SCERT Kerala · Class 12 · Chemistry

Chemistry

ORIGINAL STUDY COMPANION
PADIKAM
CLASS 12 | SCIENCE
Chemistry
Kerala SCERT / prescribed NCERT core lessons
14 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://www.hsslive.in/2015/05/plus-two-2-new-text-booksscert.html
2. https://samagra.kite.kerala.gov.in/
3. https://ncert.nic.in/textbook.php
4. https://ncert.nic.in/textbook.php?lech1=0-5
5. https://ncert.nic.in/textbook.php?lech2=0-5

CHAPTER 01
Solutions
Quick understanding
Solution properties depend on composition and on how solute particles interact with solvent particles.
Core points Check your learning
Concentration may be expressed by mole fraction, Explain the central idea of Solutions in molarity or molality. your own words.
Raoult law describes ideal volatile components. Apply one idea from Solutions to a textbook-style example or source.
Colligative properties depend on the number of dissolved particles.
Equation and notation
M = n(solute) / V(solution)
m = n(solute) / mass(solvent in kg)
$\Delta T_\beta = iK_\beta m$; $\Delta T_f = iK_f m$

$\pi = iCRT$
SYMBOLS AND UNITS
M: molarity (mol L^{-1}) m: molality (mol kg^{-1})
n: amount of substance (mol) V: solution volume (L)
i: van t Hoff factor K_β, K_f: ebullioscopic and cryoscopic constants (K kg mol^{-1})
π: osmotic pressure (Pa) C: molar concentration (mol m^{-3})
R: gas constant (J mol^{-1} K^{-1}) T: temperature (K)
One-line recall Concentration may be expressed by mole fraction, molarity or molality.

CHAPTER 02
Electrochemistry
Quick understanding
Electrochemistry connects spontaneous redox reactions with electrical work and uses supplied electricity to drive non-spontaneous change.
Core points Check your learning
Galvanic cells convert chemical energy to electrical energy. Explain the central idea of Electrochemistry in your own words.
The Nernst equation relates cell potential to concentration. Apply one idea from Electrochemistry to a textbook-style example or source.
Conductivity depends on ions, concentration and temperature.
Equation and notation
$E_{cell} = E_{cathode} - E_{anode}$
$\Delta G = -nFE_{cell}$
$E = E^\circ - (RT / nF) \ln Q$
$\Lambda_m = \kappa \times 1000 / C$
SYMBOLS AND UNITS
E_{cell}, E°: cell potentials (V) ΔG: Gibbs energy change (J mol^{-1})
n: electrons transferred per reaction F: Faraday constant (C mol^{-1})
R: gas constant (J mol^{-1} K^{-1}) T: temperature (K)
Q: reaction quotient Λ_m: molar conductivity (S m^2 mol^{-1})
κ: conductivity (S m^{-1}) C: concentration (mol m^{-3})
One-line recall Galvanic cells convert chemical energy to electrical energy.

CHAPTER 03
Chemical Kinetics
Quick understanding
Reaction rate measures change of concentration with time and reflects the pathway and energy barrier of a reaction.
Core points Check your learning
Rate law is established experimentally. Explain the central idea of Chemical Kinetics in your own words.
Reaction order need not equal stoichiometric coefficients. Apply one idea from Chemical Kinetics to a textbook-style example or source.
Temperature changes the rate constant through the Arrhenius relation.
Equation and notation
Rate = k[A]^m[B]^n
For first order: $\ln([A]_0/[A]) = kt$
$t_{1/2}$(first order) = 0.693 / k
$k = Ae^{(-E_a/RT)}$

SYMBOLS AND UNITS
Rate: concentration change per time (mol L^{-1} s^{-1}) k: rate constant with order-dependent unit
[A], [B]: molar concentrations (mol L^{-1}) m, n: partial orders
t, t½: time and half-life (s) A: frequency factor
E_a: activation energy (J mol^{-1}) R: gas constant (J mol^{-1} K^{-1})
T: temperature (K)
One-line recall Rate law is established experimentally.
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CHAPTER 04
The d- and f-Block Elements
Quick understanding
Partly filled d or f subshells produce characteristic oxidation states, colours, magnetism and complex formation.
Core points Check your learning
Transition elements show variable oxidation states. Explain the central idea of The d- and f-Block Elements in your own words.
Lanthanoid contraction affects sizes and separation.
Apply one idea from The d- and f-Block
Oxidation state and ligand environment influence
Elements to a textbook-style example or
colour and reactivity.
source.
One-line recall Transition elements show variable oxidation states.
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CHAPTER 05
Coordination Compounds
Quick understanding
Acoordination entity contains a central metal bonded to ligands in a defined geometry and oxidation state.
Core points Check your learning
Name ligands before the metal and calculate Explain the central idea of Coordination
oxidation state carefully. Compounds in your own words.
Coordination number is not the same as oxidation Apply one idea from Coordination
number. Compounds to a textbook-style example
or source.
Isomerism and bonding models explain different
structures and properties.
Equation and notation
EAN = Z - oxidation state + electrons donated by ligands
Magnetic moment $\mu = \sqrt{(n(n + 2))}$ BM
SYMBOLS AND UNITS
EAN: effective atomic number Z: atomic number
n: number of unpaired electrons μ: spin-only magnetic moment (BM)
BM: Bohr magneton
One-line recall Name ligands before the metal and calculate oxidation state carefully.
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CHAPTER 06
Haloalkanes and Haloarenes
Quick understanding
Carbon-halogen compounds react according to bond polarity, substrate structure, nucleophile strength and reaction conditions.
Core points Check your learning

SN1 and SN2 mechanisms differ in steps and stereochemical outcome.
Aryl halides resist ordinary nucleophilic substitution because the C-X bond has partial double-bond character.
Some polyhalogen compounds persist and harm the environment.
One-line recall SN1 and SN2 mechanisms differ in steps and stereochemical outcome.
Explain the central idea of Haloalkanes and Haloarenes in your own words.
Apply one idea from Haloalkanes and Haloarenes to a textbook-style example or source.
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CHAPTER 07
Alcohols, Phenols and Ethers
Quick understanding
The hydroxyl group and ether linkage control hydrogen bonding, acidity and characteristic substitution or oxidation reactions.
Core points
Alcohol boiling points reflect intermolecular hydrogen bonding.
Phenol is more acidic than an alcohol because phenoxide is resonance stabilised.
Ethers can be prepared by Williamson synthesis and cleaved by strong hydrogen halides.
One-line recall Alcohol boiling points reflect intermolecular hydrogen bonding.
Check your learning
Explain the central idea of Alcohols, Phenols and Ethers in your own words.
Apply one idea from Alcohols, Phenols and Ethers to a textbook-style example or source.
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CHAPTER 08
Aldehydes, Ketones and Carboxylic Acids
Quick understanding
Carbonyl polarity drives nucleophilic addition, while the carboxyl group combines carbonyl reactivity with acidic behaviour.
Core points
Aldehydes are generally more reactive than ketones toward nucleophiles.
Oxidation tests distinguish many aldehydes from ketones.
Electron-withdrawing groups increase carboxylic-acid strength.
One-line recall Aldehydes are generally more reactive than ketones toward nucleophiles.
Check your learning
Explain the central idea of Aldehydes, Ketones and Carboxylic Acids in your own words.
Apply one idea from Aldehydes, Ketones and Carboxylic Acids to a textbook-style example or source.
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CHAPTER 09
Amines
Quick understanding
Amines are nitrogen bases whose structure, lone pair availability and substituents determine basicity and reactions.
Core points
Classify amines by carbon groups attached to nitrogen.
Basicity order depends on solvent, inductive effect and resonance.
Aromatic diazonium salts are valuable intermediates
Check your learning
Explain the central idea of Amines in your own words.
Apply one idea from Amines to a textbook-style example or source.

for substitution and azo coupling.
One-line recall Classify amines by carbon groups attached to nitrogen.
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CHAPTER 10
Biomolecules
Quick understanding
Carbohydrates, proteins, enzymes, vitamins and nucleic acids provide structure, energy, catalysis and biological information.
Core points Check your learning
Monomers join through characteristic glycosidic, Explain the central idea of Biomolecules
peptide or phosphodiester links. in your own words.
Protein function depends on levels of structure. Apply one idea from Biomolecules to a
textbook-style example or source.
DNA stores hereditary information; RNA performs
several expression roles.
One-line recall Monomers join through characteristic glycosidic, peptide or phosphodiester links.
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CHAPTER 11
Formative Reading: Surface Chemistry
Quick understanding
Study adsorption, catalysis and colloids as surface-controlled phenomena with major industrial and biological uses.
Core points Check your learning
Adsorption occurs at a surface and differs from bulk Explain the central idea of Formative
absorption. Reading: Surface Chemistry in your own
words.
Catalysts change reaction pathway and rate without
changing equilibrium position. Apply one idea from Formative Reading:
Surface Chemistry to a textbook-style
Colloids show characteristic scattering, charge and
example or source.
stability behaviour.
Equation and notation
Freundlich form: $x/m = kP^{(1/n)}$
SYMBOLS AND UNITS
x: mass adsorbed m: mass of adsorbent
P: gas pressure (Pa) k, n: empirical constants with system-dependent units
One-line recall Adsorption occurs at a surface and differs from bulk absorption.
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CHAPTER 12
Formative Reading: Isolation of Elements
Quick understanding
Connect ore concentration, reduction, refining and thermodynamic feasibility with the production of useful metals.
Core points Check your learning
The extraction route depends on metal reactivity and Explain the central idea of Formative
ore chemistry. Reading: Isolation of Elements in your
own words.
Ellingham reasoning compares oxidation tendencies
through Gibbs energy. Apply one idea from Formative Reading:
Isolation of Elements to a textbook-style
Refining removes impurities to meet the required

example or source.
purity.
Equation and notation
$\Delta G = \Delta H - T\Delta S$
SYMBOLS AND UNITS
ΔG: Gibbs energy change (J mol^{-1}) ΔH: enthalpy change (J mol^{-1})
T: absolute temperature (K) ΔS: entropy change (J mol^{-1} K^{-1})
One-line recall The extraction route depends on metal reactivity and ore chemistry.
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CHAPTER 13
Formative Reading: Polymers
Quick understanding
Classify macromolecules by source, structure, formation and intermolecular forces and relate these features to use and disposal.
Core points Check your learning
Addition polymerisation joins unsaturated monomers Explain the central idea of Formative without a small-molecule by-product. Reading: Polymers in your own words.
Condensation polymerisation forms links while Apply one idea from Formative Reading: eliminating small molecules. Polymers to a textbook-style example or source.
Thermoplastic, thermosetting, fibre and elastomer behaviour follows chain structure and bonding.
One-line recall Addition polymerisation joins unsaturated monomers without a small-molecule by-product.
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CHAPTER 14
Formative Reading: Chemistry in Everyday Life
Quick understanding
Use chemical principles to understand medicines, food additives, cleansing agents and responsible product use.
Core points Check your learning
Drug action depends on biological targets, dose and Explain the central idea of Formative route. Reading: Chemistry in Everyday Life in your own words.
Antibiotics do not treat viral infection and misuse encourages resistance. Apply one idea from Formative Reading: Chemistry in Everyday Life to a textbook-
Soaps and detergents form micelles, but their style example or source.
environmental behaviour differs.
One-line recall Drug action depends on biological targets, dose and route.
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