

MOLE CONCEPT

GB Sir

HW →

Example XIII
 S. h. honey

(52)



$$M_{avg} = \frac{80}{1 + \alpha/2} = 56$$

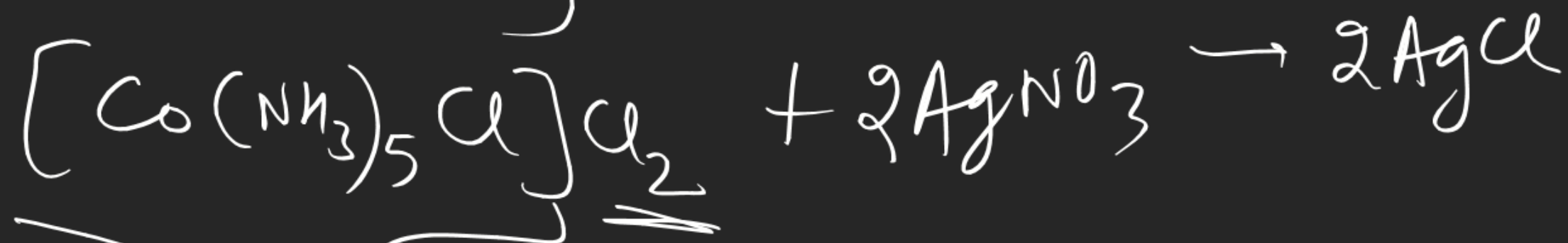
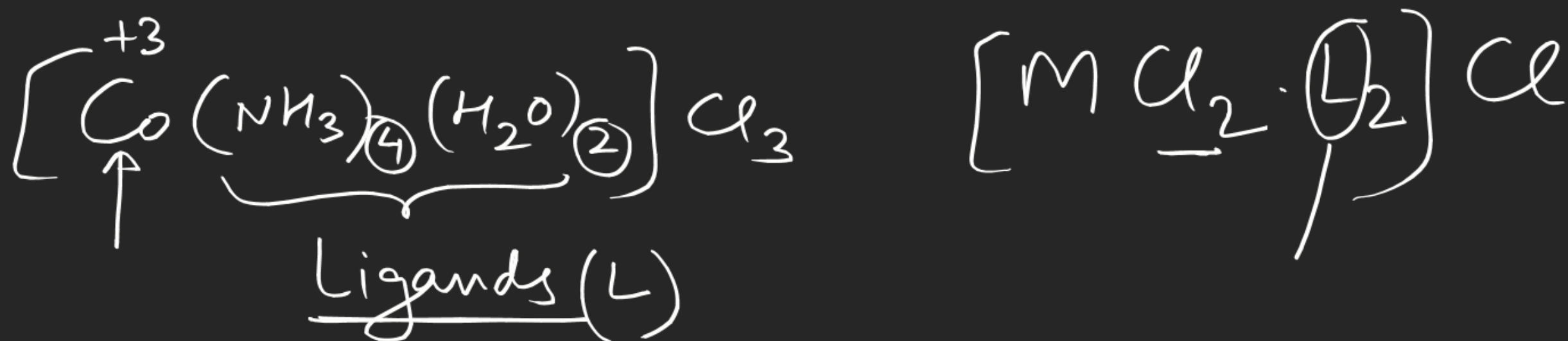
V.D \propto M_{avg}

S-1 (48)

C H O

44 4 32

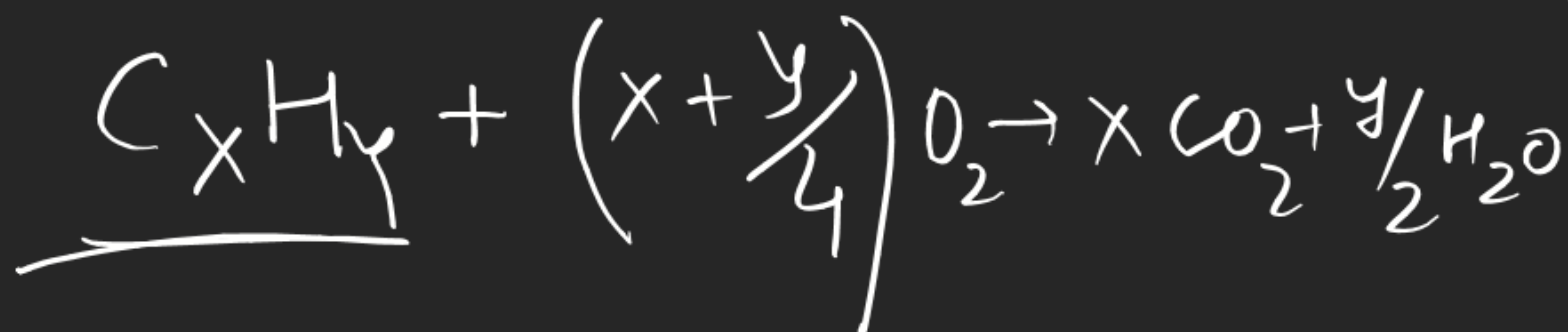
MOLE CONCEPT



Coordination
Sphere

MOLE CONCEPT

⑨



$$y = 2x$$

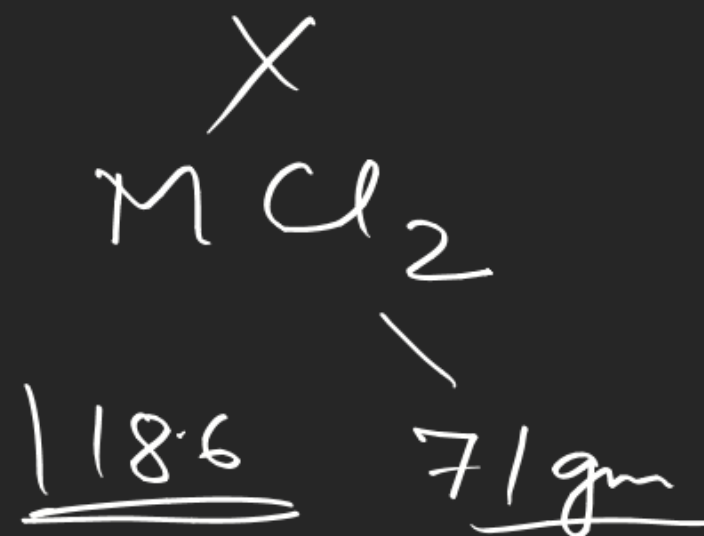
$$x = 2 \quad y = 4 \quad z = 3$$

$$\left(x + \frac{y}{4}\right) \times 2 = z$$

$$x + \frac{y}{4} = z$$

MOLE CONCEPT

$$M = \frac{94.8 \times 2}{189.6}$$



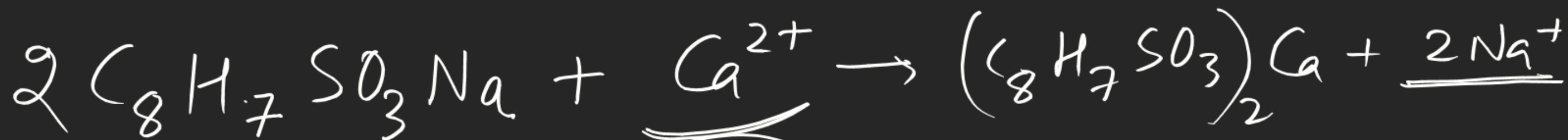
250 mg

141 mg
 $AgBr$

$$\left(80 \times \frac{141}{188} \text{ mol} \right)$$

MOLE CONCEPT

(13)

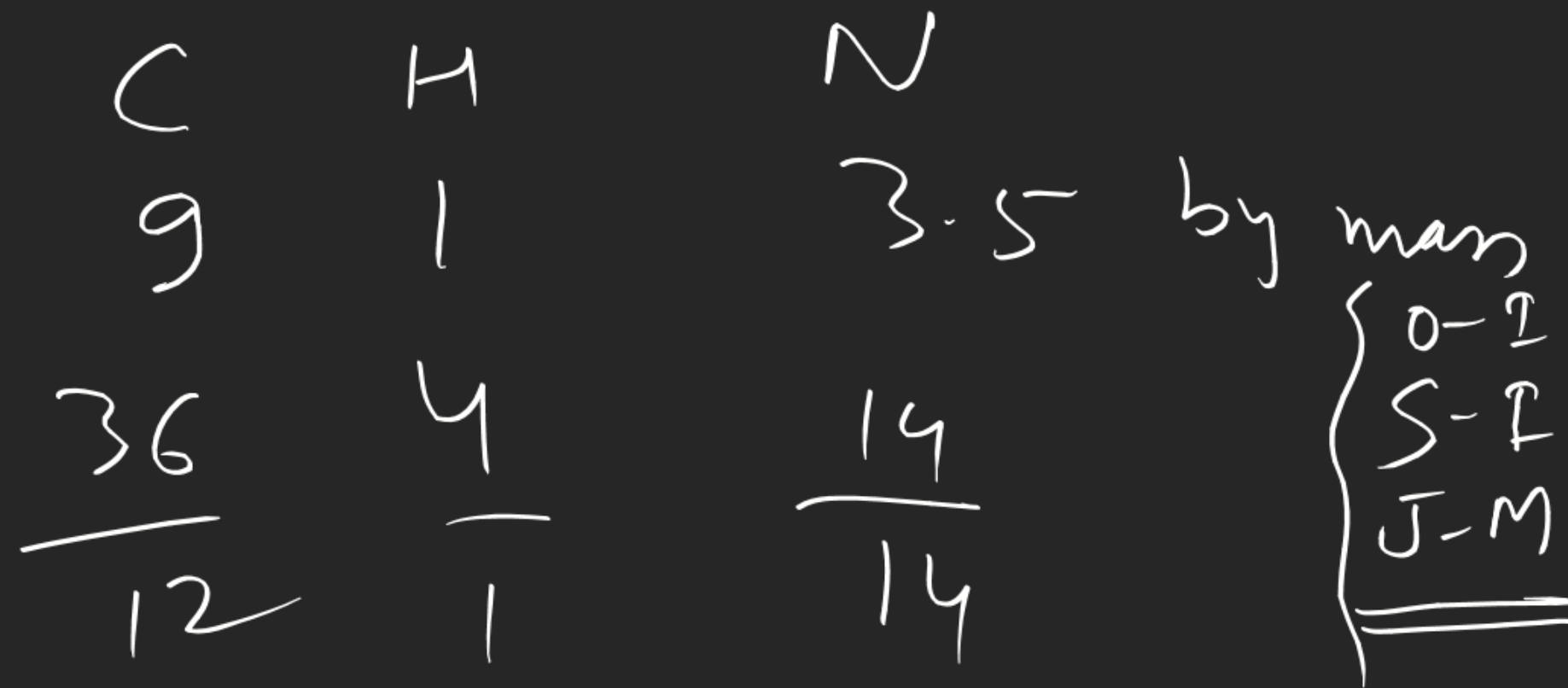


ppt

$$\frac{1 \text{ gm}}{206}$$

$$\frac{1}{206} \times \frac{1}{2}$$

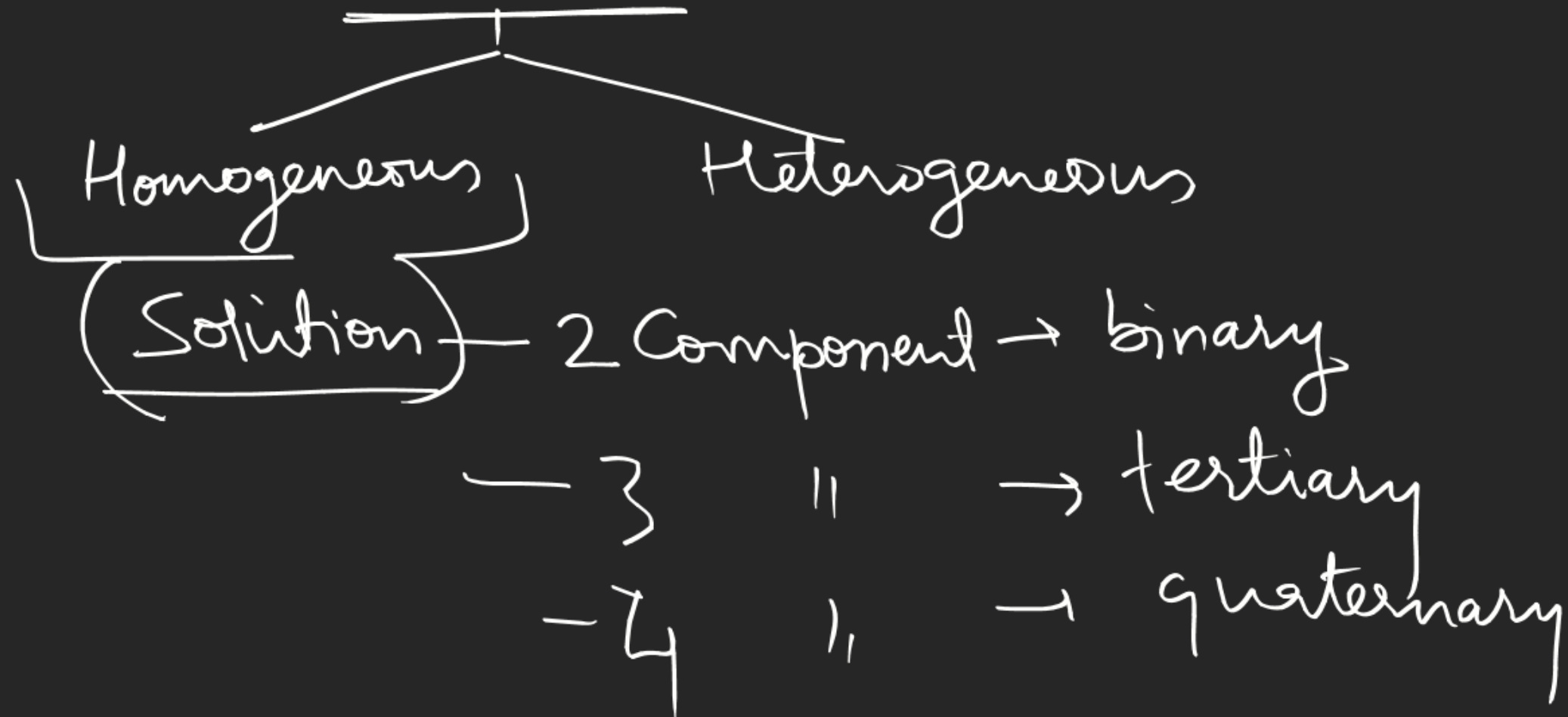
MOLE CONCEPT



MOLE CONCEPT

Concentration terms

Concentration terms are used to express the amount of a substance in its mixture



Binary solution \Rightarrow Solute + Solvent

\downarrow \downarrow

(which is less in amount) (which is more in amount)

50 gm $H_2O(l)$ 50 gm $CH_3OH(l)$

① % W/W (% by mass) 40% W/W NaOH (aq)

100 gm solution contains 40 gm NaOH

$$W_{\text{solvent}} = W_{\text{H}_2\text{O}} = 60 \text{ gm}$$

② % W/V 40% W/V NaOH

100 ml solution contains 40 gm NaOH

Given density of solⁿ = 1.5 gm/ml

$$\text{Mass of solution} = V \times d = 100 \times 1.5 = \underline{150 \text{ gm}}$$

$$W_{\text{solvent}} = 110 \text{ gm}$$

% W/W

$$150 \text{ gm} \rightarrow 40$$

$$100 - \frac{40}{150} \times 100$$

$$= \frac{400}{15}$$

③ %V/V (% by volume)

20% V/V O_2 in air ($O_2 + N_2$)

100 ml air contains 20 ml O_2

P, T

$$\begin{aligned}\text{Vol of } N_2 &= 100 - 20 \\ &= 80 \text{ ml}\end{aligned}$$

d

④ gm/lit



(mass of solute
per litre solⁿ)

40 gm/lit NaOH

1000 ml solution contains 40 gm NaOH

100 ml

||

||

4 gm NaOH

%w/v NaOH = 4

$$\text{gm/lit} = 10 \times (\%w/v)$$

ppm : \rightarrow (parts per million)

200 ppm CaCO_3 in H_2O

10^6 gm solution contains 200 gm CaCO_3

$$\begin{aligned}\underline{W_{\text{solvent}}} &= (10^6 - 200) \text{ gm} \\ &\approx \underline{10^6 \text{ gm}}\end{aligned}$$

$$\text{ppm} = 10^4 \times (\% \text{W/W})$$

$$10^6 \text{ gm} \rightarrow 200$$

$$\underline{100 \text{ gm}}$$

$$\rightarrow \frac{200}{10^6} \times 100 = \frac{2}{100} = 0.02 \text{ gm } \text{CaCO}_3$$

$$\% \text{W/W} = 0.02$$



Molarity (M) \rightarrow $2M \text{ NaOH(aq)}$

\Rightarrow 1000 ml solⁿ contains 2 mol NaOH

$$= 2 \times 40 \text{ gm NaOH}$$

$$= \underline{80 \text{ gm NaOH}}$$

(i) $\text{gm/lit} = 80$

(ii) $\% \text{ w/v}$

$$= 8$$

$$1000 \text{ ml} \rightarrow 80 \text{ gm}$$

$$100 \text{ ml} \rightarrow 8 \text{ gm}$$

$\text{gm/lit} = \text{Molarity} \times \text{Molar mass}$

$$(m) \text{ Molarity} = \frac{\text{no. of moles}}{\text{Volume of Solution (lit)}}$$

$$= \frac{\text{no. of mol}}{V \text{ (ml)}} \times 1000$$

$$\text{no. of moles} = M \times V \text{ (lit)}$$

$$\text{no. of millimoles} = M \times V \text{ (ml)}$$

$$\underline{1 \text{ mol} = 10^3 \text{ mmol}}$$

$$\begin{aligned} &= 0.01 \text{ mol} \\ &= 10 \text{ mmol} \end{aligned}$$

$$\underline{\text{no. of mmol} = 1000 \times \text{no. of moles}}$$

Molality (m)

2m NaOH

1000 gm solvent contains 2mol NaOH

$$2 \times 40 \text{ gm NaOH} \\ = 80 \text{ gm NaOH}$$

$$\text{mass of solution} = 1000 + 80 \\ = 1080 \text{ gm}$$

no. of moles
of solute
per kg solvent

$$\underline{\text{molality (m)}} = \frac{\text{no. of moles of solute}}{\text{mass of solvent (kg)}} = \frac{n}{\text{mass of solvent (gm)}} \times 1000$$