Chapter 01 — Some Basic Concepts of Chemistry

TOPIC WISE QUESTIONS

INTRODUCTION TO MOLE

Q.1 If the atomic mass of Sodium is 23, the number of moles in 46 g of sodium is :
(1) 1
(2) 2
(3) 2.3
(4) 4.6

Q.2 Which of the following contains the greatest number of atoms ?
(1) 1.0 g of butane (C_4H_{10})
(2) 1.0 g of nitrogen (N_2)
(3) 1.0 g of silver (Ag)
(4) 1.0 g of water (H_2O)

Q.3 The weight of a molecule of the compound $C_6H_{12}O_6$ is :
(1) 1.09×10^{-21} g
(2) 2.988×10^{-22} g
(3) 5.025×10^{-23} g
(4) 16.023×10^{-23} g

Q.4 Which of the following will contain same number of atoms as 20g of calcium?
(1) 24g magnesium
(2) 12g carbon
(3) 8g oxygen gas
(4) 16g oxygen atom

Q.5 Which of the following contains the least number of molecules ?
(1) 4.4 g CO_2
(2) 3.4 g NH_3
(3) 1.6 g CH_4
(4) 3.2 g SO_2

Q.6 The number of molecule in 4.25 g of NH_3 is -
(1) 1.505×10^{23}
(2) 3.01×10^{23}
(3) 6.02×10^{23}
(4) None of these

Q.7 If 3.01×10^{20} molecules are removed from 98 mg. of H_2SO_4, then the number of moles of H_2SO_4 left are :–
(1) 0.1×10^{-3}
(2) 0.5×10^{-3}
(3) 1.66×10^{-3}
(4) 9.95×10^{-2}

Q.8 4.4 g of an unknown gas occupies 2.24 litres of volume at STP. The gas may be :-
(1) N_2O
(2) CO
(3) CO_2
(4) 1 & 3 both

Q.9 Number of oxygen atoms in 8 g of ozone is -
(1) 6.02×10^{23}
(2) $\dfrac{6.02 \times 10^{23}}{2}$
(3) $\dfrac{6.02 \times 10^{23}}{3}$
(4) $\dfrac{6.02 \times 10^{23}}{6}$

Q.10 5.6 lt. of oxygen at STP contains -
(1) 6.02×10^{23} atoms
(2) 3.01×10^{23} atoms
(3) 1.505×10^{23} atoms
(4) 0.7525×10^{23} atoms

Q.11 Number of neutrons present in 1.7 g of ammonia is -
(1) N_A
(2) $N_A/10 \times 4$
(3) $(N_A/10) \times 7$
(4) $N_A \times 10 \times 7$

Q.12 The number of atoms present in 0.5g atom of nitrogen is same as the atoms in –
(1) 12g of C
(2) 32g of S
(3) 8g of oxygen
(4) 24g of Mg

Q.13 The actual weight of a molecule of water is -
(1) 18 g
(2) 2.99×10^{-23} g
(3) both (1) & (2) are correct
(4) None of these

Q.14 What is the mass of a molecule of CH_4 –
(1) 16 g
(2) 26.6×10^{22} g
(3) 2.66×10^{-23} g
(4) $16 \, N_A$ g

Q.15 Which of the following has the highest mass ?
(1) 1 g atom of C
(2) ½ mole of CH_4
(3) 10 ml of water
(4) 3.011×10^{23} atoms of oxygen

Q.16 Which of the following contains largest number of atoms ?
(1) 4 g of H_2
(2) 16 g of O_2

(3) 28 g of N_2 (4) 18 g of H_2O

Q.17 Which of the following contains greatest number of oxygen atoms ?
(1) 1 g of O
(2) 1 g of O_2
(3) 1 g of O_3
(4) all have the same number of atoms

Q.18 The weight of one atom of Uranium is 238 amu. Its actual weight is .... g.
(1) 1.43×10^{26} (2) 3.94×10^{-22}
(3) 6.99×10^{-23} (4) None of these

Q.19 Sum of number of protons, electrons and neutrons in 12g of $_6^{12}C$ is :-
(1) 1.8   (2) 12.044×10^{23}
(3) 1.084×10^{25} (4) 10.84×10^{23}

Q.20 Vapour density of gas is 11.2, volume occupied by 2.4 gms of this at STP will be -
(1) 11.2 lt   (2) 2.24 lt.
(3) 22.4 lt.   (4) 2.4 lt.

Q.21 The volume of a gas in discharge tube is 1.12×10^{-7} ml. at STP. Then the number of molecule of gas in the tube is -
(1) 3.01×10^4 (2) 3.01×10^{15}
(3) 3.01×10^{12} (4) 3.01×10^{16}

Q.22 If V ml of the vapours of substance at NTP weight W g. Then molecular wt. of substance is :-
(1) $(W/V) \times 22400$ (2) $\frac{V}{W} \times 22.4$
(3) $(W - V) \times 22400$ (4) $\frac{W \times 1}{V \times 22400}$

Q.23 The number of gram molecules of oxygen in 6.02×10^{24} CO molecules is –
(1) 10 g molecules
(2) 5 g molecules
(3) 1 g molecules
(4) 0.5 g molecules

Q.24 Which of the following has maximum mass ?
(1) 0.1 g atom of carbon
(2) at STP, 1120 cc volume of carbondioxide
(3) 6.02×10^{22} molecule of hydrogen
(4) 0.1 mole of ammonia

Q.25 The number of moles of carbon dioxide which contain 8 g of oxygen is –
(1) 0.5 moles   (2) 0.20 moles
(3) 0.40 moles   (4) 0.25 moles

Q.26 22.4 litre of water vapour at NTP, When condensed to water occupies an approximate volume of -
(1) 18 litre   (2) 1 litre
(3) 1 ml   (4) 18 ml

Q.27 Given that one mole of N_2 at NTP occupies 22.4 litre the density of N_2 is -
(1) 1.25 g/litre   (2) 0.80 g/litre
(3) 2.5 g/litre   (4) 1.60 g/litre

Q.28 The weight of 1 mole of a gas of density 0.1784 g/L at NTP is -
(1) 0.1784 g
(2) 1 g
(3) 4 g
(4) Cannot be Calculate

Q.29 If 224 ml of a triatomic gas has a mass of 1g at 273 K and 1 atm pressure, then the mass of one atom is –
(1) 8.30×10^{-23} g   (2) 2.08×10^{-23} g
(3) 5.53×10^{-23} g   (4) 6.24×10^{-23} g

Q.30 The volume of a gas at 0^0C and 700 mm pressure is 760 CC. The no. of molecules present in this volume is
(1) 1.88×10^{22} (2) 6.022×10^{23}
(3) 18.8×10^{23} (4) 18.8×10^{22}

Q.31 Number of HCl molecules present in 10 ml of 0.1 M solution is :
(1) 6.022×10^{23} (2) 6.023×10^{22}
(3) 6.022×10^{21} (4) 6.022×10^{20}

Q.32 The total number of ions present in 1 ml of 0.1 M barium nitrate $Ba(NO_3)_2$ solution is -
(1) 6.02×10^{18}
(2) 6.02×10^{19}
(3) $3.0 \times 6.02 \times 10^{19}$
(4) $3.0 \times 6.02 \times 10^{18}$

Q.33 A person adds 1.71 gram of sugar ($C_{12}H_{22}O_{11}$) in order to sweeten his tea. The number of carbon atoms added are (mol. mass of sugar = 342)
(1) 3.6×10^{22} (2) 7.2×10^{21}
(3) 0.05   (4) 6.6×10^{22}

Q.34 Insulin contains 3.4% sulphur. The minimum mol. wt. of insulin is –
(1) 941.176   (2) 944

(3) 945.27   (4) None

Q.35 Caffine has a molecular weight of 194. It contains 28.9% by mass of nitrogen Number of atoms of nitrogen in one molecule of it -

(1) 2   (2) 3   (3) 4   (4) 5

Q.36 A giant molecule contains 0.25% of a metal whose atomic weight is 59. Its molecule contains one atom of that metal. Its minimum molecular weight is -

(1) 5900   (2) 23600

(3) 11800   (4) $\dfrac{100 \times 59}{0.4}$

Q.37 The percentage of nitrogen in urea is about

(1) 46   (2) 85   (3) 18   (4) 28

QUESTIONS BASED ON EMPIRICAL FORMULA & MOLECULAR FORMULA

Q.38 A hydrocarbon contains 75% of carbon. Then its molecular formula is -

(1) CH_4 (2) C_2H_4 (3) C_2H_6 (4) C_2H_2

Q.39 A compound of X and Y has equal mass of them. If their atomic weights are 30 and 20 respectively. Molecular formula of that compound (its mol. wt. is 120) could be -

(1) X_2Y_2 (2) X_3Y_3 (3) X_2Y_3 (4) X_3Y_2

Q.40 An oxide of sulphur contains 50% of sulphur in it. Its emperial formula is -

(1) SO_2 (2) SO_3 (3) SO (4) S_2O

Q.41 A hydrocarbon contains 80% of carbon, then the hydrocarbon is -

(1) CH_4 (2) C_2H_4 (3) C_2H_6 (4) C_2H_2

Q.42 Emperical formula of glucose is -

(1) $C_6H_{12}O_6$ (2) $C_3H_6O_3$
(3) $C_2H_4O_2$ (4) CH_2O

Q.43 An oxide of metal M has 40% by mass of oxygen. Metal M has atomic mass of 24. The emperical formula of the oxide

(1) M_2O (2) M_2O_3 (3) MO (4) M_3O_4

Q.44 A compound is found to contain 80% of carbon and 20% of hydrogen, then the molecular formula of the compound is-

(1) C_6H_6 (2) C_2H_5OH
(3) C_2H_6 (4) C_2H_4

Q.45 A compound contains 38.8% C, 16.0% H and 45.2% N. The formula of the compound would be

(1) CH_3NH_2 (2) CH_3CN
(3) C_2H_5CN (4) $CH_2(NH)_2$

Q.46 The simplest formula of a compound containing 50% of element X(at wt. = 10) and 50% of element Y(at wt. = 20) is:-

(1) XY   (2) X_2Y (3) XY_2 (4) X_3Y

Q.47 The simplest formula of a compound containing 50% of the element X (At wt. 20) and 50% of the element Y (At wt. 10) is:-
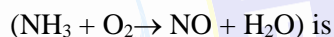
(1) XY   (2) X_2Y (3) XY_2 (4) X_2Y_3

Q.48 Which of the following compounds has same empirical formula as that of glucose:-

(1) CH_3CHO (2) CH_3COOH
(3) CH_3OH (4) C_2H_6

QUESTIONS BASED ON STOCHIOMETRY

Q.49 The moles of O_2 required for reacting with 6.8g of ammonia

$(NH_3 + O_2 \rightarrow NO + H_2O)$ is

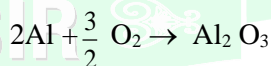(1) 5   (2) 2.5   (3) 1   (4) 0.5

Q.50 How many moles of potassium chlorate need to be heated to produce 11.2 litre oxygen at N.T.P.

(1) $\dfrac{1}{2}$ mol   (2) $\dfrac{1}{3}$ mol

(3) $\dfrac{1}{4}$ mol   (4) $\dfrac{2}{3}$ mol

Q.51 If $1\dfrac{1}{2}$ moles of oxygen combine with Al to form Al_2O_3, the weight of Al used in the reaction is (Al = 27)
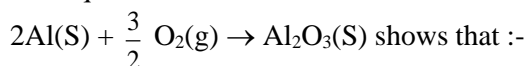
(1) 27 g   (2) 54 g
(3) 40.5 g   (4) 81 g

Q.52 9 g of Al will react, with

$2Al + \dfrac{3}{2} O_2 \rightarrow Al_2 O_3$

(1) 6 g O_2 (2) 8 gms O_2
(3) 9 g O_2 (4) 4 gms O_2

Q.53 The equation :

$2Al(S) + \dfrac{3}{2} O_2(g) \rightarrow Al_2O_3(S)$ shows that :-
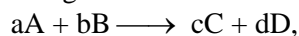
(1) 2 mole of Al reacts with $\dfrac{3}{2}$ mole of O_2 to produce $\dfrac{7}{2}$ mole of Al_2O_3

(2) 2g of Al reacts with $\frac{3}{2}$ g of O_2 to produce one mole of Al_2O_3

(3) 2 g mole of Al reacts with $\frac{3}{2}$ litre of O_2 to produce 1 mole of Al_2O_3

(4) 2 mole of Al reacts with $\frac{3}{2}$ mole of O_2 to produce 1 mole of Al_2O_3

Q.54 In a gaseous reaction of the type
$aA + bB \longrightarrow cC + dD$,
which statement is wrong ?
(1) a litre of A combines with b litre of B to give C and D
(2) a mole of A combines with b moles of B to give C and D
(3) a g of A combines with b g of B to give C and D
(4) a molecules of A combines with b molecules of B to give C and D

Q.55 What quantity of limestone ($CaCO_3$) on heating will give 56kg of CaO?
(1) 1000 kg (2) 10kg
(3) 50 kg (4) 100 kg

Q.56 0.5 mole of H_2SO_4 is mixed with 0.2 mole of $Ca(OH)_2$. The maximum number of moles of $CaSO_4$ formed is
(1) 0.2 (2) 0.5
(3) 0.4 (4) 1.5

Q.57 If 1/2 moles of oxygen combine with Aluminimum to form Al_2O_3 then weight of Aluminium metal used in the reaction is (Al= 27) -
(1) 27 g (2) 18 g
(3) 54 g (4) 40.5 g

Q.58 26 CC of CO_2 are passed over red hot coke. The volume of CO evolved is :–
(1) 15 CC (2) 10 CC
(3) 32 CC (4) None of these

Q.59 One litre of CO_2 is passed over hot coke. The volume becomes 1.4 litre. The composition of products is–
(1) 0.6 litre CO
(2) 0.8 litre CO_2
(3) 0.6 litre CO_2 and 0.8 litre CO
(4) None

Q.60 Assuming that petrol is octane (C_8H_{18}) and has density 0.8 g/ml, 1.425 litre of petrol on complete combustion will consume.
(1) 50 mole of O_2 (2) 100 mole of O_2
(3) 125 mole of O_2 (4) 200 mole ofO_2

Q.61 The number of litres of air required to burn 8 litres of C_2H_2 is approximately-
(1) 40 (2) 60 (3) 80 (4) 100

Q.62 For the reaction $A + 2B \longrightarrow C$,
5 mole of A and 8 mole of B will produce
(1) 5 mole of C (2) 4 mole of C
(3) 8 mole of C (4) 13 mole of C

Q.63 4 gms. of hydrogen are ignited with 4 gms of oxygen. The weight of water formed is -
(1) 0.5 g (2) 3.5 g
(3) 4.5 g (4) 2.5 g

Q.64 If 8 ml. of uncombined O_2 remain after exploding O_2 with 4 ml. of hydrogen, the number of ml. of O_2 originally were -
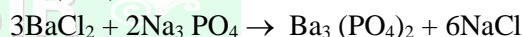(1) 12 (2) 2 (3) 10 (4) 4

Q.65 If 1.6 gms of SO_2 and 1.5×10^{22} molecules of H_2S are mixed and allowed to remain in contact in a closed vessel until the reaction
$2H_2S + SO_2 \longrightarrow 3S + 2H_2O$,
proceeds to completion. Which of the following statement is true ?
(1) Only 'S' and 'H_2O' remain in the reaction vessel.
(2) 'H_2S' will remain in excess
(3) 'SO_2' will remain in excess
(4) None

Q.66 If 0.5 mol of $BaCl_2$ is mixed with 0.1 mole of Na_3PO_4, the maximum number of mole of $Ba_3(PO_4)_2$ that can be formed is:-
$3BaCl_2 + 2Na_3 PO_4 \rightarrow Ba_3 (PO_4)_2 + 6NaCl$
(1) 0.7 (2) 0.05
(3) 0.30 (4) 0.10

Q.67 12 lit. of H_2 and 11.2 lit. of Cl_2 are mixed and exploded. The composition by volume of mixture is–
(1) 24 lit. of HCl (g)
(2) 0.8 lit. Cl_2 and 20.8 lit. HCl (g)
(3) 0.8 lit. H_2 and 22.4 lit. HCl (g)
(4) 22.4 lit. HCl (g)

Q.68 The volume of oxygen required for complete combustion of 20 ml of ethene is
(1) 30 ml (2) 60 ml (3) 40 ml (4) 50 ml

QUESTION BASED ON EQUIVALENT WEIGHTS

Q.69 Molecular weight of tribasic acid is W. Its equivalent weight will be :
(1) $\dfrac{W}{2}$ (2) $\dfrac{W}{3}$ (3) W (4) 3W

Q.70 A, E, M and n are the atomic weight, equivalent weight, molecular weight and valency of an element. The correct relation is :
(1) $A = E \times n$ (2) $A = \dfrac{M}{E}$
(3) $A = \dfrac{M}{n}$ (4) $M = A \times n$

Q.71 If equivalent weight of S in SO_2 is 8 then equivalent weight of S in SO_3 is -
(1) $\dfrac{8 \times 2}{3}$ (2) $\dfrac{8 \times 3}{2}$
(3) $8 \times 2 \times 3$ (4) $\dfrac{2 \times 3}{8}$

Q.72 One g equivalent of a substance is present in -
(1) 0.25 mole of O_2 (2) 0.5 mole of O_2
(3) 1.00 mole of O_2 (4) 8.00 mole of O_2

Q.73 In a compound A_xB_y,
(1) Mole of A = mole of B = mole of A_xB_y
(2) eq. of A = eq of B = eq. of A_xB_y
(3) yx mole of A = yx mole of B = (x + y) mole of A_xB_y
(4) y × mole of A = y × mole of B

Q.74 0.45 g of acid (molecular wt. = 90) was exactly neutralised by 20 ml. of 0.5 N NaOH. Basicity of the acid is -
(1) 1 (2) 2 (3) 3 (4) 4

Q.75 Sulphur forms two chlorides S_2Cl_2 and SCl_2. The equivalent mass of sulphur in SCl_2 is 16. The equivalent weight of sulphur in S_2Cl_2 is -
(1) 8 (2) 16 (3) 32 (4) 64

Q.76 2g of a base whose eq. wt. is 40 reacts with 3 g of an acid. The eq. wt. of the acid is
(1) 40 (2) 60 (3) 10 (4) 80

Q.77 0.84 g of a metal carbonate reacts exactly with 40 ml of N/2 H_2SO_4. The equivalent weight of the metal carbonate is -
(1) 84 (2) 64 (3) 42 (4) 32

Q.78 0.126 g of an acid requires 20 ml of 0.1 N NaOH for complete neutralisation. Eq. wt. of the acid is –
(1) 45 (2) 53 (3) 40 (4) 63

Q.79 Equivalent weight of a divalent metal is 24. The volume of hydrogen liberated at STP by 12 gms of the same metal when added to excess of an acid solution is -
(1) 2.8 litres (2) 5.6 litres
(3) 11.2 litres (4) 22.4 litres

Q.80 1.0 g of a metal combines with 8.89 gms of Bromine. Equivalent weight of metal is nearly : (at.wt. of Br = 80)
(1) 8 (2) 9 (3) 10 (4) 7

Q.81 H_3PO_4 is a tribasic acid and one of its salt is NaH_2PO_4 What volume of 1M NaOH solution should be added to 12 g NaH_2PO_4 to convert it into Na_3PO_4? (at.wt of P=31)
(1) 100 ml (2) 200 ml
(3) 80 ml (4) 300 ml

Q.82 The ratio of amount of H_2S needed to precipitate all the metal ions from 100 ml of 1M $AgNO_3$ and 100 ml of 1 M $CuSO_4$ is
(1) 1 : 2 (2) 2 : 1
(3) Zero (4) Infinite

Q.83 0.84 gms. of metal hydride contains 0.04 gms of hydrogen. The equivalent wt. of metal is ....
(1) 80 (2) 40 (3) 20 (4) 60

Q.84 A_1 g of an element give A_2 g of its oxide. The equivalent mass of the element is –
(1) $\dfrac{A_2 - A_1}{A_1} \times 8$ (2) $\dfrac{A_2 - A_1}{A_2} \times 8$
(3) $\dfrac{A_1}{A_2 - A_1} \times 8$ (4) $(A_2 - A_1) \times 8$

Q.85 When an element forms an oxide in which oxygen is 20% of the oxide by mass, the equivalent mass of the element will be –
(1) 32 (2) 40 (3) 60 (4) 128

Q.86 If 1.2 g of a metal displaces 1.12 litre of hydrogen at NTP, equivalent mass of the metal would be –
(1) 1.2×11.2 (2) 12

(3) 24   (4) 1.2 + 11.2

Q.87 One g of hydrogen is found to combine with 80 g of bromine. One g of calcium (valency = 2) combines with 4 g of bromine. The equivalent weight of calcium is –
(1) 10   (2) 20   (3) 40   (4) 80

Q.88 2.8 g of iron displaces 3.2 g of copper from a solution of copper sulphate solution. If the equivalent mass of iron is 28, then equivalent mass of copper will be –
(1) 16   (2) 32   (3) 48   (4) 64

Q.89 A metal oxide is reduced by heating it in a stream of hydrogen. It is found that after complete reduction 3.15 g of the oxide have yielded 1.05 g of the metal. We may conclude that.
(1) Atomic weight of the metal is 4
(2) Equivalent weight of the metal is 8
(3) Equivalent weight of the metal is 4
(4) Atomic weight of the metal is 8

Q.90 If m_1 g of a metal A displaces m_2 g of another metal B from its salt solution and if their equivalent weights are E_2 and E_1 respectively then the equivalent weight of A can be expressed by:-

(1) $\dfrac{m_1}{m_2} \times E_2$ (2) $\dfrac{m_2}{m_1} \times E_2$

(3) $\dfrac{m_1}{m_2} \times E_1$ (4) $\dfrac{m_2}{m_1} \times E_1$

Q.91 14 g of element X combines with 16 g of oxygen. On the basis of this information, which of the following is a correct statement:-
(1) The element X could have an atomic wt. of 7 and its oxide is XO
(2) The element X could have an atomic weight of 14 and its oxide is X_2O
(3) The element X could have an atomic weight of 7 and its oxide is X_2O
(4) The element X could have an atomic weight of 14 and its oxide is XO_2

Q.92 The oxide of a metal has 32% oxygen. It's equivalent weight would be:-
(1) 34   (2) 32   (3) 17   (4) 16

Q.93 1.6 g of Ca and 2.60 g of Zn when treated with an acid in excess separately, produced the same amount of hydrogen. If the equivalent weight of Zn is 32.6, what is the equivalent weight of Ca:-
(1) 10   (2) 20   (3) 40   (4) 5

QUESTIONS BASED ON CALCULATION OF ATOMIC WEIGHTS AND MOLECULAR WEIGHTS

Q.94 74.5 g of a metallic chloride contains 35.5 g of chlorine. The equivalent mas of the metal is –
(1) 19.5   (2) 35.5   (3) 39.0   (4) 78.0

Q.95 The molecular mass of metal chloride, MCl, is 74.5. The equivalent mass of the metal M will be –
(1) 39   (2) 74.5   (3) 110.0   (4) 35.5

Q.96 The equivalent weight of an element is 4. It's chloride has a V.D. 59.25. Then the valency of the element is –
(1) 4   (2) 3   (3) 2   (4) 1

Q.97 The atomic weight of a metal (M) is 27 and its equivalent weight is 9, the formula of its chloride will be:-
(1) MCl   (2) MCl_2
(3) M_3Cl (4) None

Q.98 The chloride of a metal contains 71% chlorine by weight and the vapour density of it is 50, the atomic weight of the metal will be:-
(1) 29   (2) 58   (3) 35.5   (4) 71

Q.99 The specific heat of a metal M is 0.25. Its eq. wt. is 12. What is it's correct at. wt. :–
(1) 25.6   (2) 36   (3) 24   (4) 12

Q.100 Vapour density of metal chloride is 77. Equivalent weight of metal is 3, then its atomic weight will be-
(1) 3   (2) 6   (3) 9   (4) 12

Q.101 Specific heat of a solid element is 0.1Cal/g °C and its equivalent weight is 31.8. Its exact atomic weight is -
(1) 31.8   (2) 63.6   (3) 318   (4) 95.4

Q.102 The specific heat of an element is 0.214 cal/g°C. The approximate atomic weight is -
(1) 0.6   (2) 12   (3) 30   (4) 65

Q.103 71 g of chlorine combines with a metal giving 111 g of its chloride. The chloride is isomorphous with $MgCl_2. 6H_2O$. The atomic mass of the metal is:-
(1) 20   (2) 30   (3) 40   (4) 69

Q.104 The carbonate of a metal is isomorphous with $MgCO_3$ and contains 6.091% of carbon. Atomic weight of the metal is nearly -
(1) 48   (2) 68.5   (3) 137   (4) 120

Q.105 A metal M forms a sulphate which is isomorphous with $MgSO_4. 7H_2O$. If 0.6538 g of metals M displaced 2.16 g of silver from silver nitrate solution, then the atomic weight of the metal M is
(1) 32.61   (2) 56.82

(3) 65.38   (4) 74.58

CONCENTRATION TERMS

Q.106 500 mL of a glucose solution contains 6.02×10^{22} molecules. The concentration of the solution is
(1) 0.1 M   (2) 1.0 M
(3) 0.2 M   (4) 2.0 M

Q.107 The molarity of the solution containing 2.8% mass-volume solution of KOH is
(1) M/10   (2) M/2   (3) M/5   (4) 1 M

Q.108 The mole fraction of water in a solution containing 117 g sodium chloride and 900 g of water is ?
(1) 0.0632 (2) 0.038   (3) 0.9615 (4) 1.000

Q.109 The molality of a sulphuric acid solution is 0.2. Calculate the total weight of the solution having 1000 g of solvent.
(1) 1000 g   (2) 1098.6 g
(3) 980.4 g   (4) 1019.6g

Q.110 Density of a 2.05 M solution of acetic acid in water is 1.02 g/mL. The molality of the solution is
(1) 3.28 mol Kg^{-1} (2) 2.28 mol Kg^{-1}
(3) 0.44 mol Kg^{-1} (4) 1.14 mol Kg^{-1}

Q.111 A 5.2 molal aqueous solution of CH_3OH is supplied. What is the mole fraction of methyl alcohol in the solution ?
(1) 0.050   (2) 0.100
(3) 0.190   (4) 0.086

Q.112 The density of a solution containing 13% by mass of sulphuric acid is 1.09 g/mL. Calculate the molarity of the solution-
(1) 1.445 M   (2) 14.45 M
(3) 144.5 M   (4) 0.1445 M

QUESTIONS BASED ON LAW OF CHEMICAL COMBINATION

Q.113 Which one of the following pairs of compounds illustrate the law of multiple proportions ?
(1) H_2O, Na_2O (2) MgO, Na_2O
(3) Na_2O, BaO   (4) $SnCl_2$, $SnCl_4$

Q.114 In the reaction $N_2 + 3H_2 \longrightarrow 2 NH_3$, ratio by volume of N_2, H_2 and NH_3 is 1 : 3 : 2. This illustrates law of -
(1) Difinite proportion (2) Multiple proportion
(3) Reciprocal proportion
(4) Gaseous volumes

Q.115 Different proportions of oxygen in the various oxides of nitrogen prove the law of -
(1) Equivalent proportion
(2) Multiple proportion

(3) Constant proportion
(4) Conservation of matter

Q.116 Elements A and B form two compounds B_2A_3 and B_2A. 0.05 moles of B_2A_3 weight 9.0 gms and 0.10 mole of B_2A weight 10 gms atomic weight of A and B are-
(1) 20 and 30   (2) 30 and 40
(3) 40 and 30   (4) 30 and 20

Q.117 Oxygen combines with two isotopes of carbon ^{12}C and ^{14}C to form two sample of carbon dioxide. The data illustrates -
(1) Law of conservation of mass
(2) Law of multiple proportions
(3) Law of reciprocal proportions
(4) None of these

Q.118 The law of conservation of mass holds good for all of the following except -
(1) All chemical reactions
(2) Nuclear reactions
(3) Endothermic reactions
(4) Exothermic reactions

Q.119 The empirical formula of an organic compound containing carbon and hydrogen is CH_2. The mass of one litre of this organic gas is exactly equal to that of one litre of N_2 at same temperature and pressure. Therefore, the molecular formula of the organic gas is –
(1) C_2H_4 (2) C_3H_6 (3) C_6H_{12} (4) C_4H_8

Q.120 Four one litre flasks are seperately filled with the gases hydrogen, helium oxygen and ozone at same room temp. and pressure. The ratio of total number of atoms of these gases present in the different flasks would be -
(1) 1 : 1 : 1 : 1   (2) 1 : 2 : 2 : 3
(3) 2 : 1 : 2 : 3   (4) 2 : 1 : 3 : 2

Q.121 A container of volume V, contains 0.28 g of N_2 gas. If same volume of an unknown gas under similar condition of temperature and pressure weighs, 0.44 g, the molecular mass of the gas is
(1) 22   (2) 44   (3) 66   (4) 88

Q.122 A and B are two identical vessels. A contains 15 g ethane at 1 atm and 298 K. The vessel B contains 75 g of a gas X_2 at same temperature and pressure. The vapour density of X_2 is –
(1) 75   (2) 150
(3) 37.5   (4) 45

Q.123 Hydrogen combines with chlorine to form HCl. It also combines with sodium to form NaH. If sodium

and chlorine also combine with each other, they will do so in the ratio of their masses as:-

(1) 23 : 35.5   (2) 35.5 : 23

(3) 1: 1   (4) 23 : 1

Q.124 Two flask A & B of equal capacity of volume contain NH_3 and SO_2 gas respectively under similar conditions which flask has more no. of moles –

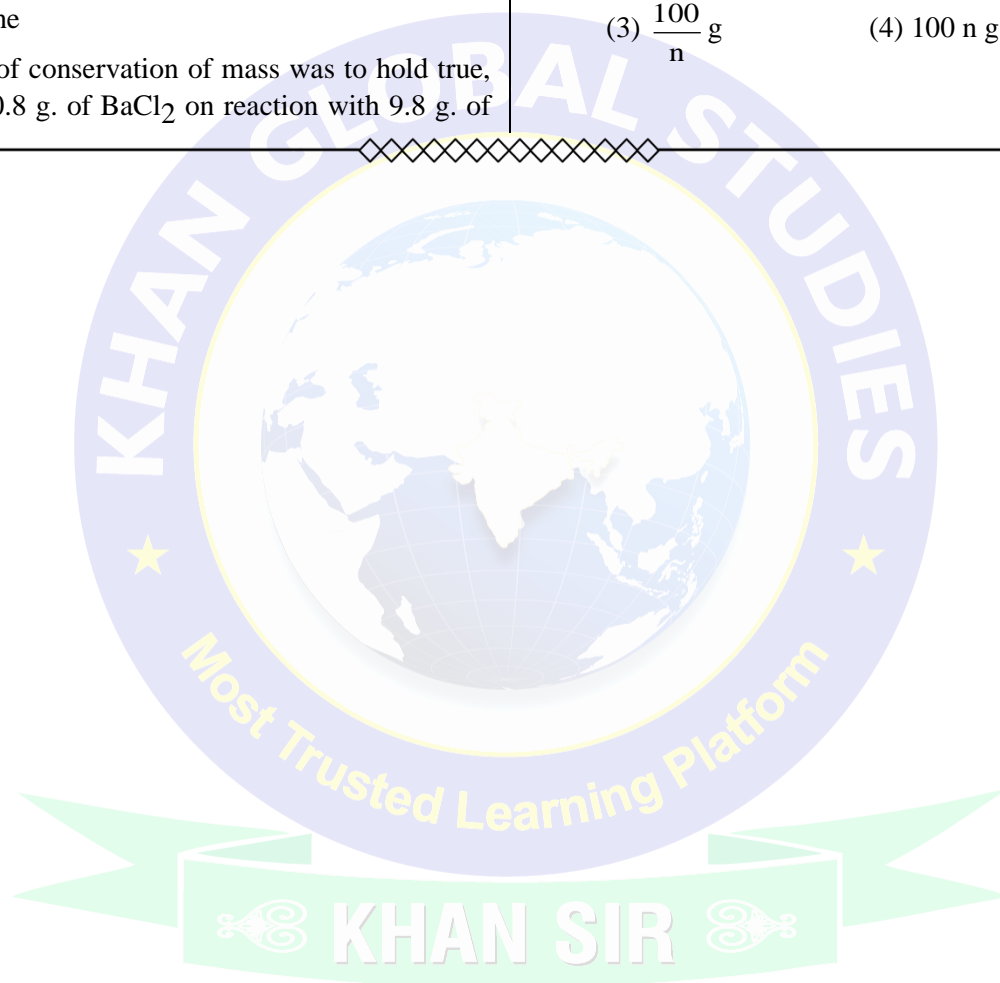(1) A

(2) b

(3) Both have same moles

(4) None

Q.125 If law of conservation of mass was to hold true, then 20.8 g. of $BaCl_2$ on reaction with 9.8 g. of H_2SO_4 will produce 7.3 g. of HCl and $BaSO_4$ equal to –

(1) 11.65 g.   (2) 23.3 g.

(3) 25.5 g.   (4) 30.6 g.

Q.126 When 100 g of ethylene polymerizes to polythylene according to equation $nCH_2 = CH_2$ $\rightarrow$ $-(CH_2 - CH_2)-_n$. The weight of polyethylene produced will be:-

(1) $\frac{n}{2}$ g   (2) 100 g

(3) $\frac{100}{n}$ g   (4) 100 n g

ANSWER KEY

TOPIC WISE QUESTIONS

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	2	1	2	3	4	1	2	4	2	2	3	3	2	3	1
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	1	4	2	3	4	3	1	2	2	4	4	1	3	3	1
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	4	3	1	1	3	2	1	1	3	1	3	4	3	3	1
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	2	3	2	4	2	2	2	4	3	4	1	2	4	3	3
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	4	2	3	3	3	2	3	2	2	1	1	1	2	2	3
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	2	3	4	2	2	2	1	3	3	1	2	2	2	3	3
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
Ans.	3	3	2	3	1	2	4	1	1	4	2	3	3	3	3
Que.	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	3	2	3	4	2	4	1	4	4	2	3	1	2	1	3
Que.	121	122	123	124	125	126									
Ans.	2	1	1	3	2	2									