**Study Guide Chemical Equilibrium (Chapter 18)**

Be sure you can:

* Describe what is happening in a system at equilibrium – what species are present and what is happening at the molecular level
* Write the equilibrium constant expression for a given equilibrium system (you may be required to write the balanced equation first) – know which substances are included and which substances are not in the K expression
* Explain the meaning of the equilibrium constant and what it represents. What does it mean if the numerical value of K is very small or large?
* List factors that may disturb an equilibrium system, and describe how the system reacts to re-establish an equilibrium
* List the types of reactants/products that influence a reaction to go to completion rather than establish an equilibrium
* Be able to compare the strengths of weak acids and bases given their Ka and Kb value
* Explain the common ion effect, and how it is related to equilibrium shifts, and to the formation of buffer solutions
* Define a buffer, and choose combinations of substances that, when combined, produce a buffered solution
* Write the chemical equation for the self-ionization of water, and know the value for the ion product of water
* Explain the hydrolysis of the anions and cations of common ionic compounds (salts), and be able to tell whether a dilute solution of a given salt would be acidic, basic, or neutral
* Define molar solubility – explain what Ksp is and what it tells you about a slightly soluble substance
* Identify strong acids/bases and weak acids and bases
* Predict products in chemical reactions to determine slightly soluble salts
* Assign oxidation numbers for monatomic ions and polyatomic ions

Be able to perform the calculations listed below:

* Given the balanced chemical equation for an equilibrium system, write the expression for K, and calculate its value from given concentrations of reactants and products at equilibrium
* Given the molar solubility of a substance, be able to write the Ksp expression and calculate the value for Ksp
* Given the Ksp for a substance, calculate its solubility (at the same temperature)
* Given a solubility table, and information about two solutions of ionic compounds, write the net ionic equation for the slightly soluble product that could form when the two solutions are mixed.
* Use ion product value compared to Ksp value to determine if a precipitate will form

Review Chapter 18 reading on pages 563-594 in your textbook and look at summary and vocabulary on p. 596. Review all notes, modeling and practice, practice problems, review problems, worksheets, and lab to help you study. Review sample problems in book to help review calculation problems.

Remember this is just a guide! We have practiced, read, discussed, reviewed, conducted a lab, and covered all concepts for test in a variety of ways in and out of class. Test dates are given weeks prior to test which makes it a long term project date!