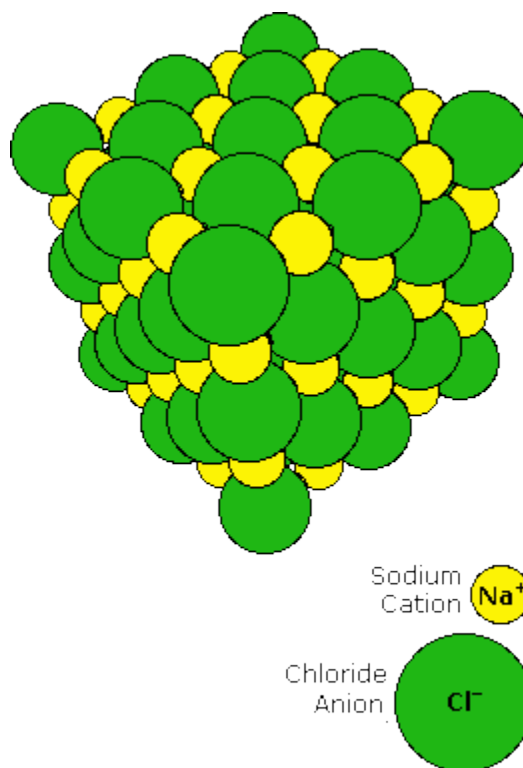


## Ionic Bonding:

When sodium is burned in a chlorine atmosphere, it produces the compound sodium chloride. This has a high melting point (800 °C) and dissolves in water to give a conducting solution. Sodium chloride is an ionic compound, and the crystalline solid has the structure shown on the right.

Ionic bond is formed due to the complete transference of electron from sodium atom to chlorine atom.

This bond is also called as electro-valent bond has due the electro-negativity difference of more than 1.7 held strongly the atoms together.



## Covalent Bonding:

The other three reactions shown above give products that are very different from sodium chloride. Water is a liquid at room temperature; carbon dioxide and carbon tetra-fluoride are gases. None of these compounds is composed of ions.

A different attractive interaction between atoms, called covalent bonding, is involved here.

Covalent bonding occurs by a sharing of valence electrons, rather than an outright electron transfer.

Similarities in physical properties (they are all gases) suggest that the diatomic elements  $H_2$ ,  $N_2$ ,  $O_2$ ,  $F_2$  &  $Cl_2$  also have covalent bonds.

## **Classification of Covalent bonds:**

Covalent bonds are classified as,

### 1). Polar covalent bond:

Polar covalent bonds are formed between two dissimilar / different elements. These bonds have electro-negativity difference less than 1.7

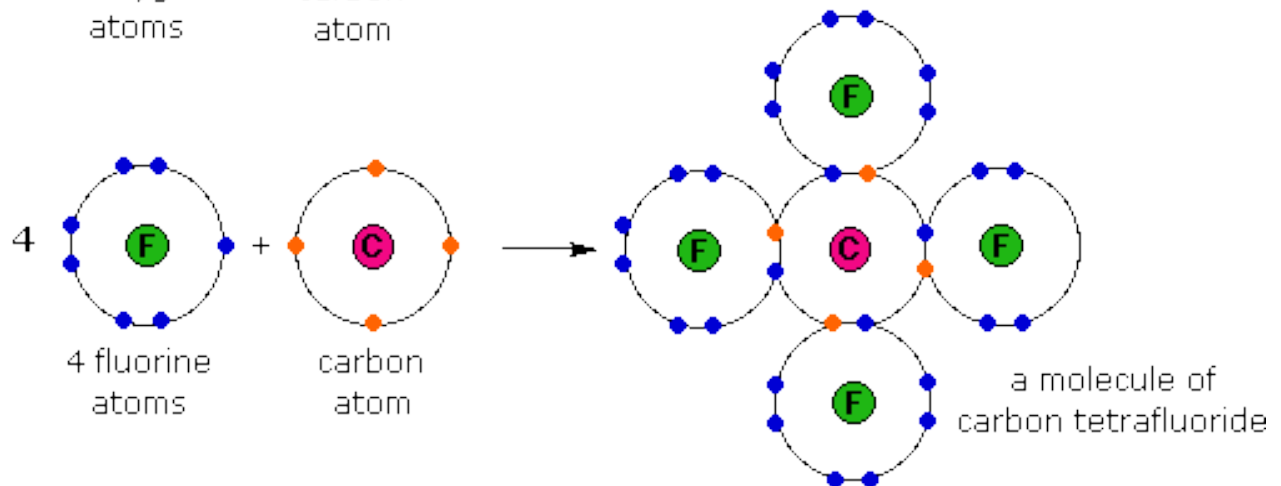
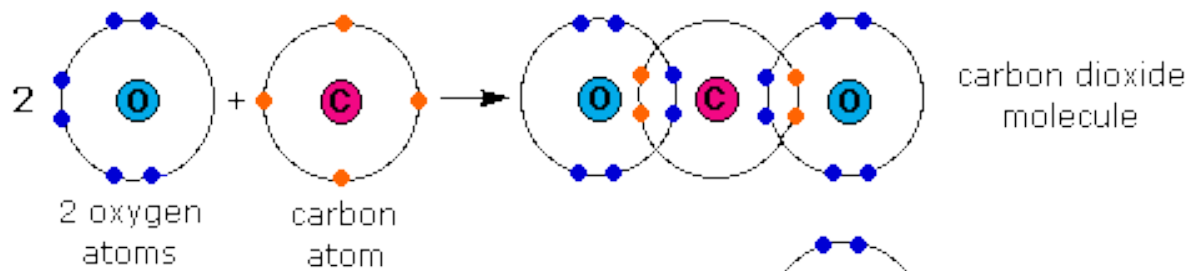
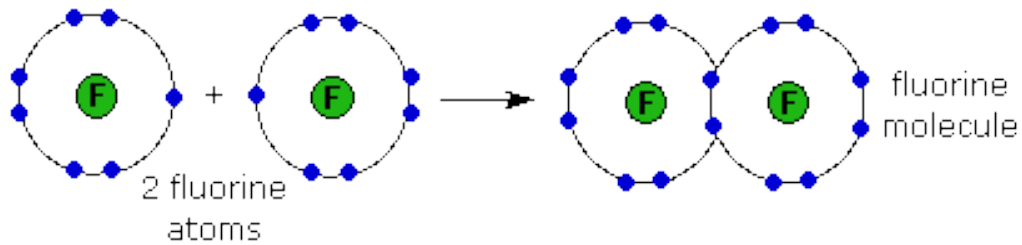
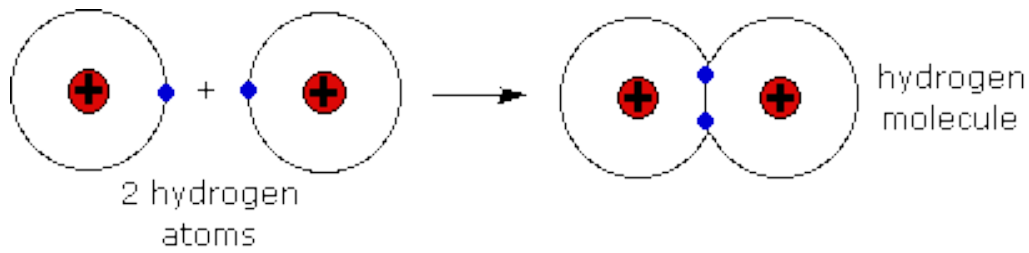
For example:  $H_2O$ ,  $CO_2$

### 2). Non- polar covalent bond:

Covalent bonds formed between two similar elements are called as non- polar covalent bonds. Their electro-negativity difference is zero.

For example:  $H_2$ ,  $Cl_2$ ,  $O_2$

## **Examples of covalent bonding:**



## Valency:

The number of valence shell electrons an atom must gain or lose to achieve a valence octet is called valence. In covalent compounds the number of bonds which are characteristically formed by a given atom is equal to that atom's valence. From the formulas written above, we arrive at the following general valence assignments:

Atom	H	C	N	O	F	Cl	Br	I
Valency	1	4	3	2	1	1	1	1