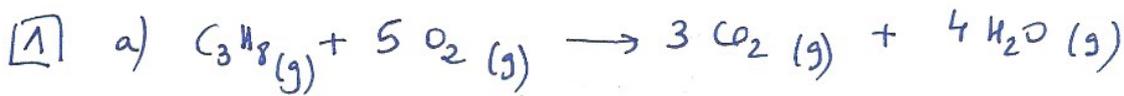


Solucions ESTEQUIOMETRIA - Repàs



b) $n_{CO_2}?$

propà $\left\{ \begin{array}{l} V = 1 dm^3 = 0'001 m^3 \\ T = 298 K \\ P = 1'01 \cdot 10^5 Pa \end{array} \right.$

$$\boxed{P \cdot V = n \cdot R \cdot T}$$

$$n = \frac{P \cdot V}{R \cdot T} = \frac{1'01 \cdot 10^5 \cdot 0'001}{8'31 \cdot 298} = 0'0407 \text{ mol propà}$$

$$0'0407 \text{ mol propà} \cdot \frac{3 \text{ mol } CO_2}{1 \text{ mol } C_3H_8} = \underline{\underline{0'1223 \text{ mol } CO_2}}$$

c) $V_{aire}?$

aire $\left\{ \begin{array}{l} T = 25^\circ C = 298 K \\ P = 1'01 \cdot 10^5 Pa \\ V = 1 dm^3 \text{ propà} \end{array} \right.$

aire té $21\% O_2 = \frac{21 L O_2}{100 L \text{ aire}}$ $\xrightarrow{\text{d'abans } 0'0407 \text{ mol propà. } \frac{5 \text{ mol } O_2}{1 \text{ mol propà}} =$

$$= \underline{\underline{0'2035 \text{ mol } O_2}}$$

$0'2035 \text{ mol } O_2 \xrightarrow{\hspace{2cm}}$

$$P \cdot V = n R T$$

$$V_{O_2} = \frac{n_{O_2} R T}{P} = \frac{0'2035 \cdot 8'31 \cdot 298}{1'01 \cdot 10^5} = 4'98 \cdot 10^{-3} m^3 O_2$$

$$V = 4'98 \cdot 10^{-3} m^3 O_2 \cdot \frac{1000 dm^3}{1 m^3} \cdot \frac{1 L}{1 dm^3} \cdot \frac{100 L \text{ aire}}{21 L O_2} = \underline{\underline{23'75 L \text{ aire}}}$$

2



$$\begin{array}{l} 3'5\text{g} \\ 200 \text{ cm}^3 \\ 25'8\% \text{ en massa} \\ d = 1140 \text{ kg/m}^3 \end{array}$$

a)

$$\text{mols: } 3'5\text{g Zn} \cdot \frac{1 \text{ mol Zn}}{65'4\text{g}} = \underline{\underline{0'0535 \text{ mol Zn}}}$$

$$200 \text{ cm}^3 \cdot \frac{1 \text{ m}^3}{10^6 \text{ cm}^3} \cdot \frac{1140 \text{ kg}}{1 \text{ m}^3} \cdot \frac{1000 \text{ g}}{1 \text{ kg}} \cdot \frac{25'8\% \text{ HCl}}{100\% \text{ dissolució}} \cdot \frac{1 \text{ mol HCl}}{36'5\text{g HCl}} = \underline{\underline{1'61 \text{ mol HCl}}}$$

densitat dissolució

Si reactiu limitant és el Zn, què en fa falta de HCl?

$$0'0535 \text{ mol Zn} \cdot \frac{2 \text{ mol HCl}}{1 \text{ mol Zn}} = \underline{\underline{0'107 \text{ mol HCl}}}, \text{ i en canvi en femos més, en tenim d'61 mol HCl. Per tant, HCl està en } \underline{\underline{\text{exés}}}$$

La suposició és correcta \Rightarrow **Zn REACTIU LIMITANT**

b) V_{H_2} ?

$$T = 25^\circ\text{C} = 298\text{K}$$

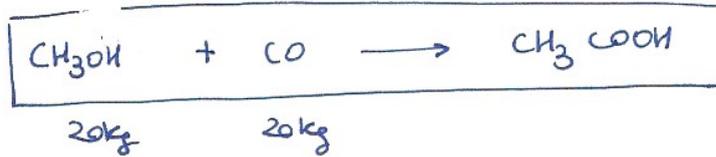
$$P = 1'01 \cdot 10^5 \text{ Pa} = 1 \text{ atm}$$

$$P \cdot V = n R T$$

$$V_{\text{H}_2} = \frac{n R T}{P} = \frac{0'0535 \cdot 0'082 \cdot 298}{1} = \underline{\underline{1'30 \text{ l H}_2}}$$

$$0'0535 \text{ mol Zn} \cdot \frac{1 \text{ mol H}_2}{1 \text{ mol Zn}} = \underline{\underline{0'0535 \text{ mol H}_2}}$$

3.- s'obté CH_3COOH :



$$R_e = 90\% = \frac{90 \text{ g}}{100 \text{ g teòric}}$$

$V_{\text{CH}_3\text{COOH}}$?

$$80\% \text{ em massa} = \frac{80 \text{ g CH}_3\text{COOH}}{100 \text{ g dissolució}}$$

$$d = \frac{1070 \text{ kg dissolució}}{1 \text{ m}^3 \text{ dissolució}}$$

* Qui és RL?

$$\boxed{\text{CH}_3\text{OH}} \quad 20 \text{ kg} = 20.000 \text{ g} \cdot \frac{1 \text{ mol}}{32 \text{ g}} = 625 \text{ mol CH}_3\text{OH} \quad \left. \begin{array}{l} \longrightarrow \text{el que en té menys} \longrightarrow \boxed{\text{RL}} \\ \boxed{1:1} \end{array} \right\}$$

$$\boxed{\text{CO}} \quad 20 \text{ kg} = 20.000 \text{ g} \cdot \frac{1 \text{ mol}}{28 \text{ g}} = 714,28 \text{ mol CO}$$

$$625 \text{ mol CH}_3\text{OH} \cdot \frac{1 \text{ mol CH}_3\text{COOH}}{1 \text{ mol CH}_3\text{OH}} \cdot \frac{60 \text{ g CH}_3\text{COOH}}{1 \text{ mol CH}_3\text{COOH}} \cdot \frac{100 \text{ g dissolució}}{80 \text{ g CH}_3\text{COOH}} \cdot \frac{1 \text{ m}^3}{1070 \cdot 10^3 \text{ g dissolució}} \cdot \frac{1000 \text{ L}}{1 \text{ m}^3}$$

Però la RL té $R_e = 90\%$: $\boxed{R_e = \frac{\text{real}}{\text{teòric}}}$

$$43,8 \cdot 0,9 = \underline{\underline{39,42 \text{ L CH}_3\text{COOH real}}}$$

$$43,8 \text{ L teòrics} \cdot \left[\frac{90 \text{ L real}}{100 \text{ L teòrics}} \right] =$$

43,8 L
CH₃COOH