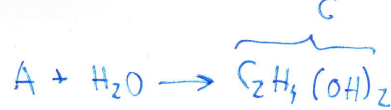


17-5

$$V = 10 \text{ m}^3$$

$$T = 423 \text{ K}$$

CSTR



$$C_{A0} = 1.7 \text{ kmol/m}^3$$

$$r = k \cdot C_A$$

$$\xi = 0.85$$

$$k = 1.188 \cdot 10^5 \exp(-67200/RT) \text{ s}^{-1}$$

$$\tau = 8000 \text{ h}$$

$$k = 5.9738 \cdot 10^{-4} \text{ s}^{-1}$$

$$\dot{m}_C = ?$$

$$\dot{m}_{A0} = ?$$

$$C_A = C_{A0} \cdot (1 - \xi) = 1.7 \cdot (1 - 0.85) = 0.255 \frac{\text{kmol}}{\text{m}^3}$$

$$C_C = C_{A0} \cdot \xi = 1.7 \cdot 0.85 = 1.445 \frac{\text{kmol}}{\text{m}^3}$$

$$A_{kud} = v_{STUP} - v_{YSTUP} + z_{NROJ}$$

$$0 = \dot{V} C_{A0} - \dot{V} C_A - r \cdot V$$

$$r = k \cdot C_A = 5.9738 \cdot 10^{-4} \cdot 0.255 = 1.5233 \cdot 10^{-4} \frac{\text{kmol}}{\text{m}^3 \cdot \text{s}}$$

$$\dot{V} = \frac{r \cdot V}{C_{A0} - C_A} = \frac{1.5233 \cdot 10^{-4} \cdot 10}{1.7 - 0.255} = 1.0542 \cdot 10^{-3} \frac{\text{m}^3}{\text{s}}$$

$$\dot{n}_C = C_C \cdot \dot{V} = 1.445 \cdot 1.0542 \cdot 10^{-3} = 1.523 \cdot 10^{-3} \frac{\text{kmol}}{\text{s}}$$

$$M_C = 2 \cdot 12 + 6 + 2 \cdot 16 = 62 \frac{\text{kg}}{\text{kmol}}$$

$$\dot{m}_{A0} = C_{A0} \cdot \dot{V} = 1.7 \cdot 1.0542 \cdot 10^{-3} = 1.7921 \cdot 10^{-3} \frac{\text{kmol}}{\text{s}} = 6.45 \text{ kmol/hod}$$

$$\dot{m}_C = 1.523 \cdot 10^{-3} \cdot 62 = 0.094426 \text{ kg/s} = 339.93 \text{ kg/hod}$$

$$\text{Produkte / 1 tok} : 339.93 \frac{\text{kg}}{\text{hod}} \cdot 8 \text{ hod} = \underline{\underline{2719 \text{ t/h}}}$$