Useful Constants

Avogadro's Number:	6.0221367×10^{23} mol^{-1}
Standard Pressure:	1 atm = 760 torr = 101325 Pa
Gas Constant:	R = 0.0820574 L-atm/mol-K = 8.31447 J/mol-K
Faraday Constant:	1 mole electrons = 96485.309 coulombs
Water Hydrolysis Constant:	$K_w = 1.00 \times 10^{-14}$ at 25°C

Useful formulae

$$X^o = \sum_{i=1}^{k} n_i X^o_{f,i}(products) - \sum_{l=1}^{m} n_l X^o_{f,l}(reactants)$$ (where X is the state function ΔH, ΔG)

$$\Delta X^o = \sum_{i=1}^{k} n_i X^o_{f,i}(products) - \sum_{l=1}^{m} n_l X^o_{f,l}(reactants)$$ (where X is the state function S)

$$\Delta E = q + w;\ w = -P\Delta V$$

$$\Delta H = \Delta E + P\Delta V = \Delta E + \Delta nRT$$

$$\Delta G = \Delta G° + RT\ln Q$$ (where Q is the reaction quotient)

$$\Delta G = -n\mathcal{F}\mathcal{E}_{cell}$$

$$\Delta G° = \Delta H° - T\Delta S° = -RT\ln K$$ (where K is the thermodynamic equilibrium constant)

$$\ln(K_1/K_2) = (\Delta H°/R) \times (T_1 - T_2)/(T_1T_2)$$

$$K_p = K_c(RT)^{\Delta n}$$

Nernst Equation:	$\mathcal{E}_{cell} = \mathcal{E}^o_{cell} - (0.059160/n)\log Q$ (at 25°C)
Zero Order Reaction:	$[A]_o - [A]_t = kt$
1st Order Reaction:	$\ln([A]_o / [A]_t) = kt$
2nd Order Reaction:	$1/[A]_t = 1/[A]_o + kt$
Arrhenius Equation:	$k = Ae^{-Ea/RT}$ (A is the pre-exponential factor)
	$\ln(k_1/k_2) = (E_a/R) \times (T_1 - T_2)/(T_1T_2)$
Freezing Point Depression:	$\Delta T = iK_f m$[1]
Boiling Point Elevation:	$\Delta T = iK_b m$

[1] "i" is the van't Hoff factor