

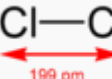

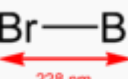

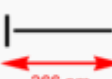



CHEMICAL PROPERTIES:

- Molecules of all halogens are diatomic. What this means is that their molecules exist with two atoms each.

halogen	molecule	structure	model
fluorine	F ₂		
chlorine	Cl ₂		
bromine	Br ₂		
iodine	I ₂		

- Halogens have seven valence electrons
- Because halogens have one electron missing, they form negative ions and are highly reactive
- They can gain an electron by reacting with atoms of other elements
- Fluorine is one of the most reactive elements in existence
- All of the halogens except for astatine have been observed to react with hydrogen to form hydrogen halides. For fluorine, chlorine, and bromine, this reaction is in the form of:
$$\text{H}_2 + \text{X}_2 \rightarrow 2\text{HX}$$
The hydrogen-halogen reactions get gradually less reactive towards the heavier halogens. A fluorine-hydrogen reaction is explosive even when it is dark and cold. A chlorine-hydrogen reaction is also explosive, but only in the presence of light and heat. A bromine-hydrogen reaction is even less explosive - it is only explosive when exposed to flames.
- When halogens react with metals, they form metal halides. All the halogens are known to react with sodium to form sodium fluoride, sodium chloride, sodium bromide, sodium iodide, and sodium astatide. Heated sodium's reaction with halogens produces bright orange flames. Sodium's reaction with chlorine is in the form of: $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$. Iron reacts with fluorine, chlorine, and bromine to form Iron(III) halides. These reactions are in the form of: $2\text{Fe} + 3\text{X}_2 \rightarrow 2\text{FeX}_3$

APPLICATIONS:

Both chlorine and bromine are used as disinfectants for drinking water, swimming pools, fresh wounds, spas, dishes, and surfaces. They kill bacteria and other potentially harmful microorganisms through a process known as sterilization. Their reactivity is also put to use in bleaching. Iodine and bromine are also used to make halogen lamps. Sodium hypochlorite (NaClO), which is produced from chlorine, is the active ingredient of most fabric bleaches and chlorine-derived bleaches are used in the production of some paper products.

VIDEO: a comparison of the four halogens

<http://www.youtube.com/watch?v=u2ogMUDBaf4>