

CLASS 12

CHEMISTRY

REVISION NOTES

Class 12 Chemistry Chapter 6 Haloalkanes and Haloarenes – Revision Notes

Quick revision notes for Class 12 Chemistry Chapter 6 – Haloalkanes and Haloarenes, covering classification, nomenclature, preparation, substitution mechanisms, and polyhalogen compounds. Ideal for last-minute board exam revision.

Contents

Classification and Nomenclature

Preparation and Physical Properties

Nucleophilic Substitution: SN1 vs SN2

Haloarenes

Polyhalogen Compounds

One-Line Summary

Quick revision notes for **Class 12 Chemistry Chapter 6 – Haloalkanes and Haloarenes**, covering classification, nomenclature, preparation, substitution mechanisms, and polyhalogen compounds. Ideal for last-minute board exam revision.

Classification and Nomenclature

Halides are classified by the carbon bearing the halogen: **alkyl** (sp^3 carbon, not adjacent to a ring/double bond), **allylic** (sp^3 carbon adjacent to $C=C$), **benzylic** (sp^3 carbon adjacent to an aromatic ring), **vinyllic** (directly on an sp^2 $C=C$ carbon), and **aryl** (directly on an aromatic ring carbon). Alkyl halides are further classed as 1° , 2° or 3° depending on the number of carbon groups attached to the $C-X$ carbon.

Preparation and Physical Properties

Common preparation routes include: alcohols+ $HX/PX_3/PX_5/SOCl_2$; alkenes+ HX or X_2 ; free-radical halogenation of alkanes; and halide exchange (the **Finkelstein reaction**, $RCl+NaI \rightarrow RI+NaCl$ in dry acetone). Alkyl halides are polar but **immiscible with water** (no hydrogen bonding possible with water), and their boiling points and densities rise with the **number and atomic mass of halogens** present ($I > Br > Cl > F$). Dipole moment falls as more halogens are added to the same carbon due to increasing cancellation by symmetry ($CH_3Cl > CH_2Cl_2 > CHCl_3 > CCl_4 \approx 0$).

Nucleophilic Substitution: S_N1 vs S_N2

S_N2 : single-step, concerted backside attack; rate depends on both substrate and nucleophile concentration; causes **inversion of configuration (Walden inversion)**; favoured by unhindered substrates ($methyl > 1^\circ > 2^\circ > 3^\circ$, reactivity decreasing with branching). **S_N1** : two-step, via a planar carbocation intermediate; rate depends only on substrate concentration; typically gives a **racemic mixture**; favoured by substrates forming stable carbocations ($3^\circ > 2^\circ > 1^\circ$, and benzylic/allylic are especially favoured due to resonance stabilisation). Leaving-group ability follows $I^- > Br^- > Cl^- > F^-$. Elimination ($E1/E2$) competes with substitution, generally following **Zaitsev's rule** (more substituted alkene favoured); aqueous KOH favours substitution, hot alcoholic KOH favours elimination.

Haloarenes

Haloarenes (e.g. chlorobenzene) are **much less reactive** towards nucleophilic substitution than haloalkanes, because the halogen's lone pair is delocalised into the ring by resonance (giving the $C-X$ bond partial double-bond character, shorter and stronger) and the sp^2 carbon resists backside attack. This same resonance donation makes halogens weakly **deactivating but ortho/para-directing** in electrophilic aromatic substitution.

Polyhalogen Compounds

Key uses (syllabus scope is limited to uses/environmental effects, not preparation): **Freon-12** (refrigerant, aerosol propellant; ozone-depleting), **DDT** (insecticide; banned in most countries due to bioaccumulation), **carbon tetrachloride** (former solvent; can form toxic phosgene), and **iodoform** (former antiseptic, action due to liberated iodine).

One-Line Summary

Chapter 6 builds a complete picture of haloalkane and haloarene chemistry — from classification and preparation through the competing S_N1/S_N2 substitution mechanisms and their stereochemical consequences, to why haloarenes resist substitution, closing with the practical uses and environmental concerns of key polyhalogen compounds.

Continue Revising — NCERT Solutions for Class 12 Chemistry:

[Chapter 1: Solutions](#) | [Chapter 2: Electrochemistry](#) | [Chapter 3: Chemical Kinetics](#) | [Chapter 4: The d- and f-Block Elements](#) | [Chapter 5: Coordination Compounds](#) | [Chapter 6: Haloalkanes and Haloarenes](#)

Recommended: Buy the Printed NCERT Class 12 Chemistry Book

Contains Amazon affiliate links.

If you'd like a printed copy alongside the PDF, here's a verified option:

NCERT Chemistry Part 1 Textbook for Class 12 (2025-26 Edition)

4.3 out of 5 stars (1,324 ratings) · Rs. 130

Buy on Amazon →

Price and availability may change on Amazon. As an Amazon Associate, ncertbooks.org earns from qualifying purchases.

© NCERTBooks.org — your one-stop source for Class 1 to 12 NCERT Books, Solutions, Extra Questions, Revision Notes, Formulas Handbooks and more. Visit ncertbooks.org for the latest chapters as they are published.