

## SYLLABUS CHEMISTRY : CLASS 12

Unit I	Solid State
Unit II	Solutions
Unit III	Electrochemistry
Unit IV	Chemical Kinetics
Unit V	Surface Chemistry
Unit VI	General Principles and Processes of Isolation of Elements
Unit VII	p-Block Elements
Unit VIII	d -and f -Block Elements
Unit IX	Coordination Compounds
Unit X	Haloalkanes and Haloarenes
Unit XI	Alcohols, Phenols and Ethers
Unit XII	Aldehydes, Ketones and Carboxylic Acids
Unit XIII	Organic Compounds containing Nitrogen
Unit XIV	Biomolecules
Unit XV	Polymers
Unit XVI	Chemistry in Everyday Life

### Unit I: Solid State: 10 Periods

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, 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.

### Unit II: Solutions: 10 Periods

Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties – relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, CBSE News NCERT Solutions Class 12 Class 11 Class 10 Class 09 fl determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.

### Unit III: Electrochemistry: 12 Periods

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, 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, fuel cells, corrosion.

### Unit IV: Chemical Kinetics: 10 Periods

Rate of a reaction (Average and instantaneous), factors affecting rate of reaction: concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment).

Activation energy, Arrhenius equation.

Unit V: Surface Chemistry 08 Periods

Adsorption – physisorption and chemisorption, factors affecting adsorption of gases on solids,

catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysis colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multimolecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation, emulsion – types of emulsions.

Unit VI: General Principles and Processes of Isolation of Elements: 08 Periods

Principles and methods of extraction – concentration, oxidation, reduction – electrolytic method  
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and refining; occurrence and principles of extraction of aluminium, copper, zinc and iron

Unit VII: Some p-Block Elements: 12 Periods

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 (elementary idea only).

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).

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).

Group 18 Elements: General introduction, electronic configuration, occurrence, trends in physical and chemical properties, uses.

Unit VIII: “d” and “f” Block Elements: 12 Periods

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  
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properties, interstitial compounds, alloy formation, preparation and properties of K Cr O

and KM O .

Lanthanoids – Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences.

Actinoids – Electronic configuration, oxidation states and comparison with lanthanoids.

Unit IX: Coordination Compounds: 12 Periods

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 (in qualitative inclusion, extraction of metals and biological system).

Unit X: Haloalkanes and Haloarenes: 10 Periods

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.

Unit XI: Alcohols, Phenols and Ethers: 10 Periods

Alcohols: Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only), identification of primary, secondary and tertiary alcohols, mechanism of dehydration, uses with special reference to methanol and ethanol.

Phenols: Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reactions, uses of phenols.

Ethers: Nomenclature, methods of preparation, physical and chemical properties, uses.

Unit XII: Aldehydes, Ketones and Carboxylic Acids: 10 Periods

Aldehydes and Ketones: Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses.

Carboxylic Acids: Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.

Unit XIII: Organic compounds containing Nitrogen 10 Periods

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.

Unit XIV: Biomolecules 12 Periods

Carbohydrates – Classification (aldoses and ketoses), monosaccharides (glucose and fructose), DL configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates.

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.

Unit XV: Polymers 08 Periods

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.

Unit XVI: Chemistry in Everyday life 06 Periods

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.

प्रस्तावित पुस्तकें —

1. रसायन ( भाग-1 ) — : ( राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद् द्वारा विकसित )  
राज्य शैक्षिक अनुसंधान और प्रशिक्षण छत्तीसगढ़ द्वारा स्वीकृत
2. रसायन ( भाग-2 ) — : ( राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद् द्वारा विकसित )  
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