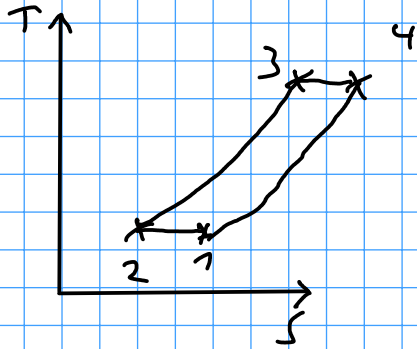
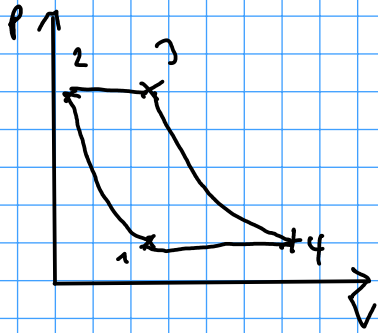


Emission-Prozess



$$Q_2 = Q_{23} + Q_{34}$$

$$Q_{ab} = Q_{41} + Q_{12}$$

$$Q_{23} = \mu c_p (T_3 - T_2) = \mu c_p (T_4 - T_1) \\ = -\mu c_p (T_1 - T_4) = -Q_{41}$$

$$Q_{34} = \mu R_i T_3 \ln\left(\frac{p_1}{p_2}\right) = \mu R_i T_3 \ln\left(\frac{p_2}{p_1}\right)$$

$$Q_{12} = \mu R_i T_1 \ln\left(\frac{p_1}{p_2}\right) = -\mu R_i T_1 \ln\left(\frac{p_2}{p_1}\right)$$

$$-W_R = \sum Q_i = \mu R_i (T_3 - T_1) \ln\left(\frac{p_2}{p_1}\right)$$

$$\Rightarrow \eta_R = \frac{-W_R}{Q_2} = \frac{\mu R_i (T_3 - T_1) \ln\left(\frac{p_2}{p_1}\right)}{\mu c_p (T_4 - T_1) + \mu R_i T_3 \ln\left(\frac{p_2}{p_1}\right)}$$

$$\Rightarrow \eta_{R, \text{ (mit Wärmetauscher) }} = \frac{T_3 - T_1}{T_3} = 1 - \frac{T_1}{T_3} = \eta_C \quad |$$

mit Wärmetauscher:

$$Q_{21} = Q_{34}$$