Mole Concept MCQs

Saitechinfo NEET-JEE Academy Worksheet

Topic: Mole Concept
Subject: Chemistry

Multiple Choice Questions

1. **Common salt obtained from sea-water contains 96% NaCl by mass. The approximate number of molecules present in 10.0 g of the salt is**
   - (a) 10^{21}
   - (b) 10^{22}
   - (c) 10^{23}
   - (d) 10^{24}

2. **When burnt in air, a 12.0 g mixture of carbon and sulphur yields a mixture of CO_2 and SO_2, in which the number of moles of SO_2 is half that of CO_2. The mass of the carbon the mixture contains is**
   - (a) 4.08 g
   - (b) 5.14 g
   - (c) 8.74 g
   - (d) 1.54 g

3. **In an experiment, it is found that 2.0769 g of pure X produces 3.6769 g of pure X_2O_5. The number of moles of X is**
   - (a) 0.04
   - (b) 0.06
   - (c) 0.20
   - (d) 0.02

4. **How many moles of $MgIn_2S_4$ can be made from 1.00 g of magnesium (of atomic mass = 24.0), 1.00 g of indium (of atomic mass = 114.8) and 1.00 g of sulphur (of atomic mass = 32.0)?**
   - (a) 6.74×10^{-4}
   - (b) 3.1×10^{-2}
   - (c) 4.17×10^{-2}
   - (d) 8.7×10^{-3}

5. **The density of water at 4°C is 1.0×10^3 kg m⁻³. The volume occupied by one molecule of water is approximately**
   - (a) 3.0×10^{-23} mL
   - (b) 6.0×10^{-22} mL
   - (c) 3.0×10^{-21} mL
   - (d) 9.0×10^{-23} mL

6. **When 0.5 mol of $BaCl_2$ is added to 0.2 mol of Na_3PO_4, the number of moles of $Ba_3(PO_4)_2$ formed is**
   - (a) 0.10

- (b) 0.20
- (c) 0.40
- (d) 0.15

7. **A gaseous mixture contains $CO_2(g)$ and $N_2O(g)$ in a 2:5 ratio by mass. The ratio of the number of molecules of $CO_2(g)$ and $N_2O(g)$ is**
   - (a) 5:2
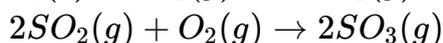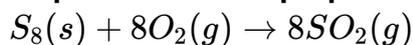   - (b) 2:5
   - (c) 1:2
   - (d) 5:4

8. **X and Y are two elements which form X_2Y_3 and X_3Y_4. If 0.20 mol of X_2Y_3 weighs 32.0 g and 0.4 mol of X_3Y_4 weighs 92.8 g, the atomic weights of X and Y are respectively**
   - (a) 16.0 and 56.0
   - (b) 8.0 and 28.0
   - (c) 56.0 and 16.0
   - (d) 28.0 and 8.0

9. **When 1 L of CO_2 is heated with graphite, the volume of the gases collected is 1.5 L. Calculate the number of moles of CO produced at STP.**
   - (a) 1
   - (b) 28
   - (c) 11.2
   - (d) 22.4

10. **Sulphur trioxide is prepared by the following two reactions.**
    $$S_8(s) + 8O_2(g) \rightarrow 8SO_2(g)$$
    $$2SO_2(g) + O_2(g) \rightarrow 2SO_3(g)$$
    How many grams of SO_3 are produced from 1 mol of S_8?
    - (a) 1280.0
    - (b) 640.0
    - (c) 960.0
    - (d) 320.0

11. **A quantity of aluminium has a mass of 54.0 g. What is the mass of the same number of magnesium atoms?**
    - (a) 121.1 g
    - (b) 24.3 g
    - (c) 48.6 g
    - (d) 97.2 g

12. **If the atomic weight of carbon is taken to be 6 amu, the value of the Avogadro constant will be**
    - (a) 12.04×10^{23} mol⁻¹
    - (b) 3.01×10^{23} mol⁻¹
    - (c) 1.5×10^{23} mol⁻¹
    - (d) 6.02×10^{23} mol⁻¹

13. **The charge on 1 gram ion of Al^{3+} is**
    - (a) $\frac{1}{27}N_A e$ coulomb
    - (b) $\frac{1}{3}N_A e$ coulomb
    - (c) $N_A e$ coulomb
    - (d) $3 \times N_A e$ coulomb

14. **How many moles of HCl will be present in 100 mL of a solution of specific gravity 1.08, containing 20% HCl by mass?**

- (a) 0.50
- (b) 0.60
- (c) 0.80
- (d) 1.12

15. **The density in grams per litre of a mixture containing an equal number of moles of methane and ethane at STP is**
    - (a) 1.03
    - (b) 1.10
    - (c) 1.20
    - (d) 1.30

16. **Equal weights of ethane and hydrogen are mixed in an empty vessel at 25°C. The fraction of the total pressure exerted by hydrogen is**
    - (a) $\frac{1}{2}$
    - (b) $\frac{1}{3}$
    - (c) $\frac{1}{9}$
    - (d) $\frac{15}{16}$

17. **n mol of N$_2$ and 0.05 mol of Ar are enclosed in a vessel of capacity 2 L at 1 atm and 27°C. Find n.** $(R = 0.082\, L\, atm\, mol^{-1}\, K^{-1})$
    - (a) 0.30
    - (b) 0.10
    - (c) 0.03
    - (d) 0.06

18. **112.0 mL of NO$_2$ at STP was liquefied, the density of the liquid being 1.15 g mL^{-1}. Calculate the volume of and the number of molecules in the liquid NO$_2$.**
    - (a) 0.10 mL and 3.01×10^{22}
    - (b) 0.20 mL and 3.01×10^{21}
    - (c) 0.20 mL and 6.02×10^{23}
    - (d) 0.40 mL and 6.02×10^{21}

19. **The mass of 1×10^{22} molecules of CuSO$_4$·5H$_2$O is**
    - (a) 4.144 g
    - (b) 2.648 g
    - (c) 8.288 g
    - (d) 5.295 g

20. **A semiconductor $YBa_2Cu_3O_7$ is prepared by a reaction involving Y_2O_3, BaO_2, and CuO. The ratio of their moles should be**
    - (a) 1:4:3
    - (b) 1:2:3
    - (c) 3:2:

Answer Key

1. (c)
2. (b)
3. (a)
4. (d)
5. (a)
6. (a)
7. (b)
8. (c)
9. (c)
10. (b)
11. (c)

12. (b)
13. (d)
14. (b)
15. (a)
16. (b)
17. (c)
18. (b)
19. (a)
20. (b)