

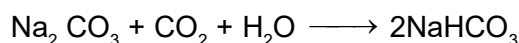
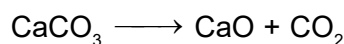
DPP No: 04

SYLLABUS : Mole Concept

- 500 mL of a glucose solution contains 6.02×10^{22} molecules. The concentration of the solution is
(A) 0.1 M (B) 1.0 M (C) 0.2 M (D) 2.0 M
 - 1000 gram aqueous solution of CaCO_3 contains 10 gram of carbonate. Concentration of solution is
(A) 10ppm (B) 100ppm (C) 1000ppm (D) 10,000 ppm
 - Equal moles of H_2O and NaCl are present in a solution. Hence, molality of NaCl solution is :
(A) 0.55 (B) 55.5 (C) 1.00 (D) 0.18
 - Decreasing order of mass of pure NaOH in each of the aqueous solution.
(I) 50 g of 40% (W/W) NaOH
(II) 50 ml of 50% (W/V) NaOH ($d_{\text{sol}} = 1.2 \text{ g/ml}$).
(III) 50 g of 15 M NaOH ($d_{\text{sol}} = 1 \text{ g/ml}$).
(A) I, II, III (B) III, II, I (C) II, III, I (D) III = II = I.
 - Mole fraction of A in H_2O is 0.2. The molality of A in H_2O is :
(A) 13.9 (B) 15.5 (C) 14.5 (D) 16.8
 - What is the molarity of H_2SO_4 solution that has a density of 1.84 g/cc and contains 98% by mass of H_2SO_4 ? (Given atomic mass of S = 32)
(A) 4.18 M (B) 8.14 M (C) 18.4 M (D) 18 M
 - The molarity of the solution containing 2.8% (mass / volume) solution of KOH is : (Given atomic mass of K = 39) is :
(A) 0.1 M (B) 0.5 M (C) 0.2 M (D) 1 M
 - A solution of FeCl_3 is $\frac{M}{30}$ its molarity for Cl^- ion will be :
(A) $\frac{M}{90}$ (B) $\frac{M}{30}$ (C) $\frac{M}{10}$ (D) $\frac{M}{5}$
 - If 500 ml of 1 M solution of glucose is mixed with 500 ml of 1 M solution of glucose final molarity of solution will be :
(A) 1 M (B) 0.5 M (C) 2 M (D) 1.5 M
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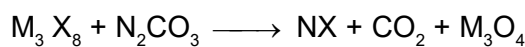
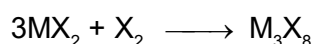
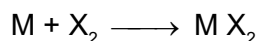
10. The volume of water that must be added to a mixture of 250 ml of 0.6 M HCl and 750 ml of 0.2 M HCl to obtain 0.25 M solution of HCl is :
- (A) 750 ml (B) 100 ml (C) 200 ml (D) 300 ml
11. What volume of a 0.8 M solution contains 100 milli moles of the solute?
- (A) 100 mL (B) 125 mL (C) 500 mL (D) 62.5 mL
12. The molarity of Cl^- in an aqueous solution which was (w/V) 2% NaCl, 4% CaCl_2 and 6% NH_4Cl will be
- (A) 0.342 (B) 0.721 (C) 1.12 (D) 2.18
13. 2M of 100 ml Na_2SO_4 is mixed with 3M of 100 ml NaCl solution and 1M of 200 ml CaCl_2 solution. Then the ratio of the concentration of cation and anion.
- (A) 1/2 (B) 2 (C) 1.5 (D) 1
14. What volume (in ml) of 0.2 M H_2SO_4 solution should be mixed with the 40 ml of 0.1 M NaOH solution such that the resulting solution has the concentration of H_2SO_4 as $\frac{6}{55}$ M.
- (A) 70 (B) 45 (C) 30 (D) 58

15. What weight of CaCO_3 must be decomposed to produce the sufficient quantity of carbon dioxide to convert 21.2 kg of Na_2CO_3 completely in to NaHCO_3 . [Atomic mass Na = 23, Ca = 40]



- (A) 100 Kg (B) 20 Kg (C) 120 Kg (D) 30 Kg

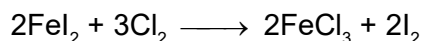
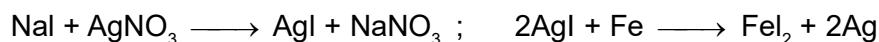
16. NX is produced by the following step of reactions



How much M (metal) is consumed to produce 206 g of NX. (Take at wt of M = 56, N=23, X = 80)

- (A) 42 g (B) 56 g (C) $\frac{14}{3}$ g (D) $\frac{7}{4}$ g

17. The following process has been used to obtain iodine from oil-field brines in California.



How many kg of AgNO_3 are required in the first step for every 254 kg I_2 produced in the third step.

- (A) 340 kg (B) 85 kg (C) 68 kg (D) 380 kg
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18. The oxidation number of Phosphorus in $\text{Mg}_2\text{P}_2\text{O}_7$ is :
 (A) + 3 (B) + 2 (C) + 5 (D) – 3
19. In the reaction $4\text{A} + 2\text{B} + 3\text{C} \rightarrow \text{A}_4\text{B}_2\text{C}_3$, what will be the number of moles of product formed, starting from one mole of A, 0.6 mole of B and 0.72 mole of C ?
 (A) 0.25 (B) 0.3 (C) 0.24 (D) 2.32
20. Find the Cl^- concentration in solution which is obtained by mixing one mole each of BaCl_2 , NaCl and HCl in 500 ml water.
21. The pressure of a gas having 2 mole in 44.8 litre vessel at 546 K is :
 (A) 1 atm (B) 2 atm (C) 3 atm (D) 4 atm
22. How many grams of silicon is present in 35 gram atoms of silicon ?
23. The density of liquid mercury is 13.6 g/cm^3 . How many moles of mercury are there in 1 litre of the metal?
24. Average atomic mass of Magnesium is 24.31 amu. This magnesium is composed of 79 mole % of ^{24}Mg and remaining 21 mole % of ^{25}Mg and ^{26}Mg . Calculate mole % of ^{26}Mg .
25. Calculate the weight of 6.022×10^{23} formula units of CaCO_3 .

ANSWER KEY

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|-----------------|-------------|---------|------------|---------|----------|---------|
| 1. (C) | 2. (D) | 3. (B) | 4. (B) | 5. (A) | 6. (C) | 7. (B) |
| 8. (C) | 9. (A) | 10. (C) | 11. (B) | 12. (D) | 13. (D) | 14. (A) |
| 15. (B) | 16. (A) | 17. (A) | 18. (C) | 19. (C) | 20. 8 M. | 21. (B) |
| 22. 980 g of Si | 23. 68 mole | 24. 10 | 25. 100 g. | | | |