

6^η ΕΡΓΑΣΙΑ ΧΗΜΕΙΑΣ Α' ΛΥΚΕΙΟΥ

ΕΝΔΕΙΚΤΙΚΕΣ ΛΥΣΕΙΣ

$$\textcircled{1} \quad M_r, \text{NH}_3 = 14 + 3 \cdot 1 = 17$$

$$n = \frac{m}{M_r} \Rightarrow m = n \cdot M_r = 0,2 \cdot 17 = \underline{3,4 \text{ g NH}_3}$$

$$n = \frac{V}{22,4} \Rightarrow V = n \cdot 22,4 = 0,2 \cdot 22,4 = \underline{4,48 \text{ L NH}_3}$$

$$n = \frac{N}{N_A} \Rightarrow N = n \cdot N_A = \underline{0,2 \cdot N_A \text{ μόρια NH}_3}$$

$$\textcircled{2} \quad \rho = \frac{m}{V} \Rightarrow m = \rho \cdot V = 1 \frac{\text{g}}{\text{mL}} \cdot 0,054 \text{ mL} = 0,054 \text{ g}$$

$$M_r, \text{H}_2\text{O} = 2 \cdot 1 + 16 = 18$$

$$n = \frac{m}{M_r} = \frac{0,054}{18} = 0,003 \text{ mol}$$

$$n = \frac{N}{N_A} \Rightarrow N = n \cdot N_A = 0,003 \cdot N_A \text{ μόρια H}_2\text{O}$$

1 μόριο H₂O περιέχει 3 άτομα πρωτονίων

$$\text{άρα} \quad 3 \cdot 0,003 \cdot N_A = \underline{0,009 \cdot N_A \text{ άτομα πρωτονίων}}$$

$$\textcircled{3} \quad \frac{N_{,A}}{N_{,B}} = \frac{3}{1} \Rightarrow N_{,A} = 3 \cdot N_{,B} \quad \textcircled{1}$$

$$A_{r,B} = 3 \cdot A_{r,A} \quad \textcircled{2}$$

$$m_A = N_{,A} \cdot A_{r,A} = \frac{N_{,A}}{N_{AVog}} \cdot A_{r,A}$$

$$m_B = N_{,B} \cdot A_{r,B} = \frac{N_{,B}}{N_{AVog}} \cdot A_{r,B}$$

$$\frac{m_A}{m_B} = \frac{\frac{N_{,A} \cdot A_{r,A}}{N_{AVog}}}{\frac{N_{,B} \cdot A_{r,B}}{N_{AVog}}} = \frac{N_{,A} \cdot A_{r,A}}{N_{,B} \cdot A_{r,B}} \quad \begin{matrix} \textcircled{1} \\ \textcircled{2} \end{matrix}$$

$$= \frac{3 \cdot \cancel{N_{,B}} \cdot \cancel{A_{r,A}}}{\cancel{N_{,B}} \cdot 3 \cdot \cancel{A_{r,A}}} = 1 \Rightarrow \underline{m_A = m_B}$$

④

Эта смесь x моль CO , y моль CO_2 , w моль CH_4

$$M_{\text{r, CO}} = 12 + 16 = 28$$

$$M_{\text{r, CO}_2} = 12 + 2 \cdot 16 = 44$$

$$M_{\text{r, CH}_4} = 12 + 4 \cdot 1 = 16$$

$$m_{\text{H}} = m_{\text{CO}} + m_{\text{CO}_2} + m_{\text{CH}_4} =$$
$$= n_{\text{CO}} \cdot M_{\text{r, CO}} + n_{\text{CO}_2} \cdot M_{\text{r, CO}_2} + n_{\text{CH}_4} \cdot M_{\text{r, CH}_4}$$

$$16,4 = x \cdot 28 + y \cdot 44 + w \cdot 16 \quad (1)$$

$$V_{\text{CO}} + V_{\text{CO}_2} + V_{\text{CH}_4} = V_{\text{H}}$$

$$n_{\text{CO}} \cdot 22,4 + n_{\text{CO}_2} \cdot 22,4 + n_{\text{CH}_4} \cdot 22,4 = 13,44$$

$$x \cdot 22,4 + y \cdot 22,4 + w \cdot 22,4 = 13,44$$

$$(x + y + w) \cdot 22,4 = 13,44 \Rightarrow$$

$$x + y + w = 0,6 \quad (2)$$

$$\frac{n_{\text{CO}}}{n_{\text{CO}_2}} = \frac{x}{y} \Rightarrow \frac{x}{y} = \frac{1}{2} \Rightarrow y = 2x \quad (4)$$

$$\frac{n_{\text{CO}}}{n_{\text{CH}_4}} = \frac{x}{w} \Rightarrow \frac{x}{w} = \frac{1}{3} \Rightarrow w = 3x \quad (5)$$

② $\xrightarrow{\begin{matrix} (4) \\ (5) \end{matrix}}$

$$x + 2x + 3x = 0,6 \Rightarrow$$

$$x = 0,1$$

$$d_{\text{P}_2} \quad n_{\text{CO}} = 0,1$$

$$n_{\text{CO}_2} = 0,2$$

$$n_{\text{CH}_4} = 0,3$$

$$M_{CO} = x \cdot 28 = 0,1 \cdot 28 = 2,8 \text{ g}$$

$$M_{CO_2} = y \cdot 44 = 0,2 \cdot 44 = 8,8 \text{ g}$$

$$M_{CH_4} = w \cdot 16 = 0,3 \cdot 16 = 4,8 \text{ g}$$

$$V_{CO} = 0,1 \cdot 22,4 = 2,24 \text{ L}$$

$$V_{CO_2} = 0,2 \cdot 22,4 = 4,48 \text{ L}$$

$$V_{CH_4} = 0,3 \cdot 22,4 = 6,72 \text{ L}$$