

MODEL SOLUTION

①

LEVEL - 1

Q.1

Soln

(1) 16g of CH<sub>4</sub>.

= 1 mole of CH<sub>4</sub>.

≡ 4 mole of H.

(2) 31.2 g of C<sub>6</sub>H<sub>4</sub>.

=  $\frac{31.2}{76}$  mol of C<sub>6</sub>H<sub>4</sub>.

eq. to 1.64 mole of H.

(3) 34.2 g of C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>.

=  $\frac{34.2}{342}$  mole of C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>.

2.2 mole of H.

(4) C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>. (36g)

=  $\frac{36}{180} \times 12$  moles of H.

= 2.4 mole of H.

Ans (1)

Some Basic Concepts of Chemistry: ①

Mole-Concept.

Level - 01

Q. 1

Sol<sup>n</sup>

~~$h = 6.627 \times 10^{-34}$~~

~~$E = h\nu$~~

~~$\Rightarrow h = \frac{E}{\nu} = \frac{ML^2T^{-2}}{\frac{1}{T}} = ML^2T^{-1}$~~

~~1) a) Force =  $MLT^{-2}$~~

~~2) b) Work = Energy =  $ML^2T^{-2}$~~

~~3) c) Angular Momentum =  $MVr$   
 $= MLT^{-1} \times L$   
 $= ML^2T^{-1}$~~

~~4) d) Torque =  $F \times r$   
 $= MLT^{-2} \times L = ML^2T^{-2}$~~

Ans (1)

Q. 2

Sol<sup>n</sup>

It is a Gay Lussac's law of gaseous volume.

Ans (4)

Q. 3

Sol<sup>n</sup>

Avogadro Hypothesis states that "Equal volume of gases under same conditions of temperature and pressure contains equal."

Volume of gases no. of molecules.

Ans (2)

Q. 4

Ans (3)

~~Q. 5~~

~~Ans (3)~~

Q. 6

Soln

Molecular formula =  $M_4O_6$

Let the ~~molar~~ atomic Mass of M be 'm'.

The molecular mass of Compound =  $4m + 96$

We have 96 gm oxygen in  $4m + 96$  grams of compound

⇒ we must have  $\left(\frac{96 \times 18.88}{4m + 96}\right)$  gm oxygen in 18.88 gm of compound.

It is given that 18.88 grams of the compound contains 10g of M and 8.88 grams of 'O'.

So,  $\frac{96}{4m + 96} \times 18.88 = 8.88$  grams

(5).

36 ml of  $H_2O = 36g$  of  $H_2O$  ( $\rho = 1g/ml$ ) (3)

18g contains  $1N_A$   $H_2O$  molecules.  
36g contains  $2N_A$   $H_2O$  molecules.

$\therefore 1 H_2O$  contains  $10N_A$  protons ( $8+2$ )

$\therefore 2N_A H_2O$  contains  $10 \times 2 N_A$   
 $= 20N_A$

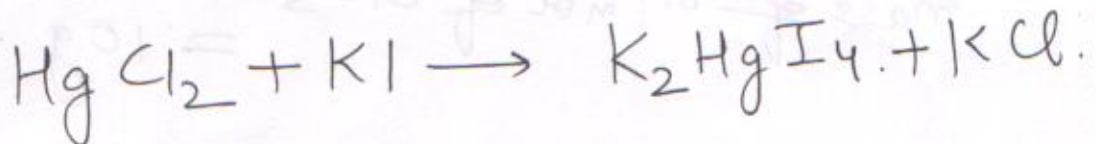
Ans (3).

$$\Rightarrow m = 27g.$$

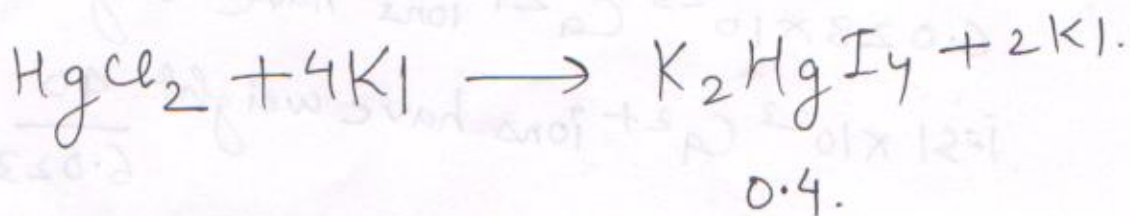
(4) (2)

Ans (3).

Q7  
Soln



First balance the chemical reaction.



Acc. to Balanced Chemical reaction.

4 Moles of KI gives 1 mole of  $\text{K}_2\text{HgI}_4$ .

so 0.4 moles of  $\text{K}_2\text{HgI}_4$  is obtained from.

Ans (1).

Q8  
Soln 8

Ammonium Nitrate :  $\text{NH}_4\text{NO}_3$ .

Molecular Mass = 80.

80g of  $\text{NH}_4\text{NO}_3$  contains 28g of Nitrogen

1000g of  $\text{NH}_4\text{NO}_3$  contains  $\left(\frac{28}{80} \times 1000\right)$  g of Nitrogen  
= 350g of Nitrogen

Ans (3)

Q-9  
(9)  
Soln 9.

1) 0.1 mol of  $\text{CaCO}_3$ .

$$\text{M.W. CaCO}_3 = 100 \text{ g}$$

$$\text{mass of } 0.1 \text{ mol of } \text{CaCO}_3 = 0.1 \times 100 = 10 \text{ g}$$

2)  $1.51 \times 10^{23}$   $\text{Ca}^{2+}$  ions.

$6.023 \times 10^{23}$   $\text{Ca}^{2+}$  ions have weight 40 gram.

$$1.51 \times 10^{23} \text{ Ca}^{2+} \text{ ions have weight } \frac{40}{6.023 \times 10^{23}} \times 1.51 \times 10^{23} \text{ g}$$

$$= 10 \text{ grams}$$

3) 0.016 mole of  $\text{CO}_3^{2-}$

$$\text{M.W. } \text{CO}_3^{2-} = 60 \text{ g}$$

$$0.016 \text{ mole of } \text{CO}_3^{2-} \text{ have mass} = 0.016 \times 60 = 0.96 \text{ grams}$$

(4)  $7.525 \times 10^{23}$  atom

which atom?

So Ans (3)

(9)

No of Hydrogen atoms = 200.

0.05 g-atoms of Nitrogen =  $6.023 \times 10^{23} \times 0.05$   
atoms of N.

$$= 3.0115 \times 10^{22}$$

No of O-atoms =  $6.023 \times 10^{23} \times 10^{-20}$ .

$$= 6.023 \times 10^3$$

$$= 6023$$

Total no of atoms =  $200 + 3.0115 \times 10^{22}$   
+ 6023.

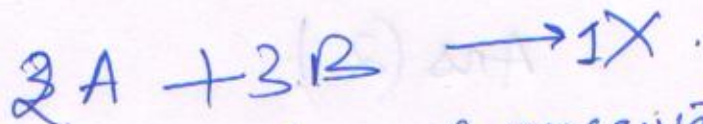
$$\approx 3 \times 10^{22} \text{ atoms}$$

Ans (3).

(10)

At wt of A = 75

At wt of B = 32.



According to law of conservation of mass.

$$\text{wt of 1 mole of X} = 2 \times 75 + 3 \times 32 \\ = 246 \text{ gms.}$$

$$\text{wt of 5 mole of X} = 246 \times 5 \\ = 1230 \text{ gm} \\ = 1.23 \text{ Kg}$$

Ans (3)

(11)

$$4 \text{ amu contains 1 He atom}$$
$$52 \text{ amu contains } \frac{1}{4} \times 52 = 13 \text{ atoms}$$

Ans (3)

(12)

$$62 \text{ g ion contain } 16 \times 32 \text{ Na ions.}$$
$$2 \text{ g ion contain } \frac{32}{62} \times 2.$$

(12)

$$1 \text{ gm ion contains } 32 \text{ Na e}^-$$
$$2 \text{ gm ion contain } 32 \times 2 \text{ Na e}^- \\ = 64 \text{ Na e}^-$$

Ans (2)



Q13

(6)

1 gram ion = 1 mol ion.

1 mol ion of  $Al^{3+}$  contain.  $3N_A$  e coulombs.

Ans (4).

(14)

Let molecular weight of cortisone be  $x$ .

Acc to Question

$$21 \times 12 = \frac{69.98}{100} \times x.$$

$$\Rightarrow x = \frac{21 \times 12 \times 100}{69.98}$$
$$= 360.1.$$

Ans (4)

15) Ans (3).

16).

$$\frac{55.9}{100} \times (142 + 18x) = 18x.$$

$$79.378 + 10.06x = 18x$$

$$7.938x = 79.378$$

$$\Rightarrow x = \frac{79.378}{7.938} \approx 10$$

Ans (4)

17

X                      Y  
 50                      50  
 %                      (A) Ans

Mole Ratio  $\frac{50}{10} = 5$        $\frac{50}{20} = 2.5$

Simplest mole ratio  $\frac{5}{2.5} = 2$        $\frac{2.5}{2.5} = 1$

$X_2 Y_1$   
 Ans (2)

18

$\frac{10 \times 18}{322} \times 100 = x$

$\Rightarrow x = 56\%$

Ans (3)

19

I                      0  
 76%                      24%

(A) mole ratio  $\frac{76}{127} = \frac{24}{16}$

∴ Mole Ratio

$$.598$$

$$= 1.5$$

(8)

Simple mole ratio

$$\frac{.598}{.598} = 1$$

$$\frac{1.5}{.598} = 2.5$$

$I_1O_{2.5}$  Empirical formulae.

$I_2O_5$  " "

Ans (3).

20)

Soln

Let  $x$  be molecular mass of compound.

$$2 \times 14 = \frac{.014}{100} \times x$$

$$\Rightarrow x = \frac{100 \times 2 \times 14}{.014}$$

$$= 20,000$$

Ans (4).

<del>21)</del> <del>Soln</del>	<del><math>N_2</math></del>	<del><math>O_2</math></del>
<del>%</del>	<del>80</del>	<del>20</del>
<del>mole ratio</del>	<del><math>\frac{80}{28} = 2.85</math></del>	<del><math>\frac{20}{32} = .625</math></del>
<del>Simple mole ratio</del>	<del><math>\frac{2.85}{.625}</math></del>	

$$\text{Mol wt of Air} = \frac{80 \times 28 + 20 \times 32}{100}$$

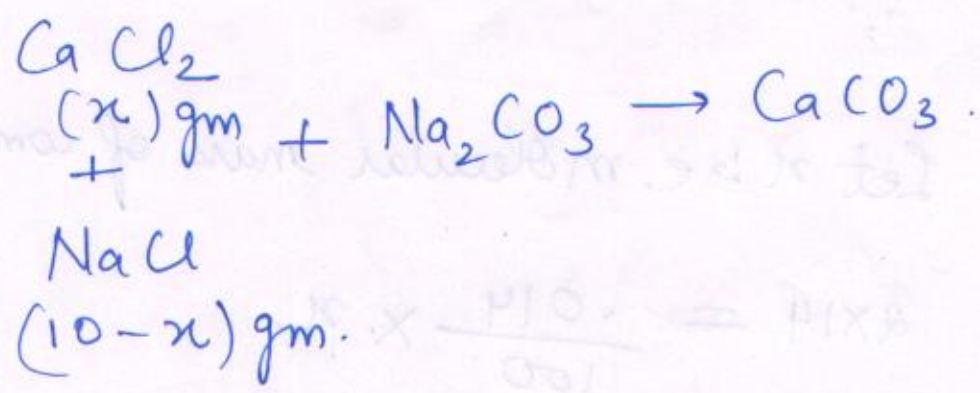
$$= \frac{2240 + 640}{100} = 28.8$$

$$\text{Mol wt} = 2 \times \text{V.D}$$

$$\text{V.D} = \frac{\text{Mol wt}}{2} = \frac{28.8}{2} = 14.4$$

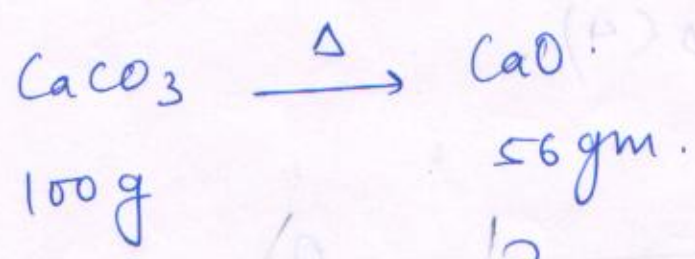
Ans (2).

22).



111 gm  $\text{CaCl}_2$  gives 100 gm. (1 mole  $\text{CaCO}_3$ )

$x$  gm.  $\text{CaCl}_2$  gives  $\frac{100}{111} x$  gm of  $\text{CaCO}_3$ .



$$\frac{100x}{111} \text{ g} \rightarrow ?$$

$\frac{56}{100} \times \frac{100x}{111}$  gm of  $\text{CaO}$  is formed.

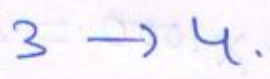
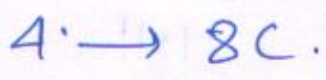
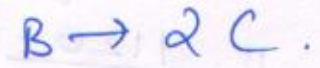
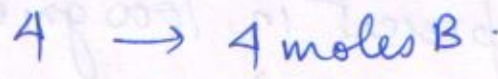
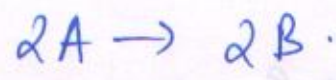
$$\frac{56x}{111} = 1.62$$

x = 3.21 gm of CaO is formed.

% composition of  $\frac{3.21}{100} \times 100 = 3.21\%$ .

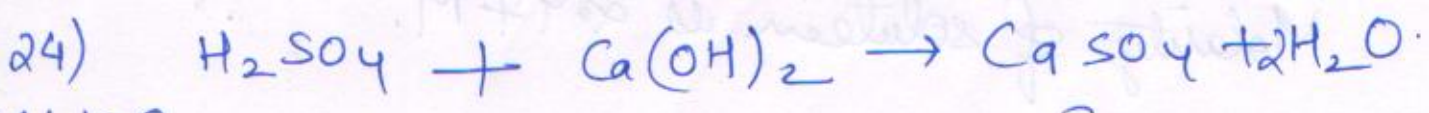
Ans(2)

23) .  $2A \rightarrow 2B, B \rightarrow 2C, 3C \rightarrow 4D.$



$$8 \rightarrow \frac{4}{3} \times 8 = \frac{32}{3} = 10.67$$

Ans(4)



At t=0 .5                      0.2                      ?

0                      0.3                      0                      .2

Ans (1)

25 1500 cc solution contains 18g Urea.

1.052 X 1500 gms solution contains 18g Urea.

1578 gm solution contain 18g Urea.

(1578 - 18) gm solute contains  $\frac{18}{60}$  gm mole Urea

1560 gm solute contain .3 mole Urea.

1000 gm solute contain  $\frac{.3}{1560} \times 1000 = .192$  mole

Ans (2).

26 3 molar means

3 mole of NaOH is present in 1000 gm of <sup>solute</sup> solution.

$\Rightarrow$  3 mole of NaOH is present in 1120 gm of solution

$\Rightarrow$  " " " " "  $\frac{1120}{1000} = 1.12$  of soln

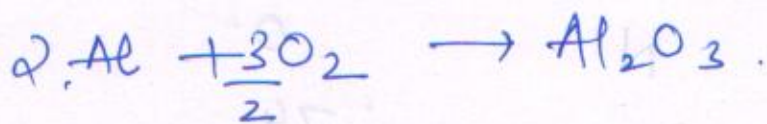
1009 ml soln  $\rightarrow$  3 mole NaOH.

1000 ml soln  $\rightarrow \frac{3}{1009} \times 1000 = 2.97$  mol of NaOH.

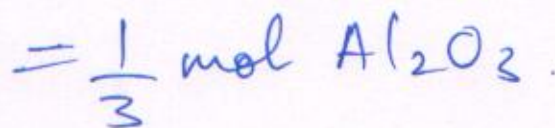
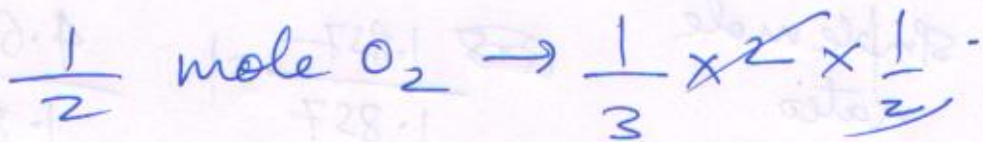
By Definition of molarity

Molarity of solution is 2.97 M.

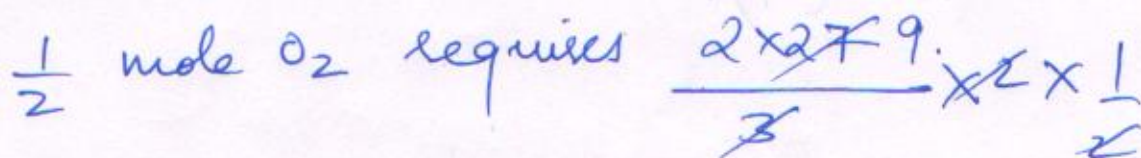
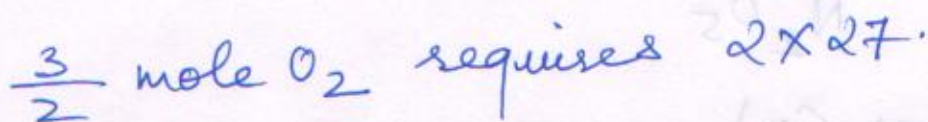
27).



(9)



∴



$$= 18 \text{ gm.}$$

Ans (4).

$$28) (1) \frac{22.4}{2} \times 2 = 4.48 \text{ L}$$

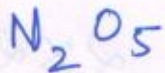
$$(2) \frac{22.4 \times 12.8}{64} = 4.48 \text{ L}$$

$$(3) 22.4 \times \frac{3.2}{32} = 2.24 \text{ L Ans (3)}$$

29

	N	O
%	26	74
mole ratio	$\frac{26}{14} = 1.857$	$\frac{74}{16} = 4.625$

simple mole ratio  $\frac{1.857}{1.857} = 1$   $\frac{4.625}{1.857} = 2.5$



Ans (4).

36)

1 mole  $(NH_4)_3PO_4$  contains 12 mole H present in 1 mole  $(NH_4)_3PO_4$ .  
 3.18 mole H present in  $\frac{1}{12} \times 3.18 (NH_4)_3PO_4$ .  
 $= 0.265 (NH_4)_3PO_4$ .

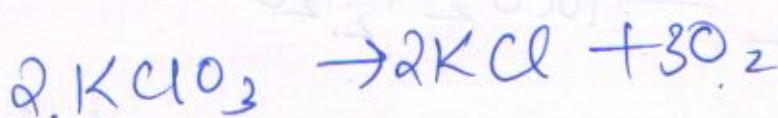
1 mole  $(NH_4)_3PO_4$  contains 4 mole O atoms  
 0.265 mole  $(NH_4)_3PO_4$  contains  $\frac{4}{1} \times 0.265$

$$= 1.06$$

Ans (3)



1).



$3 \times 22.4 \text{ O}_2 \text{ (L)}$  is obtained from 2 mole  $\text{KClO}_3$ .

$11.2 \text{ l}$  is obtained from  $\frac{2}{3 \times 22.4} \times 11.2$ .

$$= \frac{1}{3} \text{ mol.}$$

Ans (2).

2).



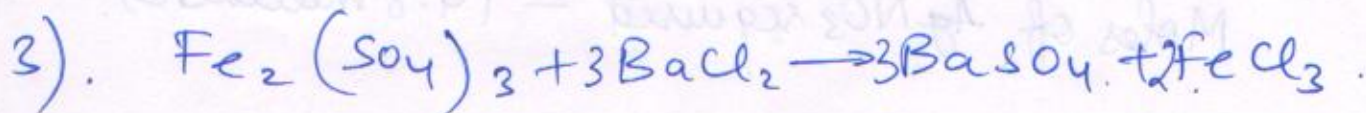
$$\leq 8$$

B is limiting Reagents



$$8B \rightarrow \frac{1}{2} \times 8 = 4 \text{ moles C.}$$

Ans (2).

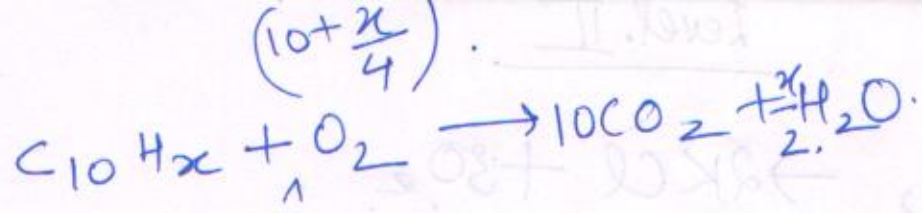


$2 \text{FeCl}_3$  obtained from 3 mole  $\text{BaCl}_2$ .

$$\frac{1}{2} \text{FeCl}_3 \text{ " " } = \frac{3}{2} \times \frac{1}{4} = \frac{3}{4} \text{ mol BaCl}_2$$

Ans (3).

4) (10)



1 mole  $C_{10}H_x$  requires  $10 + \frac{x}{4}$  mol of  $O_2$ .  
 @ 2.5 mole " "  $(10 + \frac{x}{4}) \times 2.5$  mole of  $O_2$

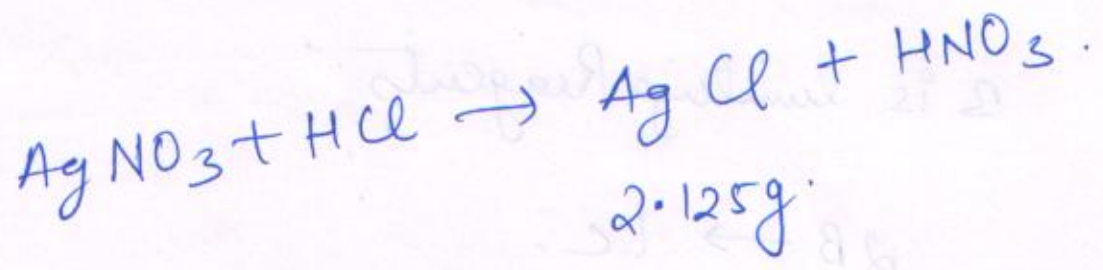
$$25 + \frac{2.5x}{4} = 32.5$$

$$\frac{2.5x}{4} = 7.5 \Rightarrow 3$$

$$x = 12$$

Ans (3)

(5)



$$\text{moles of AgCl formed} = \frac{2.125}{143.5} = 0.0148 \text{ moles}$$

$$= 14.8 \text{ millimoles}$$

$$\text{Moles of AgNO}_3 \text{ required} = 14.8 \text{ millimoles}$$

$$MV = 14.8$$

$$M \times 25 = 14.8$$

$$M = \frac{14.8}{25} = 0.6$$

Ans (2)

6  
3.60 x 98 gm H<sub>2</sub>SO<sub>4</sub> present in 1000 <sup>ml.</sup> solution (11)  
352.8 " " " " " "

2

29 gm H<sub>2</sub>SO<sub>4</sub> present in 100 gm solution

352.8 gm H<sub>2</sub>SO<sub>4</sub> present in  $\frac{100}{29} \times 352.8$  gm solution  
1216.55 gm.

density of solu<sup>n</sup> =  $\frac{1216.55}{1000} = 1.216$  gm/ml.

Ans (1).

7).  $\frac{x}{60+x} \times 100 = 20$ .

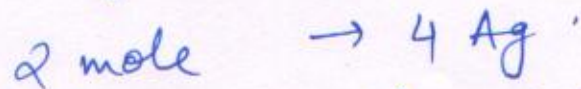
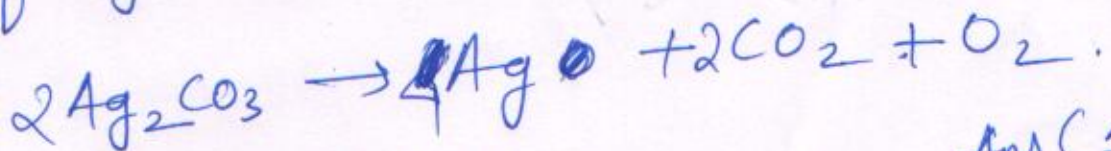
$\Rightarrow 5x = 60 + x$ .

$\Rightarrow 4x = 60$

$\Rightarrow x = 15$ .

Ans (1)

8) 2.7 g of Ag<sub>2</sub>CO<sub>3</sub>.



Ans (1)

$\frac{2.7}{276} \rightarrow \frac{4}{2} \times \frac{2.7}{276} = 0.019$  mole Ag.  
 $= 0.019 \times 108 = 2.11$  gm



(11) Ans (4)

(12)

12

$$\text{Molarity of sol}^n = \frac{2.65}{106} \times \frac{1000}{250}$$

$$= \cancel{.101 \text{ mol}} : .125$$

$$M_1 V_1 = M_2 V_2$$

$$.125 \times 10 = M_2 \times 1000$$

$$M_2 = \frac{.125 \times 10}{1000}$$

$$\text{Ans} = .00125$$

Ans (2)

13 " 1.595 gm of  $\text{CuSO}_4$  ~~contains~~ present in 100 gm of sol<sup>n</sup>.

$$1.2 \text{ gm solution} \equiv 1 \text{ ml of solution}$$

$$100 \text{ gm solution} \equiv \frac{1}{1.2} \times 100$$

$$= 83.33 \text{ ml solution}$$

Sol.

$$\frac{1.595}{159.5} = .01 \text{ mole of } \text{CuSO}_4 \text{ present in } 83.33 \text{ ml sol}^n$$

83.33 ml solution contains .01 mol of  $\text{CuSO}_4$ .

1000 ml solution contain  $\frac{.01}{83.33} \times 1000$  mol of  $\text{CuSO}_4$   
 $= .12$  mol of  $\text{CuSO}_4$ .

Ans (1).

14)

~~$N_1 V_1 = N_2 V_2$~~

Milliequivalents of basic acid.

$$= 100 \times \frac{1}{10} = 10.$$

equivalents =  $10 \times 10^{-3}$ .

So.

$$\frac{.59}{E} = \frac{10}{1000}$$

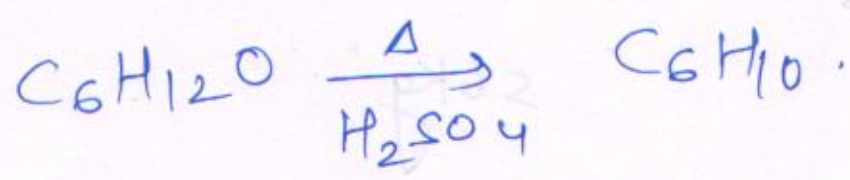
$$E = 59.$$

$$E = \text{Basicity} \times \text{Mol. wt}$$

$$\text{Mol wt} = \frac{59 \times 2}{2} = 59 \text{ Ans (2)}$$

17

(13)



$$100g \rightarrow 82gm C_6H_{10}$$

Since yield is 75%

So.

$$\frac{75}{100} \times 82 = 61.5 gm$$

Ans(1)

18



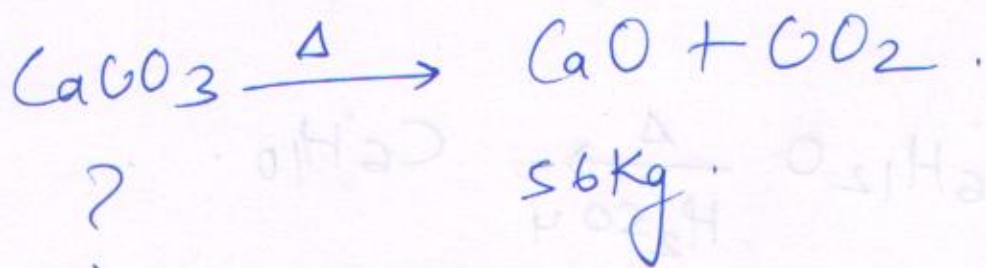
$$\frac{(2 \times 108 + 32)g}{?} = \frac{(2 \times 108)g}{1g}$$

So, we need 1.148 gm of  $Ag_2S$ ; so this is 1.34% of ore.

$$\frac{1.34}{100} \times x = 1.148$$

$$\Rightarrow x = 85.67 \text{ . Ans (2)}$$

15



56 gm of CaO is obtained from 100 gm CaCO<sub>3</sub>.

56 Kg of CaO is obtained from 100 Kg CaCO<sub>3</sub>.

Ans (4).

16

Mass of magnesium present

$$= \frac{2.68}{100} \times 3$$

$$= 0.0804 \text{ gm}$$

$$\text{moles of magnesium present} = \frac{0.0804}{24}$$

$$\text{No of magnesium atom} = \frac{0.0804}{24} \times 6.023 \times 10^{23}$$

$$= 0.0201 \times 10^{23}$$

$$\text{Ans (1)} = 2.01 \times 10^{21}$$



21)  $x$  moles  $\text{FeSO}_4$  gives  $x$  moles of  $\text{SO}_4$  ions (14)  
 $y$  moles of  $\text{Fe}_2(\text{SO}_4)_3$  gives  $3y$  moles of  $\text{SO}_4$  ions.

$$x = 3y$$

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

$x$  moles  $\text{FeSO}_4$  give  $x$  moles  $\text{Fe}^{2+}$ .  
 $y$  moles  $\text{Fe}_2(\text{SO}_4)_3$  gives  $2y$   $\text{Fe}^{3+}$

$$\text{Ans} = \frac{x}{2y} = \frac{3}{2}$$

Ans (4)

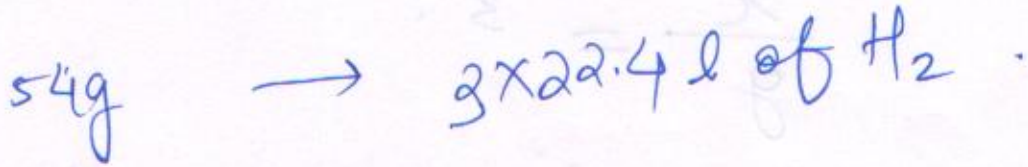
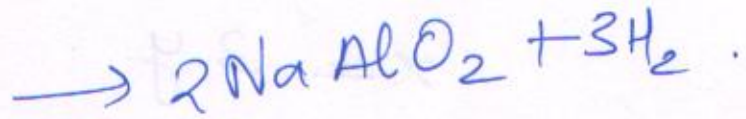
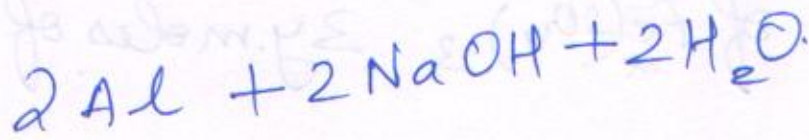
22)

1 atom weighs  $3.98 \times 10^{-23} \text{ g}$ .  
 $6.02 \times 10^{23}$  atom weighs  $\frac{3.98 \times 10^{-23}}{1} \times 6.02 \times 10^{23}$

$$= 24$$

Ans (3)

19

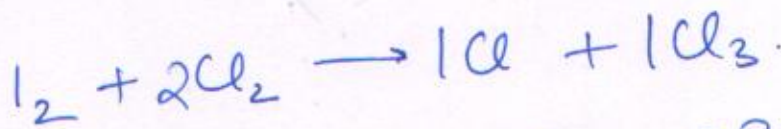


Al

$$27g \rightarrow \frac{3 \times 22.4}{54} \times 27 = 33.6 \text{ l}$$

Ans (4)

20



254g    2 x 71g

162.5

232.9

.1

.2

?  
mole

?  
mol.

.1 x 162 gms

.1 x 232.9 gms

16.2 gms

23.29 gms

Ans (1)

23

210 g of polonium contains  $6.02 \times 10^{23}$  atoms.

$1 \times 10^{-3}$  g of " "  $\frac{6.02 \times 10^{23}}{210} \times 1 \times 10^{-3}$

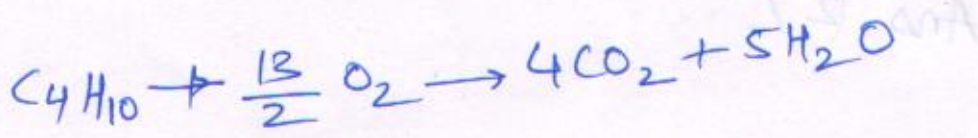
$$= 0.02867 \times 10^{23} \text{ atoms.}$$

$\frac{1}{200}$  th parts converts to lead. to lead 1 day.

$\Rightarrow \frac{1}{200} \times 0.02867 \times 10^{23}$  convert to lead 1 day.

$\Rightarrow \frac{0.02867 \times 10^{18}}{200}$  atom converts to lead atom in 1 day.

24)



1Kg ?

58g requires  $\frac{13}{2} \times 32$  g of oxygen.

1000g "  $\frac{13}{2} \times \frac{32}{58} \times 1000$  g of oxygen.

$$= 3580 \text{ g of } O_2$$

Ans (4).

25) 1g-atom  $\equiv$  1 mole atom.  
Ans (2).

26) Let the formulae be  $M_2O_x$ .

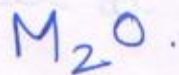
$$\text{Mol. wt} = 128 + 16x.$$

So.

$$\frac{3.2}{3.6} = \frac{128}{128 + 16x}$$

$$\Rightarrow x = 1.$$

So. simplest formulae.



Ans (2).

27)

$$\frac{\text{Fe}}{\text{C}} = \frac{3 \times 56}{6 \times 12} = \frac{28}{2 \cdot 3} = 7:3.$$

Ans (3)

28)  $M_1V_1 + M_2V_2 = M_3(V_1 + V_2)$

$$36V_1 + 15V_2 = 24(V_1 + V_2)$$

$$36 \frac{V_1}{V_2} + 15 = 24 \left( \frac{V_1}{V_2} + 1 \right)$$

$$\Rightarrow V_1/V_2 = 3/4$$

Ans (4)

29) 2 mol.

(16)



11.2 L at NTP 2 mol. x.

$\frac{1}{2}$  mol.

1 mol  $\text{SO}_2 \rightarrow 3$  mole S.

$\frac{1}{2}$  mol  $\text{SO}_2 \rightarrow \frac{3}{1} \times \frac{1}{2} = 1.5$  mole S.

Ans (1)

30)

152 g of camphor contain  $6.02 \times 10^{23} \times 27$  atoms

$25 \times 10^{-3}$  g " " "  $\frac{6.02 \times 10^{23} \times 27}{152} \times 25 \times 10^{-3}$

=  $2.67 \times 10^{21}$

Ans (4)

Q6 Ans 6 - (1)

Q7 Ans (1)

Q8 Ans (1)

Q9 Ans (1)

Q10 Ans (1)

millimoles of  $\text{Ca(OH)}_2 = 31.25 \times 0.122$   
 $= 3.8125$

millimoles of citric acid =  $0.2 \times 0.122$   
 $= 0.0244$   
for neutralization  
 $\text{M}_1 V_1 = \text{M}_2 V_2$

$$0.122 \times 0.2 = 0.2 \times V_2$$

$$10.32 = 0.2 V_2$$

Ans (1)

Q1

Soln

Ans (3).

Q2

Soln (1)

Q3

Soln (1).

Q4

Soln (4)

Q5

$$\begin{aligned} \text{millimoles of } \text{Ba(OH)}_2 &= 31.26 \times 0.165 \\ &= 5.1579 \end{aligned}$$

$$\begin{aligned} \text{millimoles of citric acid} &= 25 \times 0.139 \\ &= 3.45 \end{aligned}$$

for Neutralization

$$N_1 V_1 = N_2 V_2$$

$$5.1579 \times 2 = 3.45 \times 3$$

$$10.35 = 10.35$$

Ans (1)

# PREVIOUS YEARS QUESTIONS (18)

1) Moles of  $\text{HNO}_3$  required =  $\frac{250 \times 2}{1000}$   
= 0.5 moles of  $\text{HNO}_3$ .

70% of  $x = 0.5$

$\frac{70}{100} x = 0.5$

$x = 0.71$  moles of conc.  $\text{HNO}_3$ .

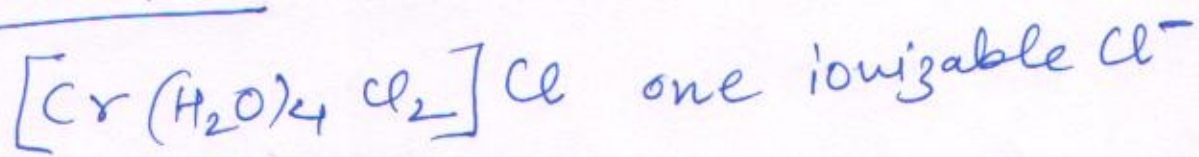
=  $0.71 \times 63$ .

$\approx 45$  g of conc.  $\text{HNO}_3$ .

Ans(2)

2) Dichloro-tetra aqua chromic (III) chloride

Ans(1).



3). 100 ml solution contain  $\frac{6.02 \times 10^{20}}{6.02 \times 10^{23}}$  moles

1000 ml " "  $\frac{10^{-3}}{100} \times 1000$ .

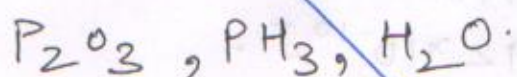
=  $\frac{1}{100}$  moles

= 0.01 M Ans(3)



Q1  
Sol1

The law states that "when two elements combines separately with third element and form different types of molecules; their combining ratio is directly reciprocated if they combine directly."



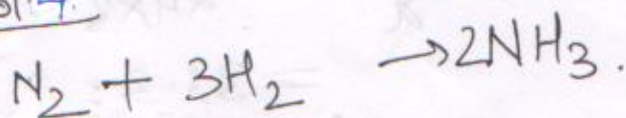
$\frac{P_2O_3}{62 \text{ g of P combines with } 48 \text{ g of O.}}$   
 $31 \text{ g of P combines with } 24 \text{ g of O.}$

$\frac{PH_3}{31 \text{ g of P combines with } 3 \text{ g of H.}}$

So, when O combines with H, they should combine in the ratio ~~24:3~~ (ie 8:1) or in simple multiple of it. The same is found to be true in  $H_2O$  molecules. The ratio of weight of H and O in  $H_2O$  is 1:8.

So Ans (1).

Q4  
Sol:4



20Kg    3Kg.

Acc to stoichiometry.

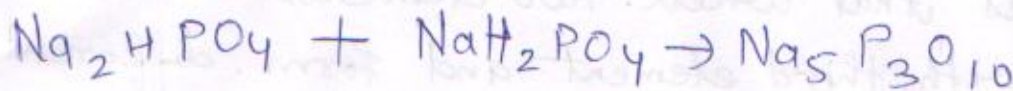
$N_2$  is in excess and Hydrogen ( $H_2$ ) is a limiting reagent

So 60Kg  $H_2$  gives 34Kg of  $NH_3$

so 3Kg of  $H_2$  gives 17 Kg of  $NH_3$ .

Ans. (1).

Q5  
Sol.5



So Ans(3)

Q6  
Soln.

$$E = mc^2 \Rightarrow E = 1.66 \times 10^{-27} \times 3 \times 10^8$$
$$= 1.492 \times 10^{-10} \text{ J.}$$

Ans(1)

Q.7

Soln.



$$TCION = 1.$$

$$Eq. wt = \frac{At. wt}{TCION} = \frac{\text{Molar Mass}}{1} = \text{Molar Mass.}$$

Ans(1).

Q.8

Soln.

Acc to Q. and let At. mass of M be  $x$ .



$$2m \rightarrow 2m + 16x$$

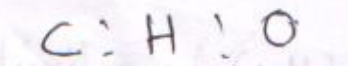
mass.

$$\frac{16x}{100} = \frac{24}{100} \times 2m \Rightarrow \frac{m}{x} = \frac{16 \times 100}{24 \times 3}$$

$$= 33.3.$$

Ans. (3).

Q9.



$$24g \quad 4g \quad 32.$$

mole ratio

$$2 : 4 : 2$$

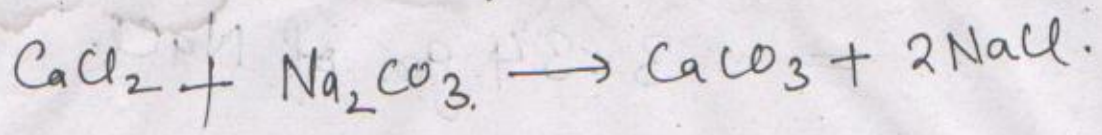
$$= 1 : 2 : 1$$

Ans (2).

10 (37)  
Sol

(20) (2)

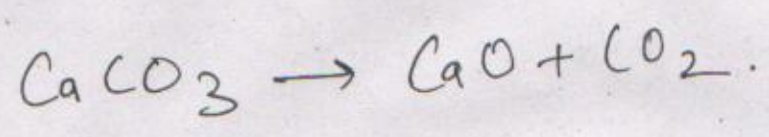
Let the amount of  $\text{CaCl}_2$  be  $x$ .



110g 100g

So 110g of  $\text{CaCl}_2$  gives 100g of  $\text{CaCO}_3$

$$x \text{ g of } \text{CaCl}_2 \text{ gives } \frac{100}{110} x \text{ g of } \text{CaCO}_3$$



$$\frac{100}{110} x \rightarrow ?$$

$$100 \rightarrow 56\text{g}$$

100 gm of  $\text{CaCO}_3$  gives 56g of  $\text{CaO}$ .

$$\frac{100x}{110} \text{ gm of } \text{CaCO}_3 \text{ gives } \frac{56}{100} \times \frac{100x}{110} \text{ g of}$$

$\text{CaO}$ .

$$= \frac{56}{110} x \text{ g of } \text{CaO}$$

Acc to Question

$$\frac{56}{100} x = .56$$

$$x = \frac{.56 \times 110}{56} = 1.1 \text{ gm of } \text{CaO}$$

So amount of  $\text{CaCl}_2$  present in mixture is 1.1 gm

$$4.44 \text{ gm} - 1.1 \text{ gm}$$

$$= 3.34 \text{ gm of NaCl}$$

% composition of NaCl in a mixture is

$$\frac{3.34}{4.44} \times 100 = 75\%$$

Ans (1).

Q11

Sol

22.4 l of oxygen at STP contains 32g oxygen.

1 l of oxygen at STP contains  $\frac{32}{22.4}$  g oxygen

$$= 1.43 \text{ g oxygen}$$

Ans (1).

Q12

22.4 l of  $\text{H}_2$  at STP contains 1 mole.

224 l of  $\text{H}_2$  at STP contains  $\frac{1}{22.4} \times 224$  mole.

$$= 10$$

Ans (2)

Q13  
Soln

18g of water contain  $6.023 \times 10^{23}$  molecules.

1 molecule of water has  $\frac{18}{6.023 \times 10^{23}}$  gm.

$\therefore$  density of  $H_2O = 1 \text{ gm/cm}^3$ .

1 gm of water has volume  $1 \text{ cm}^3$ .

$$\frac{18}{6.023 \times 10^{23}} \text{ gm of } H_2O \text{ has } \frac{18}{6.023 \times 10^{23}} \text{ cm}^3.$$

$$= 3 \times 10^{-23} \text{ cm}^3$$

Ans (4)

Q13  
Soln

1 mole of triatomic gas  $3 \times 6.02 \times 10^{23}$  atoms

$\therefore$  1 mole of triatomic gas contain

$$\frac{3 \times 6.02 \times 10^{23}}{1} \text{ atoms}$$

$$1.806 \times 10^{23} \text{ atoms.}$$

Ans (2)

Q14  
Soln

17g  $NH_3$  contains  $4 \times 6.023 \times 10^{23}$  atoms.

$$4.25 \text{g } NH_3 \text{ contains } \frac{4 \times 6.023 \times 10^{23}}{17} \times 4.25 = 6.023 \times 10^{23} \text{ atoms.}$$

Ans (1)

(40)

Q 15

Soln.

2.8g of M is present in 4g of  $M_2O_x$ .  
2x56g of M is present in  $\frac{40}{2.8} \times 2x56$  of  $M_2O_x$   
 $= 160$ g of  $M_2O_x$ .

So, this would be molecular weight

160g of  $M_2O_x$  contains  $2x56 = 112$ g of M.  
and 48g of O.

$\Rightarrow$  There are 3 oxygen atoms.

Q 16

Soln.

$$\begin{aligned} \text{No of milli equivalents} \cdot 10 &= NV \text{ (ml)} \\ &= .02 \times 100 \\ &= 2 \end{aligned}$$

$$\text{No of equivalent} = 2 \times 10^{-3}$$

$$\text{No of moles} = \frac{1}{2} \times 2 \times 10^{-3} = 10^{-3}$$

1 mole contains  $6.023 \times 10^{23}$  molecules.

$$10^{-3} \text{ mole contains } 6.023 \times 10^{23} \times 10^{-3}$$

$$= 6.023 \times 10^{20} \text{ molecules.}$$

Q1 17

Soln



$$\begin{aligned} \text{ox. No of N} &= -1 \\ \text{ox. No of N} &= +1 \end{aligned}$$

$$\begin{aligned} \text{I-factor} &= \text{change in oxidation state} \\ &= 2 \end{aligned}$$

$$\begin{aligned} \text{equivalent weight} &= \frac{\text{Mol. wt}}{\text{I-factor}} \\ &= \frac{M}{2} \end{aligned}$$

Ans (2)

Q1: 18

Soln

$$\text{Mass of } 1e^- = 9.1 \times 10^{-28} \text{ g}$$

$$\text{Mass of } 1 \text{ mol } (6.023 \times 10^{23}) e^- =$$

$$9.1 \times 10^{-28} \times 6.023 \times 10^{23}$$

$$= .55 \text{ mg}$$

Ans (2)

Q 19

Soln

$$\text{No of milli equivalents of HCl}$$

$$= NV (\text{me})$$

$$= 1 \times 100 = 100 \text{ meq}$$

$$\text{No of equivalent} = \frac{100}{1000} = .1 \text{ eq}$$

$$\text{Eq wt of M} = \text{No. of eq.} \times \text{weight}$$

1 eq contains 9g of metal.  
1 eq contain 9g of metal.  
This would be the equivalent weight of M.

Q120

Sol<sup>n</sup> 19

The metal can be  $M^+$  or  $M^{2+}$

Assume metal is  $M^{2+}$ .

the chloride is in the form  $MCl_2$

Molar Mass of Cl = 35.5

Mass of  $Cl_2 = 71$ .

Mass of Chloride = 74.5

Mass of metal =  $74.5 - 71 = 3.5$ .

We know no metal exist than has an mass 3.5 g.

So  $M^{2+}$  cannot be possible.

Let the metal be  $M^+$ , then the mass of metal =

$$74.5 - 35.5 = 39.$$

and chloride would be  $MCl$ .

Equivalent weight be Metal would be 39.

Ans (3)

Q 21

Soln.

22400 ml contains  $6.023 \times 10^{23}$  molecules.

$1.12 \times 10^{-7}$  ml contains  $\frac{6.023 \times 10^{23}}{22400} \times 1.12 \times 10^{-7}$ .

$$= 3.01 \times 10^{12}$$

Ans (1).



22  
Soln 22

23

2N  $H_2SO_4$  has volume  $0.1 \text{ dm}^3$ .

$$= \frac{0.1}{1000} \text{ m}^3.$$

$$N_1 V_1 = N_2 V_2$$

$$2 \times 0.1 = \frac{1}{10} V_2$$

$$\Rightarrow V_2 = 2.$$

Ans (3)

~~Q. 23~~  
~~Soh. 23~~

~~18g  $\rightarrow$   $6.023 \times 10^{23}$  molecules  
 $N_A$  molecules.~~

~~$18 \times 10^{-3} \rightarrow N \times 10^{-3}$  molecules.~~

~~Ans (1)~~

Q. 26  
Soh. 26

Assuming it contain 1N atom.

20% of Molecular Mass = 14  
(Molar mass of N).

$$\frac{20}{100} x = 14.$$

$$x = \frac{1400}{20}$$

Ans (1) 70.

Q 22

Soln

$$\text{Equivalent Mass} = 32 \text{ g.}$$

$$\text{Molar Mass of Metal} = 64 \text{ g.}$$

Since it is a bivalent metal, the nitrate would be  $M(\text{NO}_3)_2$ .

$$\begin{aligned} \text{So Molecular mass} &= 64 \times 2(48+14) \\ &= 188 \text{ g.} \end{aligned}$$

Ans (3)

Q 23

Soln

Ans (5)

Q 24

Soln

1.5 g of  $\text{CdCl}_2$  contain 0.9 g Cd and 0.6 g Cl

0.6 g Cl is present in 1.5 g of  $\text{CdCl}_2$ .

70 g Cl is present in  $\frac{1.5}{0.6} \times 70 = 175 \text{ g}$  of  $\text{CdCl}_2$ .

$$\text{Molecular Mass of } \text{CdCl}_2 = 175 \text{ g.}$$

$$\begin{aligned} \text{Atomic Mass of Cd} &= 175 - 70 \\ &= 105 \text{ g.} \end{aligned}$$

Ans (3)

For equivalent to be half of molecular mass.

its oxidation must be  $+4$  or  $0$ .

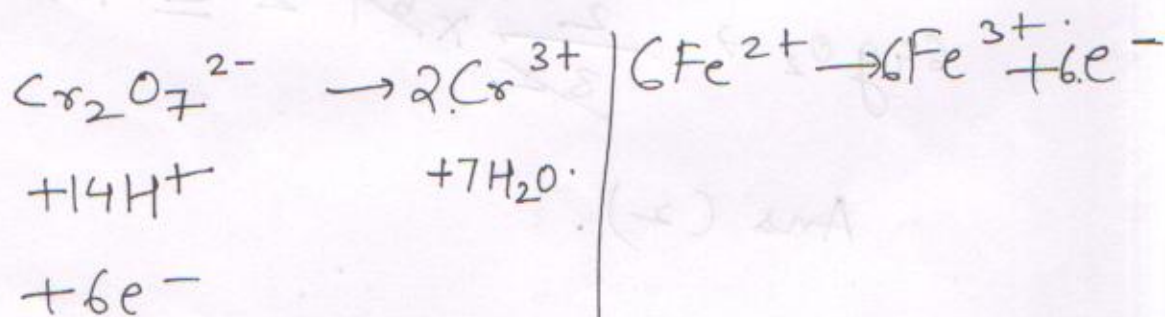
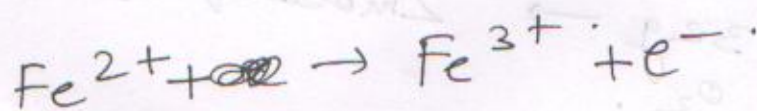
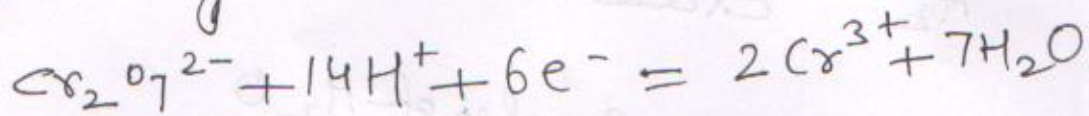
In (2) oxidation state of Mn is  $+4$ .

So Ans (2).

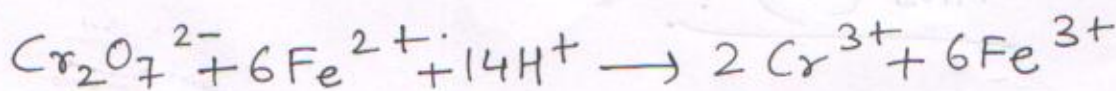
Q. 30

Sol. 30

Balancing Redox reaction



So Balanced Redox Reaction.



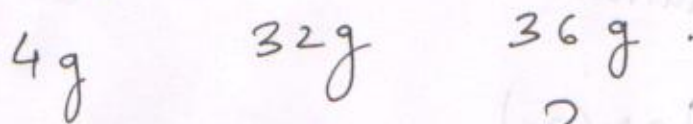
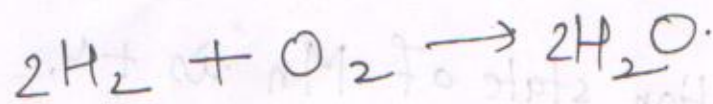
1          6

For 6 mole of Ferrous oxalate 1 mole of potassium

dichromate is required.

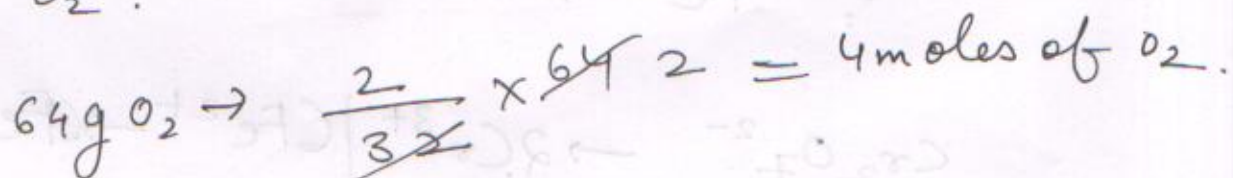
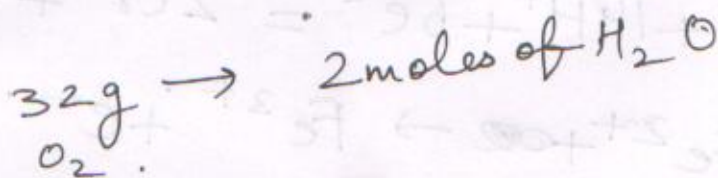
for 1 mole of ferrous oxalate  $\frac{1}{6}$  mole of potassium dichromate

Q. 27  
Sol. 27



$\text{O}_2$  : Limiting Reagent

$\text{H}_2$  : Excess



Ans (2)

Q. 28

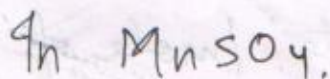
Sol. 28



Ans (2)

Q. 29

Sol



ox. state of Mn = +2

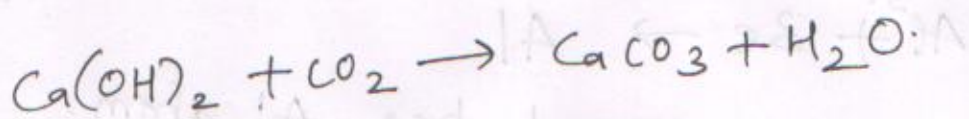
Ans (2) . 35.

25

Ans (3)

Q. 31

Sol.



$$50 \text{ ml} \times 0.5 \text{ M}$$

25 millimoles.

25 milli  
moles.

So, we get 25 millimoles of  $\text{CaCO}_3$ . Now.



25 millimoles.

So 25 millimoles required 50 millimoles of HCl.  
for neutralization.

$$M_{\text{HCl}} V_{\text{HCl}} = 50$$

$$0.1 \times V_{\text{HCl}} = 50$$

$$V_{\text{HCl}} = \frac{50}{0.1} = 500 \text{ ml.}$$

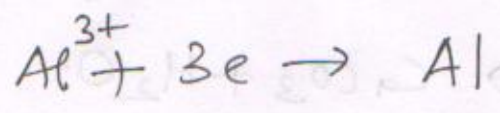
Ans (2).

Q 32

Sol =

27 g contains  $6.023 \times 10^{23}$  Al atoms.

$4.5 \times 10^{-5}$  g contains  $\frac{6.023 \times 10^{23}}{27} \times 4.5 \times 10^{-5} \times 10^{23}$  Al atoms.



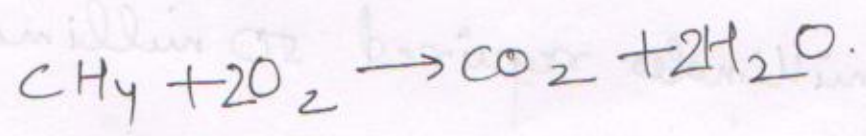
So  $3e^-$  required per Al atom.

Required number of  $e^- = \frac{3 \times 6.023 \times 10^{18}}{6} = 3.01 \times 10^{18} e^-$ .

Ans (2).

Q 33

Sol =



16 g  $2 \times 22.4$  L (at STP)

$\therefore$  16 g of Methane require  $2 \times 22.4$  L of  $O_2$ .

$\therefore$  4 g of Methane require  $\frac{2 \times 22.4 \times 4}{16} = 11.2$  L of  $O_2$

Ans (1).

Q: 34

Sol:

1 atom weighs  $1.8 \times 10^{-22}$ .

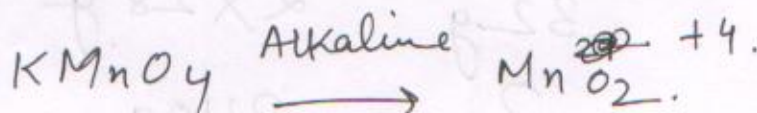
$$6.023 \text{ atom weights} \rightarrow 1.8 \times 10^{-22} \times 6.022 \times 10^{23} \\ \times 10^{23} = 108.36$$

Ans (3)

Q: 35

Sol:

Ans:



$$T.C.I.O.S. = 3$$

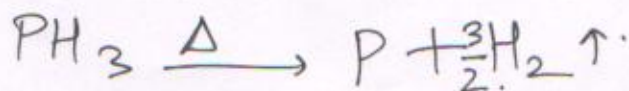
(total change in oxi. state).

$$\text{Eq. wt} = \frac{M}{T.C.I.O.S} = \frac{M}{3}$$

Ans (2)

Q: 36

Sol:



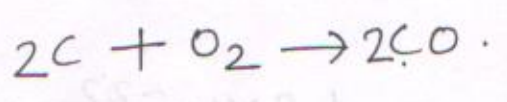
100 ml

100 ml (solid).  $\frac{3}{2} \times 100 = 150 \text{ ml}$

So Ans (1) and ↑ of 50 ml of total volume

Q. 37

Soln:



320g. 168g.

1600g ?

Amount of CO required to reduce 1.6 Kg of

$Fe_2O_3$  is  $\frac{168}{320} \times 1600 = 840g.$



32g      2x28g

?      840g

2x28g CO is obtained when 32g O is used

840g CO is obtained when  $\left(\frac{32}{2 \times 28} \times 840\right)$  O is used

$= 480g$

Ans(2).



Q. 38

Soln: ~~1~~

Ans (2)

Q. 39

Soln:

1 mole methane = 16 gm.

• 1 mole methane = 1.6 g.

Ans (3)

Q. 40

Soln: -

The compound  $M_xO_y$  has  $y \times 16$  parts of oxygen combining with  $x$  atomic mass of  $M$ .

Therefore 8 parts of oxygen combines with

$$x = \frac{Mx}{16y} \times 8$$

$$E = \frac{x \times \text{atomic mass of } M}{2y}$$

$$M = \frac{2Ey}{x}$$

Ans (1)

41

Soln

(1) Ans(1).

42

Soln. Ans(1).

43

Soln.

One eq. of the metal reacts with one mole of  $\text{OH}^-$  i.e. it reacts with 17g of  $\text{OH}^-$ .  
Similarly, one equivalent of the metal reacts with  $\frac{1}{2}$  mole oxygen atom i.e. 8g oxygen atoms.

Let  $E$  be eq. mass of the metal. and

$x$  be the no. of equivalents of Metal hydroxide ignited.

$$x(E+17) = 1.520 \text{ g}$$

$$x(E+8) = .995$$

$$\Rightarrow E = 9 \text{ g}$$

Ans(4).

44  
Soln

First oxide.

78% 22%  
Fe O.

Suppose 78g 22g

106g. 30g.

Second oxide.

70% 30%  
Fe O.

70g 30g.

Fe (first oxide)

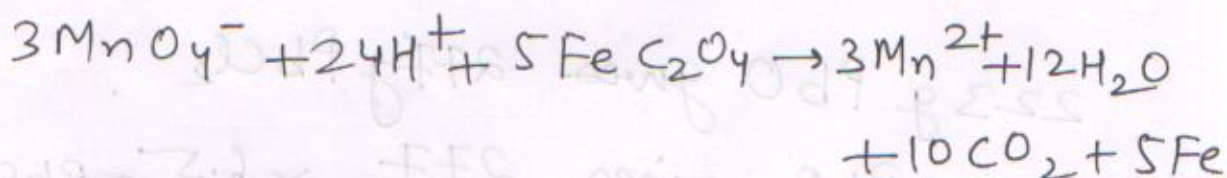
Fe (second oxide)

106 3

70 2

Ans(1).

45  
Soln



For 5 mol  $\text{FeC}_2\text{O}_4$  3 mole of  $\text{MnO}_4^-$  is required

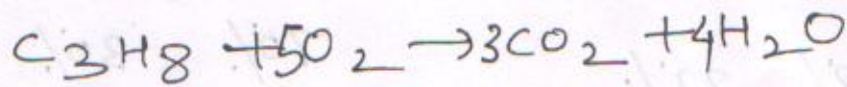
for 1 mol  $\text{FeC}_2\text{O}_4$   $\frac{3}{5} \times 1 = 0.6$  mole of  $\text{MnO}_4^-$  is required

Ans. 6.

Ans(1)

Q.46 : 59

Soln :



~~1L 5L~~

~~1L 5L~~

Ans (3)

47

Soln :-



Acc. to stio.

223g.    72g.

277g.

Given

6.5

3.2.

L.R = PbO.

223g PbO gives 277g PbCl<sub>2</sub>

6.5g PbO gives  $\frac{277}{223} \times 6.5$  g PbCl<sub>2</sub>

= 8.073 g PbCl<sub>2</sub>

= 0.029 mol of PbCl<sub>2</sub>

Ans (4)

48

Soln :

Fe<sup>2+</sup> is present in Mohr's salt is oxidised to Fe<sup>3+</sup>. So change in Oxidation no. is 1

$$\text{Equivalent mass} = \frac{M}{TCIOs} = \frac{392}{1} = 392$$

49  
Soln



Ans (3)

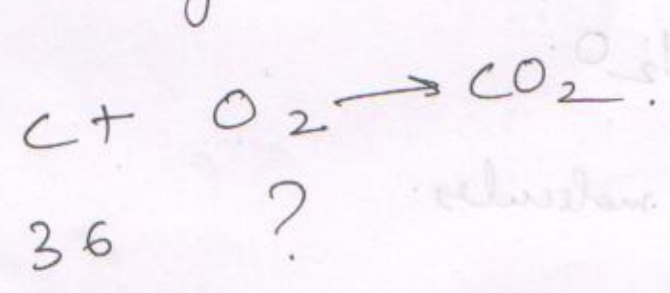
50  
Soln



$\frac{10}{100}$  % of 40 carbon remains unreacted.

$$\frac{10}{100} \times 40 = 4g \text{ carbon unreacted}$$

so only 36g of C reacted.



$$12g \rightarrow 22.4L$$
$$36g \rightarrow 22.4 \times 3L$$
$$= 66.2L$$

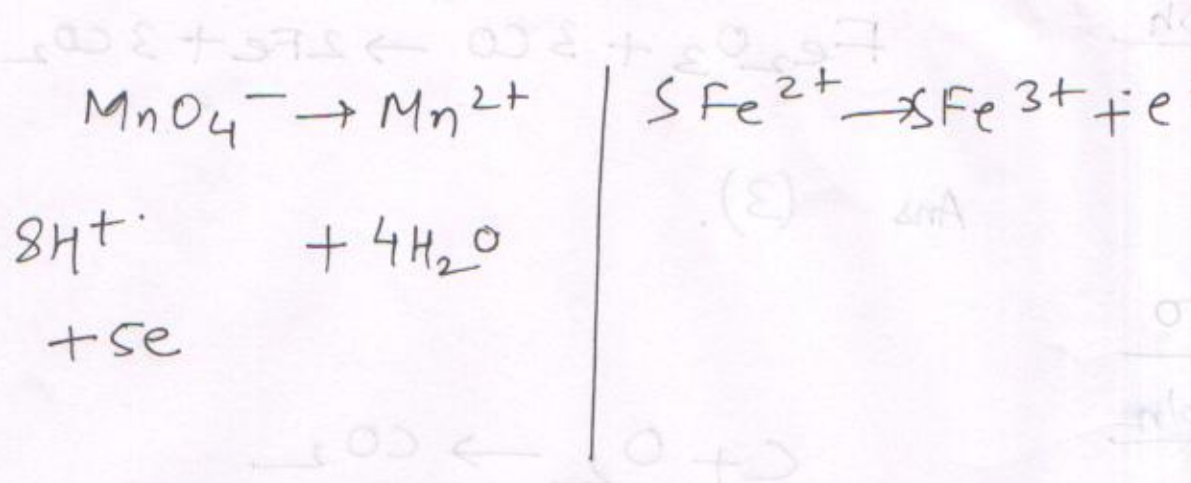
Ans(2)

51  
Soln



Ans(3)

Soln Q2



so  $5e^-$  gets transfer.

Ans(2)

Q3

Soln

(i) 34g of  $\text{H}_2\text{O}$ .

$$\frac{34}{18} \text{ NA molecules.}$$

(ii)

$$\frac{28}{44} \text{ NA molecules.}$$

(iii)

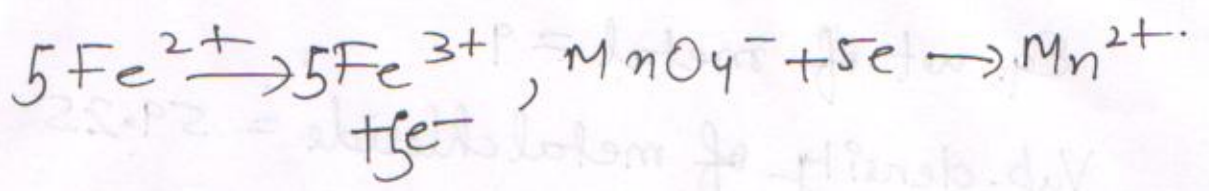
$$\frac{46}{32} \text{ NA molecules.}$$

(iv)

$$\frac{54}{118} \text{ NA moles.}$$

Ans (1).

9.55  
Soln



Ans. (2)

56  
Soln

J. factor  $KMnO_4 = 5$

$$\begin{aligned} \text{No of millimoles of } KMnO_4 \text{ present} &= MV(\text{ml}) \\ &= 250 \times 0.04 \\ &= 10 \end{aligned}$$

$$\text{No of moles of } KMnO_4 \text{ present} = \frac{10}{1000}$$

$$\begin{aligned} \text{No of equivalent is} &= j\text{-factor} \times \text{Moles} \\ &= 5 \times \frac{10}{1000} = .05 \end{aligned}$$

Ans (2)

Soln

Soln.

$$\text{Eq. wt of metal} = 9.$$

$$\text{Vap. density of metal chloride} = 59.25$$

$$\text{Molecular weight of metal chloride} = 2 \times 59.25 \\ = 118.5$$

Let the  $j$ -factor be  $x$ .

(i)  $VM =$  and Atomic mass of metal be  $m$ .

(ii)  $x$  and Molecular formulae would be.

$$MCl_x$$

$$\Rightarrow m + 35.5x = 118.5$$

$$\Rightarrow 9x + 35.5x = 118.5$$

$$\Rightarrow 44.5x = 118.5$$

$$\Rightarrow x = \frac{118.5}{44.5} = 2.66$$

$$\text{So } j\text{-factor} = 2.66$$

$$\text{Atomic Mass} = j\text{-factor} \times \text{Eq. wt}$$

$$= 2.66 \times 9$$

$$= 23.9$$

Ans (1)



Ex

$6.023 \times 10^{23}$  molecule of  $C_{60}H_{122}$  weighs 842 g  
 1 molecule of  $C_{60}H_{122}$  weighs  $\frac{842}{6.02 \times 10^{23}}$  g  
 $= 139.86 \times 10^{-23}$  g  
 $\approx 1.4 \times 10^{-21}$  g

Ans(4)

Q 58

Soln

$6.02 \times 10^{25}$  HCl chloride molecules have

100 moles

Ans(2)

Q 59

Soln

Ans(3)

Q 60

Soln

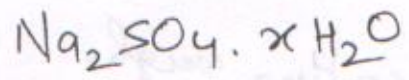


T.C.I.O.N = 2.

Equivalent weight =  $\frac{M}{T.C.I.O.N} = \frac{190}{2}$   
 $= 95$

Ans(1)

61  
Soln



Molecular weight =  $142 + 18x$ .

After heating it lost its water molecule.  
So.

$$\frac{55.9}{142 + 18x} \times 100 = 18x$$

$$\Rightarrow x = 10$$

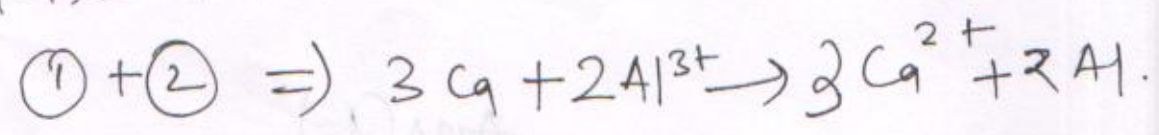
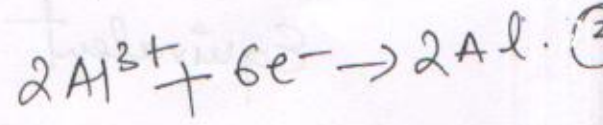
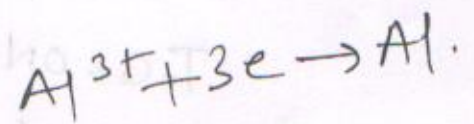
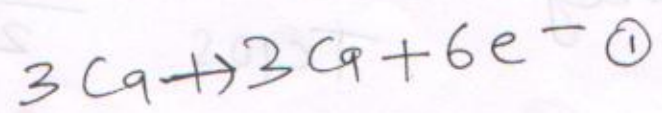
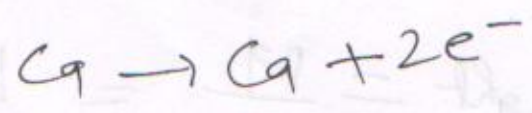
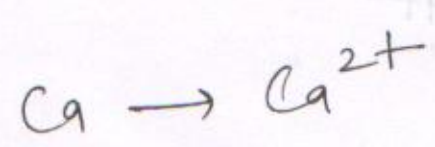
$\frac{55.9}{100} \times (142 + 18x) = 18x$

$\Rightarrow x = 10$

So we have 10  $\text{H}_2\text{O}$  molecule

Ans (4)

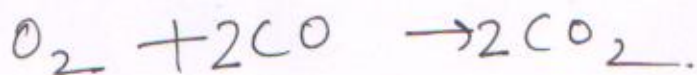
62  
Soln



Ans (3)

Q (32)

63  
Soln



At start 10L 30L

Completion 0 10L 20L.

Ans (1).

64

Soln

0.5 mole Cl is present in 25g of  $MCl_4$ .

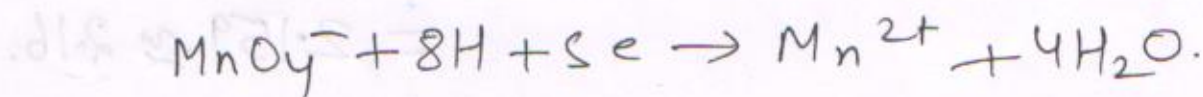
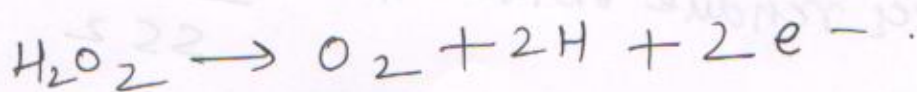
4 mole Cl is present in  $\frac{25}{0.5} \times 4$  g of  $MCl_4$

$$= 200.$$

This is molecular weight =  $200 \text{ g mol}^{-1}$ .

65

Soln



Ans (2).

Q 66

Soln

(1) 32g

(3) 100 amu of v.

(2) 80 amu

(4) 20g

(5) 44g of  $CO_2$

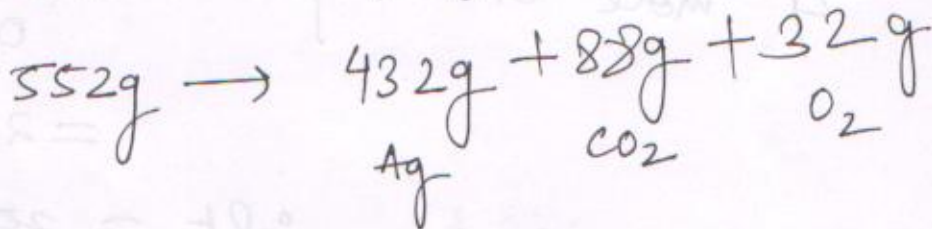
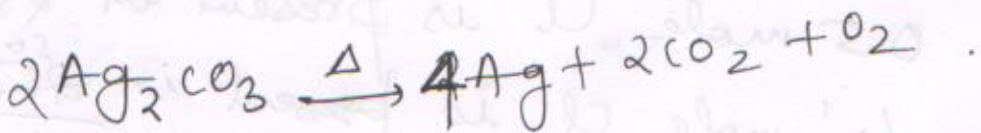
Ans (5)

Soh

68

Soh 68

Acc to  
stoicheo



$$2.76 \rightarrow ?$$

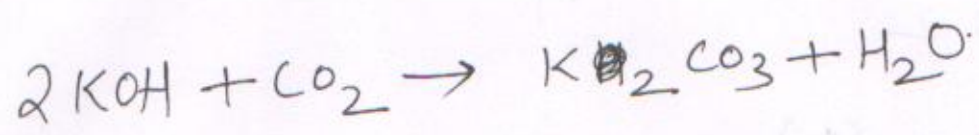
$$\text{Silver residue obtained} = \frac{432}{552} \times 2.76$$

$$= 2.159 \approx 2.16$$

Ans (1)

Q68 Sol 68 Q69 Sol 69

11.2 dm<sup>3</sup> of CO<sub>2</sub> at stp is  $\frac{1}{2}$  mole of CO<sub>2</sub>.



Acc to stoich.

2 mole.      1 mole  
?               $\frac{1}{2}$

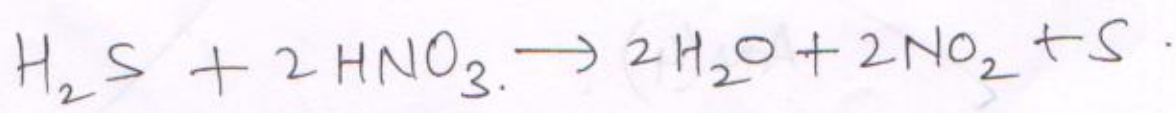
1 mole of CO<sub>2</sub> required 2 mole.

$$\frac{1}{2} \text{ mole of CO}_2 \text{ required } \frac{2}{1} \times \frac{1}{2} = 1.$$

1 mole of KOH weighs = .56g.

Ans (1).

79



Soln



$$\text{TCIOX} = 2$$

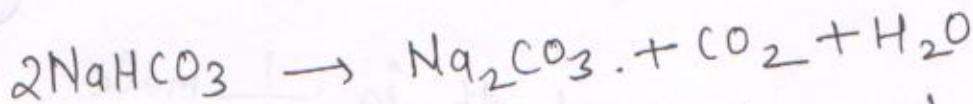
$$\text{Eq. wt} = \frac{\text{Molecular Mass}}{\text{TCIOX}}$$

$$= \frac{34}{2} = 17.$$

Ans (4).

Q 72

Soln



from.

2

1

1

1

stoich

0.2

1

-1

-1

Ans (1)

~~Q 73~~

~~Soln 73~~

~~Let the weight of  $\text{O}_2$  be 1 gm,  
and the weight of  $\text{N}_2$  be 4 gm.~~

~~$$\frac{\text{Number of molecules in 1 gm of } \text{O}_2}{\text{Number of molecules in 4 gm } \text{N}_2} = \frac{\frac{\text{NA}}{32} \times 1}{\frac{\text{NA}}{28} \times 4}$$

$$= \frac{287}{32 \times 4}$$~~

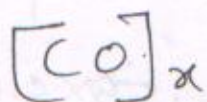
~~Ans (4)~~

Q 73

Soln

Ans (3)

79  
Soln



$$\text{Molecular Mass} = 28x$$

$$= 2 \times V.D.$$

$$= 2 \times 70 = 140.$$

So

$$28x = 140$$

$$x = \frac{140}{28} = 5$$

$$x = 5$$

Ans (3).

80  
Soln

$$\text{Moles of } 12.2 \text{ g benzoic acid} = \frac{12.2}{122} = 0.1$$

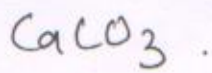
So 0.1 mole of NaOH required is 4 gms.

Ans (4).

Soln

Ans (2)

75)



100 gm of  $\text{CaCO}_3$  contains 50 proton (mol)

10 gm of  $\text{CaCO}_3$  contains  $\frac{50 \times 6.02 \times 10^{23}}{100} \times 10$

$3.01 \times 10^{24}$  protons.

Ans (1).

76)

18 gm of  $\text{H}_2\text{O}$  → give ~~18~~ 16 gm  $\text{O}_2$ .

72,000 gm of  $\text{H}_2\text{O}$  give  $\frac{16}{18} \times 72,000$  gm  $\text{O}_2$

= 64,000 = 64 Kg.

77)

$$\text{Eq wt} = \frac{\text{Mol. wt}}{\text{TCION}}$$

$$= \frac{158}{5} = 31.6$$

Ans (3).

78)

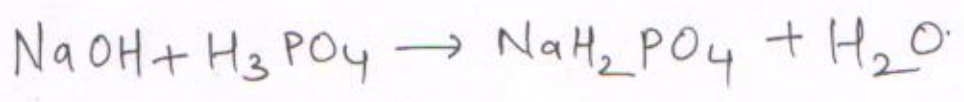
Ans 2)

Ans (2)



79

Soln

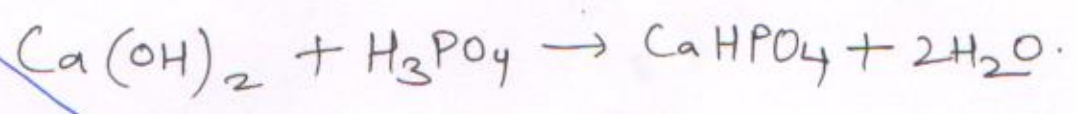


ox. No of P.      ox. No of P  
 +5                    +5

So there is no. oxidation state change.

Equivalent wt would be. Molecular wt = 98.

80  
Soln



Here,  $\text{H}_3\text{PO}_4$  having 2. displacable Hydrogen.

So. J-factor = 2.

$$\text{Eq wt} = \frac{\text{Mol. wt}}{\text{J. fac}} = \frac{98}{2} = 49.$$

Ans (4).

80

Soln



~~200~~ ~~128~~ + ~~16x~~                    ~~200~~                    ~~16x~~

$$\begin{aligned} \text{At wt of M} &= 2 \times \text{V.D} \\ &= 2 \times 32 = 64 \text{ gms.} \end{aligned}$$

128 gms of Metal is obtained from.  $(128g + 16x)$  gm of oxide

$\therefore 3.2 \text{ g}$  of metal is obtained from  $\frac{128 + 16x}{128} \times 3.2$  gm of oxide. (30)

$$\frac{128 + 16x}{128} \times 3.2 = 3.6$$

$$\Rightarrow x = 1.$$

So formulae would be  $M_2O$ .

Ans (3).

Solns:

Acc to Dulong. Petit's Law.

Atomic Mass  $\times$  Specific heat  $\approx 6.4$ .  
(in  $\text{g} \cdot \text{K}^{-1}$ ).

$$\text{Atomic Mass} \times \frac{1.05}{4.2} = 6.4$$

$$\text{Atomic Mass} = 25.6$$

$$\text{Eq wt} = \frac{\text{At wt}}{n \text{ factor}}$$

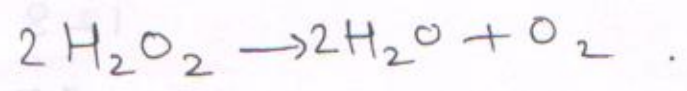
$$n \text{ factor} = \frac{25.6}{9} \approx 3$$

$$\text{Atomic weight} = 9 \times 3 = 27$$

Ans 27 Ans (4)

81

Soln



$$68g \rightarrow$$

$$22400 ml$$

$$68g \rightarrow$$

$$\frac{22400}{68} \times 68$$

Ans (2)

82

Soln

1L contain 21% O<sub>2</sub>.

$$\text{i.e. } \frac{21}{100} \times 1 \text{ l O}_2$$

∴ 22 l of O<sub>2</sub> contain 1 mol (at STP)

$$\therefore \frac{21}{100} \text{ of O}_2 \text{ contain } \frac{1}{22} \times \frac{21}{100}$$

$$= 0.09$$

Ans (4)

82

Soln

Ans (1)

83

Ans (4)

84

Ans (1)

88 87

Sol

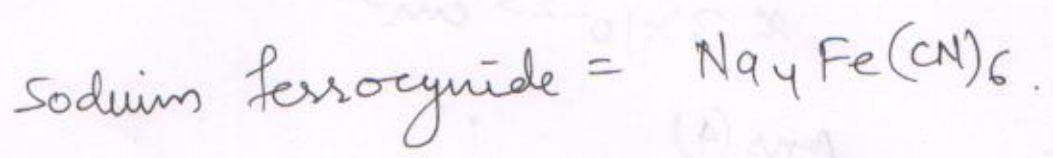
$$1.4 \text{ moles of the substance} = 1.4 \times 4 \times 6.023 \times 10^{23} \text{ atoms}$$

$$= 3.372 \times 10^{24} \text{ atoms.}$$

Ans (4)

88

soln



$$2 \text{ moles of } \text{Na}_4\text{Fe}(\text{CN})_6 = 8 \text{ moles of Na.}$$

$$= 8 \times 6.023 \times 10^{23} \text{ atoms of Na.}$$

$$= 48.18 \times 10^{23} \text{ atoms.}$$

Ans (4)

89

soln

No of replaceable H = 2.

so i-factor = 2.

$$\text{Eq. wt} = \frac{\text{At. wt}}{2}$$

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

85

Soln

$$d = \frac{m}{V}$$

$$1 = \frac{18 \times 1.66 \times 10^{-24}}{V}$$

$$= 2.9 \times 10^{-23} \cdot \text{cm}^3$$

$$\approx 3 \times 10^{-23} \text{ cm}^3$$

Ans (4)

Soln

Ans (4) same as Q.87.

Soln

$$d = \frac{\text{mass}}{\text{vol.}}$$

$$d = \frac{45}{22.4}$$

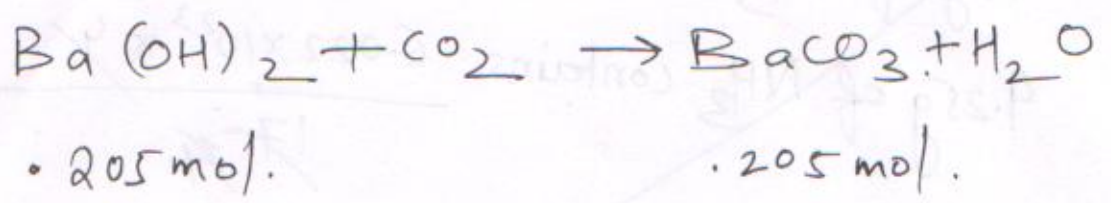
$$= 2.$$

Ans (4)

Soln

Same as Q 84.

90  
Soln



Wt of  $\text{BaCO}_3$  obtained. =  $.205 \times 197$   
(A) = 40.5g

Ans. (2)

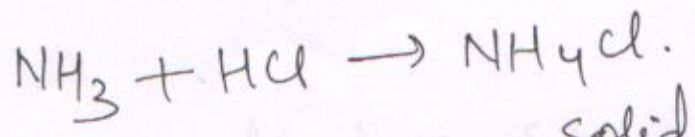
91  
Soln

Ans (4)

92  
Soln

Ans (1)

93  
Soln



At start:

4L      1.5L      solid

At the end:

2.5L      0

Ans (3)

sol.

17g of  $\text{NH}_3$  contain  $6.022 \times 10^{23} \times 4$  atoms of N  
4.25g of  $\text{NH}_3$  contains:  $\frac{6.022 \times 10^{23} \times 4}{17} \times 4.25$   
 $= 6 \times 10^{23}$

Ans (4).

soln

$$1000 = \frac{75 \times 10^3 \times 100 \times (\Delta T)}{18}$$

$$\Delta T = 2.4 \text{ K.}$$

Ans (3)

soln

soln

Ans (1)

soln

soln

$$45 \times 6.02 \times 10^{23} \text{ atoms/mol}$$

Ans (1).

soln

soln

Ans (2)

Sol 97

Let  $x$  be minimum Molecular Mass.

$$8\% \frac{8}{100} x = 32$$

$$x = \frac{32 \times 100}{8} = 400$$

Ans (2)

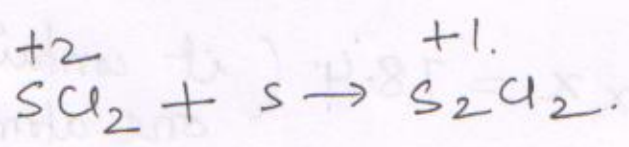
Sol 100

Ans (4)

Sol

Ans (2)

Sol 98



$$\text{T.C.I.O.N} = 2$$

~~At wt =~~

$$\text{Eq. wt} = \frac{\text{Mol. wt.}}{\text{T.C.I.O.N}}$$

$$= \frac{32}{2} = 16$$



Soln

$\therefore 1.17 \text{ g}$  is present in  $10 \text{ ml}$

$\therefore 1170 \text{ g}$  is present in  $1000 \text{ ml}$ .

No of moles of  $\text{HCl}$  in  $1170 \text{ g}$  is

$$= \frac{1170}{36.5} = 32.05$$

Ans (3)

100

Soln

Let  $x$  be the minimum molecular weights.

$$\frac{0.5}{100} \times x = 78.4 \quad (\text{it contain least one atom of Se})$$

$$x = \frac{78.4 \times 100}{0.5}$$

$$= 1.568 \times 10^4$$

Ans (1)

101

$$197\text{g} \rightarrow 44\text{g}$$

$$9.85\text{g} \rightarrow \frac{44}{197} \times 9.85$$

$$= 2.2\text{g}$$

44 gm  $\text{CO}_2$  have 22.4 l volume.

$$2.2\text{ gm } \text{CO}_2 \text{ have } \frac{22.4}{44} \times 2.2$$

$$= 1.12\text{L}$$

Ans (A)

102

$$\text{M.W}(\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}) = 346\text{ gm}$$

$$346\text{ gm contains} = 224\text{ gm of oxygen.}$$

$$32.2\text{ gm contain} = \frac{224}{346} \times 32.2\text{ gm of oxygen.}$$

$$= 20.8\text{ gm of oxygen.}$$

103

Ans (2)