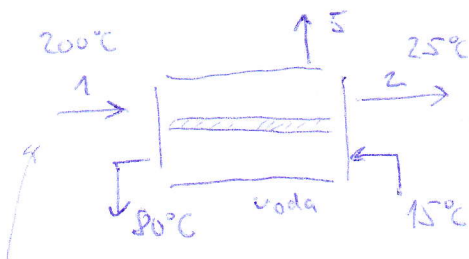


7-9



1200 kg/h směs ethylen/vodní pára  
(200 kg/h vodní pára)

$CH_2=CH_2$   
 $p = 1 \cdot 10^5 \text{ Pa}$   
ochlazený plyn nosičem  
vodní párou

$M_A = 18 \text{ kg/kmol (voda)}$   
 $M_B = 28 \text{ kg/kmol (ethylen)}$

$$\dot{m}_1 = 1200 \text{ kg/h}$$

$$w_A = \frac{200}{1200} = 1/6 \text{ vodní páry}$$

plyn nosičem  
vodní párou  
+ kondenzát

$$p \cdot y = p^\circ(25^\circ\text{C})$$

$$\uparrow 3143 \text{ Pa}$$

$$y = \frac{3143}{1 \cdot 10^5} = 0,03143 \text{ mol/mol}$$

$$w = \frac{y \cdot M_A}{y \cdot M_A + (1-y) \cdot M_B} = \frac{0,03143 \cdot 18}{0,03143 \cdot 18 + 0,96857 \cdot 28}$$

$$w = 0,02043 \text{ kg/kg}$$

$\dot{m}_1 w_A$

$$\dot{m}_1 = \dot{m}_2 + \dot{m}_5$$

$$(1 - w_{A1}) \cdot \dot{m}_1 = (1 - w_{A2}) \cdot \dot{m}_2$$

$$1200 = \dot{m}_2 + \dot{m}_5$$

$$(1 - 1/6) \cdot 1200 = (1 - 0,02043) \cdot \dot{m}_2$$

$$\dot{m}_2 = 1020,9 \text{ kg}$$

$$\dot{m}_5 = 179,1 \text{ kg}$$

Red. stav

ethylen - plyn

voda - kapalina

$$t_{red} = 25^\circ\text{C}$$

$$h_1 = 1/6 h(\text{pára}, 200^\circ\text{C}) + 5/6 h(\text{ethylen}, 200^\circ\text{C})$$

$$h_2 = 0,02043 \cdot h(\text{pára}, 25^\circ\text{C}) + (1 - \dots) \cdot h(\text{ethylen}, 25^\circ\text{C})$$

$$h_3 = h(\text{voda}, 15^\circ\text{C})$$

$$h_4 = h_3 + \int_{15}^{80} c_p dT = h_3 + 271,7 \text{ kJ/kg}$$

$$h(\text{ethylen}, 200^\circ\text{C}) = 1,882 \cdot (200 - 25)$$

$$= 329,35 \text{ kJ/kg}$$

$$h(\text{pára}, 25^\circ\text{C}) = 2442,1 + 1,506 \cdot (200 - 25)$$

$$= 2775,7 \text{ kJ/kg}$$

Tabulky

$$2775,5 - 104,75 =$$

$$= 2680$$

$h_1 = 737,1 \text{ kJ/kg}$	$m_1 h_1 + m_3 h_3 = m_2 h_2 + m_4 h_4$
$h_2 = 49,89 \text{ kJ/kg}$	$m_1 h_1 - m_2 h_2 - m_5 h_5 = m_3 (h_4 - h_3)$
$h_4 = h_3 + 271,7 \text{ kJ/kg}$	
$h_5 = 0$	
	$1200 \cdot 737,1 - 1020,9 \cdot 49,89 - 0$
	$= m_3 \cdot (271,7)$
$m_3 = 3,068 \text{ tun}$	