Organic Chemistry c3444y

2nd Hour Exam

Friday, Mar. 7, 2002
Prof. Leighton

Name:_____ **ID#**_____

Signature:_____

- Write your name on every page.
- The exam is 5 pages long (*not* including this one). Please make sure you have all of the pages.
- Write complete ***but succinct*** answers. **Good Luck!**

Question 1 (20 pts): _____

Question 2 (20 pts): _____

Question 3 (20 pts): _____

Question 4 (20 pts): _____

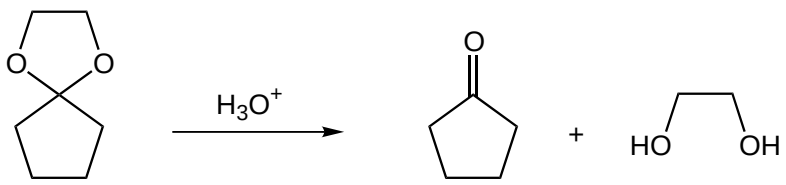
Question 5 (20 pts): _____

Total (100 pts):_____

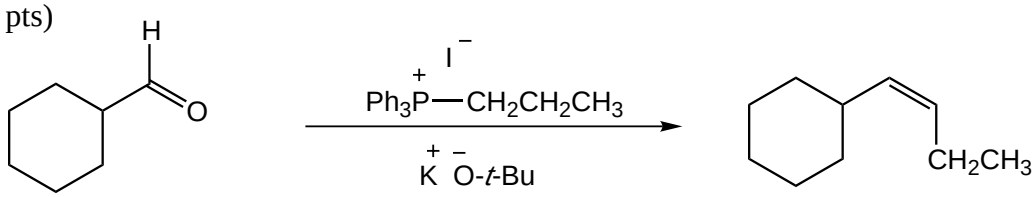
Name: _____

1. Provide detailed mechanisms for the following transformations:

a. (10 pts)



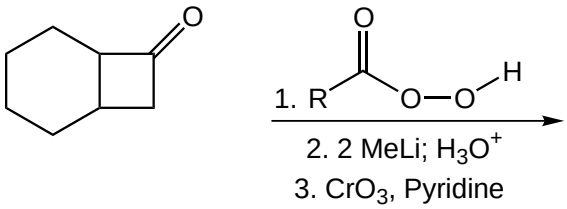
b. (10 pts)



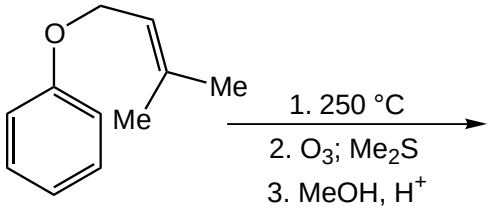
Name:_____

2. Predict the major product of the following reactions:

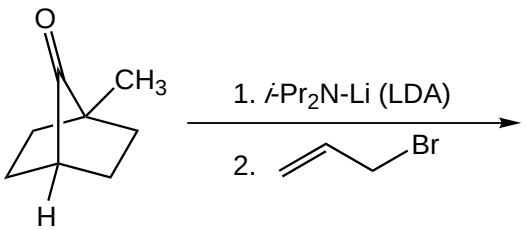
a. (7 pts)



b. (7 pts)

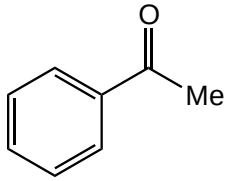


c. (6 pts)

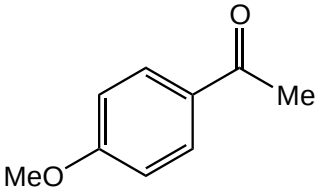


Name: _____

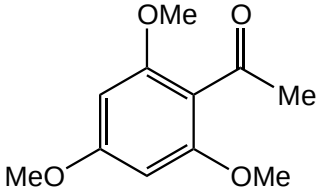
3. a. (10 pts) By simple resonance arguments, the C=O IR stretches of the first two compounds shown below make sense. By the same reasoning, we would expect the compound on the right to have a C=O IR stretching frequency even lower than 1675 cm^{-1}. As you can see, this is not the case. Provide an explanation for the unexpectedly high C=O IR stretching frequency of the compound on the right. (REMEMBER: orientation matters...)



~1690 cm^{-1}

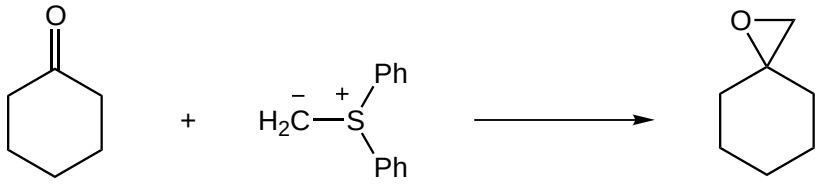


~1675 cm^{-1}



~1700 cm^{-1}

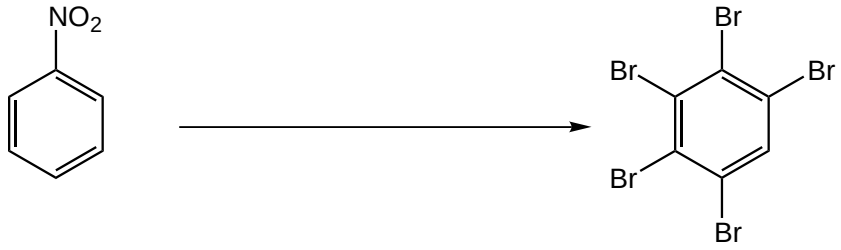
b. (10 pts) Sulfur ylids do several reactions that P-based ylids do not. Here is one. Provide a mechanism for this unusual epoxidation reaction.



Name:_____

4. Provide the reagents necessary to accomplish the following transformations:
(More than one step will be required.)

a. (7 pts)

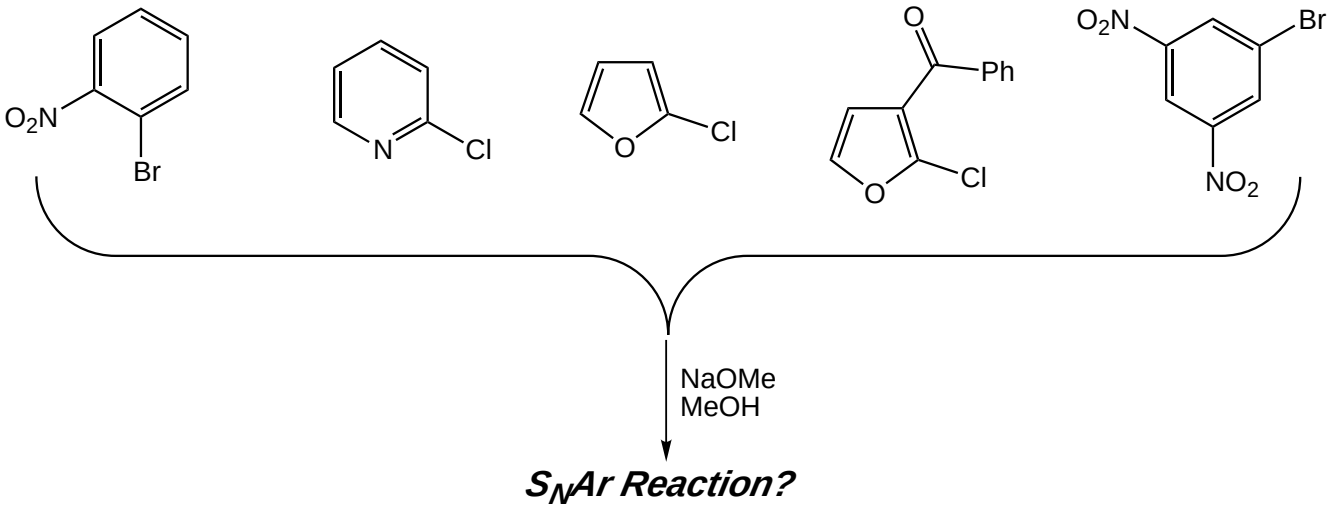


b. (7 pts)

c. (6 pts)

Name: _____

5. a. (15 pts) Circle each of the following compounds that you would expect would do smooth S_NAr reactions. Put an X through the compounds that you would NOT expect to do smooth S_NAr reactions.



b. (5 pts) Explain, using resonance structures, your answer for the third compound above.