

## Exam 2 Equation Sheet

$$1 \text{ mole} = 6.022 \times 10^{23} \text{ particles}$$

$$M = \text{mol L}^{-1}$$

$$m = \text{mol kg}^{-1}$$

$$T (\text{K}) = T(^{\circ}\text{C}) + 273.15$$

$$1 \text{ atm} = 101325 \text{ Pa}$$

$$1 \text{ atm} = 760 \text{ torr}$$

$$1 \text{ atm} = 1.01325 \text{ bar}$$

$$1 \text{ atm} = 14.696 \text{ PSI}$$

$$R = 8.314 \text{ m}^3 \text{ Pa K}^{-1} \text{ mol}^{-1} (= 8.314 \text{ J K}^{-1} \text{ mol}^{-1})$$

$$R = 62.36 \text{ L torr K}^{-1} \text{ mol}^{-1}$$

$$R = 0.08206 \text{ L atm K}^{-1} \text{ mol}^{-1}$$

$$R = 0.08314 \text{ L bar K}^{-1} \text{ mol}^{-1}$$

$$PV = nRT$$

$$P_A = P_{\text{tot}}X_A$$

$$S_{\text{gas}} = K_H P_{\text{gas}}$$

$$P_{\text{solvent}} = X_{\text{solvent}}P^{\circ}_{\text{solvent}}$$

$$\Delta T_{\text{bp}} = K_{\text{bp}}m_i$$

$$\Delta T_{\text{fp}} = K_{\text{fp}}m_i$$

$$\Pi = icRT$$

$$[A] - [A]_0 = -kt$$

$$\ln[A] - \ln[A]_0 = -kt \quad t_{1/2} = \frac{\ln 2}{k}$$

$$\frac{1}{[A]} - \frac{1}{[A]_0} = kt$$

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

$$\ln k = -\left(\frac{E_a}{R}\right)\frac{1}{T} + \ln A$$

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

$$K_P = K_C(RT)^{\Delta n}$$

$$K_w = 1.0 \times 10^{-14} \text{ at } 25^{\circ}\text{C}$$

$$\text{pH} = -\log[\text{H}_3\text{O}^+] \quad \text{pOH} = -\log[\text{OH}^-]$$

$$\text{pK}_a = -\log K_a \quad \text{pK}_b = -\log K_b$$

$$\text{pH} = \text{pK}_a + \log \frac{[A^-]}{[HA]}$$