

Haloalkanes and Haloarenes.

- The halogen derivatives of aliphatic and aromatic hydrocarbons are called alkyl halides (Haloalkanes) and aryl halides (Haloarenes). These are obtained by the replacement of a hydrogen atom of an alkane and arene by a halogen atom (F, Cl, Br, I).

Classification of Halogen Derivatives of Hydrocarbon.

1. Aliphatic halogen compounds :- These are obtained by the replacement of one or more hydrogen atoms of an aliphatic hydrocarbon by an equal number of halogen atoms. These are further classified as haloalkanes, haloalkenes, haloalkynes.

If more than one hydrogen atom is replaced then the compounds are called polyhaloalkanes.

2. Aromatic halogen compounds :- These are the compounds which are obtained by the replacement of one or more hydrogen atoms of aromatic hydrocarbon by an equal number of halogen atoms. These are of two type.

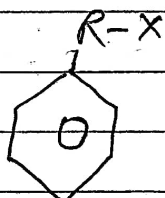
(i) Nuclear halogen derivatives :- These are derived by replacing hydrogen atom attached to the benzene ring by a halogen atom.



X = F, Cl, Br, I

(ii) Side chain halogen derivatives - These are derived by replacing hydrogen from side chain which attach to the benzene ring by a halogen atom. These compounds

are not regarded as aryl halide because halogen is not directly attached to the benzene ring. These are called side chain substituted aryl halide or aralkyl halides.



$X = F, Cl, Br, I$.

- These are further classified as.

A. Type of halogen atom: - as Fluoro, chloro, bromo, Iodo.

B. Number of halogen atoms: - as mono, di, tri.

C. Nature of Carbon atom: - as Primary (1°), Secondary (2°), Tertiary (3°).

- Classification on the basis of type of hybridization of Carbon bonded to the halogen atom: -

↓ Compounds containing sp^3 hybridised Carbon: -

(a) Haloalkanes or alkyl halides (RX): -

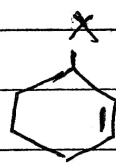
In these halides the halogen atom is bonded to an alkyl group (R).

If R is alicyclic then the halide is called cycloalkyl halide or halocycloalkane.

(b) Allylic halide: -

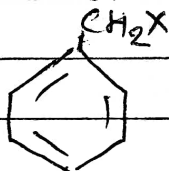
In these halides, the halogen is bonded to an sp^3 Carbon atom next to the Carbon-Carbon double bond. The Carbon atom next to the Carbon-Carbon

double bond is called allylic carbon.



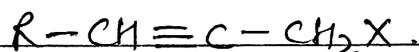
c) Benzylic halide:-

In these halides the halogen atom is bonded to an sp^3 carbon atom next to an aromatic ring



d) Propargyl halides:-

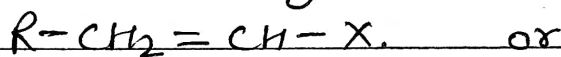
In these halides, the halogen atom is bonded to a sp^3 carbon atom next to a carbon-carbon triple bond.



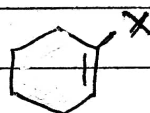
2. Compounds Containing sp^2 Carbon.

a) Vinylic halide:

In these halides the halogen atom is bonded to an sp^2 carbon (vinylic carbon)



or



b) Aryl halides:-

In these halides, the halogen atom is bonded to a sp^2 carbon of an aromatic ring. These aromatic halogen compounds are also called haloarenes.



3. Compound containing sp Carbon:-

In these halogens the halogen atom is directly bonded to one of the carbon atoms of a triple bond

