

## DPP

DAILY PRACTICE PROBLEMS

CLASS : XI<sup>th</sup>

DATE :

Solutio

SUBJECT : CHEMISTRY

DPP No. : 2

### Topic :- SOME BASIC CONCEPTS OF CHEMISTRY

1

(c)

As ratio of masses of nitrogen per gram of hydrogen in hydrazine and  $NH_3$

$$= 1 \frac{1}{2} : 1$$

$$= \frac{3}{2} : 1 \text{ or } 3 : 2$$

ie, the law of multiple proportions.

3

(a)

$$\text{Eq. of } H_2SO_4 = 0.5 \times 2 = 1.0;$$

$$\text{Eq. of } Ca(OH)_2 = 0.2 \times 2 = 0.4;$$

Equal Eq. reacts and thus, Eq. of  $CaSO_4$  formed = 0.4

$$\therefore \text{Mole of } CaSO_4 \text{ formed } = \frac{0.4}{2} = 0.2$$

4

(d)

$H_3PO_4$  is tribasic acid and thus,

$$N = M \times \text{basicity}$$

5

(d)

Empirical formula wt. = 13

$$\therefore n = \frac{\text{mol.wt.}}{\text{empirical formula wt.}} = \frac{78}{13} = 6$$

$\therefore$  Formula is  $(CH)_6$ , i. e.,  $C_6H_6$

6

(a)

For first oxide,

$$\text{Moles of oxygen} = \frac{22}{16} = 1.375,$$

$$\text{Moles of Fe} = \frac{78}{56} = 1.392$$

$$\text{Simpler molar ratio, } \frac{1.375}{1.375} = 1, \frac{1.392}{1.375} = 1$$

$\therefore$  The formula of first oxide is  $FeO$ .

Similarly for second oxide,

$$\text{Moles of oxygen} = \frac{30}{16} = 1.875,$$

$$\text{Moles of Fe} = \frac{70}{56} = 1.25$$

$$\text{Simple molar ratio} = \frac{1.875}{1.25} = 1.5, \frac{1.25}{1.25} = 1$$

$\therefore$  The formula of second oxide is  $Fe_2O_3$ .

Suppose in both the oxides, iron reacts with  $xg$  of oxygen.

$\therefore$  Equivalent weight of Fe in  $FeO$

$$\frac{\text{weight of Fe}_{II}}{\text{weight of oxygen}} \times 8$$

$$\frac{56}{2} = \frac{\text{weight of Fe}_{II}}{x} \times 8 \quad \dots (i)$$

$\therefore$  Equivalent weight of Fe in  $Fe_2O_3$



$$= \frac{\text{weight of Fe}_{\text{III}}}{\text{weight of oxygen}} \times 8$$

$$\frac{56}{3} = \frac{\text{weight of Fe}_{\text{III}}}{x} \times 8 \quad \dots \text{(ii)}$$

From Eq. (i) and (ii),

$$\frac{\text{weight of Fe}_{\text{II}}}{\text{weight of Fe}_{\text{III}}} = \frac{3}{2}$$

7

(a)

We know that protons in 1 mole  $\text{CaCO}_3$

= atomic number of calcium + atomic number of carbon + 3 (atomic number of oxygen)

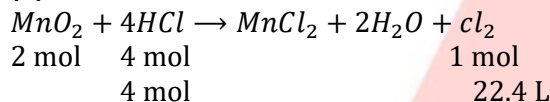
=  $20 + 6 + 3(8) = 50$  mol

$$\therefore \text{Proton in 10 g } \text{CaCO}_3 = \frac{10 \times 50}{100} \times 6.02 \times 10^{23}$$

$$= 3.01 \times 10^{24}$$

8

(b)



But the yield is 11.2.

$$\therefore \% \text{ yield} = \frac{11.2}{22.4} \times 100 = 50\%$$

9

(b)

$$N = \frac{1}{49 \times (100/1000)} = 0.2$$

10

(c)

One mole of electrons =  $6.023 \times 10^{23}$  electrons

Mass of one electron =  $9.1 \times 10^{-28}$ g

Mass of one mole of electrons

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

$$= 5.48 \times 10^{-4} \text{g} = 0.548 \text{mg}$$

$$\approx 0.55 \text{mg}$$

11

(c)

Eq. of metal = Eq. of Cl

$$\therefore \frac{74.4 - 35.5}{E} = \frac{35.5}{35.5}$$

$$\therefore E = 38.9$$

12

(a)

Equivalent wt of acid

$$= \frac{\text{molecular weight of acid}}{\text{no. of H atoms replaced during reaction}}$$

$\therefore$  Equivalent weight of acid depends on the reaction involved because different number of acids are replaced during different reactions.

14

(d)

At. wt. =  $2 \times 31.82$

$$\therefore \text{Wt. of one atom} = \frac{2 \times 31.82}{N} = \frac{63.64}{N}$$

15

(a)

22.4 litre = 1 mole;

$$\therefore 1 \text{m}^3 = 10^3 \text{ litre} = \frac{10^3}{22.4} = 44.6$$

16

(c)



245 g  $\text{KClO}_3$  on heating shows a wt. loss = 96 g (of  $\text{O}_2$ )

$\therefore$  100 g  $\text{KClO}_3$  on heating shows a wt. loss

$$= \frac{96 \times 100}{245} \text{ g} = 39.18\%$$

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(b)

$$\begin{aligned} \text{Meq.} &= \text{Normality} \times V \text{ in mL} \\ &= 500 \times 0.2 = 100 \end{aligned}$$

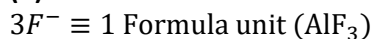
18

(a)

$$\text{Number of molecules} = \frac{\text{mass} \times N_A}{\text{molar mass}}$$

19

(d)



$$3.0 \times 10^{24} F^- = 1 \times 10^{24} \text{ Formula units (AlF}_3\text{)}$$

20

(d)

One mole of  $\text{CO}_2$  contains  $6.02 \times 10^{23}$  atoms of carbon and  $6.023 \times 10^{23}$  molecules of oxygen.

### ANSWER-KEY

Q.	1	2	3	4	5	6	7	8	9	10
A.	C	D	A	D	D	A	A	B	B	C
A										
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	A	B	D	A	C	B	A	D	D

**SMARTLEARN  
COACHING**