Chemistry 124 Constants and Equations

$h = 6.626 \times 10^{-34}\ J \cdot s$ $c = 3.00 \times 10^{8}\ m/sec$ $m_e = 9.11 \times 10^{-31}\ kg$

$N_A = 6.022 \times 10^{23}$ units/mol $1\ eV = 1.602 \times 10^{-19}\ J$

Simple Cubic $2r$ Body Centered Cubic $\frac{4r}{\sqrt{3}}$ Face Centered Cubic $2\sqrt{2}\ r$

Formal Charge = # of valence electrons - # of nonbonded electrons - # of bonds

$\Delta H^\circ_{rxn} = \Sigma\, n\Delta H^\circ_f$ **(products) -** $\Sigma\, n\Delta H^\circ_f$ **(reactants)** $\Delta S^\circ_{rxn} = \Sigma\, n\Delta S^\circ$ ***(products)*** $- \Sigma\, n\Delta S^\circ$ ***(reactants)***

$\Delta H^\circ_{rxn} = \Sigma$ **n Bond Energies (bonds broken) -** Σ **n Bond Energies (bonds formed)**

$\Delta G_{rxn} = \Delta H_{rxn} - T\Delta S_{rxn}$ $\Delta G^\circ_{rxn} = \Delta H^\circ_{rxn} - T\Delta S^\circ_{rxn}$ $\Delta G^\circ_{rxn} = \Sigma\, n\Delta G^\circ_f$ ***(products)*** $- \Sigma\, n\Delta G^\circ_f$ ***(reactants)***

$$\lambda = \frac{h}{mu} \qquad \Delta x \cdot m\Delta u \geq \frac{h}{4\pi}$$

$$E = -2.18 \times 10^{-18}\ J \left(\frac{1}{n_f^2} - \frac{1}{n_i^2}\right) \qquad \frac{1}{\lambda} = 1.097 \times 10^{7}\ m^{-1} \left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right),\ n_2 > n_1$$