Chapter: Some Basic Concepts of Chemistry

Q1. Some Basic Concepts of Chemistry, 2024 (09 Apr Shift 1)

Molarity (M) of an aqueous solution containing x g of anhyd. $CuSO_4$ in 500 mL solution at $32^{\circ}C$ is 2×10^{-1}M. Its molality will be _____ $\times 10^{-3}$ m. (nearest integer). [Given density of the solution $= 1.25$ g/mL]

Q2. Some Basic Concepts of Chemistry, 2024 (06 Apr Shift 1)

The density of ' x ' M solution (' X ' molar) of NaOH is 1.12 g mL^{-1}, while in molality, the concentration of the solution is 3 m(3molal). Then x is (Given : Molar mass of NaOH is 40 g/mol)

(1) 3.5 (2) 3.8

(3) 2.8 (4) 3.0

Q3. Some Basic Concepts of Chemistry, 2024 (01 Feb Shift 2)

10 mL of gaseous hydrocarbon on combustion gives 40 mL of $CO_2(g)$ and 50 mL of water vapour. Total number of carbon and hydrogen atoms in the hydrocarbon is _____.

Q4. Some Basic Concepts of Chemistry, 2024 (31 Jan Shift 2)

The molarity of 1L orthophosphoric acid (H_3PO_4) having 70% purity by weight (specific gravity 1 .54 g cm^{-3}) is _____ M. (Molar mass of $H_3PO_4 = 98$ g mol^{-1})

Q5. Some Basic Concepts of Chemistry, 2022 (29 Jul Shift 2)

Consider the reaction

$4HNO_3(l) + 3KCl(s) \rightarrow Cl_2(g) + NOCl(g) + 2H_2O(g) + 3KNO_3(s)$

The amount of HNO_3 required to produce110. 0 g of KNO_3 is

(Given : Atomic masses of H, O, N and K are 1, 16, 14 and 39, respectively.)

(1) 32. 2 g (2) 69. 4 g

(3) 91. 5 g (4) 162. 5 g

Q6. Some Basic Concepts of Chemistry, 2022 (29 Jul Shift 2)

$C(s) + O_2(g) \rightarrow CO_2(g) + 400$ kJ

$C(s) + \frac{1}{2}O_2(g) \rightarrow CO(g) + 100$ kJ

When coal of purity 60% is allowed to burn in presence of insufficient oxygen, 60% of carbon is converted into ' CO' and the remaining is converted into 'CO_2'.

The heat generated when 0. 6 kg of coal is burnt is

(1) 1600 kJ (2) 3200 kJ

(3) 4400 kJ (4) 6600 kJ

Q7. Some Basic Concepts of Chemistry, 2022 (28 Jul Shift 1)

In the given reaction,

$X + Y + 3Z \rightleftarrows XYZ_3$

if one mole of each of X and Y with 0. 05 mol of Z gives compound XYZ_3. (Given : Atomic masses of X, Y and Z are 10,20 and 30 amu, respectively). The yield of XYZ_3 is____g.

Q8. Some Basic Concepts of Chemistry, 2022 (27 Jul Shift 1)

250 g solution of D-glucose in water contains 10. 8% of carbon by weight. The molality of the solution is nearest to (Given: Atomic Weights are H = 1u; C = 12 u; O = 16 u)

(1) 1. 03 (2) 2. 06

(3) 3. 09 (4) 5. 40

Q9. Some Basic Concepts of Chemistry, 2022 (26 Jul Shift 2)

Hemoglobin contains 0. 34% of iron by mass. The number of Fe atoms in 3. 3 g of hemoglobin is (Given : Atomic mass of Fe is 56u, N_A in 6.022×10^{23} mol^{-1})

(1) 1.21×10^5 (2) 12.0×10^{16}

(3) 1.21×10^{20} (4) 3.4×10^{22}

Q10. Some Basic Concepts of Chemistry, 2022 (25 Jul Shift 2)

56.0 L of nitrogen gas is mixed with excess of hydrogen gas and it is found that 20 L of ammonia gas is produced, The volume of unused nitrogen gas is found to be_____ L.

Q11. Some Basic Concepts of Chemistry, 2022 (29 Jun Shift 1)

Production of iron in blast furnace follows the following equation

$Fe_3O_4(s) + 4CO(g) \rightarrow 3Fe(l) + 4CO_2(g)$

when 4.640 kg of Fe_3O_4 and 2.520 kg of CO are allowed to react then the amount of iror (in g) produced is :

[Given: Molar Atomic mass $\left(gmol^{-1}\right)$: Fe = 56

Molar Atomic mass $\left(gmolm^{-1}\right)$: O = 16

Molar Atomic mass $\left(gmolm^{-1}\right)$: C = 12]

(1) 1400 (2) 2200

(3) 3360 (4) 4200

Q12. Some Basic Concepts of Chemistry, 2022 (26 Jun Shift 1)

A commercially sold conc. HCl is 35% HCl by mass. If the density of this commercial acid is 1.46 g/ mL, the molarity of this solution is :

(Atomic mass : Cl = 35.5 amu, H = 1 amu)

(1) 10.2 M (2) 14.0 M

(3) 12.5 M (4) 18.2 M

Q13. Some Basic Concepts of Chemistry, 2022 (24 Jun Shift 1)

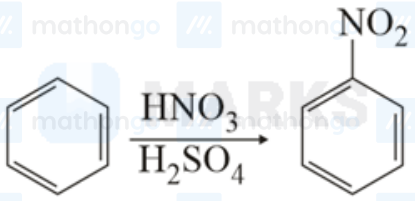
If a rocket runs on a fuel $(C_{15}H_{30})$ and liquid oxygen, the weight of oxygen required and CO_2 released for every litre of fuel respectively are :

(Given : density of the fuel is 0.756 g/ mL)

(1) 1188 g and 1296 g (2) 2376 g and 2592 g

(3) 2592 g and 2376 g (4) 3429 g and 3142 g

Q14. Some Basic Concepts of Chemistry, 2021 (17 Mar Shift 1)



In the above reaction, 3.9 g of benzene on nitration gives 4.92 g of nitrobenzene. The percentage yield of nitrobenzene in the above reaction is _____ %. (Round off to the Nearest Integer).

(Given atomic mass : C : 12.0 u, H : 1.0 u O : 16.0 u, N : 14.0 u)

Q15. Some Basic Concepts of Chemistry, 2021 (16 Mar Shift 1)

Complete combustion of 750 g of an organic compound provides 420 g of CO_2 and 210 g of H_2O. The percentage composition of carbon and hydrogen in organic compound is 15.3 and _____ respectively. (Round off to the Nearest Integer)

Q16. Some Basic Concepts of Chemistry, 2021 (26 Feb Shift 2)

The $NaNO_3$ weighed out to make 50 mL of an aqueous solution containing 70.0 mg Na^+ per mL is_ g. (Rounded off to the nearest integer)

[Given : Atomic weight in $gmol^{-1}$ – Na : 23; N : 14; O : 16]

Q17. Some Basic Concepts of Chemistry, 2021 (24 Feb Shift 1)

4.5 g of compound A(M. W. = 90) was used to make 250 mL of its aqueous solution. The molarity of the solution in M is $x \times 10^{-1}$. The value of x is_____ (Rounded off to the nearest integer)

Q18. Some Basic Concepts of Chemistry, 2020 (06 Sep Shift 1)

A solution of two components containing n_1 moles of the 1st component and n_2 moles of the 2nd component is prepared. M_1 and M_2 are the molecular weights of component 1 and 2 respectively. If d is the density of the solution in gmI^{-1}, C_2 is the molarity and x_2 is the mole fraction of the 2nd component, then C_2 can be expressed as :