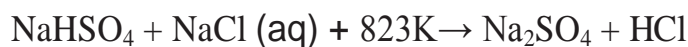


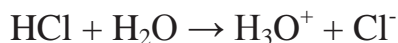
The p-Block Elements

Hydrogen Chloride (HCl)

Preparation: It is prepared in the laboratory, by heating sodium chloride with concentrated sulphuric acid.



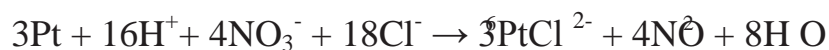
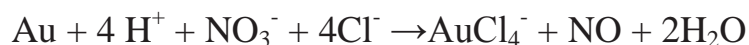
Properties: It is a colourless and pungent smelling gas. It is extremely soluble in water and ionises as:



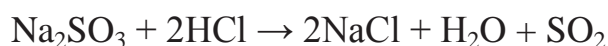
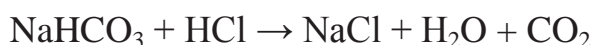
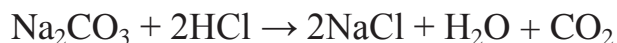
Its aqueous solution is called hydrochloric acid, which is a strong acid in water. It reacts with NH_3 and gives white fumes of NH_4Cl .



When three parts of concentrated HCl and one part of concentrated HNO_3 are mixed, aqua regia is formed which is used for dissolving noble metals, e.g., gold, platinum.



Hydrochloric acid decomposes salts of weaker acids like carbonates, hydrogen carbonates, sulphites, etc.



Uses: It is used (i) in the manufacture of chlorine, NH_4Cl and glucose (from corn starch),

(ii) for extracting glue from bones and purifying bone black,

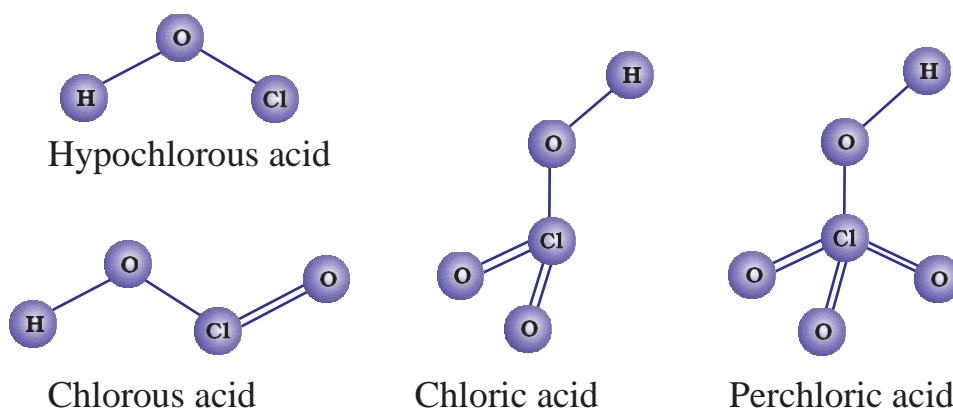
(iii) in medicine and as a laboratory reagent.

Oxoacids of Halogens

Due to high electronegativity and small size, fluorine forms only one oxoacid, HOF known as fluoric

(I) acid or hypofluorous acid. The other halogens form several oxoacids like Hypohalous acid (HOX), halous acid (HOXO), halic acid (HOXO₂) and perhalic acid (HOXO₃). They are stable only in aqueous solutions or in the form of their salts.

Chlorine forms 4 types of oxoacids – hypochlorous acid (HOCl), Chlorous acid (HOClO or HClO₂), Chloric acid (HOClO₂ or HClO₃) and perchloric acid (HOClO₃ or HClO₄). The structures of them are:

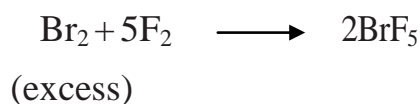
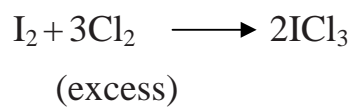
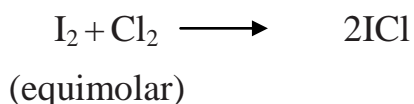
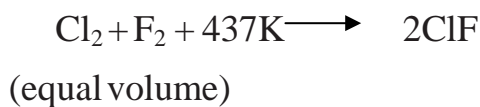


Interhalogen Compounds

When two different halogens react with each other, interhalogen compounds are formed. They can be assigned general compositions as AX, AX₃, AX₅ and AX₇, where both A and X are halogens. A is larger and more electropositive than X. As the size of the central atom (A) increases, the stability of the compound also increases.

Preparation

The interhalogen compounds can be prepared by the direct combination or by the action of halogen on lower interhalogen compounds.



Properties:

These are all covalent molecules and are diamagnetic in nature. They are volatile solids or liquids except ClF which is a gas at 298 K. Their physical properties are intermediate between those of constituent halogens. The interhalogen compounds are more reactive than halogens (except fluorine).

This is because A–X bond in interhalogens is weaker than X–X bond in halogens except F–F bond. The types of inter halogen compounds and their structures are as follows:

Type	Examples	Structure
AX	ClF, BrF, IF, BrCl, BrI	Linear
AX ₃	ClF ₃ , BrF ₃ , IF ₃ , ICl ₃ , IBr ₃ etc.	Bent T-shaped
AX ₅	ClF ₅ , BrF ₅ , IF ₅	Square pyramidal
AX ₇	IF ₇	Pentagonal bipyramidal

Uses: These compounds can be used as non aqueous solvents. Interhalogen compounds are very useful fluorinating agents.
