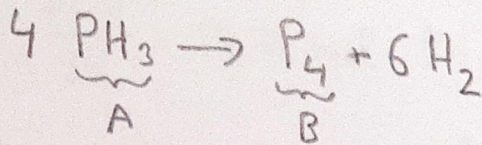


15-1



$$M_P = 31 \text{ g/mol}$$

$$M_A = 34 \text{ g/mol}$$

$$M_B = 124 \text{ g/mol}$$

$$r = k \cdot c_A \quad v_A = -4 \cdot r$$

$$\log k = - \frac{18963}{T} + 2 \log(T) + 11,53$$

$$T = 945 \text{ K}$$

$$\log k = -2,5858$$

$$k = 10^{-2,5858} = \underline{\underline{2,5959 \cdot 10^{-3} \text{ s}^{-1}}}$$

$$m_{A0} = 500 \text{ g}$$

$$p_0 = 0,101 \text{ MPa} \leftarrow \text{nemá potreba, pokud nepotřebujeme znát } V \text{ a } c_{A0}$$

$$\tau_1 = 200 \text{ s}$$

$$V \cdot \frac{dc_A}{dt} = -4 \cdot k \cdot c_A \cdot V$$

$$\int_{c_{A0}}^{c_A} \frac{dc_A}{c_A} = \int_0^{\tau} -4 \cdot k \cdot d\tau$$

$$\ln\left(\frac{c_A}{c_{A0}}\right) = -4k\tau$$

$$\rightarrow \ln(1 - \xi_A) = -4 \cdot k \cdot \tau$$

$$1 - \xi_A = 1 - \frac{c_{A0} - c_A}{c_{A0}} = \frac{c_A}{c_{A0}}$$

$$1 - \xi_A = \exp(-4 \cdot 2,5959 \cdot 10^{-3} \cdot 200)$$

$$1 - \xi_A = 0,1254$$

$$\underline{\underline{\xi_A = 0,8746}}$$

konverze po 200 s

(u reakce 1. řádu netříví dosažená konverze na c_{A0})

$$a) n_{A0} = \frac{500}{34} = 14,71 \text{ mol } \text{PH}_3$$

$$n_B = n_{B0} + \frac{1}{4} n_{A0} \xi_A = 0 + \frac{1}{4} 14,71 \cdot 0,8746 = 3,216 \text{ mol } \text{P}_4$$

$$m_B = 3,2163 \cdot 124 = \underline{\underline{398,8 \text{ g } \text{P}_4}}$$

$$b) 1 - \xi_A = 1 - 0,95 = \frac{C_A}{C_{A0}} = 0,05$$

$$\ln\left(\frac{C_A}{C_{A0}}\right) = \ln(0,05) = -4 \cdot k \cdot \tau$$

$$\tau = \frac{\ln 0,05}{-4 \cdot 2,5559 \cdot 10^{-3}} = \underline{\underline{228,6 \text{ s}}}$$

↑
95% konverze po 228 s