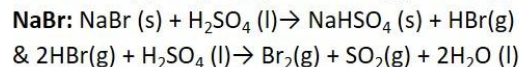
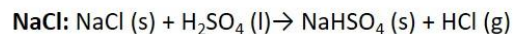
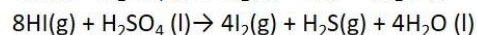
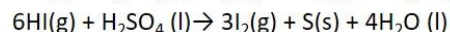
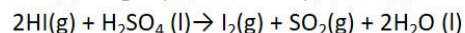
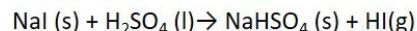


Trend in bond energies: $\text{H-F} > \text{H-Cl} > \text{H-Br} > \text{H-I}$



NaI:

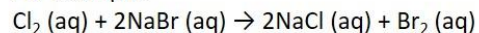


Reactions of halide ions with sulphuric acid

	Chlorine (aq)	Bromine (aq)	Iodine (aq)
KCl (aq)	no reaction	no reaction	no reaction
KBr (aq)	Cl displaces Br	no reaction	no reaction
KI (aq)	Cl displaces I	Br displaces I	no reaction

Displacement reactions

A more reactive halogen can replace a less reactive halogen from its halide solution. For Example:



Halogens are dissolved in organic solvents such as a **cyclohexane solution** for identification.

	Free halogen solution	Cyclohexane solution
Cl	Pale green	Pale yellow
Br	Yellow	Orange
I	Brown	Purple

These elements have 7 electrons in the outermost shell. Halogens are non-metals. They exist as diatomic molecules. Diatomic molecules are held by weak van der Waals' forces.

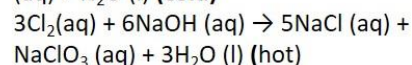
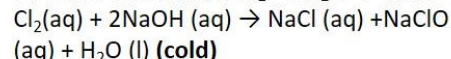
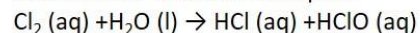
Strength of van der Waals' forces: increases with atomic number; **Melting point & boiling point:** increases down the group

Characteristic physical properties

Halogens

Disproportionation

A reaction in which an element is both oxidised and reduced. Examples:



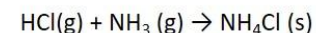
Reactivity: **decreases** down the group

Acceptance of electrons: **decreases** down the group due to the increasing atomic radius, which decreases the force of attraction and increases the shielding effect. Hence, fluorine is the strongest **electron acceptor (oxidising agent)** of group 17.

Ionic bonds: React with metallic elements wherein the metallic element loses an electron and halogens gain an electron.

Reactions of halogens

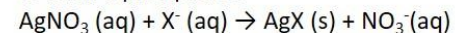
Reaction with ammonia:



Ammonium halides are in the form of white powder.

Characteristic reactions for halide ions

Halides react with a **silver nitrate solution** to form a precipitate.



	AgX	ppt. + dil. NH_3	ppt. + conc. NH_3
Cl	White	Soluble	Soluble
Br	Cream	Insoluble	Soluble
I	Pale yellow	Insoluble	Insoluble