Class12-Chemistry-CBSE-Exam-Formulas

October 20, 2025

Chapter	Concept	Formula	Variable Explanation
Solid State	Types of Solids	Ionic, Molecular, Covalent, Metallic solids	
	Unit Cell & Density	$[\rho = \frac{ZM}{a^3 N_A}]$	ρ: density, Z: atoms/unit cell, M: molar mass, a: cell edge length, N_A: Avogadro's number
	Packing Efficiency	SC: 52%, BCC: 68%, FCC: 74%	
Solutions	Concentration Terms	$[M = \frac{n}{V}]$, $[m = \frac{n}{W_{\text{solvent}}}]$	M: molarity, n: moles solute, V: volume (L); m: molality, W: solvent mass in kg
	Colligative Properties	$[\Delta T_b = K_b m]$, $[\Delta T_f = K_f m]$, $[\Pi = CRT]$	ΔT_b: boiling point elevation, K_b: ebullioscopic constant, m: molality; ΔT_f: freezing point depression, K_f: cryoscopic constant; Π: osmotic pressure, C: concentration, R: gas constant, T: temperature
	Raoult's Law	$[P_{\text{solution}} = X_A P_A^0 + X_B P_B^0]$	P: vapor pressure, X: mole fraction
	Van't Hoff Factor	$[i = \frac{\text{observed value}}{\text{normal value}}]$	Degree of dissociation/association factor
Electrochemistry	Nernst Equation	$[E = E^\circ - \frac{0.0591}{n} \log Q]$	E: cell potential, E°: standard potential, n: electrons transferred, Q: reaction quotient
	Relation with Gibbs Free Energy	$[\Delta G = -nFE]$	ΔG: Gibbs free energy change, n: electrons, F: Faraday constant, E: cell potential
	Conductance	$[\kappa = \frac{1}{R} \cdot \frac{l}{A}]$, $[\Lambda_m = \frac{\kappa \cdot 1000}{C}]$	κ: conductivity, R: resistance, l: length, A: area; Λ_m: molar conductivity, C: concentration (mol/L)
Chemical Kinetics	Rate Law	$[\text{Rate} = k[A]^m[B]^n]$	k: rate constant, $[A], [B]$: reactant concentrations, m, n: reaction orders
	First Order Reaction	$[k = \frac{2.303}{t} \log \frac{[R]_0}{[R]}]$, $[t_{1/2} = \frac{0.693}{k}]$	k: rate constant, t: time, $[R]_0$: initial concentration, $[R]$: concentration at time t
	Arrhenius Equation	$[k = Ae^{-\frac{E_a}{RT}}]$	A: frequency factor, E_a: activation energy, R: gas constant, T: temperature

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Surface Chemistry	Adsorption Isotherm	$[\frac{x}{m} = \frac{aP}{1+bP}]$	x: amount adsorbed, m: adsorbent mass, P: pressure, a, b: constants
	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 , HNO , PCl , PCl , H SO , SO , Cl , HCl, Bleaching Powder	
The d- & f-Block Elements	Magnetic Moment	$[\mu = \sqrt{n(n+2)}$ BM]	μ: magnetic moment (Bohr Magneton), n: number of unpaired electrons
	Characteristics	Variable oxidation states, colored ions, catalytic behavior	
Coordination Compounds	Nomenclature	[Metal(Ligands)] with charges, e.g., [Cr(H O)]^3	
	Oxidation State	Add ligand and ion charges to calculate	
	Isomerism	Linkage, Coordination, Geometrical, Optical	
	Crystal Field Theory	[Δ_0 splitting of d-orbitals in octahedral field]	Δ_0: crystal field splitting energy
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)	

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	Reactions	Nucleophilic addition, Aldol condensation, Cannizzaro, etc.	
Amines	Basicity	$2° > 1° > 3°$	
	Order	(aqueous); opposite in gas phase	
	Diazotization	Aniline + HNO $\rightarrow$ Diazonium salt (0–5°C)	
Biomolecules	Carbohydrates	Monosaccharides (glucose), Disaccharides (sucrose), Polysaccharides (starch)	
	Proteins	Primary, Secondary, Tertiary, Quaternary structure	
	Enzymes	Biocatalysts, specific action	
Polymers	Types	Addition (PE, PVC), Condensation (Nylon 6,6), Copolymers (Buna-S)	
	Natural Polymers	Starch, Cellulose, Proteins, Rubber	
Chemistry in Everyday Life	Drugs	Analgesics, Antipyretics, Antibiotics, Antacids	
	Cleansing Agents	Soaps (sodium salts), Detergents (sulphonates)	