

$$\Delta S_{R, 800K}^{\circ} = -76,45 - 3,089 = -79,532 \text{ J/K.mol} \quad (0,5)$$

$$\Delta G_{r, 800K}^{\circ} = -520,75 - 800 \cdot (-79,532 \cdot 10^{-3})$$

$$= -462,724 \text{ kJ/mol} \quad (0,5)$$

Exo 2 (4pts)

- E.R. le corps pur

$$\begin{cases} a_i = \frac{P_i}{P_i^*} \\ a_i = \gamma_i \cdot x_i \\ x_i = 0,013 \end{cases} \Rightarrow \begin{cases} a_1 = \frac{P_1}{P_1^*} = \frac{5,35}{2,13} = 0,025 \quad (0,25) \\ \gamma_1 = \frac{a_1}{x_1} = \frac{0,025}{0,013} = 1,923 \quad (0,25) \end{cases}$$

- E.R. Solution infiniment diluée:

$$\begin{cases} a_i = \frac{P_i}{K_i} \\ K_i = \frac{P_i^*}{x_i} \\ x_i \rightarrow 0 \\ a_i = \gamma_i' \cdot x_i \end{cases}$$

$$\Rightarrow \begin{cases} K_1 = \frac{P_1^*}{x_1} = \frac{2,13}{0,00394} = 538,071 \text{ mmHg} \quad (0,5) \\ a_1' = \frac{P_1}{K_1} = \frac{5,35}{538,071} = 0,01 \quad (0,25) \\ \gamma_1' = \frac{a_1'}{x_1} = \frac{0,01}{0,013} = 0,769 \quad (0,25) \end{cases}$$

Exo 3 (4pts)

$$V = n_{\text{eau}} \bar{V}_{\text{eau}} + n_{\text{alco}} \bar{V}_{\text{alco}} \quad (0,5)$$

pour 100g de solution $\begin{cases} \rightarrow 60 \text{ g alcool} \\ \rightarrow 40 \text{ g d'eau} \end{cases}$

$$n_{\text{alcool}} = \frac{m_{\text{alco}}}{M_{\text{alco}}} = \frac{60}{32} = 1,875 \text{ mol} \quad (0,5)$$

$$n_{\text{eau}} = \frac{m_{\text{eau}}}{M_{\text{eau}}} = \frac{40}{18} = 2,22 \text{ mol} \quad (0,5)$$

$$V_{\text{sol}} = \frac{m_{\text{sol}}}{\rho_{\text{sol}}} \Rightarrow V_{\text{sol}} = V = \frac{100}{0,8946} = 111,782 \text{ cm}^3 \quad (0,5)$$

$$\text{d'où : } V = n_{\text{eau}} \bar{V}_{\text{eau}} + n_{\text{alco}} \bar{V}_{\text{alco}}$$

$$\bar{V}_{\text{alco}} = \frac{1}{n_{\text{alco}}} (V - n_{\text{eau}} \bar{V}_{\text{eau}}) \quad (0,5)$$

$$\bar{V}_{\text{alco}} = \frac{1}{1,875} (111,78 - 2,22 \cdot 16,8) = 39,72 \text{ cm}^3 / \text{mol} \quad (0,5)$$