

Equations of Interest

1. $\Delta G = \Delta G^0 + RT \ln Q$ ($\Delta G = \Delta G^0 + 2.303 RT \log Q$)
2. If $Q = k_c$ from (1) then the system is at $\Delta G = 0$
3. $\Delta G = \Delta H - T\Delta S$ at std. state $\Delta G^0 = \Delta H^0 - T\Delta S^0$
4. ΔS (univ.) = ΔS (system) + ΔS (surroundings) reversible process
5. $\Delta G = -nFE$ $F = 96,500 \text{ C/mole } e^{\circ}$
6. $E = E^0 - \frac{RT}{nF} \ln Q$ $E = E^0 - (0.0592/n) \log Q$ at 298K only.
7. $\log k_c = nE^0/0.0592$ @ $Q = k_c$ & $E = 0$ at 298K
8. Cathode \leftrightarrow reduction; anode \leftrightarrow oxidation
 $E > 0$ spontaneous $E < 0$ non-spontaneous
9. $\ln\left(\frac{k_1}{k_2}\right) = \frac{E_a}{R} \left(\frac{1}{T_2} - \frac{1}{T_1}\right)$ $R = 8.31 \text{ J/mole} \cdot \text{K}$
10. Hess's Law for ΔH , ΔG and $S = \Sigma(n\text{Products}) - (n\text{Reactants})$.
11. $C = \lambda\nu$
12. $E = h\nu$
13. $1/\lambda = (R_H) \left(\frac{1}{\eta_{i-1}^2} - \frac{1}{\eta_F^2} \right)$ (t) energy absorbed (gained)
 $i-1$ energy emitted (lost)
14. $\lambda = h/m\nu$
15. $\Delta X \cdot \Delta(m\nu) \geq h/4\pi$
16. $h = 6.63 \times 10^{-34} \text{ joule-sec}$
17. $C = 3.00 \times 10^8 \text{ m/sec}$
18. $R_H = 1.01 \times 10^7 \text{ m}^{-1}$