Volume Strength of H_2O_2, % labelling of Oleum

Course on Mole Concept for Class XI

akhilesh • Lesson 12 • June 29, 2021

(8) $CH_3OH \longrightarrow CH_3O^- + H^+$

$0.5(1-\alpha)$ $\quad 0.5\alpha$ $\quad 0.5\alpha = 2.5 \times 10^{-4}$

(14) 1 mol solution contain 0.2 mol urea

$n_{H_2O} =$ 0.8 mol H_2O

(17) $10^6 - 17 = 10^6$

20

69.8% w/v HNO_3 50 ml	+	$H_2O(l)$ V ml	=	20% w/v (50 + V)

34.9 gm + 0 = $\frac{20}{100} \times (50 + V)$

(21)

500 gm

0·2 mol fract of urea

+

1000 gm

=

mole fraction

H_2O | Urea

0·8 | 0·2

0·8 × 18 | 12 gm

14·4 gm

= 26·4 gm

26·4 gm → 14·4 gm

500 gm → $\frac{14.4}{26.4} \times 500$

(21) 100 ml 80% w/w H_2SO_4

$d = 1.96$ gm/ml

$W_{soln} = 196$ gm

H_2SO_4 $\frac{80}{100} \times 196$ gm

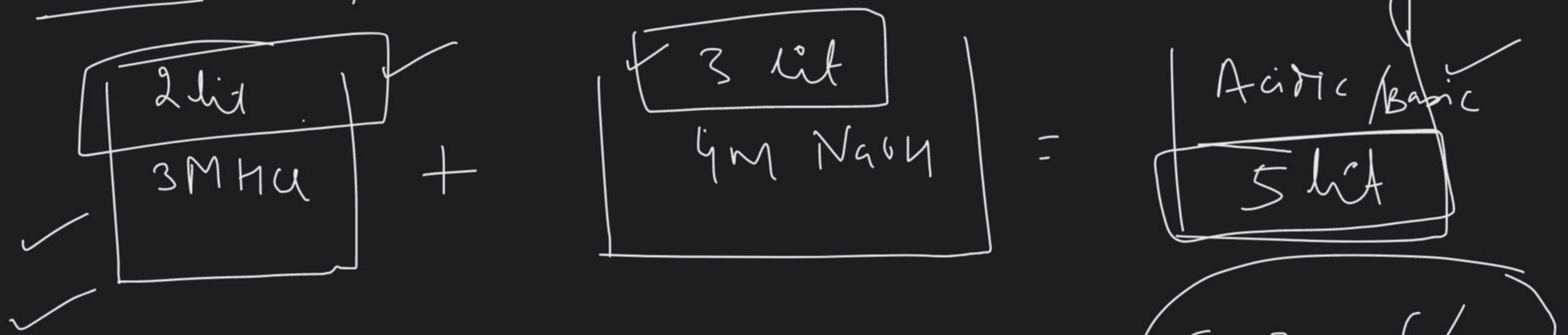
2 N

$SO_3 + H_2O \rightarrow H_2SO_4$

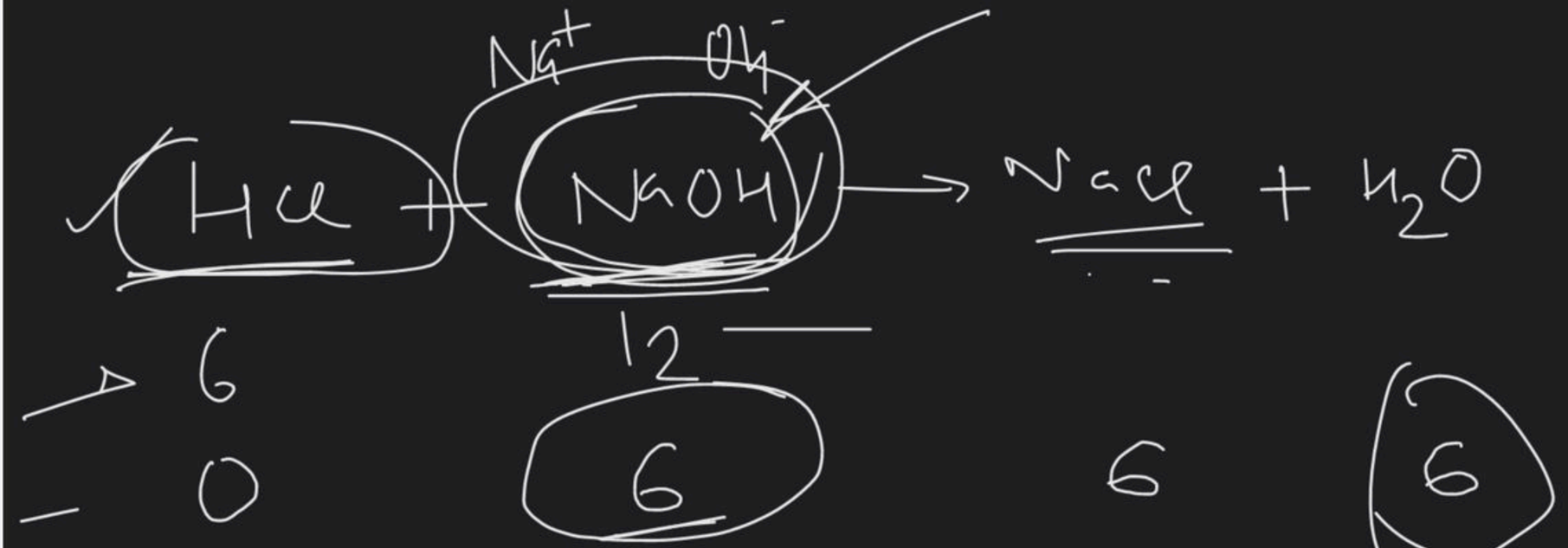
$\frac{4}{80}$ $\frac{1}{2}$ 0

$\frac{1}{20} \times 98$

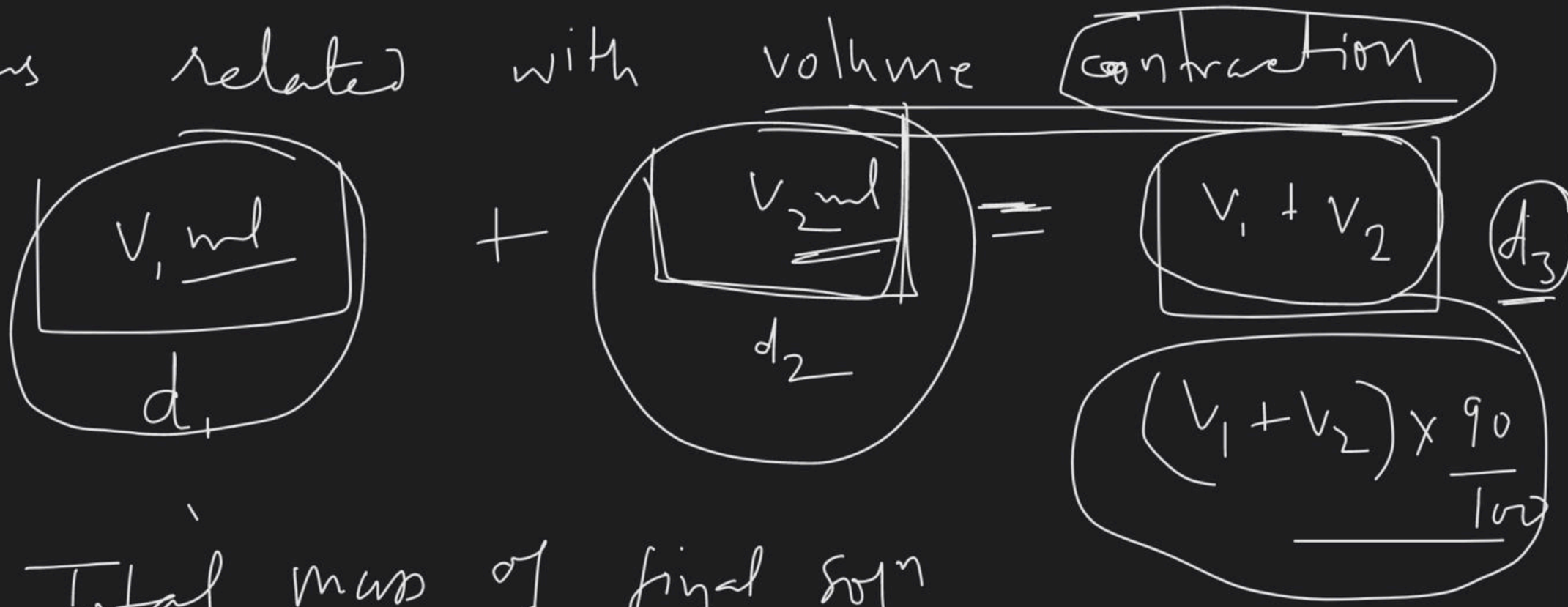
Case-II If chemical occurs on mixing



$[OH^-] = 6/5$



Problems related with volume contraction



$$V_{final} = \frac{\text{Total mass of final soln}}{\text{density of final soln}}$$

$$= \frac{V_1 d_1 + V_2 d_2}{d_3} = \frac{W_1 + W_2}{d_3}$$

Q. 16.8 ml pure H_2O is mixed with 3.2 gm CH_3OH. find molarity of CH_3OH if density of final soln is 0.8 gm/ml.

(A) 100/8.4

(B) 100/16.8

(C) 4

(D) 2

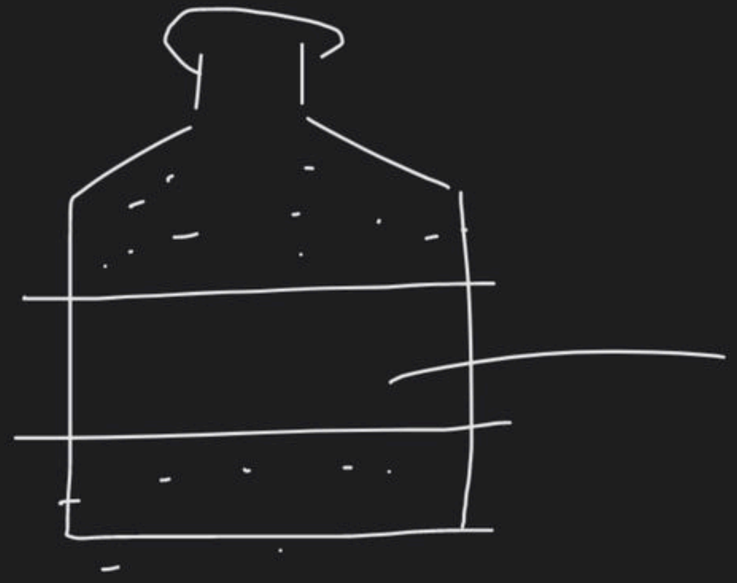
16.8 gm + 3.2 gm = 20 gm

$= \frac{200}{0.8} = 25$ ml

$= \frac{0.1}{25} \times 1000 = 4$

Volume strength of H_2O_2 :⟶ 2M

$$2H_2O_2 \longrightarrow 2H_2O + O_2$$



'20V' H_2O_2 (aq)

20V ≡

1 lit solution gives 20 lit O_2 at STP after ~~when~~ complete decomposition of H_2O_2.

5 lit '10V' H_2O_2 (aq)

V_{O_2} = 50 lit O_2 at STP

2M H_2O_2 (aq)

1 lit H_2O_2 Molarity $= x$

$$2H_2O_2(aq) \longrightarrow 2H_2O(aq) + O_2(g)$$

x $\qquad$ $x/2$ mol

$$\text{Vol. of } O_2 = \frac{x}{2} \times 22.7$$

$$\text{Vol. Strength} = x \times 11.35$$

$$\boxed{\text{Vol. str} = \text{Molarity} \times 11.35}$$

old convention

Vol str = M × 11.2

(A) 22.7
(B) 45.4
(C) 11.35
(D) None

Q. $NH_3(aq)$ decomposes to give $N_2H_2(aq)$ & $H_2(g)$. find relationship bet. vol. str and Molarity similar to $H_2O_2(aq)$

Vol. str = M × y

$$2NH_3 \longrightarrow N_2H_2 + 2H_2$$

1 mol

x x

Vol. str $= x \times 22.7$