

ATOMS AND MOLECULES

MASS PERCENTAGE, EMPIRICAL FORMULA

❖ Mass percentage of an element from molecular formula:

The molecular formula of a compound may be defined as the formula which specifies the number of atoms of various element in the molecule of the compound.

For example: The molecular formula of glucose is $C_6H_{12}O_6$. This shows that a molecule of glucose contains six atoms of carbon, twelve atoms of hydrogen and six atoms of oxygen. With the help of molecular formula of a compound we can calculate its percentage composition by mass. First we calculate the molecular mass of the compound. From this we can find out mass of one mole of the compound, which is equal to its gram molecular mass. Then we calculate mass of each element in one mole of the compound. The mass percentage of each element is then calculated by the following formula.

$$\text{Mass percentage of element X} = \times \frac{\text{Mass of X in one mole}}{\text{Mass of one mole of the compound that is gram molecular mass}} \times 100$$