DPP

DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

**Solutions**

SUBJECT : CHEMISTRY
DPP No. : 6

# Topic :- SOME BASIC CONCEPTS OF CHEMISTRY

1 **(d)**

Volume of 100 g solution, $V = \frac{m}{\rho}$

$= \frac{100g}{1.14\text{g cm}^{-3}} = 87.72\text{cm}^3$

Amount of sulphuric acid in 100 g solution,

$n = \frac{m}{M} = \frac{20.0g}{98\ g\ mol^{-1}} = 0.207\ mol$

Molarity of sulphuric acid,

$\text{M} = \frac{\text{n}}{\text{V}} = \frac{0.207\text{ mol}}{87.72 \times 10^{-3}\text{dm}^3} = 2.32\text{ mol dm}^{-3}$

2 **(b)**

Meq. of $Fe^{2+}$ = Meq.of $FeCl_2$

= Meq.of$HCl = 50 \times 4 = 200$ ;

$\therefore$ Mole of $Fe^{2+} = \frac{200}{2} \times 10^{-3} = 0.1$

3 **(c)**

Meq. of $HCl = 100 \times 0.3 = 30$

Meq.of $H_2SO_4 = 200 \times 0.6 = 120$

$\therefore \quad N_{\text{mixture}} = \frac{30 + 120}{300} = \frac{1}{2}$

4 **(b)**

Meq. of acid = Meq. of caustic potash

$\therefore \quad \frac{45}{90/n} \times 1000 = 200 \times 5,$

$\therefore \quad n = 2$

5 **(c)**

$2Cr(OH)_3 + 4OH^- + KIO_3 \rightarrow 2CrO_4^{2-} + 5H_2O + KI$

Change in oxidation number of effective element (I) in $KIO_3 = (+5) - (-1) = 6$

Equivalent weight of oxidation$= \frac{\text{mol. wt.}}{6}$

6 **(c)**

No. of atoms in 1g of $O_2(g) = 2 \times \frac{1}{32} \times 6.023 \times 10^{23}$

$= 0.38 \times 10^{23}$

No. of atoms in 1g of $Ni(s) = \frac{1}{58.2} \times 6.023 \times 10^{23}$

$= 0.10 \times 10^{23}$

No. of atoms in 1g of $B(s) = \frac{1}{10.8} \times 6.023 \times 10^{23}$

$= 0.58 \times 10^{23}$

No. of atoms in 1g of $N_2(g) = 2 \times \frac{1}{28} \times 6.023 \times 10^{23}$

$= 0.43 \times 10^{23}$

Alternative: Smaller the atomic mass, larger will be the no. of atoms in sample.

7 **(d)**

Follow stoichiometry of reaction.

8 **(c)**

Mole of $O_2 = \frac{3.2}{32} = \frac{1}{10}$

$\therefore$atoms of O $= 2N \times \frac{1}{10} = 12.04 \times 10^{22}$

9 **(a)**

No. of molecules in $n$ mole $= n \times$ Av. no;Also no. of atom in 1 molecule = atomicity.

10 **(d)**

$$\text{Moles} = \frac{\text{mass}}{\text{molecular mass}}$$

Given, mass of $Al_2(SO_4)_3 = 50$g

Molecular mass of $Al_2(SO_4)_3 = 342$ g

$\therefore$ Moles of $Al_2(SO_4)_3 = \frac{50}{342} = 0.14$ mol

11 **(c)**

In air

Molecular weight of $N_2 = \frac{28 \times 78}{100} = 21.84$

Molecular weight of $O_2 = \frac{32 \times 21}{100} = 6.72$

Molecular weight of $Ar = \frac{18 \times 0.9}{100} = 0.162$

Molecular weight of $CO_2 = \frac{44 \times 0.1}{100} = 0.044$

So, molecular weight of air $= 21.84 + 6.72 + 0.162 + 0.044$

$= 28.766$

12 **(d)**

Meq. of oxide = Meq. of hydroxide;

Thus, $\frac{0.995}{E + 8} = \frac{1.520}{E + 17}$ $\therefore E = 9$

13 **(d)**

Per cent loss of $H_2O$ in one mole of

$$Na_2SO_4 \cdot nH_2O = \frac{18n \times 100}{(142 + 18n)} = 55$$

$\therefore$ $n = 10$

15 **(c)**

VD of substance $= 4$ (when VD of $CH_4 = 1$ )

$\therefore$VD of substance $= 8 \times 4$ (when VD of $CH_4 = 8$ )

$\therefore$mol. wt. of substance $= 32 \times 2 = 64$

16 **(d)**

According to Dulong and Petit's law

At. mass of element $\times$ specific heat (in cal/g)=6.4(app.)

This law is applicable only to solid elements excepts Be, B, C and Si.

17 **(a)**

$$M_{H_2O} = \frac{\frac{1000 \times d}{18}}{1} = 55.6 \times d$$

$\therefore \quad d = 1 \quad \therefore M = 55.6$

18 **(a)**

Follow definition of molality.

19 **(a)**

1 mole (g mol. wt.) of a substance displaces 22.4 litre air at NTP.

20 **(d)**

$$M = \frac{\text{wt.} \times \text{density} \times 1000}{\text{m.wt.} \times \text{wt.of solution}}$$

$$3.6 = \frac{29 \times d \times 1000}{98 \times 100}$$

$$d = 1.22\text{g/mL}$$

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