20.320 Exam 1 Equation Sheet

$$\Delta G = RT\ln(K_d)$$

$$y_{excessLigand} = \frac{L_0}{L_0 + K_d}$$

$$y_{ligand\_depletion} = \frac{(K_d + L_0 + P_0) - \sqrt{(K_d + L_0 + P_0)^2 - 4P_0L_0}}{2P_0}$$

$$\Delta G = \Delta H - T\Delta S$$

$$Q_i = \Delta H(C_i - C_{i-1})V_{Cell}$$

$$RU_{eq} = RU_{\max}\left(\frac{L_0}{L_0 + K_d}\right)$$

$$RU_{dissociation} = RU_{eq}\left(\exp(-k_{off} \cdot time)\right)$$

$$RU_{association} = RU_{eq}\left(1 - \exp(-k_{obs} \cdot time)\right)$$

$$1\ RU = 0.0001° = 1\ pg/mm^2$$

$$k_{obs} = k_{on}L_0 + k_{off}$$

$$t_{1/2,association} = \frac{\ln 2}{k_{obs}}$$

$$t_{1/2,dissociation} = \frac{\ln 2}{k_{off}}$$

R = 1.987 cal mol^{-1} K^{-1}

$$\frac{dP}{dt} = V = \frac{(k_2 E_0) S_0}{\left(\frac{k_{\_1} + k_2}{k_1} \right) + S_0} = \frac{V_{\max} S_0}{K_M + S_0}$$

$$\frac{1}{V} = \left(\frac{K_M}{V_{\max}} \right) \frac{1}{S_0} + \frac{1}{V_{\max}}$$

$$t_{QSSA} = \frac{1}{k_1 (K_M + S_0)}$$

$$t_S = \frac{K_M + S_0}{k_2 E_0}$$

$$\frac{\Delta S}{S_0} = \frac{E_0}{K_M + S_0}$$

$$V = \frac{V_{\max} S_0}{K_M \left(1 + \frac{I}{K_I} \right) + S_0}$$

$$V = \frac{\frac{V_{\max}}{\left(1 + \frac{I}{K_I} \right)} S_0}{K_M + S_0}$$

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