Chemistry 204 Experiment 10 Post-lab help sheet Fall 2007

1d) You have the rate law: rate = $k[AB][X]^2$

To compare two different conditions, just plug in 1 for the concentration of each component for the original condition and calculate the rate in terms of k. Then then plug in the multiplier for each component for the new condition. For example, this problem says that AB is doubled and X is halved, so plug in 2 for AB and ½ for X, and calculate the rate in terms of k again. Then compare the two results and you should be able to see how changing the concentrations affects the rate (double, quadruple, half, etc.).

2. Add the reactions to get the overall reaction. The rate law is determined by the rate of the slowest step. Intermediates are formed as products and then consumed as reactants later. Catalysts are consumed as reactants early and then produced as products later.

3. First determine the order with respect to A, and use that information to determine the order with respect to B. Solve part b) the same way you did question 1d.

4. First calculate molar concentrations for each reactant (moles/liter), then plug them into the rate law. Make sure the units on your rate are correct.

5. a) First compare the rates of experiments 1 and 3, where [B] is constant, and [A] is tripled. This will tell you the order with respect to A. Then compare the rates of reaction for experiments 1 and 2. You already know the order for A, and should be able to figure out the order for B. Now you know the rate law for the reaction.

b) Just grab the data for any one of the three experiments and plug those numbers into the rate law.