SOME BASIC CONCEPTS OF CHEMISTRY

GAY LUSACC LAW AND MOLE CONCEPT

❖ EQUIVALENT MASSES OR CHEMICAL EQUIVALENTS

Equivalent mass of a substance (element or compound) is defmed as the number of parts by mass of the substance which combine or displace directly or indirectly 1.008 parts by mass of hydrogen or 8 parts by mass of oxygen or 35.5 parts by mass of chlorine or 108 parts by mass of silver.

The equivalent mass is a pure number. When the equivalent mass of a substance is expressed in grams, it is called gram equivalent mass. For example, equivalent mass of sodium is 23, hence, its gram equivalent mass is 23 g The equivalent mass of a substance may have different values under different conditions. The -equivalent mass of an element

may vary with change of valency. For example, copper fronts two oxides CUO and Cu20. In CUO, 63.5 parts of copper combine with 16 parts of oxygen. Thus, equivalent mass of copper in this oxide is 65 31.75. In Cu 20' 2 x 63.5parts of copper combine with 16 parts of oxygen; thus, the equivalent mass of copper in this oxide is:

$$\frac{2\times 63.5}{2} = 63.5$$

Relation between atomic mass, equivalent mass and valency: Suppose an element X combines with hydrogen to. from a compound, XHn , where n is the valency of the element X. n parts by mass of hydrogen combine with atomic mass of element X

1 part by mass of hydrogen combines with

$$\frac{\text{Atomic mass of element}}{\text{n}}$$

By above definition, $\frac{\text{Atomic mass of element}}{\text{n}}$

is the equiva-lent mass of the element.

$$\text{Thus, Equivalent mass } = \frac{\text{Atomic mass}}{\text{n}}$$

or $$\text{Atomic mass} = \text{Equivalent mass} \times \text{Valency}$$