DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
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

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

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

ie, the law of multiple proportions.

3 **(a)**

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

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

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

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

4 **(d)**

H_3PO_4 is tribasic acid and thus,

$N = M \times$ basicity

5 **(d)**

Empirical formula wt. =13

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

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

6 **(a)**

For first oxide,

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

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

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,

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

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

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

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

$\frac{56}{2} = \frac{\text{weight of } Fe_{II}}{x} \times 8 \quad \ldots \text{(i)}$

$\therefore$ Equivalent weight of Fe in Fe_2O_3

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

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

From Eq. (i) and (ii),

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

7 **(a)**

We know that protons in 1 mole $CaCO_3$

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

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

$\therefore$ Proton in 10 g $CaCO_3 = \frac{10 \times 50}{100} \times 6.02 \times 10^{23}$

$= 3.01 \times 10^{24}$

8 **(b)**

$MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + cl_2$

2 mol 4 mol 1 mol

4 mol 22.4 L

But the yield is 11.2.

$\therefore$ % 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= 6.023×10^{23} electrons

Mass of one electron=9.1×10^{-28}g

Mass of one mole of electrons

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

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

≈ 0.55 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. $= 2 \times 31.82$

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

15 **(a)**

22.4 litre = 1 mole;

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

16 **(c)**

$2KClO_3 \longrightarrow 2KCl + 3O_2 \uparrow$;

245 g $KClO_3$ on heating shows a wt. loss = 96 g (of O_2)

$\therefore$100 g $KClO_3$ on heating shows a wt. loss

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

17 **(b)**

Meq. = Normality × V in mL

$= 500 \times 0.2 = 100$

18 **(a)**

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

19 **(d)**

$3F^- \equiv 1$ Formula unit (AlF_3)

$3.0 \times 10^{24} F^- = 1 \times 10^{24}$ Formula units (AlF_3)

20 **(d)**

One mole of CO_2 contains 6.02×10^{23} atoms of carbon and 6.023×10^{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