

## Exam 3 Review Sheet for Monday, April 2 Exam Chem 1120, Spring 2001, Robertson

Our exam will include material from parts of **chapters 16, 17, and 18**. **Only material that I have covered in class, have assigned homework problems for or is mentioned on this review sheet will be tested.** The answers to all problems in the chapters are on reserve in the library. Material from previous tests is fair game, but will be given limited coverage. On Monday, you should be able to:

### Chapter 16

- Determine the reaction order by fitting to an integrated rate law of zero, 1<sup>st</sup> or 2<sup>nd</sup> order for A or 2A going to a product P. For the integrated rate law you must be able to use all equations relating to it. This includes the concept of half-life. You will be given the integrated rate law expressions and half-life expressions for 0, 1<sup>st</sup> and 2<sup>nd</sup> order on the test, but the order will not be identified.
- Explain the Arrhenius Equation for the specific rate constant "k". Be able to use this equation to determine the activation energy or the factor A for a reaction. This equation will not be given on the exam.

### Chapter 17

- Write reaction quotients and equilibrium constants for reactions. Answer questions concerning tendency of a reaction to occur, whether or not equilibrium has been established and in what direction the reaction will proceed if equil has not been established. Solve problems using these constants.
- Be able to change  $K_c$  to  $K_p$  and vice versa.
- State Le Chatelier's Principle. Give examples. Tell how the reaction will shift if various stresses are put on it. Determine when the equilibrium constant itself will change as a function of that stress.

### Chapter 18

- Explain the reasons for attempting to classify substances as acids, bases, and salts. Explain the models of acid/base behavior from the viewpoint of Arrhenius, Bronsted-Lowry, and Lewis.
- Be able to use the BL theory to identify in a reaction acid, base, CA, CB.
- Define terms such as monoprotic, polyprotic, monobasic, polybasic, amphiprotic, and hydronium ion.
- Name binary and ternary acids and their anions.
- Identify strong acids from weak acids, and strong bases from weak bases. Write appropriate chemical reactions for their ionization in water.
- Write the appropriate reactions for a polyprotic acid in water.
- Define pH and pOH. Define  $K_w$ . List what the relationship between hydronium and hydroxide is in aqueous solution for a solution that is acidic, basic, or neutral. Work problems involving strong acids and strong bases to determine pH and pOH and the corresponding concentrations of hydronium ion and hydroxide ion.
- Write weak acid and weak base equilibrium constant expressions and solve for pH, pOH, and anion and cation concentrations. Be able to use the quadratic equation or the method of successive approximations.
- Predict whether a salt will dissolve in water to give an acidic, basic or neutral solution. Calculate the pH and pOH of the resulting salt solutions using the hydrolysis constant.