Date: _____ AP Chemistry

Chapter 15 – Chemical Equilibrium (Syllabus)

Chemistry: The Central Science

(pgs. 622-663)

1. This Chapter is the beginning of the **MOST IMPORTANT** topic on the AP Exam!!!
   - Read the chapter a minimum of a couple of times (including all the Sample & Practice Exercises).
   - Try as many problems as possible.
   - An equilibrium problem is guaranteed to be the first problem on the AP Exam!!
   - The discussion of equilibrium will extend into Chapters 16 & 17.

2. Intro. & 15.1 (The Concepts Of Equilibrium): Basic terminology and concept setup (What is chemical equilibrium?)

3. 15.2 (The Equilibrium Constant):
   - ➢ Describe the Haber process and its significance.
   - ➢ The law of mass action
   - ➢ Equilibrium constant expressions (K_{eq}, K_c, and K_p)
   - ➢ How does K_c relate to K_p? (on AP Equation sheet)
   - ➢ What does the magnitude of K tell us about the reactants and products?
   - ➢ How does the direction of a reaction relate to K?

4. 15.3 (Understanding And Working With Equilibrium Constants):
   - ▪ What is significance of the size (magnitude) of K?
   - ▪ What does the value of K relate to the direction of the chemical equation?
   - ▪ How does the balanced equation relate to K?

5. 15.4 (Heterogeneous Equilibria):
   - o Homogeneous vs. heterogeneous equilibria
   - o What types of substances do not appear in the K expression? Explain.

6. 15.5 (Calculating Equilibrium Constants):
   - ✓ Calculations involving equilibrium concentrations, equilibrium partial pressures, and K (K_{eq}, K_c, and K_p)
   - ✓ Get to REALLY know the 4 steps to help you work through equilibrium problems (pg. 639).
   - ✓ This will take a lot of practice with the problems!!

7. 15.6 (Applications Of Equilibrium Constants): What is Q? How does it relate to K?

8. 15.7 (Le Châtelier's Principle):
   - ✓ How do different stresses on a system affect its equilibrium?
   - ✓ Stresses: changes in temperature, concentration, volume, pressure, and catalysts added to the system

9. Labs:
   - ❖ Experiment 15-1: Equilibrium Water Games (NOT IN LAB MANUAL)
   - ❖ LabQuest 10: Colorimetric Determination of an Equilibrium Constant (K_c) in Aqueous Solution
   - ❖ *(as time permits) Experiment 23: Chemical Equilibrium: LeChâtelier's Principle (or a similar lab)

10. Chapter 15 Exercises:
    - o Visualizing Concepts & Exercises: #'s 1, 2, 13, 15, 3, 17, 21, 25, 27, 29, 32, 37, 41, 43, 45, 47, 53, 55, 61, 63 & 65
    - o Additional Exercises: #'s 71, 74, 80, 83, & 91
    - o Integrative Exercises: #'s 95 & 97

11. Ch. 15 Test: The test will be in about 2 weeks and will be about a 100 pt. test & may contain at least 1 AP Exam question.