Definitions for Thermodynamics

Energy: The capacity to do work or transfer heat.

Enthalpy: Energy change at constant pressure.

Entropy: The amount of molecular disorder or randomness in a system.

Free Energy: $G = H - TS$ $\Delta G = \Delta H - T\Delta S$ $\Delta G^0 = \Delta H^0 - T\Delta S^0$

Heat: The process of energy transfer from one body or system to another as a result of a difference in temperature.

Laws of Thermodynamics

> **First Law**: Energy is conserved. It can be neither created nor destroyed in an isolated system.
>
> **Second Law**: In an isolated system, natural processes are spontaneous when they lead to an increase in entropy.
>
> **Third Law**: The entropy of a perfect crystal of any pure substance approaches zero as the temperature of the crystal approaches 0 K.
>
> **Zeroth Law**: When two systems are in equilibrium with a third, those two systems are in equilibrium with each other.

Spontaneous Process: A process that proceeds on its own without any continuous external influence.

State Function: A property of a system that is determined only by the state or condition of the system.

Standard Conditions: Solutions 1 mol/L; pressure 1 atm; if the temperature is not specified, 25 °C.

Standard State: The most stable form of a substance under standard conditions.

Surroundings: Everything but the system.

System: Portion of the universe being studied.

Temperature: The property of a body or region of space that determines whether or not there will be a net flow of heat into or out of it from a neighboring body or region and in which direction the heat will flow.

Alan D. Earhart 5/16/2017