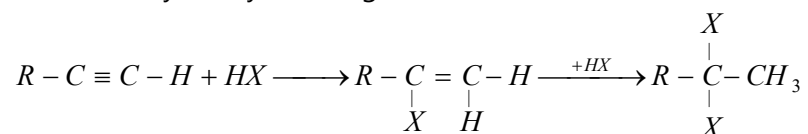


## Preparations and properties of Dihalides.

### (1) Methods of preparation of dihalides

#### (i) Methods of preparation of gemdihalide

##### (a) From alkyne (Hydrohalogenation) :



##### (b) From carbonyl compound: $RCHO + PCl_5 \longrightarrow RCHCl_2 + POCl_3$ [Terminal dihalide]

Note: If ketone is taken internal dihalide formed.

#### (ii) Methods of preparation of vicinal dihalide

##### (a) From alkene [By halogenation] : $R-CH=CH_2 + Cl_2 \longrightarrow R-\underset{\substack{| \\ Cl}}{CH}-\underset{\substack{| \\ Cl}}{CH_2}$

##### (b) From vicinal glycol: $\begin{array}{c} R-CH-OH \\ | \\ CH_2-OH \end{array} + 2PCl_5 \longrightarrow \begin{array}{c} R-CH-Cl \\ | \\ CH_2-Cl \end{array} + 2HCl + 2POCl_3$

### (2) Properties of dihalides

#### (i) Physical properties

(a) Dihalide are colourless with pleasant smell liquid. Insoluble in water, soluble in organic solvent.

(b) M.P and B.P  $\propto$  -molecular mass.

(c) Reactivity of vicinal dihalides > Gem dihalide.

#### (ii) Chemical properties of dihalide

##### (a) Reaction with aqueous KOH: $RCHX_2 + 2KOH(aq.) \xrightarrow{-KX} RCH(OH)_2 \xrightarrow{-H_2O} RCHO$

##### (b) Reaction with alcoholic KOH: $RCH_2-CHX_2 \xrightarrow[-(KX+H_2O)]{Alc.KOH} R-\underset{\substack{| \\ H}}{C}=\underset{\substack{| \\ X}}{C}-H \xrightarrow[-(NaX+NH_3)]{NaNH_2} R-C \equiv CH$

##### (c) Reaction with Zn dust

□ Gem halide (di) form higher symmetrical alkene.

□ Vicinal dihalide form respective alkene.

##### (d) Reaction with KCN: $R-CHX_2 + 2KCN \xrightarrow{-2KX} RCH(CN)_2 \xrightarrow[Hydrolysis]{H_3O^+} RCH(COOH)_2$

(e) Other substitution reaction

