CH 222 Chapter Nine Study Guide

- Understand the terms reactant- and product-favored. We shall study these again during CH 223.

- Understand the difference between kinetic and potential energy. Know the general equations from physics for each energy type.

- Be able to utilize the joule in energy and heat calculations. Be able to convert between joules and calories, and be aware of the differences between calories and Calories.

- Be able to use specific heat in calculations. Know how to utilize the magnitude of specific heat to predict temperature changes, etc.

- Understand the sign conventions of **q** regarding heat transfer.

- Be able to use heat of fusion and heat of vaporization values to find the quantity of thermal energy involved in changes of state. Be able to apply the system and surroundings concepts to chemical reactions.

- Understand the definition of exothermic and endothermic and be able to predict these if given the sign of ΔT, ΔH or q_{sys}.

- Know the first law of thermodynamics (the law of energy conservation).

- Understand enthalpy. Enthalpy must be measured relative to something else (a "change in"), and enthalpy is not a specific value for a given reactant. Know that $\Delta H = q_p$. Is $\Delta H = q_v$ true? *(**No!** What is q_v equal to?)*

- Be able to apply Hess' Law to find values of enthalpy.

- Know the definition of standard conditions (i.e., °) in thermodynamics.

- Be able to write balanced chemical equations that define the standard molar enthalpy of formation, ΔH°_f, for a compound.

- Know the difference between the standard molar enthalpy of formation, ΔH°_f, and the enthalpy change for a reaction, ΔH°_{rxn}.

- Understand the theory of calorimetry as discussed in lab and lecture.

- Be able to use bond dissociation energy in calculations.

- Be able to solve and understand the assigned problems in problem set #3.