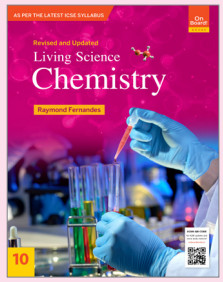
ICSE Living Science CHEMISTRY

Class 10



Multiple-Choice Questions

CHAPTER 5: MOLE CONCEPT AND STOICHIOMETRY

1. The statement "Equal volumes of all gases at the same temperature and pressure contain the same number of molecules" is termed as the

   (a) Boyle's law. (b) Avogadro's law.
   (c) Charle's law. (d) Gay-Lussac's law.

   Ans: b

2. The value of Avogadro number is

   (a) 6.022×10^{23} (b) 6.022×10^{-23} (c) 1.66×10^{-24} (d) 1.99×10^{-23}

   Ans: a

3. The number of atoms present in one molecule of an element is called its

   (a) Molecular number. (b) Atomic number.
   (c) Atomicity. (d) Avogadro's number.

   Ans: c

4. Match the Columns.

Column A	*Column B*
(i) Boyle's law	(A) $V_1/T_1 = V_2/T_2$
(ii) Charle's law	(B) $P_1V_1/T_1 = P_2V_2/T_2$
(iii) Gas equation	(C) The volume relationships of reacting gases
(iv) Gay-Lussac's law	(D) $P_1V_1 = P_2V_2$

   Choose the correct option.

   (a) (i)–(B), (ii)–(C), (iii)–(A), (iv)–(D) (b) (i)–(A), (ii)–(D), (iii)–(C), (iv)–(B)
   (c) (i)–(D), (ii)–(A), (iii)–(B), (iv)–(C) (d) (i)–(C), (ii)–(A), (iii)–(D), (iv)–(B)

   Ans: b

5. If empirical formula of an organic compound is CH_2O, then its actual formula is

   (a) $C_2H_2O_2$ (b) C_2H_5O (c) $C_6H_{12}O_6$ (d) $C_3H_6O_3$

   Ans: c

6. The number of moles present in 64 g of oxygen is

   (a) 2.0 moles (b) 3.0 moles (c) 4.0 moles (d) 5.0 moles

   Ans: a

   [Hint: Molar mass of oxygen = 32 g mol^{-1}

   Therefore, number of moles of oxygen = 64 g / 32 g mol^{-1} = 2.0 moles]

7. One atomic mass unit is equal to

(a) 1.66×10^{-26} kg (b) 1.66×10^{-27} kg (c) 1.66×10^{-23} kg (d) 3.66×10^{-27} kg

Ans: b

8. The volume occupied by 1 mole of any gas at S.T.P. (i.e. at 273 K and 10^5 Pa) is equal to

(a) 27.4 L (b) 29.4 L (c) 22.4 L (d) 32.4 L

Ans: c

9. How many atoms are there in 24 g of carbon?

(a) 12.204×10^{24} atoms (b) 6.022×10^{23} atoms (c) 1.204×10^{23} atoms (d) 1.204×10^{24} atoms

Ans: d

[Hint: 24 g of carbon = 24 / 12 moles = 2 moles

1 mole of atoms = 6.022×10^{23}

2 moles of carbon contains $2 \times 6.022 \times 10^{23}$ atoms = 1.204 × 1024 atoms]

10. The mass of 6.022×10^{23} molecule of Calcium carbonate ($CaCO_3$) is

(a) 10 g (b) 100 g (c) 0.1 g (d) 1.5 g

Ans: b

[Hint: Molar mass of $CaCO_3$ = 40 + 12 + 3 × 16 = 100 g

No. of moles of $CaCO_3$ = No. of molecules/Avogadro number = 6.022×10^{23}/ 6.022×10^{23} = 1 mole

Mass of $CaCO_3$ = No. of moles × molar mass = 1 × 100 g = 100 g]

11. Which one will have maximum numbers of water molecules?

(a) 18 molecules of water (b) 1.8 grams of water

(c) 18 grams of water (d) 18 moles of water

Ans: d

12. The number of atoms present in 0.1 moles of a triatomic gas is

(a) 1.806×10^{23} (b) 1.806×10^{22} (c) 3.600×10^{23} (d) 6.026×10^{22}

Ans: a

13. The volume of hydrogen gas liberated by heating 6 g of magnesium with excess hydrochloric acid is equal to [Mg = 24, H = 1, Cl = 35.5]

(a) 22.4 L (b) 5.6 L (c) 11.2 L (d) 56 L

Ans: b

[Hint: 24 g of magnesium on heating with HCl produces 22.4 L of H_2 gas.

6 g of magnesium on heating with HCl will produce = (22.4 × 6) / 24 = 5.6 L of H_2]

14. Which of the following informations a chemical equations does not give?

(a) Number of molecules or atoms of reactants and products

(b) Number of moles of reactants and products

(c) The temperature at which reaction takes place

(d) Volumes of gaseous reactants and products measured at S.T.P.

Ans: c

15. The vapour density of nitrogen dioxide is [N = 14,O = 16]

(a) 46 (b) 23 (c) 4.6 (d) 2.3

Ans: b

[Hint: Molecular weight of NO_2 = 14 + 2 (16) = 46

V.D. = ½ × molecular weight = ½ × 46 = 23]

16. Which of the following statements about a compound is incorrect?

(a) A molecule of a compound has atoms of different elements.

(b) The ratio of atoms of different elements in a compound is fixed.

(c) A compound retains the physical properties of its constituent elements.

(d) A compound cannot be separated into its constituent elements by physical methods of separation.

Ans: c

17. The elements X, Y combine to form two compounds as XY and X_2Y. Find the atomic weight of X and Y, when the weight of 0.1 moles of XY is 10 g and 0.05 moles of X_2Y is 9 g.

(a) 60, 40 (b) 80, 20 (c) 30, 20 (d) 20, 30

Ans: b

18. Which of the following reactions is not correct?

(a) $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$

(b) $C_3H_8(g) + O_2(g) \rightarrow CO_2(g) + H_2O(g)$

(c) $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$

(d) $P_4(s) + 5O_2(g) \rightarrow P_4O_{10}(s)$

Ans: b

19. Which of the following pairs have the same number of atoms?

(i) 16 g of $O_2(g)$ and 4 g of $H_2(g)$

(ii) 16 g of $O_2(g)$ and 44 g of CO_2

(iii) 28 g of $N_2(g)$ and 32 g of $O_2(g)$

(iv) 12 g of C(s) and 23 g of Na(s)

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (ii) and (iv)

Ans: c

20. A statement of assertion followed by a statement of reason is given below. Mark the correct choice.

Assertion: One atomic mass unit is defined one twelfth of the mass of one carbon-12 atom.

Reason: Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Both assertion and reason are false.

Ans: b