

Class12-Chemistry-CBSE-Exam-Formulas

October 18, 2025

Chapter	Concept	Formula / Key Point
Solid State	Types of Solids	Ionic, Molecular, Covalent, Metallic solids
	Unit Cell & Density	$\rho = \frac{ZM}{a^3 N_A}$ Z = number of atoms/unit cell
	Packing Efficiency	SC: 52%, BCC: 68%, FCC: 74%
Solutions	Concentration Terms	Molarity: $M = \frac{n}{V}$, Molality: $m = \frac{n}{W_{\text{solvent in kg}}}$
	Colligative Properties	$\Delta T_b = K_b m$, $\Delta T_f = K_f m$, $\Pi = CRT$
	Raoult's Law	$P_{\text{solution}} = X_A P_A^0 + X_B P_B^0$
	Van't Hoff Factor	$i = \frac{\text{observed value}}{\text{normal value}}$
Electrochemistry	Nernst Equation	$E = E^\circ - \frac{0.0591}{n} \log Q$
	Relation with Gibbs Free Energy	$\Delta G = -nFE$
	Conductance	$\kappa = \frac{1}{R} \cdot \frac{l}{A}$ $\Lambda_m = \frac{\kappa \cdot 1000}{C}$
Chemical Kinetics	Rate Law	Rate = $k[A]^m[B]^n$
	First Order Reaction	$k = \frac{2.303}{t} \log \frac{[R]^*0}{[R]}$ $t * 1/2 = \frac{0.693}{k}$
	Arrhenius Equation	$k = Ae^{-\frac{E_a}{RT}}$

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Surface Chemistry	Adsorption Isotherm	$\frac{x}{m} = \frac{aP}{1+bP}$ (Langmuir)
	Tyndall Effect	Shown by colloids, not true solutions
The p-Block Elements	Group Trends	Acidity, bond angles, oxidation states vary down the group
	Important Compounds	NH ₃ , HNO ₃ , PCl ₃ , PCl ₅ , H ₂ SO ₄ , SO ₂ , Cl ₂ , HCl, Bleaching Powder
The d- & f-Block Elements	Magnetic Moment	$\mu = \sqrt{n(n+2)}$ BM
	Characteristics	Variable oxidation states, colored ions, catalytic behavior
Coordination Compounds	Nomenclature	[Metal(Ligands)] with charges, e.g., [Cr(H ₂ O)] ³⁺
	Oxidation State	Add ligands and ion charges to calculate
	Isomerism	Linkage, Coordination, Geometrical, Optical
	Crystal Field Theory	Δ_0 splitting of d-orbitals in octahedral field
Haloalkanes & Haloarenes	SN1 & SN2 Reactions	SN1: 2-step, tertiary preferred SN2: 1-step, primary preferred
	Physical Properties	Haloalkanes are polar, undergo substitution & elimination
Alcohols, Phenols & Ethers	Reactions	Dehydration, oxidation, esterification
	Acidity Order	Phenol > Alcohol > Water
Aldehydes, Ketones & Carboxylic Acids	Tests	2,4-DNP, Fehling's, Tollen's test (only for aldehydes)
	Reactions	Nucleophilic addition, Aldol condensation, Cannizzaro, etc.
Amines	Basicity Order	2° > 1° > 3° (in aqueous); opposite in gas phase

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Biomolecules	—	—
	Diazotization	Aniline + HNO ₃ → Diazonium salt (0–5°C)
	—	—
	Carbohydrates	Monosaccharides (glucose), Disaccharides (sucrose), Polysaccharides (starch)
	—	—
Polymers	Proteins	Primary, Secondary, Tertiary, Quaternary structure
	—	—
	Enzymes	Biocatalysts, specific action
	—	—
	Types	Addition (PE, PVC), Condensation (Nylon 6,6), Copolymers (Buna-S)
Chemistry in Everyday Life	—	—
	Natural Polymers	Starch, Cellulose, Proteins, Rubber
	—	—
	Drugs	Analgesics, Antipyretics, Antibiotics, Antacids
	—	—
	Cleansing Agents	Soaps (sodium salts), Detergents (sulphonates)