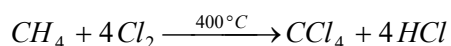


Tetra-halides (Carbon tetrachloride or tetrachloromethane, CCl₄).

It is the most important tetrahalogen derivative of methane.

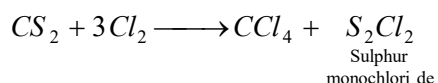
(1) Manufacture

(i) **From methane:** Chlorination of methane with excess of chlorine at 400°C yields impure carbon tetrachloride.

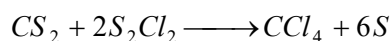


Methane used in this process is obtained from natural gas.

(ii) **From carbon disulphide:** Chlorine reacts with carbon disulphide in presence of catalysts like iron, iodine, aluminium chloride or antimony pentachloride.

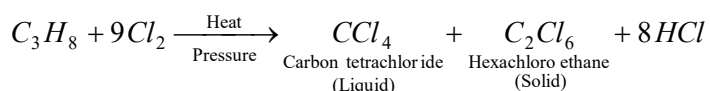


S₂Cl₂ further reacts with CS₂ to form more of carbon tetrachloride.



Carbon tetrachloride is obtained by fractional distillation. It is washed with sodium hydroxide and then distilled to get a pure sample.

(iii) **From propane:** Propane is reacted with chlorine at about 400°C and at a pressure of 70-100 atmosphere.

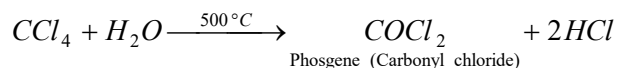


(2) Physical properties

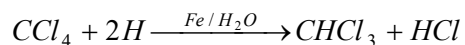
- (i) It is a colorless liquid having characteristic smell.
- (ii) It is non-inflammable and poisonous. It has boiling point 77°C.
- (iii) It is insoluble in water but soluble in organic solvents.
- (iv) It is an excellent solvent for oils, fats, waxes and greases.

(3) **Chemical properties:** Carbon tetrachloride is less reactive and inert to most organic reagents. However, the following reactions are observed.

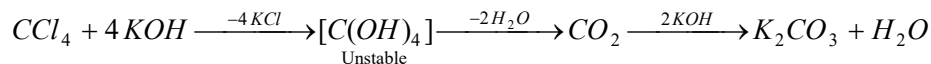
(i) **Reaction with steam** (Oxidation): Carbon tetrachloride vapours react with steam above 500°C to form phosgene, a poisonous gas.



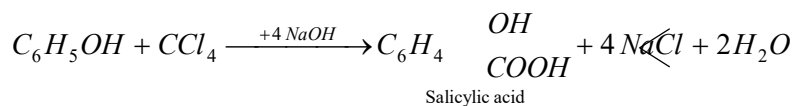
(ii) **Reduction**: It is reduced by moist iron filling into chloroform.



(iii) **Hydrolysis**: On heating with aqueous potassium hydroxide it forms carbon dioxide which combines with potassium hydroxide to give KCl and potassium carbonate (Inorganic salts).



(iv) **Reaction with phenol** (Reimer-tiemann reaction) : It combines with phenol in presence of sodium hydroxide to form salicylic acid.



(4) Uses

(i) It is used as a fire extinguisher under the name **pyrene**. The dense vapours form a protective layer on the burning objects and prevent the oxygen or air to come in contact with the burning objects.

(ii) It is used as a solvent for fats, oils, waxes and greases, resins, iodine etc.

(iii) It finds use in medicine as **helmenthicide** for elimination of hook worms.