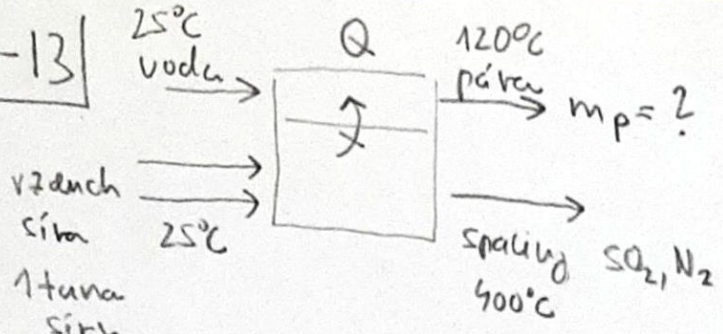
**7-13** (2,85 t)




1 tuna síry

$S + O_2 \rightarrow SO_2$

$m_S = 1000\ kg$

$n_{O_2} = n_S = \frac{m_S}{M_S} = \frac{1000\ kg}{32\ kg/kmol}$

$m_{O_2} = n_{O_2} \cdot M_{O_2} = \frac{1000}{32} \cdot 32 = 1000\ kg$

$\frac{m_{O_2}}{m_{N_2}} = \frac{23,3}{76,7} \Rightarrow m_{N_2} = \frac{76,7}{23,3} \cdot 1000 = 3439,5\ kg$

$m_{SO_2} = n_{SO_2} M_{SO_2} = \frac{1000}{32} \cdot 64 = 2000\ kg$

$n_{SO_2} = n_S$

$Q = m_p \left( h_{para}^{120°C} - h_{voda}^{25°C} \right)$

2706 kJ/kg, 104,8 kJ/kg

$m_p = \frac{Q}{2601,2\ kJ/kg}$

Ref. stav 25°C
látky ve formě prvků

$H^{in} = H^{out} + Q$

$H^{in} = 0$ (na vstupu jsou jen prvky v ref. teplotě)

$H^{out} = m_{SO_2} h_{SO_2}^{out} + m_{N_2} h_{N_2}^{out}$

$h_{SO_2}^{out} = \Delta_F h_{SO_2} + \langle c_{p,SO_2} \rangle \cdot (400-25) = -4638 + 0,720 \cdot 375 = -4368$ kJ/kg

$h_{N_2}^{out} = \langle c_{p,N_2} \rangle (400-25) = 1,054 \cdot 375 = 395,25$ kJ/kg

$\langle c_{p,N_2} \rangle$: kJ/kg·K, 210°C

$Q = H^{in} - H^{out} = 0 - \{-2000 \cdot 4368 + 3439,5 \cdot 395,25\} = 7,377 \cdot 10^6\ kJ$

$m_p = \frac{7,377 \cdot 10^6}{2601,2} = 2836\ kg$ páry