Energetics Equations

Calorimetry $\Delta H = m\ c\ \Delta T$

Hess's Law $\Delta H_1 = \Delta H_2 + \Delta H_3$

Bond Enthalpy $\Delta H_{RXN}^{\circ} = \Sigma\ BE_{\text{bonds broken}} - \Sigma\ BE_{\text{bonds formed}}$

Enthalpy of formation $\Delta H_{rxn} = \Sigma\ \Delta H_f^{\circ}{}_{\text{products}} - \Sigma\ \Delta H_f^{\circ}{}_{\text{reactants}}$

The ΔH_f° of an element in its standard state is zero.

Born-Haber Cycles $\Delta H_{at(m)}^{\circ} + \Delta H_{at(nm)}^{\circ} + \Delta H_{IE}^{\circ} + \Delta H_{EA}^{\circ} + \Delta H_{latt}^{\circ} = \Delta H_f^{\circ}$

Entropy (Disorder) $\Delta S^{\circ} = \Sigma S^{\circ}(\text{products}) - \Sigma S^{\circ}(\text{reactants})$

Gibb's Free Energy $\Delta G^{\circ} = \Delta H^{\circ} - T\Delta S^{\circ}$

$\Delta G^{\circ} = \Sigma \Delta G_f^{\circ}(\text{products}) - \Sigma \Delta G_f^{\circ}\ (\text{reactants})$

The ΔG_f° of an element in its standard state is zero.

Standard <u>Thermochemical</u> Conditions

- Temperature 25 C, 298 K
- Pressure 101.3 kPa, 1 atm, 760 mmHg