Chemistry

ORIGINAL STUDY COMPANION
PADIKAM
CLASS 11 | SCIENCE
Chemistry
CBSE / NCERT core lessons | Academic year 2026-27
11 chapter lessons
Quick explanations, core points, exam practice and chapter-specific notation in one consistent format.
Padikam explanations are independently written. Official textbooks are used as the coverage map, chapter sequence and terminology reference.

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Study rhythm
Read the quick explanation, recall the core points aloud, then answer the prompts without looking back. Use the official textbook links for full prescribed readings, activities and diagrams.
Textbook and verification links
1. https://cbseacademic.nic.in/web_material/CurriculumMain27/SecPart2/Chemistry_SecP2_2026-27.pdf
2. https://ncert.nic.in/textbook.php
3. https://cbseacademic.nic.in/curriculum_2027.html

CHAPTER 01
Some Basic Concepts of Chemistry
Quick understanding
Use the mole to connect microscopic particles with measurable mass, volume and concentration.
Core points Check your learning
Balance equations before using stoichiometric ratios. Find the empirical formula from percentage composition.
The limiting reagent fixes the maximum product.
Calculate limiting reagent and percentage yield.
Keep significant figures and units through every step.
Equation and notation
n = m/M

$N = nN_A$
Molarity = moles of solute / volume of solution in L
SYMBOLS AND UNITS
n: amount (mol) M: molar mass (g mol^{-1})
N_A: Avogadro constant m: sample mass (g)
N: number of particles Volume in molarity: litre (L)
One-line recall Balance equations before using stoichiometric ratios.

CHAPTER 02
Structure of Atom
Quick understanding
Follow atomic models from spectra to quantum numbers and electronic configuration.
Core points Check your learning
Orbitals are probability distributions, not fixed paths. Write quantum numbers for the last electron of an element.
No two electrons in an atom share all four quantum numbers. Calculate wavelength or energy of radiation.
Aufbau, Pauli and Hund rules guide configuration.
Equation and notation
$E = h\nu = hc/\lambda$
$\lambda = h/mv$
$\Delta x \Delta p \geq h/4\pi$
SYMBOLS AND UNITS
h: Planck constant v: frequency (s^{-1})
λ: wavelength (m) c: speed of light (m s^{-1})
m: particle mass (kg) v: particle speed (m s^{-1})
Δx: position uncertainty (m) Δp: momentum uncertainty (kg m s^{-1})
One-line recall Orbitals are probability distributions, not fixed paths.

CHAPTER 03
Classification of Elements and Periodicity
Quick understanding
Use electronic configuration to explain recurring trends across the periodic table.
Core points Check your learning
Effective nuclear charge generally increases across a period.
Atomic radius generally decreases across a period and increases down a group.
Ionisation enthalpy, electron-gain enthalpy and electronegativity have related but distinct meanings.
Compare sizes of an atom and its ions.
Explain an apparent exception in ionisation enthalpy.
One-line recall Effective nuclear charge generally increases across a period.

CHAPTER 04
Chemical Bonding and Molecular Structure
Quick understanding
Explain stability and shape through ionic, covalent and coordinate bonding, VSEPR and orbital overlap.
Core points Check your learning
Lewis structures track valence electrons and formal charge.
Predict shape and hybridisation of NH_3, H_2O and SF_6.

Lone-pair repulsion changes ideal bond angles. Calculate bond order using molecular orbitals.
Hybridisation and molecular orbital theory answer different structural questions.
Equation and notation
Formal charge = $V - L - \frac{1}{2}B$
Bond order = $\frac{1}{2}(N_b - N_a)$
SYMBOLS AND UNITS
V: valence electrons L: nonbonding electrons
B: bonding electrons N_b: electrons in bonding molecular orbitals
N_a: electrons in antibonding molecular orbitals Bond order and formal charge: dimensionless
One-line recall Lewis structures track valence electrons and formal charge.

CHAPTER 05
Thermodynamics
Quick understanding
Measure energy changes in chemical systems and connect enthalpy, entropy and spontaneity.
Core points Check your learning
State functions depend only on initial and final states. Use bond enthalpies to estimate ΔH.
Predict spontaneity from ΔH and ΔS.
Hess's law follows from enthalpy being a state function.
Negative Gibbs energy indicates thermodynamic possibility, not reaction speed.
Equation and notation
$\Delta U = q + w$
$\Delta H = \Delta U + \Delta(PV)$
$\Delta G = \Delta H - T\Delta S$
SYMBOLS AND UNITS
ΔH: enthalpy change (kJ mol^{-1}) ΔS: entropy change (J mol^{-1} K^{-1})
ΔG: Gibbs energy change ΔQ or q: heat supplied to the system (J)
ΔU: internal-energy change (J) ΔW or w: work (J)
P: pressure (Pa) V: volume (m^3)
n: amount of gas (mol) R: molar gas constant (J mol^{-1} K^{-1})
T: absolute temperature (K) Q_H: heat absorbed from hot reservoir (J)
One-line recall State functions depend only on initial and final states.

CHAPTER 06
Equilibrium
Quick understanding
Treat physical and chemical equilibria as dynamic states and predict shifts and ionic behaviour.
Core points Check your learning
At equilibrium forward and reverse rates are equal. Write Kc and Kp for a reaction.
K changes with temperature, not with catalyst or initial concentration. Calculate pH or solubility product in a simple system.
Buffers resist pH change through a conjugate acid-base pair.
Equation and notation
$K_p = K_c(RT)^{\Delta n}$
$pH = -\log[H^+]$
$K_w = [H^+][OH^-]$
SYMBOLS AND UNITS

K_c: concentration equilibrium constant K_p: pressure equilibrium constant
R: gas constant T: absolute temperature (K)
Δn: gaseous-product moles minus gaseous-reactant [H+], [OH-]: molar concentrations (mol L^{-1})
moles
pH: dimensionless
One-line recall At equilibrium forward and reverse rates are equal.

CHAPTER 07
Redox Reactions
Quick understanding
Track electron transfer through oxidation number and balance redox equations systematically.
Core points Check your learning
Oxidation raises oxidation number; reduction lowers it. Assign oxidation numbers in a polyatomic ion.
Oxidising agent is reduced; reducing agent is oxidised. Balance a redox equation in acidic or basic medium.
Charge and atoms must both balance.
One-line recall Oxidation raises oxidation number; reduction lowers it.

CHAPTER 08
Organic Chemistry: Some Basic Principles and Techniques
Quick understanding
Build a language for carbon compounds using structure, naming, electronic effects and purification.
Core points Check your learning
Identify the longest chain and principal functional group before naming. Give IUPAC names and structural isomers.
Inductive, resonance and hyperconjugative effects influence stability and reactivity. Compare stability of reaction intermediates.
Reaction intermediates include carbocations, carbanions and free radicals.
Watch this Do not choose numbering before identifying the principal functional group.
One-line recall Identify the longest chain and principal functional group before naming.

CHAPTER 09
Hydrocarbons
Quick understanding
Compare alkanes, alkenes, alkynes and aromatic compounds through preparation, structure and reactions.
Core points Check your learning
Alkanes mainly undergo substitution and combustion. Predict products of addition to an unsymmetrical alkene.
Unsaturated hydrocarbons undergo addition; orientation may follow Markovnikov's rule. Explain aromatic substitution in benzene.
Benzene favours electrophilic substitution because aromaticity is stabilising.
Equation and notation
Alkanes: C_nH_{2n+2}
Alkenes: C_nH_{2n}
Alkynes: C_nH_{2n-2}
SYMBOLS AND UNITS
n: number of carbon atoms; n is a positive integer Subscripts: number of atoms of each element in one

molecule
One-line recall Alkanes mainly undergo substitution and combustion.
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CHAPTER 10
Formative Reading: The Gaseous State
Quick understanding
Extend gas behaviour through ideal assumptions, gas laws and molecular interpretation.
Core points Check your learning
Use kelvin temperature in every gas-law calculation. Solve a combined gas-law problem.
The ideal-gas equation combines pressure, volume, Explain one cause of deviation from ideal
amount and temperature. behaviour.
Real gases approach ideal behaviour most closely at
low pressure and high temperature.
Equation and notation
$PV = nRT$
$P_1V_1/T_1 = P_2V_2/T_2$
SYMBOLS AND UNITS
P: pressure (Pa) V: volume (m^3)
n: amount of gas (mol) R: gas constant ($J\ mol^{-1}\ K^{-1}$)
T: absolute temperature (K)
One-line recall Use kelvin temperature in every gas-law calculation.
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CHAPTER 11
Formative Reading: s- and p-Block Elements
Quick understanding
Relate valence-shell configuration to characteristic properties and trends of representative elements.
Core points Check your learning
s-block elements have differentiating electrons in an Compare two group trends with reasons.
s subshell; p-block elements in a p subshell.
Explain anomalous behaviour of the first
Group trends reflect changing size, ionisation element of a group.
enthalpy and oxidation-state stability.
Important compounds should be understood through
preparation, structure, properties and use rather
than isolated equations.
Watch this This enrichment lesson is formative reading; follow the current school assessment
notice for summative scope.
One-line recall s-block elements have differentiating electrons in an s subshell; p-block elements in a p subshell.
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