

3610 Midterm Exam 4 Equations and Constants

Gas Constant Values			
8.314	$\frac{J}{mole\ K}$	0.08314	$\frac{L\ bar}{mole\ K}$
0.08206	$\frac{L\ atm}{mole\ K}$	8.314	$\frac{m^3\ Pa}{mole\ K}$
Boltzmann Constant Values			
1.381×10^{-23}	$\frac{J}{K}$	0.6950	$\frac{cm^{-1}}{K}$

Conversions		
1 L atm	=	101.325 J
1 atm	=	1.01325 bar
1 atm	=	760 torr
1 atm	=	101,325 Pa

$$v = \frac{d[A]}{\nu_A dt} = \frac{1}{V} \frac{d\xi}{dt}$$

$$\log\left(\frac{v_2}{v_1}\right) = m \log\left(\frac{[A]_2}{[A]_1}\right)$$

$$\chi = \chi_0 e^{-t/\tau}$$

$$\tau = \frac{1}{k_r + k'_r}$$

$$k = Ae^{-\frac{E_a}{RT}}$$

$$\log\left(\frac{k_2}{k_1}\right) = -\frac{E_a}{R} \left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

$$v_{\text{Lind.-Hinsh.}} = \frac{k_a k_b [A]^2}{k_b + k'_a [A]}$$

$$\tau_0 = \frac{1}{k_F + k_{IC} + k_{ISC}}$$

$$\phi_{F,0} = \frac{k_F}{k_F + k_{IC} + k_{ISC}} = k_F \tau$$

$$\frac{\phi_0}{\phi} = 1 + \tau_0 k_Q [Q]$$

$$\eta_T = 1 - \frac{\phi_F}{\phi_{F,0}} = \frac{R_0^6}{R_0^6 + R^6}$$

$$\frac{1}{v} = \frac{1}{v_{max}} + \left(\frac{K_M}{v_{max}}\right) \frac{1}{[S]_0}$$

$$v = P\sigma v_{rel} N_A^2 e^{-\frac{E_a}{RT}} [A][B]$$

$$k_d = \frac{8RT}{3\eta}$$

$$k \propto e^{\Delta S^\ddagger/R} e^{\Delta H^\ddagger/RT}$$