Formulae and Possibly Useful Information

$P_A = X_A P^o_A$ $\quad P_A = K_A[A]$ $\quad \Pi = MRT$

$\Delta T_b = K_b m$ $\quad \Delta T_f = K_f m$ $\quad PV = nRT$

$\Delta S_{sys} = q_{rev}/T = \Delta H/T$ $\quad \Delta S_{surr} = -\Delta H/T$

$w = -P_{ext}V$ $\quad q_p = nC_p\Delta T$ $\quad \Delta E = q + w$

$\Delta H = \Delta E + P\Delta V$ $\quad \Delta H = \Delta E + RT\Delta n$ $\quad \Delta S_{univ} = \Delta S_{sys} + \Delta S_{surr}$

$\Delta G = \Delta H - T\Delta S$ $\quad \Delta G = \Delta G^o + RTLnQ$ $\quad \Delta G^o = -RTLnK$

$Ln(K_2/K_1) = -(\Delta H^o/R)[(1/T_2) - (1/T_1)]$ $\quad K_w = [H^+][OH^-]$

$pH = -Log[H^+]$ $\quad K_w = 1.0 \times 10^{-14}$ (at 25°C) $\quad K_aK_b = K_w$

$pH + pOH = pK_w$ $\quad K_p = K_c(RT)^{\Delta n}$

1 calorie = 4.184 Joule $\quad$ 1 Joule = 1 kg-m^2-s^{-2} = 1 N-m

$c = 2.99792458 \times 10^8$ m/s $\quad h = 6.62606876 \times 10^{-34}$ J-s

$\pi = 3.1415927$ $\quad N_o = 6.02214199 \times 10^{23}$ mol^{-1}

$K = {}^oC + 273.15$ $\quad {}^oF = (9/5)^oC + 32$ (*exactly)*

$F = \dfrac{-Gm_1m_2}{r^2}$ $\quad G = 6.67 \times 10^{-11}$ N-m^2-kg^{-2}

$F = \dfrac{1}{4\pi\varepsilon_o} \times \dfrac{q_1q_2}{r^2}$ $\quad \varepsilon = 8.85 \times 10^{-12}$ C^2-N^{-1}-m^{-2}

R = 8.3145 J/mol-K = 0.08206 L-atm/mol-K

1 atm = 760 torr = 101325 Pa