



Aufgabe 5

$$t_1 = 20^\circ\text{C} \quad \varphi_1 = 40\%$$

$$t_2 = 50^\circ\text{C} \quad \varphi_2 = 80\%$$

$$p = p_0 \text{ isobar}$$

$$\frac{\dot{v}_{L1}}{\dot{v}_{L2}} = \frac{2}{3} =: \eta$$

- Ableiten: $x_1 = 0,0059$ $h_1 = 35,5 \frac{\text{kJ}}{\text{kg}}$

$$x_2 = 0,0674 \quad h_2 = 225 \frac{\text{kJ}}{\text{kg}}$$

$$\eta = \frac{x_3 - x_2}{x_1 - x_3} \Rightarrow x_3 = \frac{\eta x_1 + x_2}{1 + \eta} = 0,0428 \Rightarrow h_3 = 148 \frac{\text{kJ}}{\text{kg}}, \quad t_3 = 38^\circ\text{C}, \quad \varphi_3 = 93\%$$

- Rechnen: $p_s(t_1) = 0,0234 \text{ bar}$ $p_s(t_2) = 0,124 \text{ bar}$

$$\Rightarrow x_1 = \frac{M_w}{M_L} \frac{\varphi_1 p_s(t_1)}{p - \varphi_1 p_s(t_1)} = 0,00580 \quad x_2 = 0,0672 \Rightarrow x_3 = 0,0426$$

$$h_{\text{Luft}1} = c_{pL} t_1 + x_1 (r_{00} + c_{pD} t_1) = 34,8 \frac{\text{kJ}}{\text{kg}} \quad h_{\text{Luft}2} = 224,5 \frac{\text{kJ}}{\text{kg}} \quad h_{\text{Luft}3} = 148,6 \frac{\text{kJ}}{\text{kg}}$$

$$\Rightarrow t_3 = \frac{h_{\text{Luft}3} - x_3 r_{00}}{c_{pL} + x_3 c_{pD}} = 38,76^\circ\text{C} \Rightarrow p_s(t_3) = 0,0631 \text{ bar}$$

$$\varphi_3 = \frac{p}{p_s(t_3)} \frac{x_3}{x_3 + M_w/M_L} = 0,941$$