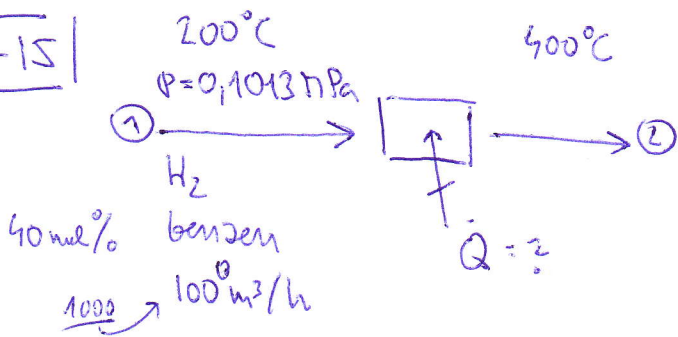


7-15



Ref. state

$$T_{\text{ref}} = 200^\circ\text{C}$$

$\text{H}_2 = (\text{g})$

benzen = (g)

$$h_1 = 0$$

$$h_2 = \bar{C}_p \cdot (400 - 200)$$

$$\bar{C}_p = 0,4 \cdot C_p^{\text{benzen}} + 0,6 \cdot C_p^{\text{H}_2}$$

\uparrow 300°C \uparrow 300°C
 152,01 29,36 J/mol·K
 J/mol·K

$$\bar{C}_p = 78,42 \text{ J/mol}\cdot\text{K}$$

$$h_2 = 78,42 \cdot (400 - 200) = \underline{\underline{15,684 \text{ kJ/mol}}}$$

Ent. balance: $\dot{m}_1 h_1 + \dot{Q} = \dot{m}_2 h_2$
 $\dot{m}_1 = \dot{m}_2 = \dot{m}_{12}$

$$\dot{Q} = \dot{m}_{12} (h_2 - h_1)$$

$$\dot{Q} = 7,153 \cdot (15,683 - 0)$$

$$\dot{Q} = 112,19 \text{ kJ/s}$$

$$\dot{Q} = \underline{\underline{112,19 \text{ kW}}}$$

$$P_1 \dot{V}_1 = \dot{m}_1 RT$$

$$P_1 \dot{V}_1 = \dot{m}_1 RT$$

$$\dot{m}_1 = \frac{P_1 \dot{V}_1}{RT} = \frac{0,1013 \cdot 10^6 \cdot (1000/3600)}{8,314 \cdot (273,15 + 200)}$$

$$\dot{m}_1 = \underline{\underline{7,153 \text{ mol/s}}}$$