Chapter Name

Mole Concept

NCERT Exercise

Q.1.>

(c)

$$\text{Molarity (M)} = \frac{n_{solute} \times 1000}{V_{solution}\ (\text{in ml})}$$

$$n_{solute} = \frac{\text{Mass}}{\text{Molar Mass}} = \frac{5.85}{58.5} \Rightarrow 0.1$$

$$V_{sol^n} = 500\ \text{ml}$$

$$M = \frac{0.1 \times 1000}{500} \Rightarrow 0.2\ \text{mol L}^{-1}$$

Q.2.>

(b)

$$\boxed{M_1V_1 = M_2V_2}$$

$M_1 = 5M$, $M_2 = ?$

$V_1 = 500\ \text{ml}$, $V_2 = 1500\ \text{ml}$

$$5 \times 500 = M_2 \times 1500$$

$$\boxed{M_2 = 1.66M}$$

Q.3.>

(d) Total no. of atoms ∝ moles

$n_{He} = \frac{4}{4} \Rightarrow 1$, $n_{Na} = \frac{46}{23} \Rightarrow 2$

$n_{Ca} = \frac{0.4}{40} \Rightarrow 0.01$, $n_{He} = \frac{12}{4} \Rightarrow 3$

Q.4.>

(c)

$$M = \frac{d\ (\text{in gm L}^{-1})}{MM_{solute}} = \frac{0.9}{180} \Rightarrow 0.005M$$

Q.5.>

(d)

$$m = \frac{n_{solute} \times 1000}{\text{Mass of solvent (in gm)}}$$

$$\because\ n_{solute} = \frac{\text{Mass}}{\text{Molar Mass}} = \frac{18.25}{36.5}$$

$$n_{solute} = 0.5$$

$$m = \frac{0.5 \times 1000}{500}$$

$$\boxed{m = 1}$$

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Q.6.>

(a)

$$M = \frac{n_{solute} \times 1000}{V_{soln}\ (\text{in ml})}$$

$$0.02 = \frac{n_{solute} \times 1000}{100} \Rightarrow \boxed{n_{solute} = 0.002}$$

$$\text{Total molecules} = \text{mole} \times N_A$$

$$= 0.002 \times 6.022 \times 10^{23}$$

$$= 12.044 \times 10^{20} \text{ molecules}$$

Q.7.>

(b) % of carbon = $\frac{\text{Mass of Carbon in } CO_2}{\text{Total mass of } CO_2} \times 100$

$= \frac{12}{44} \times 100 \Rightarrow \underline{27.27\%}$

Q.8.>

(c) empirical Formula = CH_2O

empirical Formula Mass (1 mole) $\Rightarrow 12 + 2\times1 + 16 \Rightarrow 30$ gm

Molar mass = 180 gm (Given)

Molar Mass = n × E. Formula Mass

$180 = n \times 30$

$\boxed{n = 6}$

Q.9.>

(a) density = $\frac{\text{Mass}}{\text{Volume}}$

So,

Mass = density × volume = $3.12 \times 1.5 \Rightarrow 4.68 \Rightarrow 4.7$ gm

(3.12: 3 sigficant figure; 1.5: 2 significant figure (lowest))

Q.10.>

(c) A compound has different properties of its constituent elements.

Q.11.>

(a) <u>law of conservation of Mass :→</u>

According to law of conservation of Mass in all Physical & chemical change total Mass of system remains same".

or

" In a physical or chemical change Mass is neither be created nor be destroyed".

Total Mass of Reactant = Total Mass of Product

Q.12.>

(b) Reaction not balanced

Q.13.>

(b) C, O → CO_2 ⇒ 12 : 32 (12 fixed)
C, O → CO ⇒ 12 : 16
} mass ratio

Ratio of oxygen ⇒ 32 : 16

⇒ 2 : 1

Q.14.>

(1) Molecular Formula of ethene → Empirical formula (simple ratio)

$C_2H_4 \longrightarrow C_1H_2$

Molecular Mass ⇒ 28 u   E.F. Mass ⇒ 14 u

×2

Q.15.>

(a) Both A & R are true & R is correct explanation of A.

Q.16.>

(c) $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

16gm   64gm   2×18 ⇒ 36 gm

Q.17.>

(a) $M = \frac{w_{CH_3COONa} \times 1000}{M_{CH_3COONa} \times V_{sol^n}(\text{in ml})}$

$0.575 = \frac{w_{CH_3COONa} \times 1000}{82 \times 250}$

$w_{CH_3COONa} = 11.79 \text{ gm}$

Q.18.>

(b)

$$2C_2H_2 + 5O_2 \longrightarrow 4CO_2 + 2H_2O$$

2 vol.   5 vol.

(Ans.)

Q.19.>

(d) oxalic Acid dihydrate

$$\begin{matrix} COOH \\ | \\ COOH \end{matrix} \cdot 2H_2O$$

∵ 1 mole of oxalic Acid dihydrate have ⇒ 6 moles of oxygen

Total No. of oxygen Atoms = $n_{oxygen} \times N_A$

$= 6 \times 6.022 \times 10^{23}$

$\Rightarrow 36.13 \times 10^{23}$

Q.20.>

(c) diatomic gas ⇒ X_2

$$n_{X_2} = \frac{\text{Volume}}{22.4} \Rightarrow \frac{2.8}{22.4} \Rightarrow 0.125 \text{ mole of } X_2$$

Total No. of molecules ⇒ $n_{X_2} \times N_A \Rightarrow 0.125 \times 6.022 \times 10^{23}$

$\Rightarrow 7.5 \times 10^{22}$

Total Atoms ⇒ Atomicity × Total molecules

$\Rightarrow 2 \times 7.5 \times 10^{22} \Rightarrow 15 \times 10^{22}$

Q.21>

(d) $M_R V_R = M_1V_1 + M_2V_2$

$M_R \times 250 = 0.5 \times 50 + 0.25 \times 150$

$\boxed{M_R = 0.25M}$

$M_1 = 0.5M$, $M_2 = 0.25M$

$V_1 = 50ml$, $V_2 = 150ml$

M_R = Resultant Molarity

$V_R = V_1 + V_2 + V_3 \rightarrow H_2O$

= 250ml (Given)

Q.22>

(a) Molality(m) = $\frac{n_{solute} \times 1000}{\text{Mass of solvent (in gm)}}$

$m = \frac{0.25 \times 1000}{100}$

$\boxed{m = 2.5}$

$n_{NaOH} = \frac{\text{Mass}}{\text{Molar Mass}}$

$= \frac{10}{40} \Rightarrow 0.25$

Mass of solvent = 100 gm (Given)

Q.23>

(a) Same as Q. (22)

Q.24.>

(c) Law of Multiple Proportion :→

(Given by Dalton)

"According to law of Multiple proportion if two Elements combine to form more than one compound then the different Mass of one Element which combine with a fixed mass of other Element bear a simple ratio to one another."

Mass of N_2	Mass of O_2
14 gm × 2	16 gm × 2
14 gm × 2	32 gm × 2
28 gm	32 gm
28 gm	80 gm

↑ fixed Mass

Ratio of O_2 ⇒ 32 : 64 : 32 : 80

⇒ **2 : 4 : 2 : 5** ← simple Ratio

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Q.25.>

(c) Mass related concentration terms are temperature independent.

so Molality(m)

Q.26.>

(b) having same constituents particles i.e. PbO, PbO_2

Q.27.>

(b) $\frac{1}{12}$th Part of C-12 atom = 1 a.m.u.

Q.28.>

(b)

$$C_2H_4 + 3O_2 \longrightarrow 2CO_2 + 2H_2O$$

Ref. ⇒ 28 gm 3×32 gm

∵ 28 gm C_2H_4 required ⇒ 96 gm O_2

∴ 1 gm C_2H_4 Required ⇒ $\frac{96}{28}$ gm O_2

∴ 560 gm C_2H_4 required ⇒ $\frac{96}{28} \times 560$ gm O_2

⇒ 1920 gm

⇒ 1.92 Kg

Q.29.>

(a)

15 ppm chloroform by mass

↓

15 gm Chloroform present in 10^6 gm of solution ($CHCl_3$)

$$n_{CHCl_3} = \frac{\text{Mass}}{\text{Molar Mass}} = \frac{15}{119.5} \Rightarrow 0.125 \text{ mole}$$

Mass of Solvent = Mass of solution − Mass of solute

$$= 10^6 - 15 \simeq 10^6 \text{ gm}$$

$$m = \frac{n_{solute} \times 1000}{\text{Mass of solvent (in gm)}} = \frac{0.125 \times 1000}{10^6}$$

$$\boxed{m = 1.25 \times 10^{-4}}$$

Q.30.>

(a)

Element	% (gm)	Mole = $\frac{\text{Mass}}{\text{Molar mass}}$	simple ratio
Mg	21.9 gm	0.9125	$\frac{0.9125}{0.896} \Rightarrow 1.01$
P	27.8 gm	0.896	$\frac{0.896}{0.896} \Rightarrow 1$
O	50.3 gm	3.14	$\frac{3.14}{0.896} \Rightarrow 3.5$

So, $Mg_1P_1O_{3.5} \Rightarrow \boxed{Mg_2P_2O_7}$ Ans.

Q.31.>

(b) ∵ Mass of 1 atom of Hydrogen ⇒ 1 u

∴ Mass of 100 atoms of Hydrogen ⇒ 100 u

{ ∵ 1 u ↓ 1.66×10^{-24} gm }

$\Rightarrow 100 \times 1.66 \times 10^{-24}$ gm

$\Rightarrow 1.66 \times 10^{-22}$ gm

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Q.32.>

(a) $M_1 = 15.995\,u$, $M_2 = 16.999\,u$, $M_3 = 17.999\,u$

$x_1 = 99.763\%$, $x_2 = 0.037\%$, $x_3 = 0.200\%$

$$\text{Avg. Atomic Mass} = \frac{M_1x_1 + M_2x_2 + M_3x_3}{x_1 + x_2 + x_3}$$

$$= \frac{(15.995 \times 99.763) + (16.999 \times 0.037) + (17.999 \times 0.2)}{100}$$

$$= 15.999\,u \quad \text{Ans.}$$

Q.33.>

(a) $$n_{sugar} = \frac{\text{Mass (in gm)}}{\text{Molar mass}} = \frac{1000}{342}$$

{ $C_{12}H_{22}O_{11}$ ⇓ 342 u }

$$\text{Total Atoms} = \text{Atomicity} \times n_{C_{12}H_{22}O_{11}} \times N_A$$

$$= 45 \times \frac{1000}{342} \times N_A \Rightarrow 7.92 \times 10^{25} \text{ atoms}$$

Q.34.>

(b) equal no. of molecules means we can say equal no. of moles.

$$n_{O_2} = \frac{\text{Mass (in gm)}}{\text{Molar Mass}} = \frac{40}{32} \Rightarrow 1.25$$

moles of CO_2 = moles of O_2 (Given)

= 1.25

Mass of CO_2 = n_{CO_2} x Molar Mass of CO_2

= 1.25 x 44

= 55 gm

Q.35.>

(c) Mass of one Molecule of CO_2 = 44 u

$\Rightarrow 44 \times 1.66 \times 10^{-24}$ gm

$\Rightarrow 7.30 \times 10^{-23}$ gm

{ ∵ 1u → 1.66×10^{-24} gm }

Q.36.>

(C)

$M_1 \longrightarrow {}^{35}Cl$ $\qquad$ ${}^{37}Cl \longleftarrow M_2$

X_1: 3 or 75% $\qquad$: $\qquad$ X_2: 1 or 25%

$$\text{Avg. Atomic Mass} = \frac{M_1X_1 + M_2X_2}{X_1 + X_2}$$

$$\text{Avg. Atomic Mass} = \frac{35 \times 3 + 37 \times 1}{3+1}$$

$$= 35.5\,u$$

Q.37.>

(a) $2Mg + O_2 \longrightarrow 2MgO$

{ mole = $\frac{Mass}{GAM/MM}$

mole $\frac{1}{24}$ $\frac{0.5}{32}$

$\frac{mole}{stoi.coeff.}$ $\frac{mole}{stoi.coeff.}$

$\frac{0.04}{2} > \frac{0.01}{1}$ ↳ L.R.

$2Mg + O_2 \longrightarrow 2MgO$

Ref. 48gm 32gm

∵ 32 gm O_2 will react will ⇒ 48 gm Mg

∴ 1 gm " " " ⇒ $\frac{48}{32}$ gm Mg

∴ 0.5 gm " " ⇒ $\frac{48}{32} \times 0.5$

⇒ 0.75 gm (used)

Remaining Mass of Mg = Total − used

= 1 − 0.75 ⇒ 0.25 gm

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Q.38.>

(b) $CaCO_3(s) \longrightarrow CaO(s) + CO_2(g)$

Ref. ⇒ 1mole   22.4 litre

∵ 1 mole $CaCO_3$ will produce ⇒ 22.4 L of CO_2

∴ 0.5 " " ⇒ 0.5 × 22.4 l CO_2

⇒ 11.2 L CO_2

$n_{CaCO_3} = \frac{50}{100}$ ⇒ 0.5 mole (Given)

Q.39.>

(b)

Avogadro Hypothesis :- "According to avogadro's hypothesis Under similar condition of Temperature & pressure equal volume of all gases contain equal No. of Molecules."

Q.40.>

(a) No. of Al^{+3} ions $= n_{Al^{+3}} \times N_A$

$= 1 \times 10^{-3} \times 6.022 \times 10^{23}$

$= 6.022 \times 10^{20}$ ions

Ans.

$n_{Al^{+3}} = \frac{\text{Mass (gm)}}{\text{GAM}}$

$= \frac{0.051}{27}$

$= 1 \times 10^{-3}$

Q.41.>

(a) No. of oxygen Atoms = Atomicity $\times n_{CO_2} \times N_A$

$$= 3 \times 2 \times 6.022 \times 10^{23}$$

$$= 24.08 \times 10^{23}$$

$$n_{CO_2} = \frac{88}{44} = 2 \text{ mole}$$

Q.42.>

(b) Both A & R are correct but Reason is not correct explanation of Assertion.

Q.43.>

(c) $X_{0.25}Y_{0.5} \Rightarrow XY_2$

Q.44.>

(d) gram-atoms $= n_{Atom} = \dfrac{\text{Mass (in gm)}}{\text{Molar Mass}}$

Molar Mass of atom = Mass of 1 atom $\times N_A$

$$= 3.32 \times 10^{-23} \times 6.022 \times 10^{23}$$

$$= 20 \text{ gm}$$

$$n_{Atom} \Rightarrow \frac{2000}{20} \Rightarrow 1000$$

Q.45.>

(b)

$$H_2 + Cl_2 \longrightarrow 2HCl$$

mole ⇒ $\frac{100}{2} > \frac{100}{35.5}$ (LR)

$$H_2 + Cl_2 \longrightarrow 2HCl$$

Reference ⇒ 2 gm 71 gm 2 × 36.5

∵ 71 gm of Cl_2 will form ⇒ 73 gm of HCl

∴ 1 gm " " ⇒ $\frac{73}{71}$ gm of H_2

∴ 100 gm " " ⇒ $\frac{73}{71} \times 100$

⇒ 102.8 gm of H_2

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Q.46.>

(c)

$$CH_4(g) + 2O_2(g) \longrightarrow CO_2(g) + 2H_2O(g)$$

	CH_4	O_2	CO_2	H_2O
mole ⇒	1 mole (16 gm)	2 mole (64 gm)	1 mole (44 gm)	2 mole (36 gm)
↓ × 22.4 L				
Volume	22.4 L	44.8 L	22.4 L	44.8 L

Q.47.>

(a) $$\text{mass \% of } x = \frac{\text{wt. of } x}{\text{wt. of solution}} \times 100$$

{∵ wt. of solution = wt. of solute + wt. of solvent

$$= \frac{5}{5+45} \times 100$$

$$= 10\%$$

Q.48.>

(c) $$CuO + H_2 \longrightarrow Cu + H_2O$$

Ref. 1 mole (CuO) ↓ 79.5 gm ; 1 mole (H_2) ↓ 22.4 L

∵ 22.4 L H_2 gas will reacts with ⇒ 79.5 gm of CuO

∴ 1 L " " ⇒ $\frac{79.5}{22.4}$ gm of CuO

∴ 2.8 L " " ⇒ $\frac{79.5}{22.4} \times 2.8$ gm of CuO

⇒ 9.93 gm of CuO

Q.49.>

(d)

Element	% (gm)	Mole = $\frac{\text{Mass}}{\text{Molar mass}}$		Simple ratio
P	27.3	$\frac{27.3}{12} \Rightarrow$	2.275	$\frac{2.275}{2.275} \Rightarrow 1$
Q	72.7	$\frac{72.7}{16} \Rightarrow$	4.54	$\frac{4.54}{2.27} \Rightarrow 2$

Empirical Formula is ⇒ PQ_2

Q.50.>

(d) $2CO(g) + O_2 \longrightarrow 2CO_2(g)$

∵ 1 Litre of O_2 (LR) will reacts with ⇒ 2 litre of CO (used)

Remaining volume of CO_2 ⇒ Total − used

⇒ 3 − 2 ⇒ 1 L of CO

∵ 1 Litre of O_2 will form ⇒ 2 litre of CO_2

Q.51.>

(d)

Element	% (gm)	Mole = $\frac{Mass}{Molar\ mass}$	Simple ratio
C	54.2 gm	4.51	$\frac{4.51}{2.2875} \Rightarrow 2$
H	9.2 gm	9.2	$\frac{9.2}{2.2875} \Rightarrow 4$
O	36.6 gm	2.2875	$\frac{2.2875}{2.2875} \Rightarrow 1$

Empirical Formula ⇒ $C_2H_4O_1$

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Q.52.>

(a)

$$\text{Total volume} = (n_{H_2} + n_{O_2}) \times 22.4 \text{ litre}$$

$$= \left(\frac{2}{2} + \frac{32}{32}\right) \times 22.4$$

$$\Rightarrow 44.8 \text{ litre}$$

Q.53.>

(b)

$$\text{Molarity} = \frac{n_{solute} \times 1000}{V_{sol^n} (\text{in ml})}$$

$$= \frac{0.107 \times 1000}{250}$$

$$= 0.428 \text{ mole } L^{-1}$$

$$n_{solute} = \frac{4.28}{40} = 0.107$$

$$V_{sol^n} = 250 \text{ ml}$$

Q.54.>

C

Total No. of NH_3 molecules $= n_{NH_3} \times N_A$

$= 0.5 \times N_A$

$= 3.011 \times 10^{23}$

$n_{NH_3} = \frac{8.5}{17}$

$= 0.5$

∵ 1 molecule of NH_3 contains ⇒ 3 Atoms of Hydrogen

∴ 3.011×10^{23} " " ⇒ $3 \times 3.011 \times 10^{23}$

$= 9.033 \times 10^{23}$ Atoms of H

Q.55.>

ⓐ

Total No. of CH_4 molecules $= n_{CH_4} \times N_A$

$= 0.1 \times N_A$

$= 6.022 \times 10^{22}$

$n_{CH_4} = \frac{1.6}{16}$

$= 0.1$

∵ 1 molecule of CH_4 contains ⇒ 10 electrons

∴ 6.022×10^{22} " " ⇒ $10 \times 6.022 \times 10^{22}$ electrons

⇒ 6.022×10^{23} electrons

Q.56.>

(d)

$$n_{HCl} = \frac{\text{Mass}}{\text{Molar Mass}} = \frac{3.65}{365} \Rightarrow 0.01$$

$$V_{sol^n} = 100 \text{ ml}$$

$$\text{Molarity} = \frac{n_{solute} \times 1000}{V_{sol^n} (\text{in ml})} = \frac{0.01 \times 1000}{100}$$

$$= 0.1 \text{ mole } L^{-1}$$

Q.57.>

(a)

$$2HCl + Mg(OH)_2 \longrightarrow MgCl_2 + 2H_2O$$

Ref. 2mole 1mole
↓
58.31gm

∵ 2 mole of HCl will reacts with ⇒ 58.31 gm of $Mg(OH)_2$

∴ 1 mole " " ⇒ $\frac{58.31}{2}$

⇒ 29.16 gm of $Mg(OH)_2$

Q.58.>

(d) $$\text{Mass \% of oxygen} = \frac{\text{wt. of oxygen in } C_2H_5OH}{\text{wt. of } C_2H_5OH} \times 100$$

$$= \frac{16}{46} \times 100$$

$$= 34.78\ \%$$

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Q.59.>

(a) $$2KClO_3 \longrightarrow 2KCl + O_2$$

Given ⇒ 4.88 gm 2.96 gm 1.92 gm

Total Mass of $KClO_3$ = Mass of KCl + Mass of O_2

⇓

follow law of conservation of Mass

Q.60.>

(a) $$CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$$

Ref. 100 gm 2 × 36.5 gm

↓ × 1/2 ↓ × 1/2

50 gm **36.5 gm** Ans.

Q.61.>

(a) Law of Multiple Proportion :->

(Given by Dalton)

"According to Law of Multiple proportion if two Elements combine to form more than one compound then the different Mass of one Element which combine with a fixed mass of other Element bear a simple ratio to one another."

Q.62.>

(c) Gay lussac's law is valid only for gaseous substance.

Q.63.>

(b) Atoms combine in the ratio of small whole numbers to form compounds.

Q.64.>

(d) fact (all of the above)

Q.65.>

(b)

Element	% (gm)	Mole = $\frac{Mass}{Molar\ mass}$	Simple ratio
X	50 gm	2.5	$\frac{2.5}{1.25} \Rightarrow 2$
Y	50gm	1.25	$\frac{1.25}{1.25} \Rightarrow 1$

Empirical Formula is X_2Y

Q.66.>

(c) Molecular Formula = n × Empirical Formula

{ n = 1, 2, 3, ...

if **n = 2**

then molecular Formula ⇒ $2 \times [CH_2O_2]$

⇒ $C_2H_4O_4$

Q.67.>

(d)

Element	% (gm)	Mole = $\frac{Mass}{Molar\ mass}$	Simple ratio
C	78 gm	6.5	$\frac{6.5}{6.5} \Rightarrow 1$
H	22gm	22	$\frac{22}{6.5} \Rightarrow 3.38$

Empirical Formula ⇒ C_1H_3 ← Rounding off

Q.68.>

(c)

	H_2	:	O_2	:	CH_4
Mass ⇒	x gm	:	x gm	:	x gm
Mole ⇒	$\frac{x}{2}$	:	$\frac{x}{32}$	:	$\frac{x}{16}$ Litre
Volume ⇒	$\frac{x}{2} \times 22.4$	:	$\frac{x}{32} \times 22.4$	:	$\frac{x}{16} \times 22.4$

⇒ **16 : 1 : 2**

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Q.69.>

(b) 1 mole $= 6.022 \times 10^{23}$ molecules

↓

(58.5 gm of NaCl)

A & R both correct but R is not correct explanation

Q.70.>

(a) equal no. of atoms ⇒ equal no. of Moles of Atom

$n_O \Rightarrow \frac{2}{16} \Rightarrow \frac{1}{8}$

$n_S = \frac{4}{32} \Rightarrow \frac{1}{8}$

} contains equal no. of Atoms

Q.71.>

(b) triatomic gas ⇒ X_3

$$\text{Total Atoms} = \text{Atomicity} \times n_{X_3} \times N_A$$

$$= 3 \times 0.1 \times 6.022 \times 10^{23}$$

$$= 1.806 \times 10^{23}$$

Q.72.>

(a) $$n_{NH_3} = \frac{\text{Mass}}{\text{M.M.}} = \frac{4.25}{17} \Rightarrow 0.25 \text{ moles}$$

$$\text{Total No. of } NH_3 \text{ molecules} = n_{NH_3} \times N_A$$

$$= 0.25 \times N_A$$

$$= 1.5 \times 10^{23}$$

∵ 1 molecule of NH_3 contains ⇒ 4 Atoms

∴ 1.5×10^{23} " " ⇒ $4 \times 1.5 \times 10^{23}$

$$= 6 \times 10^{23}$$

Q.73->

(d) $N_2(g) + 3H_2(g) \longrightarrow 2NH_3(g)$

∵ 2 mole of NH_3 will form by ⇒ 3 moles of H_2

∴ 1 mole ,, ,, ⇒ $\frac{3}{2}$ moles of H_2

∴ 20 moles ,, ,, ⇒ $\frac{3}{2} \times 20$

⇒ 30 moles of H_2

Q.74->

(a) 63 % w/w HNO_3

↓

63 gm HNO_3 present in 100 gm solution

$$n_{HNO_3} = \frac{63}{63} \Rightarrow 1 \text{ mole}$$

$$\text{density} = \frac{\text{Mass of solution}}{\text{Volume of sol}^n}$$

$$\text{volume of sol}^n = \frac{100}{1.4} \text{ ml}$$

Now

$$M = \frac{n_{solute} \times 1000}{\text{volume of sol}^n (\text{in ml})} = \frac{1 \times 1000 \times 1.4}{100}$$

$$\Rightarrow 14 \text{ M}$$

Q.75.>

(C) HCOOH $\xrightarrow{\text{con. } H_2SO_4}$ CO(g) + H_2O (l)

(CO: Neutral)

Ref. 44 gm → 28 gm

× 1/20 → × 1/20

2.3 gm → **1.4 gm**

COOH
|
COOH $\xrightarrow{\text{con. } H_2SO_4}$ CO(g) + CO_2(g) + H_2O (l)

(CO_2: acidic)

Ref. 90 gm → 28 gm, 44 gm

× 1/20 → × 1/20, × 1/20

4.5 gm → **1.4 gm**, **2.2 gm**

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CO(g) + CO_2 $\xrightarrow{\text{KOH Pellets}}$

(1.4 + 1.4) ⇓ 2.8 gm   2.2 gm

KOH will absorb CO_2 (acidic) gas

2.8 gm of CO Pass

Q.76.>

(d) mole = M × V (in litre)

$NaCl \longrightarrow Na^+ + Cl^-$

mole ⇒ 0.3 × 0.3 ⇓ 0.09 ; Cl^- ⇓ 0.09 mole

$BaCl_2 \longrightarrow Ba^{+2} + 2Cl^-$

mole ⇒ 0.4 × 0.2 ⇓ 0.08 ; 2 × 0.08 ⇓ 0.16 mole

$$[Cl^-] = \frac{\text{Total moles of } Cl^- \times 1000}{\text{Total volume of solution (in ml)}}$$

$$= \frac{(0.09 + 0.16) \times 1000}{300 + 200}$$

$$= 0.5\ M$$

Q.77.>

(a)

$\because$ 6.022×10^{23} atoms $\Rightarrow$ 12 gm carbon

$\therefore$ 1 atoms $\Rightarrow$ $\frac{12}{6.022 \times 10^{23}}$ gm carbon

$\therefore$ 6.022×10^{20} atom $\Rightarrow$ $\frac{12}{6.022 \times 10^{23}} \times 6.022 \times 10^{20}$

$\Rightarrow$ 0.012 gm /mole

Q.78.>

(c) Gay-Lussac's law :→

Given by → Gay-Lussac

"According to this law gases react with each other in simple ratio of their volume & if product is also in gaseous state then the volume of the product is also bear simple ratio to the volume of gaseous reactant when all volume are measured under similar condition of Temperature & Pressure"

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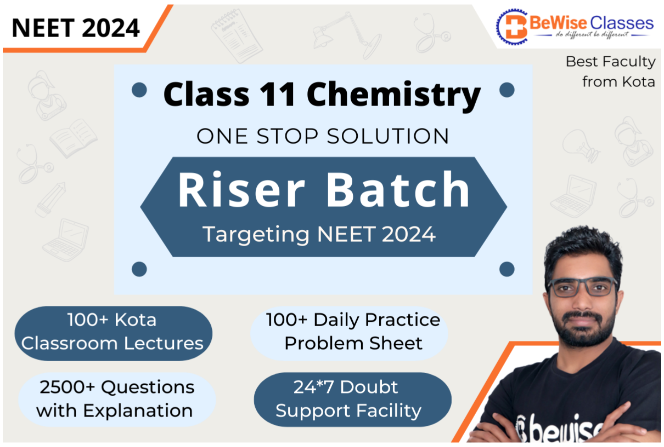
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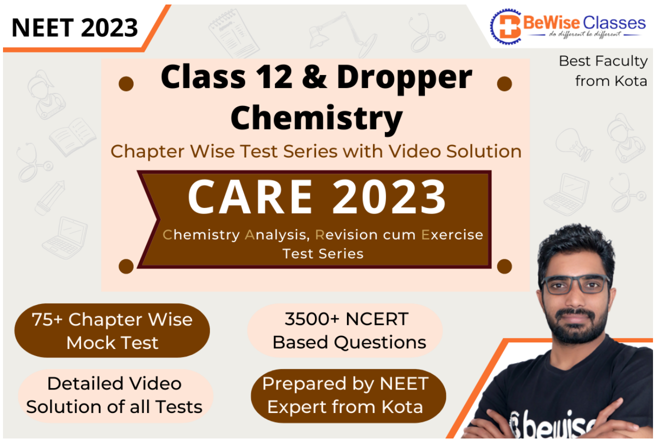
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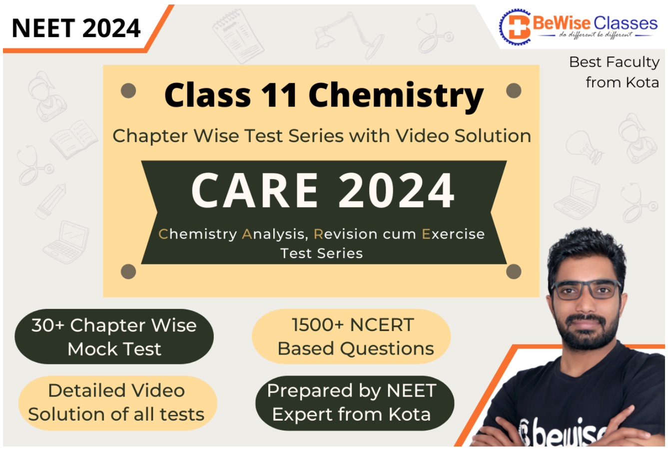
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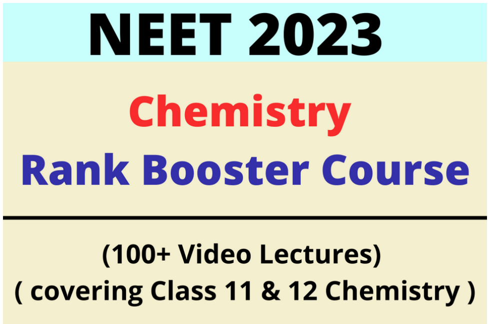
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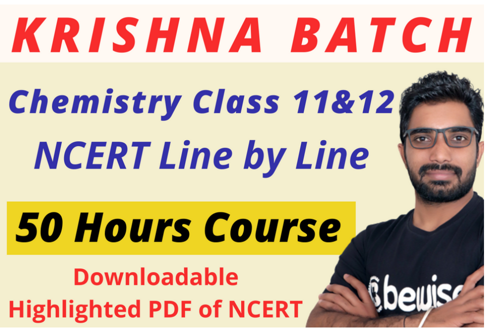
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