SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

STICHIOMETRY UT-03

1. How many significant figures are present in the following ; (A) 0.0025 , (B) 500.0

a)2,4 b)4,2 c) 5,4 d) 2,1

2. How many significant figures should be present in the product of 5×5.364

a) 5 b) 4 c) 3 d) 1

3. Law of multiple proportions is illustrated by one of the following pairs

a) $H_2S \& SO_2$ b) $NH_3 \& NO_2$ c) $Na_2S \& Na_2O$ d) $N_2O \& NO$

4. 2.16 gm of Cu on reaction with HNO_3 **followed by ignition of the nitrate give 2.7 gm of copper oxide. In another experiment 1.15 gm of copper oxide upon reduction with hydrogen gave 0.92 gm of copper. This data illustrate the law of**

a) Multiple proportions b) Definite proportions

c) Reciprocal proportions d) Conservation of mass

5. Neon has two istopes Ne^{20} **and** Ne^{22}**. If the atomic weight of neon is 20.2, the ratio of the relative abundances of the isotopes is**

a) 1 : 9 b) 9 : 1 c) 70% d) 80%

6. Which has the maximum no.of molecules among the following .

a) 8g H2 b) 64 g SO_2 c) 44 gm CO_2 d) 48g O_3

7. The total no. of electrons in 1.6 g f CH_4 **to that in 1.8 gm of** H_2O

a) Double b) Same c) Triple d) One fourth

8. The no. of atoms in 4.25 gm of NH_3 **approximately**

a) 4×10^{23} b) 1.5×10^{23} c) 1×10^{23} d) 6×10^{23}

9. A solution is prepared by adding 2 gm of a substance 'A' to 18 gm of H_2O**. Calculate the mass percentage of the solute**

a) 10% b) 20% c) 30% d) 40%

10. How many grams of NaOH is added to water to prepare 250 ml solution of 2M NaOH

a) 9.6×10^3 b) 2.4×10^3 c) 20 d) 24

11. The total no. of electrons in 4.2 gm of N^{-3} **ion is** $\left(N_A = \text{Avagadro's number}\right)$

a) 2.1 N_A b) 4.2 N_A c) 3 N_A d) 3.2 N_A

12. The density of 3M solution of NaCl is 1.25gm/ml. Calculate the molality of the solution

a) 1.79 m b) 279 m c) 2.79 m d) 2.09 m

13. Concentrated aqueous sulphuric acid is 98% by mass and has density of 1.80 gm/L . The volume of acid required to make one litre of 0.1 M H_2SO_4 **solution is**

a) 10.05 ml b) 22.20 ml c) 5.55 ml d) 11.10 ml

14. Mole fraction of solvent in aqueous solution of NaOH having molality of 3m is

a) 03 b) 0.05 c) 0.7 d) 0.95

15. When 100 ml of $\frac{M}{10}$ H_2SO_4 **is mixed with 500 ml of** $\frac{M}{10}$ **NaOH. Then the nature of resulting solution and resulting normality is**

a) Acidic , $\frac{N}{5}$ b) Basic , $\frac{N}{5}$ c) Basic, $\frac{N}{20}$ d) Acidic, $\frac{N}{10}$

16. The oxidation number of 'C' in $CH_4, CH_3Cl, CH_2Cl_2, CHCl_3$ and CCl_4 is respectively

a) -4, -2, 0, +2, +4 b) +2, +4, 0, -2 , -4 c) 4, 2, 0, -2, 4 d) 0 , -2, 2, 4 ,4

17. Which of the following involves the reduction of copper

a) $Cu_{(s)} + \frac{1}{2}O_{2(g)} \rightarrow CuO_{(s)}$ b) $Cu^{+2}_{(aq)} + 2I^{-}_{(aq)} \rightarrow 2CuI_{(aq)}$

c) $CuCl_2 + 2F^{-}_{(aq)} \rightarrow CuF_2 + Cl_2$ d) $CuO + H_2O \rightarrow Cu(OH)_2$

18. The oxidation number of sulphur in $H_2S_2O_8$ is

a) +7 b) +6 c) -6 d) +4

19. When SO_2 is passed in acidified potassium dichromate solution. The oxidation number of 'S' is changed from

a) + 4 to zero b) +4 to +2 c) +4 to +6 d) +6 to +4

20. Oxidation state of 'Fe' in Fe_3O_4 is

a) $\frac{5}{4}$ b) $\frac{4}{5}$ c) $\frac{3}{2}$ d) $\frac{8}{3}$

21. In acidic medium, H_2O_2 changes from $Cr_2O_7^{-2}$ to CrO_5, which has two (-O-O-) bonds. Oxidation state of 'Cr' in CrO_5 is

a) +5 b) +3 c) +6 d) +10

22. Oxidation number of sodium in sodium amalgam is

a) +1 b) 0 c)-1 d) +2

23. In alkaline solution $KMnO_4$ reacts as follows

$2KMnO_4 + 2KOH \rightarrow 2K_2MnO_4 + H_2O + 1/2O_2$

Therefore, its equivalent weight will be

a) 31.6 b) 52.7 c) 79.0 d) 158.0

24. Given oxidation number of Sulphur is -2. The equivalent weight of Sulphur is

a) 16 b) 32 c) 9 d) 4

25. In the reaction, $I_2 + Na_2S_2O_3 \rightarrow 2NaI + Na_2S_4O_6$ equivalent weight of iodine is

a) M.Wt. b) $\frac{M.Wt.}{2}$ c) $\frac{M.Wt.}{4}$ d) $\frac{M.Wt.}{3}$

26. In balancing the reaction , $\mathbf{x}Zn + NO_3^- + \mathbf{y}H^+ \rightarrow \mathbf{x}Zn^{+2} + NH_4^+ + zH_2O, \mathbf{x}, \mathbf{y}$ & $\mathbf{z}$ are

a) 4,10,3 b) 3,8,3 c) 3,10,3 d) 4,3,10

27. When an oxide M_2O_3 is oxidized to M_2O_5. Its equivalent weight is

a) $\frac{\mathbf{M}.Wt.}{1}$ b) $\frac{M.Wt.}{2}$ c) $\frac{M.Wt.}{4}$ d) $\frac{M.Wt.}{8}$

28. The relative number of atoms of different elements in a compound are as follows : A=1.33, B=1 and C=1.5.The empirical formula of the compound is

a) $A_2B_2C_3$ b) ABC c) $A_8B_6C_9$ d) $A_3B_3C_4$

29. Determine the empirical formula of an oxide of Iron, which has 69.9%. Iron and 30.1% dioxygen by mass

a) FeO b) Fe_2O_3 c) Fe_4O_3 d) Fe_3O_4

30. A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molar mass is 98.96 g. What is its molecular formula.

a) $C_2H_4Cl_2$ b) $C_2H_3Cl_3$ c) CH_2Cl d) CH_2Cl_2

31. The empirical formula of an organic compound is CH_2O. Its vapour density is 42 gm. Its molecular formula is

a) CH_2 b) C_2H_2 c) C_3H_6 d) C_3H_8

32. An oxide of nitrogen contains 36.8% by weight of nitrogen . The formula of the compound is

a) N_2O b) N_2O_3 c) NO d) NO_2

33. 60 gms of limestone on heating produces 22 gm of CO_2. The percentage of $CaCO_3$ in limestone is

a) 80% b) 60% c) 83.3% d) 87.6%

34. How many moles of methane are required to produce 22gm of $CO_{2(g)}$ after combustion

a) 0.5 b) 1 c) 0.05 d) 2

35. 50.0 kg of $N_{2(g)}$ and 10.0 kg of $H_{2(g)}$ are mixed to produce $NH_{3(g)}$. Calculated amount of NH_3 produced

a) 3.33 kg b) 1.78 kg c) 56.66 kg d) 56.66 gm

36. Calculate the amount of water (g) produced by the combustion of 16 gm of methane

a) 18 gm b) 16 gm c) 32 gm d) 36 gm

37. 20 ml of a hydrocarbon requires 100 ml of oxygen under the same conditions for complete combustion, 60 ml of CO_2 is formed. The formula of hydrocarbon is

a) C_2H_4 b) C_3H_6 c) C_3H_8 d) C_2H_6

38. 0.01 ml of Iodoform reacts with excess of Ag power to produce a gas whose volume at STP is

a) 224 ml b) 112 ml c) 336 ml d) 448 ml

39. One litre of CO_2 is passed through hot coke. The volume becomes 1.4 litre at same temperature & pressure. The composition of product is

a) $0.8\,\text{litre of } CO_2 \text{ and } 0.6\,\text{litre of CO}$ b) $0.8\,\text{litre of } CO_2 \text{ and } 0.7\,\text{litre of CO}$

c) $0.6\,\text{litre of } CO_2 \text{ and } 0.8\,\text{litre of CO}$ d) $0.4\,\text{litre of } CO_2 \text{ and } 1.0\,\text{litre of CO}$

40. No.of Fe atoms in 100 gm of Hemoglobin if it contain 0.33% Fe (atomic mass of Fe = 56)

a) 0.0035×10^{23} b) 35 c) 3.5×10^{23} d) 7×10^{8}

41. KCl is used as an electrolyte in salt bridge because

a) K^+ and Cl^- are iso electronic b) Movements ions are required

c) Both the ions almost same velocity d) They have similar site

42. Electrode potential depends upon

a) Size of electrode b) surface area of electrode

c) temperature d) Shape of electrode

43. Three metals A, B and C are arranged in the increasing order of standard reduction potential, hence their chemical reactivity will be

a) A<B<C b) A>B>C c) B>C>A d) A=B=C

44. Standard reduction electrode potential of three metals x, y and z are -1.2 V, +0.5V and -3.0V respectively. The reducing power will be

a) X>Y>Z b) Y>Z>X c) Y>X>Z d) Z>X>Y

45. Oxidation number of carbon in carbon suboxide.

a) $+\frac{2}{3}$ b) $+\frac{4}{3}$ c) +4 d) $+\frac{4}{7}$

INTEGER TYPE QUESTION

46. The density the solution prepared by dissolving 120 gm of urea (Molar mass = 60u) in 1000 gm of water is 1.15 g/ml The molarity of the solution is _____

47. The Mass of potassium dichromate crystals required to oxidise 7.50 cm^3 of 0.6M salt solution is _____

48. Haemoglobin contains 0.334 % of Iron by weight. The molecular weight of Haemoglobin is approximately 67200. The number of atoms present in one molecule Haemoglobin (atomic mass Fe = 56)

49. 10 gm of hydrogen and 64 gm of oxygen were filled in a steel vessel and exploded Amount of water produced in this reaction will be …….

50. At S.T.P the density of CCl_4 vapuor in g/L will be nearest to……

51. 10 ml of H_2O_2 solution (volume strength is = x) required 10 ml of $\frac{1}{0.56}$ N MnO_4^- solution in Acid medium Hence 'X' is _____

52. Oxidation number of central atom in $\left[Ni(CN)_4\right]^{-2}$ is

53. In N_3H Oxidation number of nitrogen is _____

54. _____ weight of oxygen (in gms) required to completely react with 27 gm of 'Al'

55. In the reaction , $H_3PO_4 + Ca(OH)_2 \rightarrow CaHPO_4 + 2H_2O$ the equivalent weight of phosphoric acid is _____

KEY SHEET

1) **1**	2) **2**	3) **4**	4) **2**	5) **2**	6) **1**	7) **2**	8) **4**	9) **1**	10) **3**
11) **3**	12) **3**	13) **3**	14) **4**	15) **3**	16) **1**	17) **2**	18) **2**	19) **3**	20) **4**
21) **3**	22) **2**	23) **4**	24) **1**	25) **2**	26) **1**	27) **3**	28) **3**	29) **2**	30) **1**
31) **3**	32) **2**	33) **3**	34) **1**	35) **3**	36) **4**	37) **3**	38) **2**	39) **3**	40) **1**
41) **3**	42) **3**	43) **2**	44) **4**	45) **2**					
46) **2.05**	47) **22.05**	48) **4**	49) **4**	50) **6.875**					
51) **10**	52) **+2**	53) $-\frac{1}{3}$	54) **24**	55) **49**					

SOLUTIONS

1. 0.0025 has Two significant figures 500.0 has 4 significant figures.

2. The answer to the calculation 5×5.364 will contain 4 significant figures as 5.364 contains. Four significant figures. Here exact figure 5 is not considered .

3. Two elements chemically combine to give two (or) more compounds

4. Weight of copper = 2.16 g

Weight of copper oxide obtained on ignition = 2.70 g

Percentage of copper in copper oxide $= \frac{2.16}{2.70} \times 100 = 80\%$

$\therefore$% of oxygen in copper oxide = 100 – 80 = 20%

Weight of copper left after reeducation = 0.92 gm

Weight of copper oxide = 1.15 gm

$\therefore$ % in Copper oxide = $\frac{0.92}{1.25} \times 100 = 80\%$

$\therefore$ % of oxygen = 100 – 80 = 20 %

Thus the data illustrates the law of define proportions

5. Let W % of $Ne^{20} = x$

W % $Ne^{22} = 100 - x$

20.2 = $\frac{x \times 20 + (100 - x)22}{100}$

2020 = 20x + 2200 -22x

2x = 180

X = 90 %

$\therefore w\% of\ Ne^{20} = 90\%$

$\therefore w\% of\ Ne^{22} = 100 - 90 : 10$

$Ne^{20} : Ne^{22} = 9 : 1$

6. Number of molecules = mole × N_A

8 gm H_2 = $\frac{8}{2} = 4\, moles$

$64\, gm\, SO_2 = \frac{64}{64} = 1 mole$

$44\, gm\, CO_2 = \frac{44}{44} = 1 mole$

$48\, g\, O_3 = \frac{48}{48} = 1 mole$

7. Number of $\bar{e}$ in 1.6 gm CH_4 = $\frac{1.6}{16}\times 10\bar{e}\times N_0 = N_0$

Number $\bar{e}$ in 1.8 gm of $H_2O = \frac{1.8}{18}\times 10\bar{e}\times N_0 = N_0$

8. Number of atoms = mole × No × atomicity

$$= \frac{4.25}{17}\times 6\times 10^{23}\times 4 = 6\times 10^{23}$$

9. Mass percent of A : $\frac{Mass\,of\ A}{Mass\,of\ solution}\times 100$

$\Rightarrow \frac{2}{20}\times 100$

= 10 %

10. Molarity (M) = $\frac{Wt}{G.M.Wt}\times\frac{1000}{Vol.\ in\ ml}$

= $\frac{wt}{40}\times\frac{1000}{250}$

Wt = 20 gm

11. Number of $\bar{e}$ in 4.2 g N^{-3} = $\frac{4.2}{14}\times 10\bar{e}\times N_A$

= 3 N_A

12. Molarity (m) = $\frac{100\times molarity}{100\times d - M.M^1}$

M = Molarity

M^1 = molecule wt of solute

$\therefore m = \frac{1000\times 3}{1.25\times 100 - 3\times 58.5}$

M = 2.79

13. $M = \frac{\%\left(\frac{w}{w}\right)\times d\times 10}{Mol.wt} = \frac{98\times 1.80\times 10}{98} = 18M$

Then $M_1V_1 = M_2V_2$

$18 \times V_1 = 1000 \times 0.1$

$\Rightarrow V_1 = 5.5\,ml$

14. Mole fraction of solute $X_{NaOH} = \dfrac{X_{NaoH}}{X_{NaOH} + nH_2O}$

But for one molal solution,

$X_{NaoH} = molarity$

$X_{NaOH} = \dfrac{m}{m + nH_2O}$

$X_{NaOH} = \dfrac{3}{3 + 55.55}$

$X_{NaOH} = \dfrac{3}{58.55}$

$X_{NaOH} = 0.05$

But $XH_2O = 1 - 0.05$

$= 0.95$

15. Number of M.eq. of $H_2SO_4 = N \times V$

$= \dfrac{2}{10} \times 100 = 20$ M.eq.

Number of M.eq. of NaOH = $N \times V$

$= \dfrac{1}{10} \times 500 = 50$ M.eq.

∴ Solution shows basic nature due to excess of M.eq. of base

Resulting normality (N) = $\dfrac{N_bV_b - N_aV_a}{V_a + V_b}$

$N = \dfrac{50 - 20}{600}$

$N = \dfrac{1}{20}$

16. $CH_4 \rightarrow x + 4 = 0 \rightarrow x = -4$

$CH_3Cl \rightarrow x + 3 - 1 = 0 \Rightarrow x = -2$

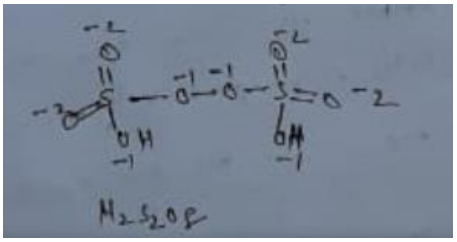
$CH_2Cl_2 \rightarrow x+2-2=0 \Rightarrow x=0$

$CCl_4 \rightarrow x-4=0 \Rightarrow x=+4$

$CHCl_3 \rightarrow x+1-3=0 \Rightarrow x=2$

17. $Cu^{+2} + 2I^{-} \underset{\text{Reduction}}{\rightarrow} Cu^{+1}I^{-1}$

18.

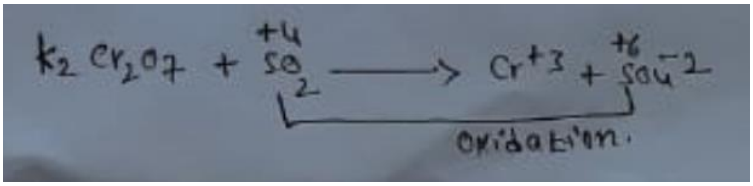


+2 + 2x – 12 -2 = 0

2x = 12

x = +6

19.



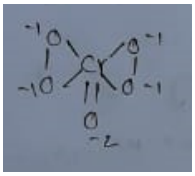
20. Fe_3O_4

3x – 8 = 0

3x = +8

$x = \frac{8}{3}$

21.



X – 4 - 2 = 0

X = +6

22. An amalgam is a homogeneous mixture

$\therefore$ The oxidation state of sodium and mercury in sodium amalgam is zero

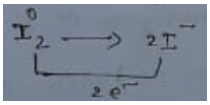
23. $2\overset{+7}{K}\overset{+2\bar{e}}{Mn}O_4 \rightarrow K_2\overset{+6}{Mn}O_4$

For Two moles of $KMno_4, 2\bar{e}$ are required one mole of $KMno_4, 1\bar{e}$ is required

Eq .wt of $KMnO_4 = \dfrac{Mol.wt\ of\ KMnO_4}{1}$

24. Eq , wt of 's' = $\dfrac{At.wt}{Volency} = \dfrac{32}{2} = 16$

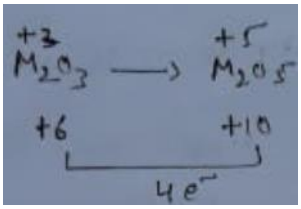
25. In the above reaction



$\therefore Eq.wt = \dfrac{mol.wt}{2}$

26. $4Zn + NO_3^- + 10H^+ \rightarrow 4Zn^{+2} + NH_4^+ + 3H_2O$

27.



28.

A	:	B	:	C	
$(1.33$	:	1	:	$1.5)\times 6$	$\Rightarrow A_8B_6C_9$

29. The relative moles of Iron in Iron oxide

$= \dfrac{\%\ of\ Iron\ by\ mass}{Atomic\ mass\ of\ Fe} = \dfrac{69.9}{55.85} = 1.25$

The relative mass of oxygen in Iron oxide

$= \dfrac{\%\ of\ oxygen\ by\ mass}{Atomic\ mass\ of\ oxygen} = \dfrac{30.1}{16.00} = 1.88$

Simplest molar existing of Iron to oxygen

$= 1.25 : 1.88$

$= 1 : 1.5$

$= 2 : 3$

$\therefore emf = Fe_2O_3$

30. $n_{H_2} = \dfrac{4.07}{1.008} = 4.04$

$n_C = \dfrac{24.27}{12.01} = 2.021$

$n_{Cl} = \dfrac{71.65}{35.453} = 2.021$

Divide each value by smallest value

Since 2.021 is smallest value, division by it gives a ratio of 2:1:1 for H:C:Cl
E.m.f : CH_2Cl
Molecular formula (MF) = $(CH_2Cl) \times n$

$$\Rightarrow n = \frac{98.96}{49.48} = 2 \Rightarrow (CH_2Cl)_2 = C_2H_4Cl_2$$

31. Mol.wt = 2×vapour density
= 2×42
Mol.wt = 44
∴ Mol.wt C_3H_6 is 44 gram

32. Relative no.of atoms of nitrogen and oxygen

$$N : O = \frac{36.8}{14} : \frac{63.2}{16}$$

33. $CaCO_3 \rightarrow CaO + CO_2$
100 gm $CaCO_3$ - 44 gm CO_2
? - 22 gm

$$= \frac{100 \times 22}{44} = 50gm$$

$$\therefore \%\ CaCO_3 = \frac{50}{60} \times 100$$

$$= 83.3\%$$

34. $CH_{4(g)} + O_{2(g)} \rightarrow CO_{2(g)} + 2H_2O_{(g)}$
1 mole of CH_4 ……. 1 mole of CO_2(44 gm)
½ mole of C …… ½ mole of CO_2(22 gm)
0.5 mole of CH_4 is required to produce 22 gm CO_2

35. $N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}$

No. of moles of $N_2 = \frac{50 \times 10^3}{28} = 1.78 \times 10^3$

No. of moles of $H_2 = \frac{10 \times 10^3}{2} = 5 \times 10^3$

According to equation , 1 moles of N_2 requires 3 mole of H_2.
Hence $1.78 \times 10^3 moles$ of N_2 requires $5.358 \times 10^3 moles$ of Hydrogen.
But we have only $5 \times 10^3 moles$ H_2.
Hence dihydrogen is limiting reagent
3 moles of Hydrogen - 2 moles of NH_3
$5 \times 10^3 moles$ of H_2 …….. ?

$$\frac{5 \times 10^3 \times 2}{3} = 3.33 \times 10^3 \text{ moles of } NH_3$$

$$\text{Wt of } NH_3 = 3.33 \times 10^3 \times \frac{wt}{17}$$

$$\text{Wt of } NH_3 = 56.66 \times 10^3 gm$$

$$= 56.66\ Kg$$

36. $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
$1\ mole\ of\ CH_4 \rightarrow 2 \times 18gm\ H_2O\ produced$
16 gm of CH_4 – 36gm of H_2O

37. $C_xH_y + \left(x + \frac{y}{4}\right)O_2 \rightarrow xCO_2 + \frac{y}{2}H_2O$

$20x = 60C$
$x = 3$

No of carbons = 3

1 mole $C_xH_y = \left(x + \frac{y}{4}\right)O_2$

20 mole = ?

$20\left(x + \frac{y}{4}\right) = 100$

$240 + 20y = 400$

y = 8

Hydrogen = 8

Formulae = C_3H_8

38. $2CHI_3 + 6Ag \rightarrow C_2H_2 + 6AgI$

2 moles of CHI_3 --------- 1 mole of C_2H_2 gas

2 moles of CHI_3 --------- $1 \times 22400 ml \ of \ C_2H_2 gas$

$0.01 \ mole \ of \ CHI_3 \rightarrow ?$

$\frac{0.01 \times 22400}{2} = 112 ml$

39. $CO_{2(g)} + C_{(s)} \rightarrow 2CO_{(g)}$

1 0 0

$1 - x \quad 2x$

$1 - x + 2x = 1.42$

$x = 0.42$

Volume of CO = 2x = 2 × 0.4 = 0.8 L

Volume of CO_2 =1 – x = 1- 0.4 = 0.6L

40. 100 gm of Heamoglobin = 0.33 gm Fe

$\therefore$ Moles of $Fe = \frac{0.33}{56} = 5.89 \times 10^{-3}$ mole

No. of 'Fe' atoms $= 5.89 \times 10^{-3} \times 6 \times 10^{23}$

$= 0.035 \times 10^{23} atoms$

41. $K^+ \ \& Cl^-$ are have almost similar size

42. $\Delta G = -nFE^0$

Where ΔG , depends on temperature

43. As the standard reduction potential (SRP) values increase, reactivity decreases(oxidizing capacity)

44. Least SRP value gets oxidized and acts as good reducing agent

45. Carbon suboxide = C_3O_2

$3x - 4 = 0$

$3x = +4$

$x = \frac{+4}{3}$

46. Molality (m) = $\frac{1000M}{1000d - MM^1}$

M = Molarity, M^1 = Mol. Wt. of solute

Molality (m) = $\frac{120}{60} \times \frac{1000}{1000}$

$m = 2 \ molal$

$\therefore molality(m) = \frac{1000 \times M}{1000 \times 1.15 - M \times 60}$

$= \frac{1000 \times M}{1150 - M \times 60}$

$$2300-120M=1000M$$
$$m=2.05$$

47. G.E Wt. of mohr's salt = $\frac{0.6N\times 750}{1000}=0.45$

$\therefore G.E.wt\ K_2Cr_2O_7 = G.E.wt\ mohr's\ salt$

$$\frac{X}{\frac{294}{6}}=0.45$$

$\therefore$ Mass of $K_2Cr_2O_7\left(x\right)=22.05gm$

48. 100 gm Haem. = 0.334gm of Fe

? = 56 gm

$$\frac{56\times 100}{0.334}=16766.46g$$

$\therefore$ no. of Fe atoms = $\frac{67200}{16766.46}=4$

49. $H_2+\frac{1}{2}O_2\rightarrow H_2O$

No. of moles H_2 is 5 moles and no. of moles of O_2 is 2 moles.

As per equation, half mole of O_2 requires one mole of dihydrogen. Hence two moles of oxygen requires four moles of dihydrogen. But 5 moles of dihydrogen is given.

$\therefore$ oxygen is a limiting reagent

$$\Rightarrow \frac{1}{2}O_2\rightarrow 1mole\ H_2O$$
$$2M\ O_2\rightarrow 4H_2O$$

50. STP 154gm CCl_4 = 22.4 Litres

= 1 Litre

$$\frac{154}{22.4}=6.875$$

51. $N_1V_1=N_2V_2$

$$N_1\times 10=\frac{1}{0.56}\times 10$$

$$N_1=\frac{1}{0.56}Normal$$

But vol. strength (x) = $5.6\times Normality$

$$x=5.6\times\frac{1}{0.56}=10$$

52. $\left(Ni\left(CN\right)_4\right)^{-2}$

$$x-4=-2$$
$$x=+2$$

53. $\overset{x}{N}_3\overset{+1}{H}=0$

$$3x+1=0$$
$$3x=-1$$
$$x=-\frac{1}{3}$$

54. $4Al+3O_2\rightarrow 2A_2lO_3$

$4moles\ of\ Al\rightarrow 3moles\ of\ O_2$

$4\times 27gm\ Al\rightarrow 3\times 32gm\ of\ O_2$

$27gm\ Al\rightarrow$

$$= \frac{27 \times 3 \times 32}{4 \times 27}$$

$$= 24gm$$

55. $H_3PO_4 + Ca(OH)_2 \rightarrow CaHPO_4 + 2H_2O$

$$Eq.wt\ of\ \ H_3PO_4 = \frac{98}{n - factor\ of\ \ base}$$

$$= \frac{98}{2} = 49$$