

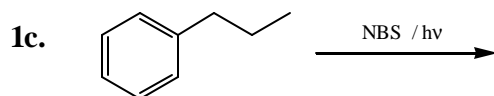
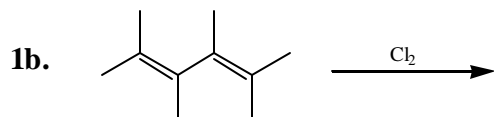
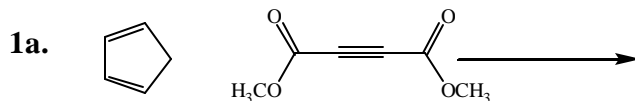
**Organic Chemistry – CHEM 331B**

Spring 2001 - Whittier College

**Test #1**

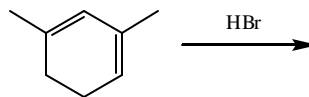
September 6, 2001

1. Predict the major product for the following reactions (disregard stereochemistry): (15 points)



2. Consider the following questions and provide a one to two-sentence explanation or answer: (30 points)
- 2a. What is a pericyclic reaction? What kind of reaction is an example?
- 2b. In free radical bromination, product formation is based on what?
- 2c. Under what kind of reaction conditions do kinetically controlled reactions occur? Why?
- 2d. Under what kind of reaction conditions do thermodynamically controlled reactions occur? Why?
- 2e. In the Diels-Alder reaction, what effect does addition of an electron-withdrawing group to the diene have on the rate of the reaction? Explain briefly.
- 2f. In the Diels-Alder reaction, what effect does addition of an electron-donating group to the diene have on the rate of the reaction? Explain briefly.

3. Consider the following reaction: (30 points)



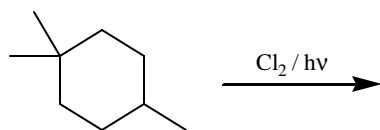
3a. What are all possible and unique products formed in this reaction (neglecting stereochemistry)?

3b. What is the thermodynamically controlled product for the reaction? Explain.

3c. What is the kinetically controlled product for the reaction? Explain.

3d. Draw an energy diagram that depicts the reaction. Label all important parts of the diagram.

4. Consider the following reaction: (30 points)



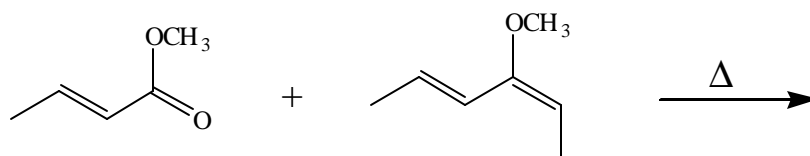
4a. What is (are) the product(s) for the reaction?

4b. What percent yields would you predict for each product? Show your work.

4 cont.

4c. Choose one of your products and provide a mechanism that accounts for formation of that product.

5. Consider the following reaction: (20 points)



5a. What is (are) the product(s) of the reaction, neglecting stereochemistry?

5b. Draw a transition state that will assist you in predicting the stereochemistry for this reaction.

5c. What stereochemical product does your transition state predict?