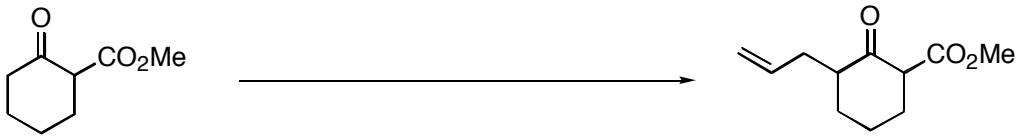
Chem 634
Professor Fox
Exam 1
Fall 2007
3 hours

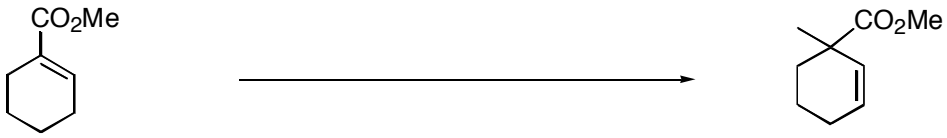
Your Name_____

1. Provide conditions for the following transformations.
Mechanistic details are not required. 4 points each)

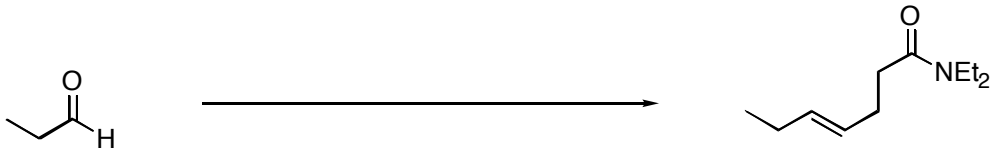
a



b

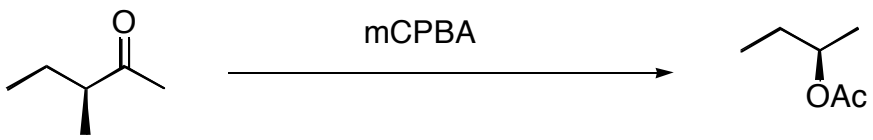


c

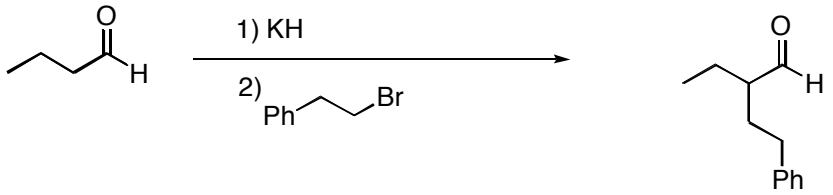


2. Indicate whether the reactions below would proceed as indicated. Provide a brief but detailed explanation. If the product does not proceed as shown, indicate the structure of the product(s) that would be formed instead of (or in addition to) the product that is drawn (4 points each).

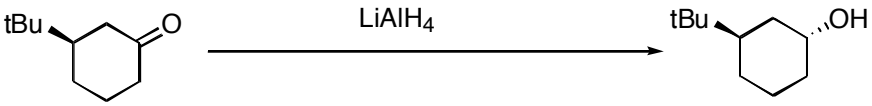
a



b

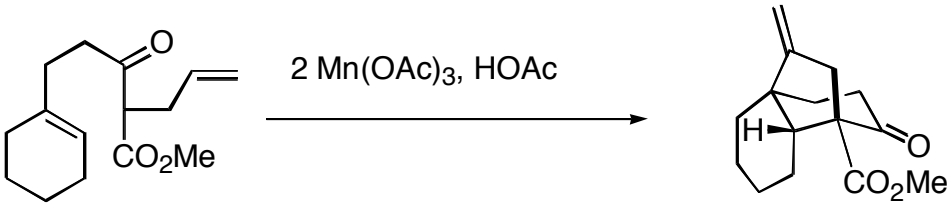


c

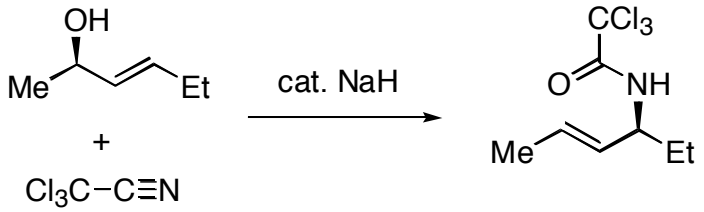


15 points

3. Provide a detailed arrow pushing mechanism

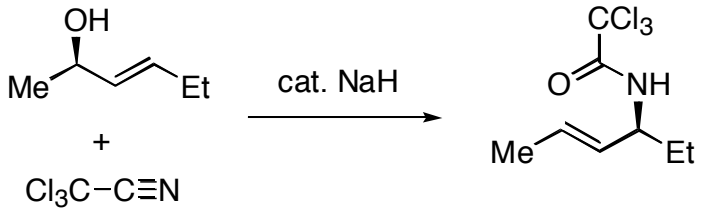


4. This question has two parts, both of which deal with the reaction below:



a. Provide an arrow pushing mechanism for the reaction above. For this part of the problem, it is not necessary to explain the stereochemical aspects of the reaction. Just push the arrows and show how the final product is formed. (10 points)

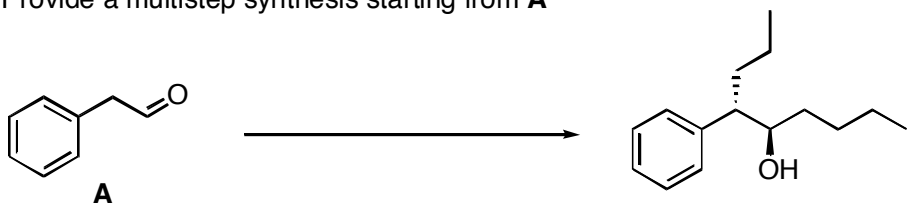
4. This question has two parts, both of which deal with the reaction below:



b. Provide a detailed model with explains all of the stereochemical aspects (stereocenters and alkene stereochemistry). (10 points)

5. Provide a multistep synthesis starting from **A**

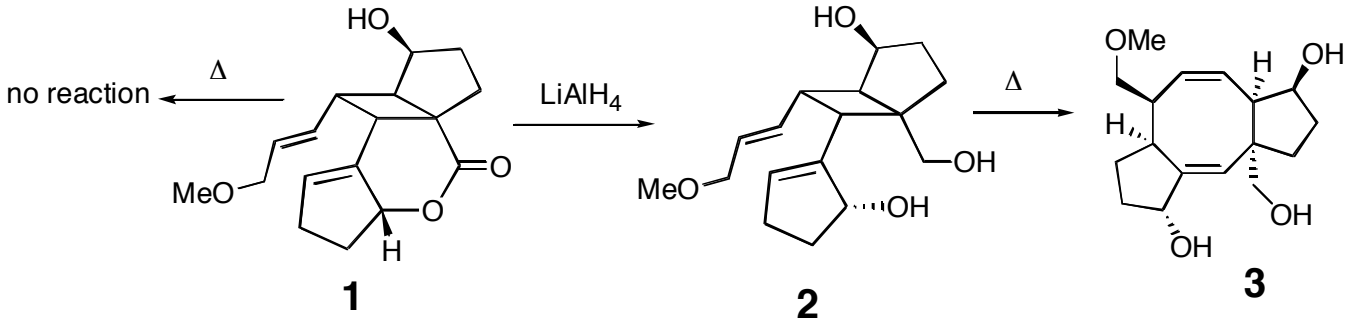
16 points



A

6. Compound **1** does not react when heated. However, reduction of the lactone gives **2**, which rearranges to **3** upon heating.

25 total points



a) provide an arrow pushing mechanism for the transformation of **2** into **3**.

b) provide a stereochemical model that explains why **1** does NOT undergo a Cope rearrangment.

c) provide a model that explains the stereospecificity in the formation of **3**.

HINT: Neither **1** nor **2**can rearrange via a chair transition state. Invoke BOAT transition states instead

Continue your answer on the next page