

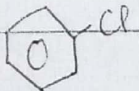
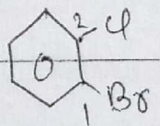
# Alkyl halides and Aryl halides or Haloalkanes and Haloarenes

Aliphatic compound containing carbon halogen bond ( $-\overset{|}{\underset{|}{C}}-X$ ) are called alkyl halide. These compound are represented by  $(R-X)$  as general formula. ( $X = -Cl, -Br, -I$ , rarely  $-F$ ).

Aromatic compounds containing carbon halogen bond in which halogen is directly bonded with aromatic ring carbon are called aryl halide. These compound are represented by  $Ar-X$  as general formula.

## IUPAC nomenclature

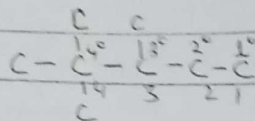
Halides are considered as substituent group therefore main chain is considered as alkane and in aryl halide benzene as main group

- ①  $CH_3-Cl \Rightarrow$  Chloromethane
- ②  $CH_3-CH_2-Br \Rightarrow$  Bromomethane
- ③  $CH_2Br-CH_2Br \Rightarrow$  1,2-Dibromoethane (vic dihalide)
- ④  $CH_3-CHBr_2 \Rightarrow$  1,1-Dibromoethane (gem dihalide)
- ⑤  $CH_2Cl-CHCl-CH_2Cl \Rightarrow$  1,1,2,3-Tetrachloropropane
- ⑥  $CH_2Cl-CHBr-CHClBrI \Rightarrow$  1,2-Dibromo-1,3-dichloro-1-iodopropane
- ⑦   $\leftarrow$  chlorobenzene
- ⑧   $\leftarrow$  1-Bromo-2-chlorobenzene

\* Alphabetical order for smallest number.

## Classification of alkyl halides

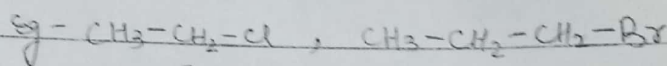
Carbon atoms in the chain are classified as:



Alkyl halides are classified as:

1. Primary alkyl halide ( $1^\circ$ ) :-

Halogen functional group is bonded with primary carbon atom in the chain.

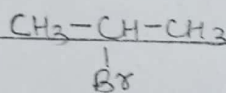


Ethylchloride      primary propyl bromide  
or n-propyl bromide

2. Secondary alkyl halide ( $2^\circ$ ) :-

Halogen functional group is bonded with the secondary carbon atom in the chain.

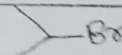
Eg



or



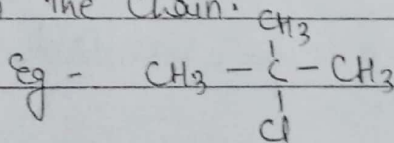
or



2-Bromopropane, Sec. propyl bromide, Isopropyl bromide.

3. Tertiary alkyl halide ( $3^\circ$ ) :-

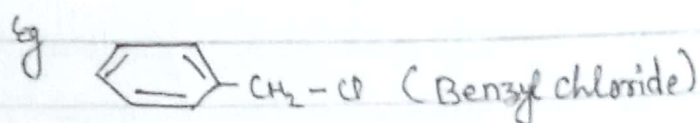
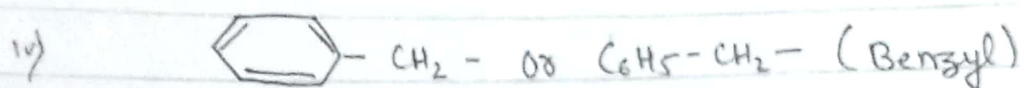
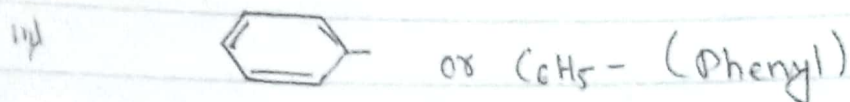
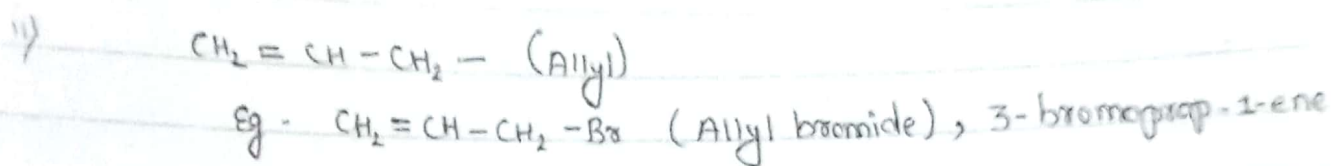
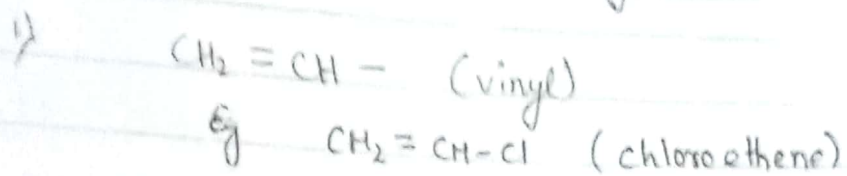
Halogen functional group is bonded with tertiary carbon atom in the chain.



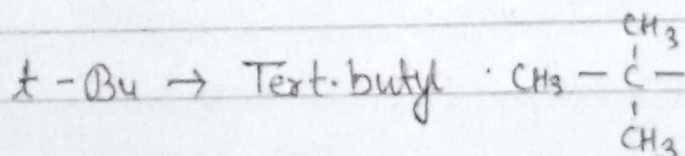
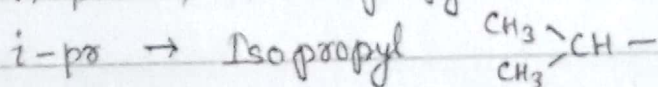
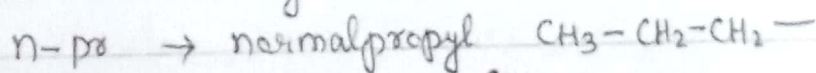
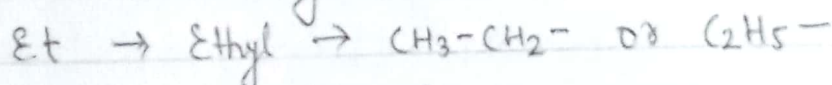
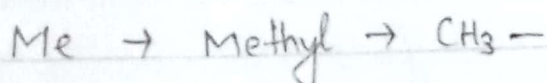
2-chloro-2-methylpropane, Neobutyl chloride, Tert. butyl chloride



## Important groups :-

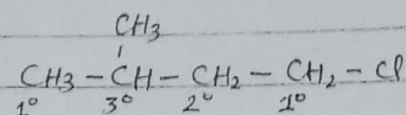


## Symbolic representation



Q. How many  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  carbon and hydrogen atoms are present 1-chloro-3-methylbutane.

Ans :-



$$1^\circ \text{C} = 3, \quad 1^\circ \text{H} = 8$$

$$2^\circ \text{C} = 1, \quad 2^\circ \text{H} = 2$$

$$3^\circ \text{C} = 1, \quad 2^\circ \text{H} = 1$$

Q write down the possible structural isomers of molecular formula  $\text{C}_4\text{H}_9\text{Cl}$ . Give their IUPAC name and classify them as  $1^\circ$ ,  $2^\circ$ ,  $3^\circ$  alkyl halide.

