

15-14

$$r = k \cdot C_A$$

$$\tau_{1/2} = 120 \text{ min}$$

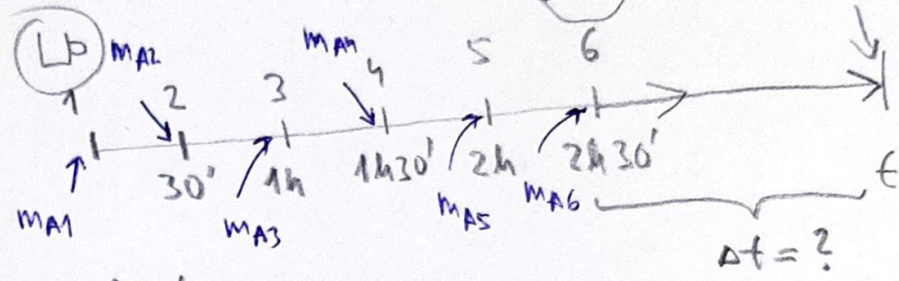
$$V = 40 \text{ dm}^3$$

Id. míchaný vsádkový reaktor, make 1. řádu

6 x 20g A po 30 min  
↑  
Δm



0,02 kmol/l



$$k = \frac{\ln 2}{\tau_{1/2}}$$

Odvzetím:

$C_{A0}$  v čase 0

$C_{A0}/2$  v čase  $\tau_{1/2}$

$$\frac{dC_A}{dt} = -k C_A$$

$$\int_{C_{A0}}^{C_{A0}/2} \frac{dC_A}{C_A} = -k \tau_{1/2}$$

$$\ln\left(\frac{C_{A0}}{2 C_{A0}}\right) = -k \tau_{1/2}$$

$$-\ln 2 = -k \tau_{1/2}$$

$$k = \frac{\ln 2}{\tau_{1/2}}$$

$$m_A = \frac{n_A}{V}$$

$$\frac{dm_A}{dt} = -k \cdot \frac{n_A}{V} V$$

$$\frac{dm_A}{n_A} = -k dt = \frac{dm_A}{m_A}$$

$$\int_{m_{A0}}^{m_{A1}} \frac{dm_A}{m_A} = \int_{t_0}^{t_1} -k dt$$

$$\ln\left(\frac{m_{A1}}{m_{A0}}\right) = -k \cdot (t_1 - t_0)$$

$$m_{A1} = m_{A0} \cdot \exp(-k(t_1 - t_0))$$

$$k = \frac{\ln 2}{120}$$

$m_{A1} = 0$  - před LP

$m_{A2} = (m_{A1} + \Delta m) \exp(-k \cdot 30 \text{ min})$  před LP LP

~~$m_{A3} = (m_{A2} + \Delta m) \exp(-k \cdot 30) = ((m_{A1} + \Delta m) \exp(-k \cdot 30) + \Delta m) \exp(-k \cdot 30)$~~

$$m_{A2} = (0 + 20) \exp\left(-\frac{\ln 2}{120} \cdot 30\right) = 20 \exp(-0,17329) = 16,818 \text{ g}$$

$$m_{A3} = (16,818 + 20) \exp(-0,17329) = 30,96 \text{ g}$$

$$m_{A4} = (30,96 + 20) \exp(-k t) = 42,852 \text{ g}$$

$$m_{A5} = (42,852 + 20) \exp(-k t) = 52,852 \text{ g}$$

- 2 strana -

$$m_{A6} = (52,852 + 20) \exp(-kt) = 61,261 \text{ g} \quad \text{před}$$

$$m_{A6} = (m_{A6} + 20) \cdot \exp(-k \cdot \Delta t) = m_{A, \text{lim}}$$

$$m_{A, \text{lim}} = 0,02 \cdot 10^{-2} \cdot m_{\text{TOT}} = 0,02 \cdot 10^{-2} \cdot (40 \text{ dm}^3 \cdot 1 \frac{\text{g}}{\text{dm}^3} \cdot 1000 \frac{\text{g}}{\text{dm}^3})$$
$$= \underline{\underline{8 \text{ g}}}$$

$$\ln \left( \frac{m_{A, \text{lim}}}{m_{A6} + 20} \right) = -k \cdot \Delta t$$

$$\frac{1}{k} \ln \frac{61,261}{8} = \Delta t = \underline{\underline{401,3 \text{ min} = 6,7 \text{ hod}}}$$

$$k = \frac{142}{120} = 0,0057762 \text{ min}^{-1}$$

(~~tozka od aldehydu je ale spic. u kofeinu i kofeinu - obrazena~~  
~~kapacita ...~~)