DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth
DATE :

Solutions

SUBJECT : CHEMISTRY
DPP No. : 3

Topic :- SOME BASIC CONCEPTS OF CHEMISTRY

1 **(b)**

See mole ratio $A:B:C::1:2:1$

2 **(d)**

1 mg $C_4H_{10} = \frac{14N}{58} \times 10^{-3}$ atoms,

1 mg $N_2 = \frac{2N \times 10^{-3}}{28}$ atoms,

1 mg Na $= \frac{N \times 10^{-3}}{23}$ atoms,

1 mL = 1 g $H_2O = \frac{3N}{18}$ atoms,

($\because$ M g of a substance $= N$ molecules $= a \times N$ atoms;where a is number of atoms in one molecule).

3 **(c)**

An aromatic hydrocarbon (empirical formula C_5H_4)

$+ H_2SO_4 \rightarrow$ monosulphonic acid

$\because$ 0.104 g of monosulphonic acid required 10 mL

of $\frac{N}{20}$ NaOH for complete neutralisation

$\therefore \quad \frac{0.104}{n(5 \times 12 + 4 \times 1)} = \frac{1}{20} \times 10 \times 10^{-3}$

$n = \frac{104}{32} = 3.25 \approx 3$

The molecular formula of hydrocarbon will be $C_{15}H_{12}$.

4 **(a)**

In 12 g carbon, mass of C-14 isotope $= 12 \times \frac{2}{100} = 0.24g$

$\therefore$ Number of C-14 atoms in 12 g of $C = \frac{0.24}{14} \times 6.02 \times 10^{23}$

$= 1.032 \times 10^{22}$

5 **(b)**

To prepare 20 g zinc sulphate crystals, zinc required

$= \frac{22.65}{100} \times 20$

$= 4.53g$

6 **(b)**

Number of gram molecules $= \frac{6.02 \times 10^{25}}{6.02 \times 10^{23}} = 100$

7 **(a)**

Ferrous is Fe^{2+}

8 **(b)**

$$M = \frac{5}{34 \times 100/1000} = 1.47$$

9 **(b)**

4.6×10^{22} atoms weight $= 13.8$ g

Hence, 6.02×10^{23} atoms will weigh

$= \frac{13.8 \times 6.02 \times 10^{23}}{4.6 \times 10^{22}} = 108.6$ g (molar mass)

10 **(c)**

Eq. of HCl = Eq. of $CaCO_3$

Thus, $\frac{w}{36.5} = \frac{100}{50}$;

$\therefore \quad w = 73$ g HCl;

50 g HCl is present in 100 g HCl solution and thus, volume of solution required for,

73 g HCl $= \frac{73 \times 100}{50} = 146$g.

12 **(d)**

The law of constant composition — According to this law, "A chemical compound is always found to be made up of the same elements combined together in the same proportions by weights".

This law is same as law of definite proportions.

13 **(d)**

Atomic weight of the element

$X = 6.643 \times 10^{-23} \times N_A = 40$

No. of moles of $X = \frac{20 \times 1000}{40} = 500$

14 **(a)**

Limiting reagent is one which is completely consumed in reaction.

15 **(d)**

ppm = wt. of solute in 10^6 g H_2O

10^3 g H_2O contains 10 g $CaCO_3$

$\therefore \quad 10^6$ g H_2O contains $= \frac{10 \times 10^6}{10^3} = 10{,}000$ ppm $CaCO_3$

16 **(d)**

	$BaCl_2$	+ H_2SO_4	$\rightarrow BaSO_4$	$+2HCl$
mm	20×0.5	20×1		
taken	$= 10$	20	0	0
mm	0	10	10	20

formed

Milli mole of $BaSO_4 = 10$

or Mole of $BaSO_4 = 10^{-2}$

17 **(d)**

Percentage of element M in $M_2O_3 = 53$

Let the atomic mass of $M = x$

Mass of Min $M_2O_3 = 2x$

Total atomic mass of $M_2O_3 = 2x + 16 \times 3$

$= 2x + 48$

Percentage of an element

$$= \frac{\text{Mass of an element in a compound}}{\text{Total mass of compound}} \times 100$$

$$53 = \frac{2x}{2x + 48} \times 100$$

$53(2x + 48) = 200x$

$x = 27$

18 **(a)**

H_3BO_3 accepts OH^- ions to act as weak monobasic Lewis acid.

$H_3BO_3 + H_2O \longrightarrow B(OH)_4^- + H^+$; $K_a = 10^{-9}$

19 **(a)**

Meq. of KOH added $= 25 \times 0.4210 = 10.525$

Meq. of KOH left $= 8.46 \times 0.2732 \times 2 = 4.623$

∴ Meq. of KOH used by oil $= 10.525 - 4.623 = 5.902$

or $\frac{w}{56} \times 1000 = 5.902$

or ${}^{w}KOH = 0.3305$ g

∴Saponification no.

= wt. of KOH used in mg per g of oil

$= \frac{0.3305}{1.5763} \times 1000$

$= 209.6$

20 **(c)**

$(NH_4)_2SO_4 \longrightarrow 2NH_3 + H_2O + SO_3$

$3NH_3 + 2HCl \longrightarrow 2NH_4Cl$

$(NH_4)_2SO_4 \equiv 2NH_3 \equiv 2HCl$

132 g 73g

$73gHCl \equiv 132g(NH_4)_2SO_4$

$292\text{ g HCl} \equiv \frac{132 \times 292}{73} g(NH_4)_2SO_4$

$= 528\text{ g}(NH_4)_2SO_4$

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