate chemical characteristics of diazonium chloride. Co-scholastic ′ They will develop skill and competence. ′ They will be able to realise importance and application of this topic in various fields of life. ′ Critical thinking will be developed by analysing different cases. ′ Team work and collaboration will be developed. | Students would be able to tell about  Method of preparation of amines and their properties, distinguishing tests for primary, secondary and tertiary amines |
| **10. Chapter – Biomolecules**  define the biomolecules like carbohydrates, proteins and nucleic acids;  • classification of carbohydrates, proteins, nucleic acids and vitamins on the basis of their structures  • explain the difference between DNA and RNA | Integration with other domains: During the study of the chapter, students have to draw various structures of biomolecules; this can be integrated with drawing  . Co scholastic activities: Students will be shown virtual lab activities related to the topics done in this chapter. It will help in enhancing learning process of students. This will bring social skills, intellectual skills and moral values among students. This ensures that students get to learn effectively | student will be able to:  • Define the biomolecules like carbohydrates, proteins and nucleic acid  • Classify carbohydrates, proteins and nucleic acid on the basis of their structures  • Explain the difference between RNA and DNA  • Appreciate the role of biomolecules in biosystems |