

The Orchid School
Baner
Weekly Syllabus Overview 2015- 2016
Std : XII
Subject : Chemistry

Month	Lesson / Topic	Expected Learning Objective	Activities/ FAs Planned (Practicals)	Remark
March	Unit IV: Chemical Kinetic Rate of a reaction (Average and instantaneous), factors affecting rate of reaction:	Most of the learners will be able to understand rate of reaction and interpret values of average rate reaction.		
APRIL	concentration, temperature, catalyst; order and molecularity of a reaction	*Most of the learners will be able to state the factors affecting rate of the reaction. *Learners will be able to derive the equation for zero order and first order reactions.	Effect of concentration on the rate of reaction between sodium thiosulphate and hydrchloric acid.	
	rate law and specific rate constant, integrated rate equations and half life (only for zero and first order reactions), concept of collision theory	Learners will be able to write the rate law and rate constant for given reactions. Learners will be able to plot graph for zero order reaction.	Effect of temperature on the rate of reaction between sodium thiosulphate and hydrchloric acid.	
	Unit V: Surface Chemistry Adsorption - physisorption and chemisorption, factors affecting adsorption of gases on solids, catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysis	Learners will be able to distinguish and classify the given examples into adsorption and absorption.) Preparation of one lyophilic and one lyophobic sol. Lyophilic sol - starch, egg albumin and gum Lyophobic sol - aluminium hydroxide, ferric hydroxide, arsenous sulphide.	

	colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multimolecular and macromolecular colloids;	Learners will be able to differentiate between physical and chemical adsorption. Learners will be able to classify the given examples into physical and chemical adsorption.		
MAY	properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion - types of emulsions.	Learners will be able to list the applications of adsorption based on isotherm graphs. Learners will be able to plot graph for adsorption isotherm.	Dialysis of sol-prepared in (a) above. c) Study of the role of emulsifying agent in stabilizing the emulsions of different oils	
	Unit II: Solutions Types of solutions, expression of concentration of solutions of solids in liquids	Learners will be to- express concentrations in various terms and solve numericals.	Determination of concentration/molarity of KMnO_4 solution by titrating it against a standard solution of Oxalic acid.	
JUNE	, colligative properties - relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.	Learners state the four colligative properties and write their expressions. Learners solve numericals based on given formulae of colligative properties.	Determination of concentration/molarity of KMnO_4 solution by titrating it against a standard solution of Ferrous ammonium sulphate	
	Unit III: Electrochemistry Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration,, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell -electrolytic cells and Galvanic cells, lead accumulator	Learners describe the electrochemical cell differentiate between galvanic and electrolytic cell	Variation of cell potential in $\text{Zn}/\text{Zn}^{2+}/\text{Cu}^{2+}/\text{Cu}$ with change in concentration of electrolytes (CuSO_4 or ZnSO_4) at room temperature.	

EMF of a cell, standard, electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell,	Learners apply Nernst equation for calculating the emf of cell. Learners derive relation between Gibbs energy and equilibrium constant.	Enthalpy of neutralization of strong acid (HCl) and strong base (NaOH).	
fuel cells, corrosion.	Learners describe the construction of some primary and secondary batteries and fuel cells.		

UT 1

Unit I: Solid State Classification of solids based on different binding forces: molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea). Unit cell in two dimensional and three dimensional lattices, calculation of density of unit cell	Learners will be able to- distinguish between amorphous and crystalline solids; classify solids on basis of nature of binding forces.		
packing in solids, packing efficiency, voids, number of atoms per unit cell in a cubic unit cell, point defects, electrical and magnetic properties. Band theory of metals, conductors, semiconductors and insulators and n and p type semiconductors.	Learners will be able to: calculate the packing efficiency different types of cubic cells; correlate the electrical and magnetic properties of solids and their structure.		

JULY

<p>Unit X: Haloalkanes and Haloarenes. Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation. Haloarenes: Nature of C-X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only). Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.</p>	<p>Most of the learners will be able to name and draw the structures for haloalkanes; describe the reactions involved in preparation of haloalkane; correlate the structures with types of reactions.</p>		
<p>Unit XI: Alcohols, Phenols and Ethers Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols,</p>	<p>Most of the learners will be able to name and draw the structures for alcohols, and ethers;; describe the reactions involved in preparation of ethers and alcohol; correlate the structures with types of reactions.</p>		
<p>Mechanism of dehydration, uses with special reference to methanol and ethanol. Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols.</p>	<p>Most of the learners will be able to name and draw the structures for phenol;; describe the reactions involved in preparation of phenol; correlate the structures with types of reactions.</p>		

AUG

Unit IX: Coordination Compounds Coordination compounds - Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds	Most of the learners define and write the different types of isomerism in co-ordination compounds ; write the formulae and names of mononuclear compounds ; make a list of co-ordination compounds used in industries.	Preparations of Inorganic Compounds	
Unit XII: Aldehydes, Ketones and Carboxylic Acids Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties	Most of the learners will be able to name and draw the structures for aldehydes, ketones and carboxylic acids;; describe the reactions involved in preparation of aldehydes and ketones; correlate the structures with types of reactions.	Tests for the functional groups present in organic compound : (Periods 6) Unsaturation, alcoholic, phenolic, aldehydic, ketonic, carboxylic and amino (Primary) groups.	
.Mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes: uses. Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.	Most of the learners will be able to describe the reactions involved in preparation of carboxylic acids; correlate the structures with types of reactions.		

<p>Unit XIII: Organic compounds containing Nitrogen Amines: Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. Cyanides and Isocyanides - will be mentioned at relevant places in text. Diazonium salts: Preparation, chemical reactions and importance in synthetic organic chemistry.</p>	<p>Most of the learners will be able to classify the amines into primary, secondary and tertiary amines; name amines by common name and IUPAC names; describe the preparation of amines.</p>	<p>Preparation of any two of the following compounds (i) Acetanilide (ii) Di-benzal acetone (iii) p-Nitroacetanilide. (iv) Aniline yellow or 2-Naphthol aniline dye. (v) Iodoform</p>	
<p>Unit VII: "p"-Block Elements Group -15 Elements: General introduction, electronic configuration, occurrence, oxidation states, trends in physical and chemical properties; Nitrogen preparation properties and uses; compounds of Nitrogen, preparation and properties of Ammonia and Nitric Acid, Oxides of Nitrogen (Structure only) ; Phosphorus - allotropic forms, compounds of Phosphorus: Preparation and Properties of Phosphine, Halides and Oxoacids</p>	<p>Learners will be able to: learn the preparation, properties and uses of nitrogen and phosphorous.</p>		

SEPT

<p>Group 16 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties, dioxygen: Preparation, Properties and uses, classification of Oxides, Ozone, Sulphur -allotropic forms; compounds of Sulphur: Preparation Properties and uses of Sulphur-dioxide, Sulphuric Acid: industrial process of manufacture, properties and uses; Oxoacids of Sulphur (Structures only).</p>	<p>Learners will be able to describe the properties , write the oxidation states and electronic configuration of group 16 elements</p>		
<p>TERM 1 EXAM</p>			
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<p>Group 17 Elements: General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; compounds of halogens, Preparation, properties and uses of Chlorine and Hydrochloric acid, interhalogen compounds, Oxoacids of halogens (structures only).</p>	<p>Learners will be able to describe the properties , write the oxidation states and electronic configuration of group 16 elements</p>		

Term 1 Exam				
OCT	Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.	Learners will be able to describe the properties , write the oxidation states and electronic configuration of group 15 elements		
	Unit VIII: "d" and "f" Block Elements General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of K Cr O and KMnO	Learners will be able to- write the electronic configuration of d and f block elements; describe the preparation, uses and structure of KMnO ₄ etc..	Determination of one cation and one anion in a given salt. Cation - Pb ²⁺ , Cu ²⁺ , As ³⁺ , Fe ³⁺ , Mn ²⁺ , Zn ²⁺ ...	
	Lanthanoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids.	Learners will be able to write the oxidation states in terms of electrode potential values; compare the lanthanoids and actinoids w.r.t. their chemical behaviour.		

	Unit VI: General Principles and Processes of Isolation of Elements Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining;	Learners will be able to explain the terms minerals, ores, concentration, benefaction, calcination etc; apply thermodynamic principles of extraction of Al, Zn, Cu and Fe.	Separation of pigments from extracts by paper chromatography and determination of Rf values.	
NOV	occurrence and principles of extraction of aluminium, copper, zinc and iron.	Learners will be able to explain the reduction of oxides; explain the action of reducing agents and uses of reduction.		
	Unit XIV: Biomolecules Carbohydrates - Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates.	Most of the learners will be able to define the biomolecules; classify the biomolecules into different classes giving examples.		
	Proteins -Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure. Vitamins - Classification and functions. Nucleic Acids: DNA and RNA.	Most of the learners will be able to define the terms-proteins, peptide bond, polypeptides etc.; distinguish between RNA and DNA; classify vitamins giving examples.	Characteristic tests of carbohydrates, fats and proteins in pure sample and their detection in given food stuffs.	

DEC	<p>Unit XV: Polymers Classification - natural and synthetic, methods of polymerization (addition and condensation), copolymerization, some important polymers: natural and synthetic like polythene, nylon polyesters, bakelite, rubber. Biodegradable and non-biodegradable polymers.</p>	<p>Most of the learners will be able to distinguish between different classes of polymers; describe the types of polymerization with examples; make a list of uses of polymers in our day to day life.</p>		
	<p>Unit XVI: Chemistry in Everyday life Chemicals in medicines - analgesics, tranquilizers antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines. Chemicals in food - preservatives, artificial sweetening agents, elementary idea of antioxidants. Cleansing agents- soaps and detergents, cleansing action</p>	<p>Most of the learners will be able to define the terms analgesics, antipyretic, tranquilizers etc. ;correlate the chemicals in medicine with their uses; make a list of preservatives used in food industry.</p>		
	UNIT TEST 2			
	Revision			
UT 2				

JAN	Pre-boards			
FEB	Study Leave			
Final Exam				