

## ATOMS AND MOLECULES

### CHEMICAL FORMULAE

#### ❖ Chemical formula:

The chemical formula of a compound describes the composition of a molecule of the compound in terms of the symbols of elements and the number of atoms of each element present in one molecule of the compound.

- In the chemical formula of a compound, the elements present are denoted by their symbols and the number of atoms of each element are denoted by writing their number as subscripts to the symbols of the respective element.

**Example:** Water is a compound whose one molecule is made up of two atoms of hydrogen and one atom of oxygen and hence its chemical formula is  $H_2O$ .

- While writing the formula of an ionic compound the metal is written on the left hand side while the non-metal is written on the right hand side. The name of the metal remains as such but that of the non-metal is changed to have the ending 'ide'.

**Example:**  $MgO$  is named as magnesium oxide,  $KCl$  is named potassium chloride etc.

- Molecular compounds, formed by the combination between two different non-metals, are written in such a way that the less electronegative element is written on the left hand side while the more electronegative element is written on the right hand side. In naming molecular compounds, the name of the less negative non-metal is written as such but the name of the more electronegative element is changed to have the ending 'ide'.

**Example :**  $H_2S$  is named as hydrogen sulphide.

- When there are more than one atoms of an element are present in the formula of the compound, then the number of atoms are indicated by the use of appropriate prefixes (Mono for : 1, di for 2, tri for 3. tetra for 4 atoms etc.) in the name of the compound.

**Example:**  $CO_2$  is named as carbon di oxide,  $CCl_4$  is named as carbon tetra chloride.

The prefixes are needed in naming those binary compounds in which the two non-metals form more than one compounds (by having different number of atoms).

**Example:** Two non-metal, nitrogen and oxygen, combine to form different compound like nitrogen monoxide (NO), nitrogen di-oxide ( $\text{NO}_2$ ), Nitrogen tri oxide ( $\text{N}_2\text{O}_3$ ) etc.

- But, if two non-metals form only one compound, then prefixes are not used in naming such compounds.

**Example:** Hydrogen and sulphur combine to form only one compound  $\text{H}_2\text{S}$ , So,  $\text{H}_2\text{S}$  is named as hydrogen sulphide and not hydrogen monosulphide.