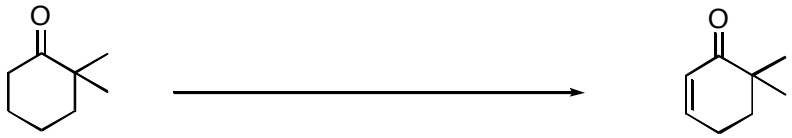
Chem 634
Exam 2
December 10, 2007
3 hours
Prof. Fox

Your Name_____

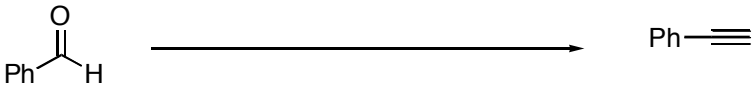
1. Provide reagents for the following transformation. More than one step may be required. Do not write mechanisms.

2.5 points each

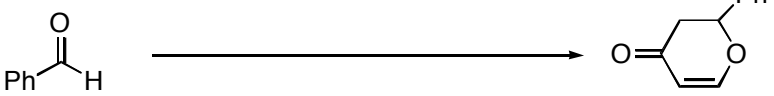
*a*



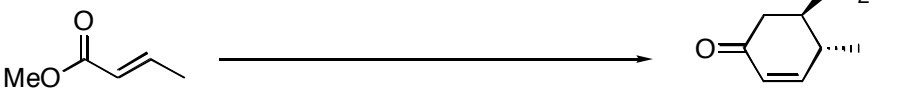

*b*




*c*

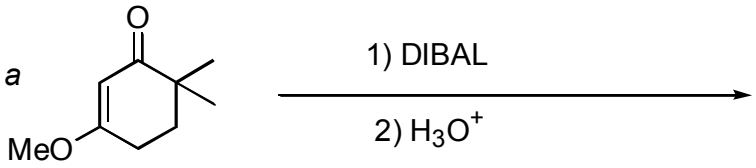



*d*

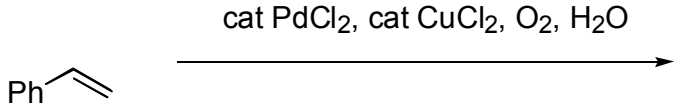


2. Provide the products of the following transformations. Do not provide mechanisms (2.5 pts each)

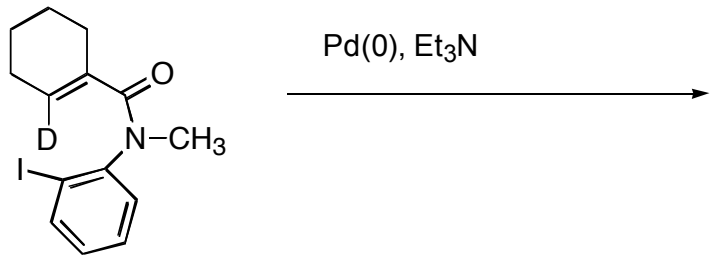
*a*



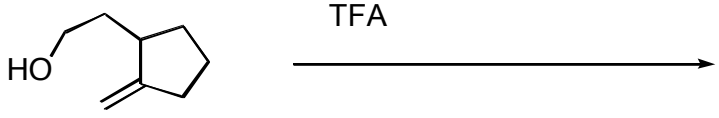

*b*




*c*

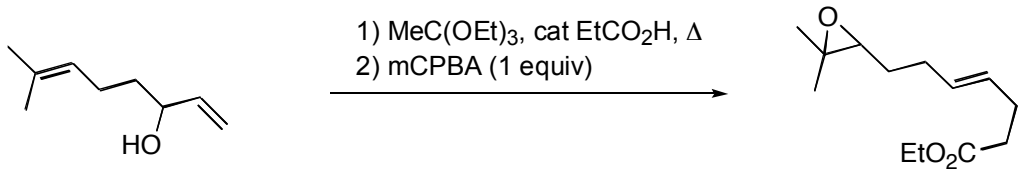



*d*

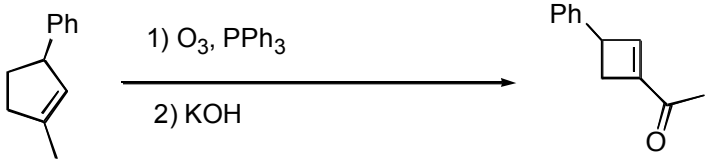


3. Indicate if the following would or would not proceed as written. If it will not proceed as written, provide the structure of the product that would be formed instead along with a brief explanation. 4 pts each

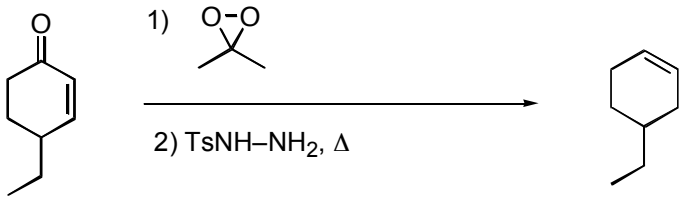
a.



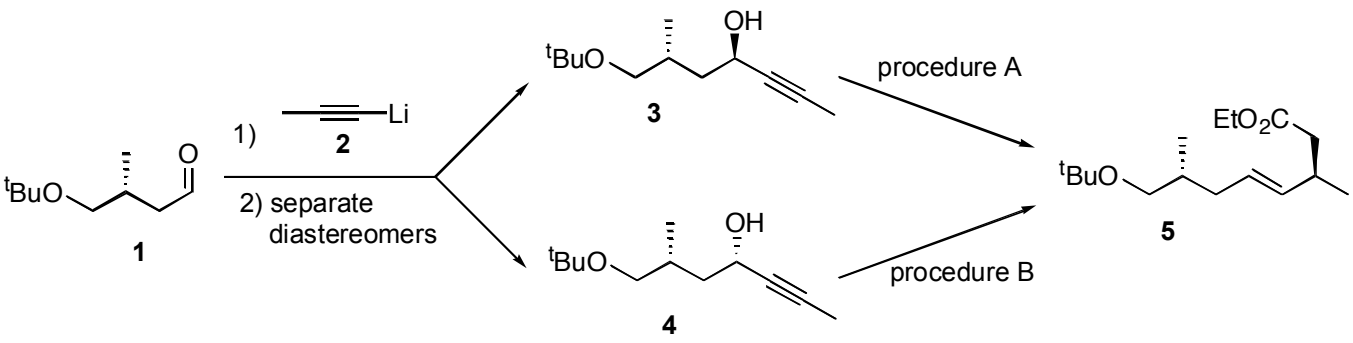

b.




c.



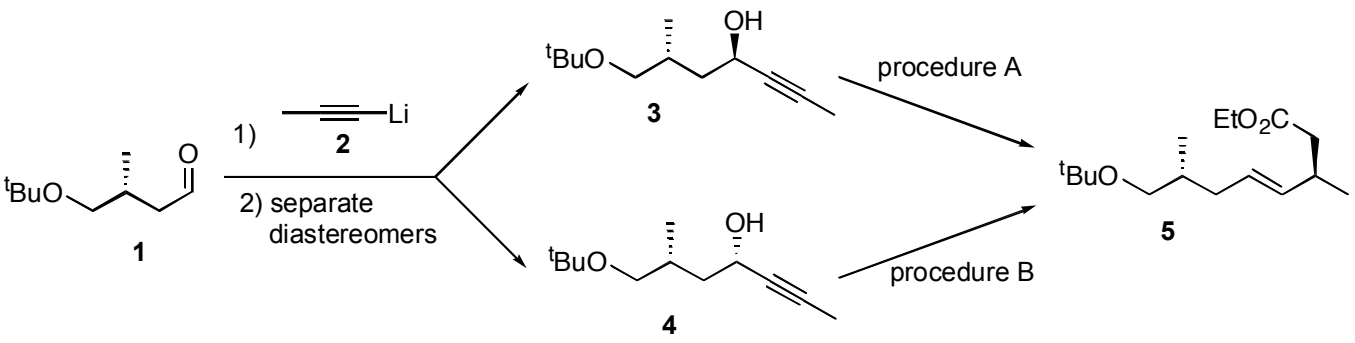
4. You require a synthesis of **5** from aldehyde **1**. Unfortunately, the addition of acetylide **2** to aldehyde **1** is not selective: it gives a mixture of diastereomers **3** and **4**. Luckily, diastereomers **3** and **4** are separable by chromatography, and can be separately converted into **5**. 20 pts




a. Outline a stereospecific synthesis of **5** from **3** below.

b. Provide a stereochemical model that explains the stereospecificity of the key transformation in your proposed synthesis

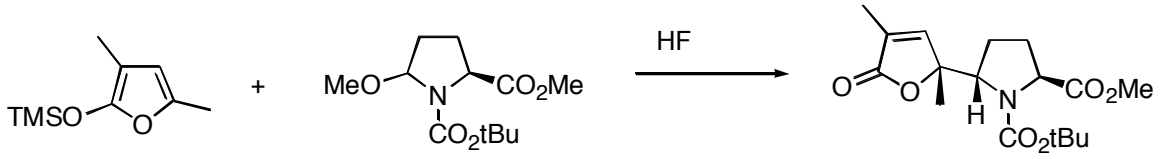
4. You require a synthesis of **5** from aldehyde **1**. Unfortunately, the addition of acetylide **2** to aldehyde **1** is not selective: it gives a mixture of diastereomers **3** and **4**. Luckily, diastereomers **3** and **4** are separable by chromatography, and can be separately converted into **5**. 20 pts



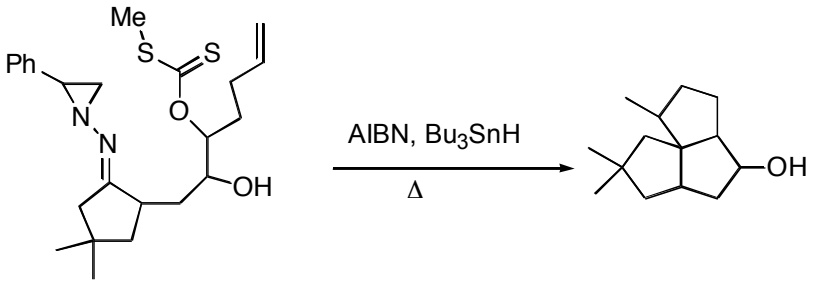

c. Outline a stereospecific synthesis of **5** from **4** below.

d. Provide a stereochemical model that explains the stereospecificity of the key transformation in your proposed synthesis

5. Provide a detailed, arrow pushing mechanism. 12 pts



6. Provide a detailed, arrow pushing mechanism. 20 pts



7. Outline a multistep synthesis 20 pts