

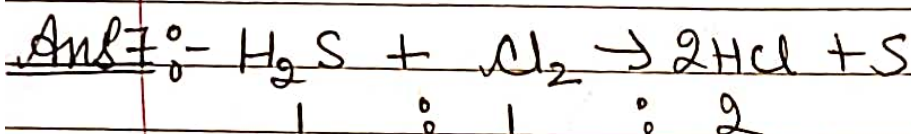
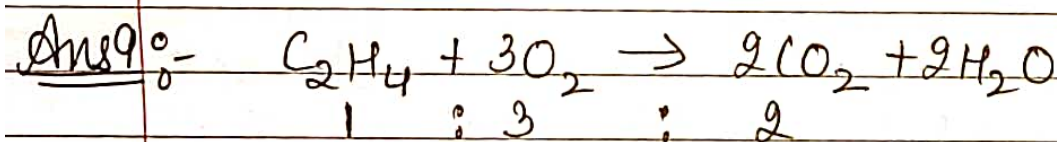
CLASS - X

SUBJECT - CHEMISTRY

CHAPTER - 5

TEACHER - MOHINISHA THAKUR

ANSWER - KEY

Mole Concept and Stoichiometry
Exercise 5(A)(112 cm³) (120 cm³)112 cm³ of H₂S will react with 112 cm³ of Cl₂Unused Cl₂ = 120 - 112 = 8 cm³112 cm³ of H₂S will produce 112 × 2 = 224 cm³ of HCl.(i) Volume of gaseous product = 224 cm³ of HCl(ii) Resulting mixture will be product + unused gas = 224 cm³ HCl + 8 cm³ of unused Cl₂

(11 lit) ?

11 litres of C₂H₄ will require 11 × 3 = 33 lit O₂
at T = 273°C and P = 380 mm HgFor finding the volume O₂ at STP we will use gas equation.Let P₁ = 380 mm, T₁ = 273°C = 273 + 273V₁ = 33 L

= 546 K

STP → P₂ = 760 mm, T₂ = 273 K, V₂ = ?

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$V_2 = \frac{P_1 V_1 T_2}{P_2 T_1} = \frac{380 \times 33 \times 273}{760 \times 546} = \frac{33}{4} = 8.25 \text{ litres}$$

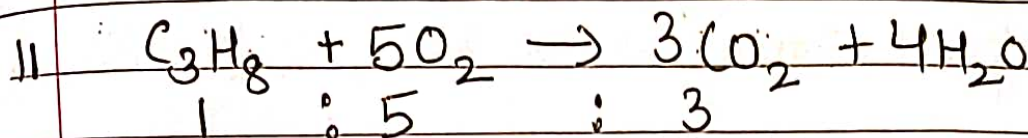
(P.T.O.)

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[Air contains 21% or around $\frac{1}{5}$ th oxygen]

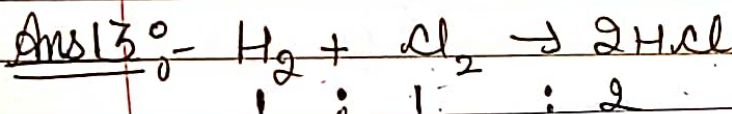
Air used = 500 cm^3 , it means O_2 used = $500 \times \frac{1}{5} = 100 \text{ cm}^3$

Now according to the ratio,

5 volumes of O_2 requires 1 volume of C_3H_8

$\therefore$ 1 volume of O_2 requires 1 volume of C_3H_8

$\therefore$ 100 cm^3 of O_2 will require $100 \times \frac{1}{5} = 20 \text{ cm}^3$ of C_3H_8



(6L) (4L)

H_2 and Cl_2 are used in same ratio, it shows

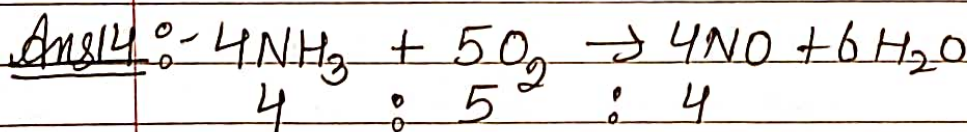
4 lit of Cl_2 will react with 4 lit. of H_2

Unused $\text{H}_2 = 6 - 4 = 2$ litres

4 lit. of Cl_2 will give $4 \times 2 = 8$ litres of HCl gas

Result:- (8 litres HCl (g) + 2 litres H_2 (g))

When water is added to the resultant gases, HCl gas being highly soluble in water dissolves completely by 2 litres of H_2 (gas) is left behind.



Given that $\text{NH}_3 + \text{O}_2 = 27$ litres used

Amount of NH_3 consumed = $\frac{27}{4+5} \times 4 = \frac{27}{9} \times 4 = 12$ litre

Amount of O_2 consumed = $\frac{27}{4+5} \times 5 = \frac{27}{9} \times 5 = 15$ litres (P.T.O)

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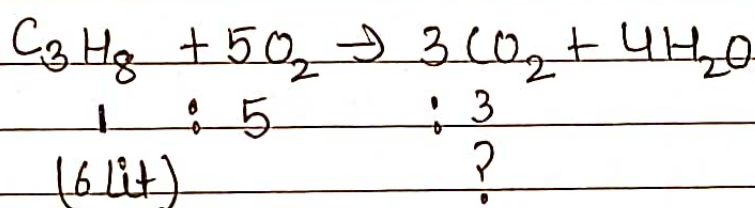
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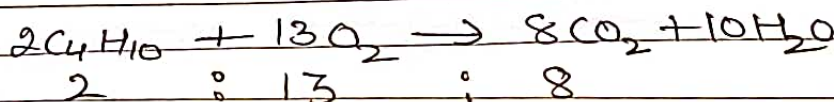
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Ratio of NH_3 and NO are same, therefore NO produced = 12 litres.

17%:- 10 litres of mixture = 60% C_3H_8 and 40% C_4H_{10}
It means $\text{C}_3\text{H}_8 = 6$ litres and $\text{C}_4\text{H}_{10} = 4$ litres

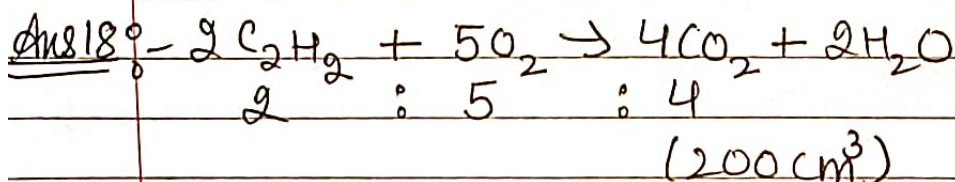


1 Volume of C_3H_8 will produce 3 volumes of CO_2
6 litre of C_3H_8 will produce $6 \times 3 = 18$ litre of CO_2



2 Volume of C_4H_{10} will produce 8 volumes of CO_2
 $\therefore$ 1 volume of C_4H_{10} will produce $\frac{8}{2} = 4$ volumes of CO_2
 $\therefore$ 4 volumes or 4 litres of C_4H_{10} will produce
 $4 \times 4 = 16$ litre of CO_2

Total CO_2 produced = $18 + 16 = 34$ litres of CO_2



4 volume of CO_2 requires 2 volume of C_2H_2
 $\therefore$ 1 volume of CO_2 will require $\frac{2}{4} = \frac{1}{2}$ volume of C_2H_2
 $\therefore$ 200 litre of CO_2 will require $\frac{200 \times 1}{2} = 100$ litre C_2H_2

4 volume of CO_2 requires 5 volume of O_2
 $\therefore$ 1 volume of CO_2 requires $\frac{5}{4}$ volume of O_2 (b.T.O)