Kalorische Zustandsgln.

$u = u(T, v)$

$$du = \left(\frac{\partial u}{\partial T}\right)_v dT + \left(\frac{\partial u}{\partial v}\right)_T dv$$

$$= c_v\, dT + \left(\frac{\partial u}{\partial v}\right)_T dv$$

$h = h(T, p)$

$$dh = c_p\, dT + \left(\frac{\partial h}{\partial p}\right)_T dp$$

Wärmezufuhr:

$$Q_{12} = m\, \bar{c}_v \Big|_{T_1}^{T_2} (T_2 - T_1)$$ isochor + reversibel

$$Q_{12} = m\, \bar{c}_p \Big|_{T_1}^{T_2} (T_2 - T_1)$$ isobar + reversibel

$$\bar{c} \Big|_{T_1}^{T_2} = \frac{1}{T_2 - T_1} \int_{T_1}^{T_2} c\, dT$$

Berechnung von $\bar{c} \Big|_{T_1}^{T_2}$ aus Tabellenwerten $\bar{c} \Big|_{T_0}^{T}$

Aufgabe 7b

gesucht: $\overline{c_p}\Big|_{0°C}^{220°C} = 0.930 \frac{kJ}{kg\,K}$

T	c_p
100	0.908
220	
300	0.954

$$y = 0.908 + \frac{120}{200}(0.954 - 0.908)$$

$$\overline{c_p}\Big|_{0°C}^{220°C} = 0.9756 \frac{kJ}{kg \cdot K}$$