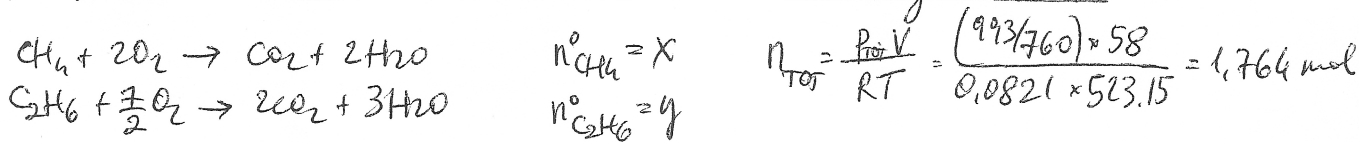
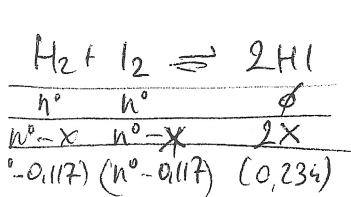


# Soluzioni della Prova Scritta del 17 luglio 2014



$$\begin{aligned} 16,05x + 30,08y &= 10 \\ 3x + 5y &= 1,764 \end{aligned} \quad \left\{ \begin{aligned} x &= 0,3115 \text{ mol} = n_{\text{CH}_4}^0 \\ y &= 0,1662 \text{ mol} = n_{\text{C}_2\text{H}_6}^0 \end{aligned} \right. \quad \left\{ \begin{aligned} m_{\text{CH}_4}^0 &= 5,0 \text{ g} \\ m_{\text{C}_2\text{H}_6}^0 &= 5,0 \text{ g} \end{aligned} \right. \quad \left\{ \begin{aligned} \% \text{CH}_4 &= \underline{\underline{50,0}} \\ \% \text{C}_2\text{H}_6 &= \underline{\underline{50,0}} \end{aligned} \right.$$

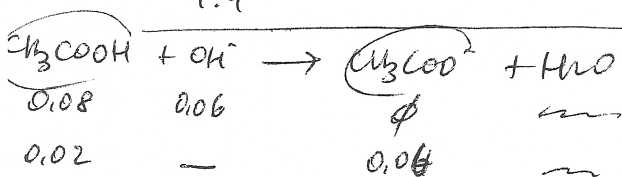
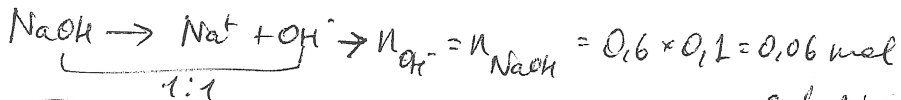


$$\left\{ \begin{aligned} [\text{HI}] &= \frac{2x}{V} = 7,20 \cdot 10^{-2} \text{ M} \rightarrow x = 0,117 \text{ mol} \\ V &= 3,25 \text{ l} \end{aligned} \right. \rightarrow$$

$$\rightarrow K = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]} = \frac{(0,234)^2}{(n^0 - 0,117)^2} = 50,28 \rightarrow \frac{0,234}{n^0 - 0,117} = \sqrt{50,28} \rightarrow$$

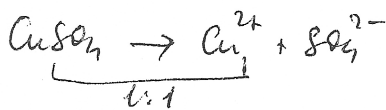
$$n^0 = 0,117 + \frac{0,234}{\sqrt{50,28}} = \underline{\underline{0,150 \text{ mol}}} = n_{\text{H}_2}^0 = n_{\text{I}_2}^0$$

$$n_{\text{CH}_3\text{COOH}} = 0,4 \text{ l} \times 0,2 \text{ M} = 0,08 \text{ mol}$$

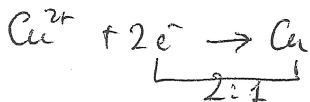


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 $K_a = 1,8 \cdot 10^{-5} > 10^{-7}$

$$\begin{aligned} \text{pH} &= \text{p}K_a + \log \frac{[\text{CH}_3\text{COO}^-]}{[\text{CH}_3\text{COOH}]} \\ &= 4,74 + \log \frac{0,06}{0,02} = \underline{\underline{5,22}} \end{aligned}$$



$$n_{\text{Cu}^{2+}} = n_{\text{CuSO}_4} = 0,1 \text{ l} \times 0,15 \frac{\text{mol}}{\text{l}} = 0,015 \text{ mol}$$



$$n_{\text{Cu}} = \frac{1}{2} n_{\text{e}^-} = \frac{I \times t}{2F} \cdot \frac{90}{100} = \frac{0,2 \times 8400 \times 90}{2 \times 96486 \times 100} = 7,83 \cdot 10^{-3} \text{ mol}$$

$$m_{\text{Cu}} = n_{\text{Cu}} \cdot M_{\text{Cu}} = 7,83 \cdot 10^{-3} \times 63,55 = \quad (n_{\text{Cu}} < n_{\text{Cu}^{2+}})$$

$$\approx \underline{\underline{0,50 \text{ g}}} = 500 \text{ mg} \quad (\underline{\underline{498 \text{ mg}}})$$