

Exam 1 Equation Sheet

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

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

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

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

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

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

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

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

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

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

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

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

$$S_{\text{gas}} = k_{\text{H}} P_{\text{gas}}$$

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

$$\Delta T_{\text{bp}} = K_{\text{bp}} m i$$

$$\Delta T_{\text{fp}} = K_{\text{fp}} m i$$

$$\Pi = i M R T$$

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

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

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

$$k = A e^{-\frac{E_a}{RT}}$$

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

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