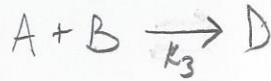
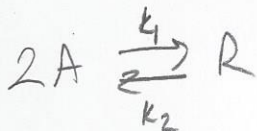


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A - cyclopentadiene

R - dicyclopentadiene

B - t-1,3-pentadiene

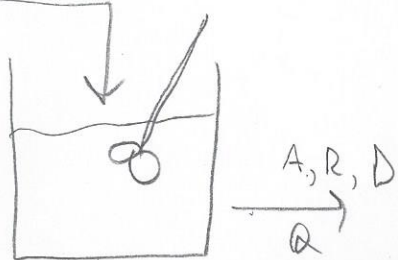
D - codimer

$$r_A = 2K_1 C_A^2 - K_2 C_R + K_3 C_A C_B$$

$$r_B = K_3 C_A C_B$$

A, B Q

a)



$$V \frac{dC}{dt} = C_A^{in} Q - C_A^{out} Q - r_A V$$

$$A: \frac{dm_A}{dt} = \dot{m}_A^{in} - \dot{m}_A^{out} + \dot{G}_A$$

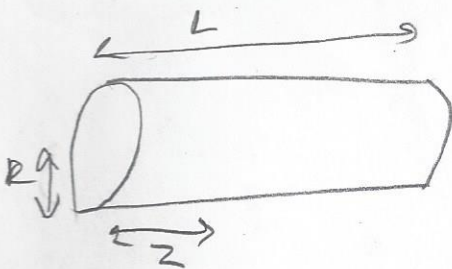
$$0 = C_A^{in} Q - C_A^{out} Q - 2K_1 C_A^2 V - K_2 C_R V + K_3 C_A C_B V$$

$$B: \frac{dm_B}{dt} = \dot{m}_B^{in} - \dot{m}_B^{out} + \dot{G}_B$$

$$V = CV$$

$$0 = C_B^{in} Q - K_3 C_A C_B V$$

b)



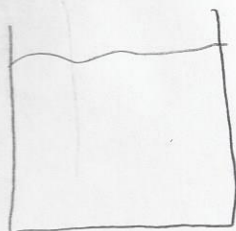
$$\frac{dm_A}{dt} = \dot{m}_{A,z} - \dot{m}_{A,z+\Delta z} - 2K_1 C_A^2 + K_2 C_R - K_3 C_A C_B$$

$$0 = C_A (\pi R^2 \dot{z}) - C_A [\pi R^2 (\dot{z} + \Delta \dot{z})] [-2K_1 C_A^2 + K_2 C_R - K_3 C_A C_B] [\pi R^2 (\dot{z} + \Delta \dot{z})]$$

$$\frac{dm_B}{dt} = \dot{m}_{B,z} - \dot{m}_{B,z+\Delta z} - 2K_1 C_A^2 + K_2 C_R - K_3 C_A C_B$$

$$0 = C_A (\pi R^2 \dot{z}) - C_A [\pi R^2 (\dot{z} + \Delta \dot{z})] + \pi R^2 (\dot{z} + \Delta \dot{z}) [-2K_1 C_A^2 + K_2 C_R - K_3 C_A C_B]$$

c)



$$\frac{dC_A}{dt} = -2K_1 C_A^2 - K_2 C_R + K_3 C_A C_B$$

$$\frac{dC_B}{dt} = -K_3 C_A C_B$$