

Latest Revised Syllabus Issued by CBSE for Academic Year (2020-2021)

CHEMISTRY (CODE NO. 043)

Time: 3 Hours

THEORY

Max. Marks: 70

Unit No.	Topic	No. of Periods	Marks
Unit I-V	Physical Chemistry	33	23
Unit VII-IX	Inorganic Chemistry	22	19
Unit X-XIV	Organic Chemistry	43	28
	Total	98	70

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, 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
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Unit II: Solutions

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, determination of molecular masses using colligative properties.

✘	Abnormal molecular mass, Van't Hoff factor
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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), 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.

✘	Dry cell-electrolytic cells and Galvanic cells, lead accumulator; Fuel cells, corrosion
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Unit IV: Chemical Kinetics

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
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Unit V: Surface Chemistry

Adsorption: physisorption and chemisorption, factors affecting adsorption of gases on solids, colloidal state distinction between true solutions, colloids and suspension; lyophilic, lyophobic multi-molecular and macromolecular colloids; properties of colloids; Tyndall effect, Brownian movement, electrophoresis, coagulation.

✘	Catalysis, homogenous and heterogenous activity and selectivity; enzyme catalysis; Emulsion - types of emulsions
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✘	Unit VI: General Principle and Processes of Isolation of Elements Principles and methods of extraction - concentration, oxidation, reduction - electrolytic method and refining; Occurrence and principles of extraction of aluminium, copper, zinc and iron.
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Unit VII: Some 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 (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: properties and uses; Oxoacids of Sulphur (Structures only).

✘	Industrial process of manufacture of sulphuric acid
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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

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.

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

✘	Preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$, Actinoids - Electronic configuration, oxidation states and comparison with lanthanoids.
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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 (in qualitative inclusion, extraction of metals and biological system)
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Unit X: Haloalkanes and Haloarenes

Haloalkanes: Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions.

Haloarenes: Nature of C-X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only).

✘	Optical rotation; Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT
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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, mechanism of dehydration.

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

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

✘	Uses with special reference to methanol and ethanol
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Unit XII: Aldehydes, Ketones and Carboxylic Acids

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

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
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Unit XIV: Biomolecules

Carbohydrates: Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D-L configuration.

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.

Nucleic Acids: DNA and RNA.

✘	Oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of carbohydrates; Hormones - Elementary idea excluding structure; Vitamins - Classification and functions
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✘	Unit XV: Polymers Copolymerization, some important polymers: natural and synthetic like polythene, nylon polyesters, bakelite, rubber. Biodegradable and non-biodegradable polymers.
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✘	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.
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Note: Topics/Chapters/Units in the boxes are not in the syllabus for the academic year 2020-21.