

Soluzione della Prova Scritta del 24/1/2022 - BGER - in presenza

$$E1) n_C = n_{CO_2} = \frac{7,04g}{44,01g/mol} = 0,160 mol ; n_H = 2 \cdot n_{H_2O} = 2 \cdot \frac{2,40g}{18,02g/mol} = 0,266 mol$$

$$m_C = n \cdot M = 0,160 \cdot 12,011 = 1,921g ; m_H = n \cdot M = 0,266 \cdot 1,008 = 0,269g$$

$$m_O = m_{C_xH_yO_z} - (m_C + m_H) = 3,90 - (1,921 + 0,269) = 1,71g$$

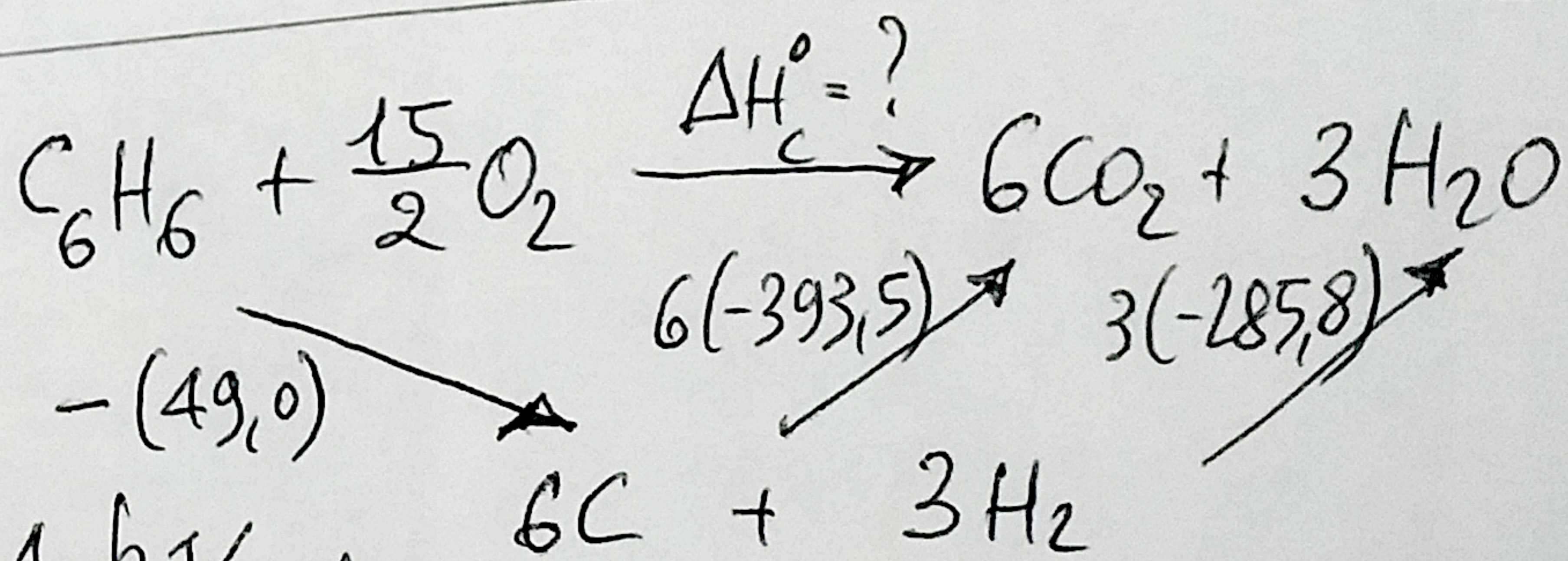
$$n_O = \frac{1,71g}{15,999g/mol} = 0,107 mol ; \left. \begin{array}{l} C: 0,160/0,107 = 1,5 \rightarrow 3 \\ H: 0,266/0,107 = 2,5 \rightarrow 5 \\ O: 0,107/0,107 = 1,0 \rightarrow 2 \end{array} \right\} \begin{array}{l} \text{formula} \\ \text{MINIMA} \\ C_3H_5O_2 \end{array}$$

$$M(C_3H_5O_2) = 73,07g/mol$$

$$\frac{M(C_xH_yO_z)}{M(C_3H_5O_2)} = 2 \rightarrow C_6H_{10}O_4$$

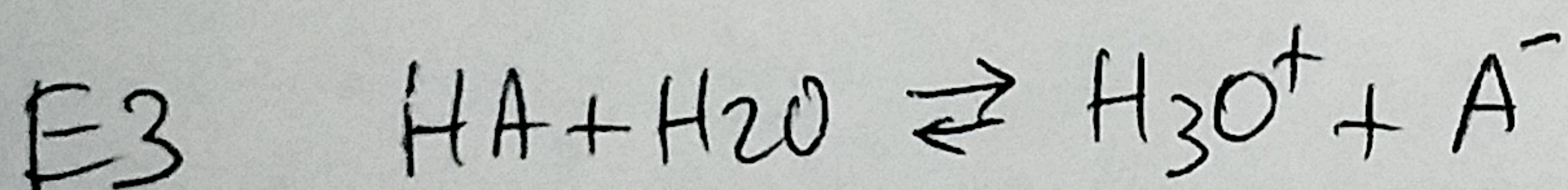
(f. MOLECOLARE)

$$E2) n_{C_6H_6} = \frac{7,812g}{78,12g/mol} = 0,10 mol$$



$$\Delta H_c^\circ = 6(-393,5) + 3(-285,8) - (49,0) = -3267,4 kJ/mol$$

$$Q = n |\Delta H_c^\circ| = 0,10 \cdot |-3267,4| = 326,74 kJ$$



$$pH = 2,3 \rightarrow [H_3O^+] = 10^{-2,3} \gg 10^{-7} \rightarrow$$

$$\rightarrow [H_3O^+] = c_d \rightarrow c = \frac{[H_3O^+]}{\alpha} = \frac{10^{-2,3}}{0,29} = 1,73 \times 10^{-2} M$$