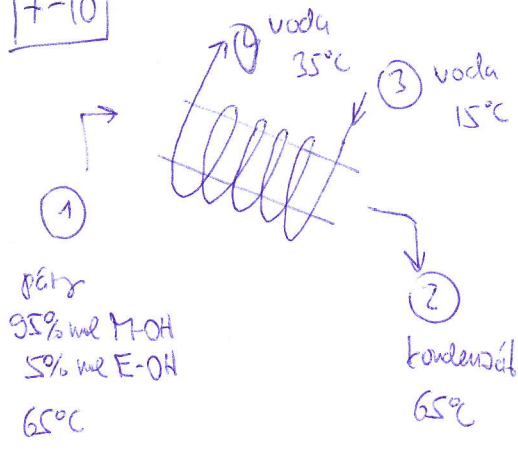


7-10



ref. stav:  $t_{ref} = 15^\circ\text{C}$

voda  
metanol (l)  
etanol (l)

$h_3 = 0$  (stejná jako ref. stav.)

$h_4 = C_p \cdot (35 - 15)$  - ohřev z ref. stavu na  $35^\circ\text{C}$   
 ↑ voda při  $25^\circ\text{C}$

$h_2 = C_p \cdot (65 - 15)$  - ohřev z ref. stavu na  $65^\circ\text{C}$   
 ↑ směs Met/Et při  $40^\circ\text{C}$

$h_1 = h_2 + \Delta_{cv}h$   
 ↑ směs Met/Et při  $65^\circ\text{C}$

- ohřev z ref. stavu a změna skupenství z (l) na (g)

$h_1 \dot{m}_{12} + h_3 \dot{m}_{34} = h_2 \dot{m}_{12} + h_4 \dot{m}_{34}$

$m_1 = m_2 = \dot{m}_{12}$

$m_3 = m_4 = \dot{m}_{34}$

$(h_1 - h_2) \dot{m}_{12} = (h_4 - h_3) \dot{m}_{34}$

$(h_2 + \Delta_{cv}h - h_2) \dot{m}_{12} = (C_p \cdot (35 - 15) - 0) \cdot \dot{m}_{34}$   
 ↑ voda,  $25^\circ\text{C}$

$\Delta_{cv}h \cdot \dot{m}_{12} = C_p \cdot (35 - 15) \cdot \dot{m}_{34}$   
 ↑ směs  $65^\circ\text{C}$       ↑ voda,  $25^\circ\text{C}$

$C_{p, \text{voda}} = 4,18 \text{ kJ/kj}\cdot\text{K}$

$\Delta_{cv}h_A = 1110 \text{ kJ/kj}$   
 ↑ metanol,  $65^\circ\text{C}$

$\dot{m}_{34} = \frac{\Delta_{cv}h \cdot \dot{m}_{12}}{C_p \cdot (35 - 15)}$

$\dot{m}_{34} = \frac{1092 \text{ kJ/kj} \cdot 120 \text{ kj/h}}{4,18 \text{ kJ/kj}\cdot\text{K} \cdot (35 - 15) \text{ K}}$

$\Delta_{cv}h_B = 860,3 \text{ kJ/kj}$   
 ↑ etanol,  $65^\circ\text{C}$

$\dot{m}_{34} = 1567 \text{ kg/hod}$

Převod  $x_i \rightarrow w_i$

$M_A = 32 \text{ kg/kmol}$

$M_B = 46 \text{ kg/kmol}$

$w_A = \frac{0,95 \cdot 32}{0,95 \cdot 32 + 0,05 \cdot 46} = 0,9297$

$\Delta_{cv}h = 0,9297 \cdot 1110 + (1 - 0,9297) \cdot 860,3 = 1092 \text{ kJ/kj}$