Useful Formula ($\star$ means for a system that is ideal or otherwise restricted)

$$\left(\frac{\partial \mu}{\partial T}\right)_p = -\bar{S} \qquad \left(\frac{\partial \mu}{\partial p}\right)_T = \bar{V}$$

$$dp/dT = \Delta_{trs}\bar{S}/\Delta_{trs}\bar{V}$$

$$dp/dT = \Delta_{fus}\bar{H}/T\Delta_{fus}\bar{V} \qquad dp/dT = \Delta_{vap}\bar{H}/T\Delta_{vap}\bar{V}$$

$$d\ln(p)/d(1/T) = -\Delta_{fus}\bar{H}/R$$

$$\hat{X}_j = \left(\frac{\partial X}{\partial n_j}\right)_{n_i,T,P}$$

$$\Delta_{mix}G = RT\sum n_i \ln(p_i/p) \qquad \Delta_{mix}H^\star = 0 \qquad \Delta_{mix}\bar{G}^\star = RT\sum z_i \ln(z_i)$$

$$p_i = x_i p_i^\star \qquad p_i = x_i K_i$$

$$\Delta T = x_B RT^2/\Delta_{vap}\bar{H} \qquad \Delta T = x_B RT^{\star 2}/\Delta_{fus}\bar{H}$$

$$\ln(x_B) = -\left(\Delta_{fus}\bar{H}/R\right)(1/T - 1/T^\star)$$

$$\Pi = x_B RT/\bar{V} \qquad \Pi = [B]RT\,(1 + B[B] + \ldots)$$

$$\mu_A = \mu_A^\star + RT\ln(f_A/f_A^\star) \qquad \mu_A = \mu_A^\star + RT\ln(x_A) + RT\ln(\gamma_A)$$
$$\mu_B = \mu_B^\star + RT\ln(K_B/p_B^\star) + RT\ln(x_B) \qquad \mu_B = \mu_B^\dagger + RT\ln(x_B)$$
$$\mu_B = \mu_B^\dagger + RT\ln(\kappa) + RT\ln(b_B/b^\circ) \qquad \mu_B = \mu_B^{\circ\!\!-} + RT\ln(b_B/b^\circ)$$

$$F = (C - N) - P + 2$$

$$\Delta_f\bar{H}(H^+, aq) = 0 \qquad \Delta_f\bar{G}(H^+, aq) = 0 \qquad \bar{S}(H^+, aq) = 0$$

$$\Delta_{solv}\bar{G} = -\left(\frac{z_i^2 q^2 N_o}{8\pi\epsilon_o r_i}\right)\left(1 - \frac{1}{\epsilon_r}\right)$$

$$\gamma_\pm = (\gamma_+^p \gamma_-^q)^s \qquad s = p + q$$

$$\log(\gamma_\pm) = -\frac{A|z_+ z_-|\sqrt{I}}{1 + B\sqrt{I}} \qquad A = 0.509 \text{ at } 25\ ^\circ\text{C} \qquad \log(\gamma_\pm) = -A|z_+ z_-|\sqrt{I}$$

$$I = \tfrac{1}{2}\sum z_i^2 (b_i/b^\circ)$$

$$Q = \Pi a_i^{\gamma_i}$$

You may tear off and keep this page of equations.