H.W. 5.

$$P_{nx} \underset{k_2}{\overset{K \quad k_1}{\rightleftharpoons}} nP_x^-$$

at equilibrium

$$k_1[P_{nx}] = k_2[P_x^-]^n$$

$$\Rightarrow \frac{k_1}{k_2} = K = \frac{([P_x^-])^n}{[P_{nx}]}$$

$$\Rightarrow [P_x^-] = (K[P_{nx}])^{1/n}$$

n initiator molecules make 1 inactive P_{nx}

$$[P_x^-] + n[P_{nx}] = [I]_0$$

Since P_{nx} dissociate slightly $(K \ll 1)$. $\Rightarrow [P_x^-] \ll [P_{nx}]$

$$\Rightarrow n[P_{nx}] = [I]_0 \Rightarrow [P_{nx}] = \frac{I_0}{n}$$

$$r_p = -\frac{1}{V}\frac{dM}{dt} = k_p[M][P_x^-]$$

$$= k_p[M](K[P_{nx}])^{1/n}$$

$$= k_p[M]\left(K\left(\frac{I_0}{n}\right)\right)^{1/n}$$

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