Biomaterials Exam 1 Cheat Sheet

October 5, 2016

M_i=Molar mass

$$\bar{M}_n = \sum n_i M_i = \frac{1}{\sum \frac{w_i}{M_i}}$$

$$\bar{M}_w = \frac{\sum n_i M_i^2}{\sum n_i M_i} = \sum w_i M_i$$

$$\bar{M}_z = \frac{\sum n_i M_i^3}{\sum n_i M_i^2} = \frac{\sum w_i M_i^2}{\sum w_i M_i}$$

$$PDI = \frac{\bar{M}_w}{\bar{M}_n}$$

$$p = \frac{[M]_0 - [M]}{[M]_0}$$

$$X_n = \frac{1}{1-p}$$

$$M_n = M_0 \bar{X}_n$$

Internally catalyzed

$$\frac{1}{(1-p)^2 2kt[M]_0^2 + 1}$$

$$R_p = k[M]^2$$

$$\frac{1}{[M]^2} - \frac{1}{[M]_0^2} = 2kt$$

$$X_n^2 = 2[M]_0^2 kt + 1$$

Externally catalyzed

$$\frac{1}{(1-p)^2 2kt[M]_0 + 1}$$

$$r = \frac{N_A}{N_B} or \frac{N_A}{N_B + 2N_e nd}$$

$$\bar{X}_n \frac{1+r}{1+r-2rp}$$

Free radical

$$R_p = k_p \left(f\frac{k_d}{k_t} \right) [M][I]^{1/2}$$

$$\bar{X}_n = \frac{k_p[M]}{(1+q)(fk_d k_t[I])^{1/2}}$$

$$R_i = 2fk_d[I]$$

$$R_p = k_p[M][M*]$$

$$R_t = 2k_t[M*]^2$$

$$C_M = \frac{k_{tr,M}}{k_p}; C_S = \frac{k_{tr,S}}{k_p}; C_I = \frac{k_{tr,I}}{k_p}$$

$$\frac{1}{\bar{X}_n} = \frac{1}{(\bar{X}_n)_0} + C_M + C_S\frac{[S]}{M]} + C_I\frac{[I]}{[M]}$$

Cationic

$$R_p = \left(k_p\frac{k_i}{k_t}\right)[M]^2[R+A-]$$

$$\frac{1}{\bar{X}_n} = \frac{k_t}{k_p}\frac{1}{[M]} + \frac{k_{tr,M}}{k_p}$$

Anionic living

$$\bar{X}_n = \frac{cK[M]_0}{[I]_0}$$

K=1 for organomettalic K=2 for electron transfer