

TENDER HEART HIGH SCHOOL, SEC-33B, CHD.

Class - IX

Subject - Chemistry

Chapter - 5

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Relative atomic mass or atomic weight of an element is the number of times one atom of the element is heavier than $\frac{1}{12}$ times of the mass of an atom of Carbon-12.
Thus :-

$$\text{Relative atomic Mass} = \frac{\text{Mass of 1 atom of Element}}{\frac{1}{12} \text{th of Mass of C-12}}$$

Q:- Calculate of molecular mass of $(\text{NH}_4)_2\text{SO}_4$ (Cu = 63.5, S = 32, O = 16, N = 14, H = 1)

Ans:-

$$2[14 + 4 \times 1] + 32 + 4 \times 16$$

$$2[14 + 4] + 32 + 64$$

$$2[18] + 32 + 64$$

$$= 132 \text{ a.m.u.}$$

Mole of atom:- one mole of atoms contain 6.022×10^{23} atoms having mass equal to its gram atomic mass.

- Q. The number of atoms in one mole [one-atom of an element] is 6×10^{23} . Calculate
- The no. of molecules in 14g of nitrogen gas.
 - Total number of atoms in 18g of water.
 - The number of Chloride ions in 111g of anhydrous Calcium Chloride.

Ans - a) Mass of 1 mole of nitrogen = 28g

28g of nitrogen gas contain 6×10^{23} .

$$\therefore 14g \text{ of nitrogen contain } = \frac{6 \times 10^{23} \times 14}{28}$$

$$= 3 \times 10^{23} \text{ molecules.}$$

b) Mass of 1 mole of water = 18g
 $\therefore 18g \text{ of water } = 6 \times 10^{23} \text{ molecules}$

But H_2O contain 3 atoms

$$\therefore 18g \text{ of water contain } = 18 \times 10^{23}$$

$$3 \times 6 \times 10^{23} = 18 \times 10^{23} \text{ atoms}$$

c) Mass of 1 mole of anhydrous $CaCl_2$
 $= 40 + 71 = 111g$

But 1 molecule of $CaCl_2$ contain 2 Chloride ions
 $2 \times 6 \times 10^{23} = 12 \times 10^{23} \text{ Chloride ion}$

Q:- a) The mass of 5.6 l of certain gas at ST.P is 12g. Calculate relative molecular mass or molar mass of the gas?

b) Calculate the vol occupied by 2 moles of SO_2

Ans:- a)
$$\text{No. of moles} = \frac{\text{Given Vol.}}{22.4}$$

$$= \frac{5.6}{22.4} = 0.25 \text{ moles}$$

$$\text{No. of moles} = \frac{\text{Given wt.}}{\text{molecular wt.}}$$

$$0.25 = \frac{12}{x}$$

$$x = \frac{12}{0.25} = 48 \text{ g}$$

b)

1 mole	contains	= 22.4 l
2 mole	"	= 2×22.4
		= 44.8 l