



# IIT-JEE · NEET · CBSE eBOOKS

CLASS 11&12th



CLASS 12th

Haloalkanes & Haloarenes

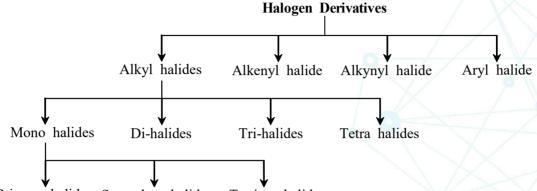


## 01. Introduction

Compounds derived from hydrocarbons by replacement of one or more H-atoms by corresponding no. of halogen atoms are known as halogen derivatives.

#### **Classification:**

On the basis of nature of hydrocarbon from which they are obtained, hydrocarbon derivatives can be classified as :



Primary halide Secondary halide Tertiary halide

(i) Mono halides: These involves replacement of one H-atom by halogen atom.

General formula  $C_nH_{2n+1}X$ , where X = F, Cl, Br, I.

Example: CH<sub>3</sub>Cl Methyl chloride (Chloro methane)

CH<sub>3</sub>CH<sub>2</sub>Br Ethyl bromide (Bromo ethane)

(ii) Dihalides: Replacement of two H-atom by halogen atoms.

General formula C<sub>n</sub>H<sub>2n</sub>X<sub>2</sub>,

Example:

$$\begin{array}{ccc} CH_2X & Ethylene \ dihalide \ or \ Vicinal \ dihalide \\ CH_2X & \\ CH_3 & Ethyledene \ dihalide \ or \ geminal \ dihalide \\ CHX_2 & \end{array}$$

(iii) Trihalides: Replacement of three H-atoms by halogen atoms.

General formula  $C_nH_{2n-1}X_3$ .

Example: CHX<sub>3</sub> Trihalo methane or haloform

(iv) Tetra halide and Perhalo compounds: Replacement of 4 H-atoms by halogen atom (in  $CH_4 \rightarrow CCl_4$ )  $\rightarrow$  Tetrahalides.

When all the H-atoms from an alkene are replaced by halogen atoms, then the compounds are called as perhalo compound.

General formula C<sub>n</sub>H<sub>2n-2</sub>X<sub>4</sub> (tetra halide).

 $CH_4 \rightarrow CX_4$  (per halo methane)

# 02. IUPAC Nomenclature

# Classification of alkyl halides

$$\begin{array}{ccc} & & & CH_3 \\ 1^\circ & 2^\circ \middle| \\ CH_3CH_2CH_2-Br & CH_3-CH-I \\ 1-Bromopropane & 2-Iodopropane \\ & (Primary) & (Secondary) \end{array}$$

2-Chloro-2-methylpropane (Tertiary)

## Haloalkenes or Alkenyl halides

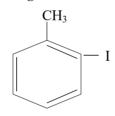
$$\begin{array}{ccc} & & 3 & 2 & 1 \\ CH_2=CH-Cl & Br-CH_2-CH=CH_2 \\ Chloroethene & 3-Bromoprop-1-ene \\ \textit{(Vinyl chloride)} & \textit{(Allyl bromide)} \end{array}$$

#### Haloalkynes or Alkynyl halides

$$H-C \equiv C-C1$$
  $Br-CH_2-C \equiv CH$   $S-Bromoprop-1-yne$   $S-Bromoprop-1-$ 

## Aromatic halogen compounds

## Nuclear halogen derivatives



2—Iodo—1—methylbenzene or 2—Iodotoluene (o-Iodotoluene)

# Side chain halogen derivatives aralkyl halides:



CHC<sub>12</sub>

CCl<sub>3</sub>

(Benzyl chloride)

1-chloro-1-phenylmethane 1,1-Dichloro-1-phenylmethane 1,1,1-Trichloro-1-phenylmethane (Benzal dichloride)

(Benzotrichloride)

#### Allylic halides



3-Haloprop-1-ene (Allyl halide)

