$\boxed{11-2}$ část 1

$\dot{m}_{RO} = 1500 \ kg/h \qquad\qquad p = 101,3 \ kPa$

$w_0 = 0,1 \qquad w_1 = 0,3 \qquad t_P = 130°C$

$t_{RO} = 30°C$

1) $\quad \dot{m}_{RO} = \dot{m}_{R1} + \dot{m}_{B1} \qquad 1500 = \dot{m}_{R1} + \dot{m}_{B1} \implies \dot{m}_{B1} = 1500 - 500 = 1000 \ kg/h$

$\dot{m}_{RO} \, w_0 = \dot{m}_{R1} \, w_1 \qquad 1500 \cdot 0,1 = \dot{m}_{R1} \approx 0,3 \implies \dot{m}_{R1} = 500 \ kg/h$

$$\dot{m}_{RO} \, h_{RO} + Q_V = \dot{m}_{R1} \, h_{R1} + \dot{m}_{B1} \, h_{B1}$$

$A - NaOH$
$B - H_2O$

2) elevace

$t_{R1}^0 = 100°C$

$\Delta_e = 3816 / (11,67 + aX + bX^2 + cX^3) - 327$

$a = -0,9853 \qquad\qquad w = 0,3 \implies X$
$b = -0,8253$
$c = 0,4717$

$w = \dfrac{m_A}{m_A + m_B} \qquad X = \dfrac{m_A}{m_B} = \dfrac{m_A}{m_A} \cdot \dfrac{w}{1-w}$

$\downarrow$

$w \, m_A + w \, m_B = m_A$

$w \cdot m_B = m_A - w \cdot m_A$

$X_1 = \dfrac{0,3}{1-0,3} = 0,4286 \qquad m_B = m_A \cdot \left(\dfrac{1-w}{w}\right) \qquad X_0 = \dfrac{0,1}{1-0,1} = 0,111$

$\Delta_e = 15,77°C$

$\boxed{\begin{array}{l} \text{NaOH} \quad \overset{a}{7,34} \quad \overset{b}{125 \cdot 10^{-3}} \quad \overset{c}{13,38 \cdot 10^5} \quad J/mol \, K \\[4pt] \qquad C_p = a + b \cdot T + c/T^2 \\[8pt] \qquad M_{NaOH} = 40 \cdot 10^{-3} \ \dfrac{kg}{mol} \end{array}}$

$\underline{\underline{t_{R1} = 115,77 \ °C}}$

$C_p(NaOH, 15°C) = 59,47 \ \dfrac{J}{mol \cdot K} \implies 1486,75 \ \dfrac{J}{kg \, K}$

$C_p(NaOH, 58°C) = 60,93 \ \dfrac{J}{mol \cdot K} \longrightarrow 1523,25 \ \dfrac{J}{kg \, K}$

| 11-2 | část 2

$$h_{RO} = \left[w_0 \cdot t_{RO} \cdot C_p(15) + (1-w_0) \cdot h(voda, t_{RO}) + \cancel{w_0}\ 0,1 \cdot (-1071) \right] 10^3$$

$$h_{R1} = w_1\ t_{R1}\ C_p(60) + (1-w_1) \cdot h(voda, t_{R1}) + 0,3 \cdot (-954) \cdot 10^3$$

$$h_{RO} = 0,1 \cdot 30 \cdot 1,487 + 0,9 \cdot 125,67 + 0,1(-1071) = 10,464\ \frac{kJ}{kg}$$

$$h_{R1} = 0,3 \cdot 115,77 \cdot 1,523 + 0,7 \cdot \overset{482,54}{\cancel{544,74}} + 0,3 \cdot (-954) = \cancel{11,18}\ \frac{kJ}{kg}$$

$$\phantom{h_{R1}} = 104,47$$

$$h_{R1} = 2698,8\ W/kg$$

$$1500 \cdot 10,464 + \dot{Q}_v = 1000 \cdot 2699 + 500 \cdot 104,47$$

$$\dot{Q}_v = 2735539\ kJ/hod$$

$$\dot{m}_p = \frac{\dot{Q}_v}{\Delta h_v (130°)} = \frac{2735539}{2174} = 1258\ kg/h$$