

Daily Tutorial Sheet-1

Level-1

1.(A) Atom is the smallest matter particle that takes part in chemical reaction.

2.(D) No. of atoms = $\frac{0.635}{63.5} \times 6.023 \times 10^{23} = 6.023 \times 10^{21}$

3.(C) At STP 1 mole = 22400 cm³ ; 22400 cm³ CH₄ gas weight = 16gm at STP.

For 112 cm³, Mass = $\frac{112}{22400} \times 16 = 0.08\text{g}$

4.(A) (i) Molecule of O₂ = $\frac{32}{6.02 \times 10^{23}} = 0.5 \times 10^{-23} \text{ gm}$

(ii) One atom of N = $\frac{14}{6.02 \times 10^{23}} = 2.3 \times 10^{-23} \text{ gm}$

(iii) 10⁻¹⁰ gm mol. wt. of oxygen = 10⁻¹⁰ × 32 = 3.2 × 10⁻⁹ gm

(iv) 10⁻¹⁰ gm atom of copper = 10⁻¹⁰ × 63 = 6.3 × 10⁻⁹ gm

5.(B) Molar mass is mass of one mole of a substance.

6.(C) (A) 1g of O₂ → moles = $\frac{1}{32}$; atoms = $\frac{N_A \times 2}{32}$

(B) 1g of N_i → Number of Atoms = moles × N_A ⇒ $\frac{1}{(59)} \times N_A$ (Atomic wt. of Ni = 59 g mol⁻¹)

(C) 1g of B → Atoms = moles × N_A ⇒ $\frac{1}{11} \times N_A$

(D) 1g of N₂ → Atoms = moles × 2N_A = $\frac{1}{28} \times 2 \times N_A$

7.(D) Atoms of gold = Moles of gold × N_A = $\frac{19700}{197} \times 6.023 \times 10^{23} = 6.023 \times 10^{25}$

8.(B) 1 cc of CCl₄ contains 1.59 gms of it

∴ 12 L of liquid CCl₄ will contain = (12 × 1000 × 1.59) g

9.(D) No. of atoms = $\frac{20 \times 10^3}{6.6 \times 10^{-23}} = 3 \times 10^{26}$

No. of moles = $\frac{3 \times 10^{26}}{6 \times 10^{23}} = 500$

10.(D) No. of water molecules = No. of moles of water × N_A = $\frac{\text{Mass of water}}{18} \times N_A = \frac{1000 \times 1}{18} \times N_A = 55.55N_A$

11.(A) Molecules of H₂SO₄ present in 1 mole of H₂SO₄ = 6.02 × 10²³

⇒ Atoms present in 1 mole of H₂SO₄ = 7 × 6.02 × 10²³.

12.(C) Atomic mass of H = 1u = 1.6 × 10⁻²⁷ kg = 1.6 × 10⁻²⁴ g

13.(D) All have same number of atoms.

14.(A) Maximum moles contain maximum molecules

$$15\text{L H}_2 \text{ gas} = \frac{15}{22.4} \text{ mol H}_2 \text{ gas} ; 5\text{L N}_2 \text{ gas} = \frac{5}{22.4} \text{ mol N}_2 \text{ gas}$$

$$0.5\text{g H}_2 \text{ gas} = \frac{1}{4} \text{ mol H}_2 \text{ gas} ; 10\text{g O}_2 \text{ gas} = \frac{1}{3.2} \text{ mol O}_2 \text{ gas}$$

15.(D) 1 mole of CO_2 contains 6.02×10^{23} molecules of CO_2

$\Rightarrow$ 1 mole of CO_2 contains 6.02×10^{23} atoms of C.