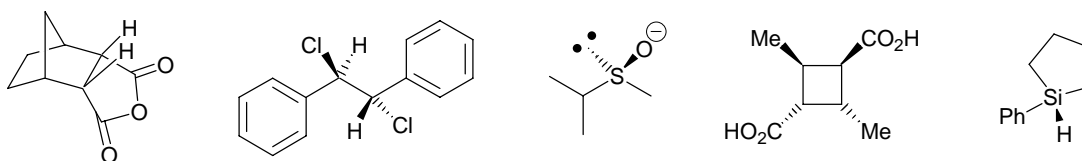


Asymmetric Synthesis Tutorial Sheet

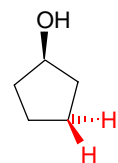
PAC

Attempt **all the questions** and hand your answers into your tutor at least 2 days before your tutorial. **You will need to do some additional reading** from the recommended texts to answer some of the question.

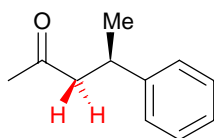
Q1: Which of the following molecules are chiral? For those that you select, draw the enantiomer. (*Hint:* It may be helpful to build molecular models).



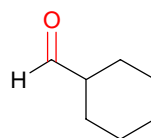
Q2: Examine the following molecules and indicate whether the groups or faces present are diastereotopic or enantiotopic. In the cases of the aldehydes identify the *Re*- and *Si*-faces of the carbonyl groups.



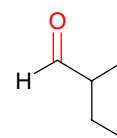
protons shown



protons shown

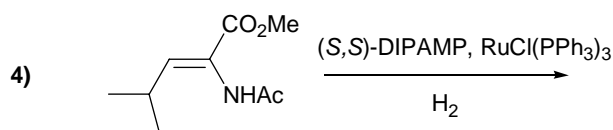
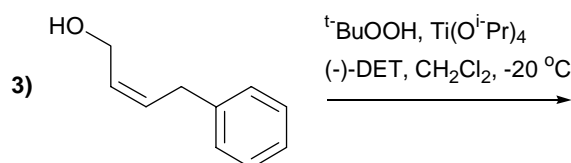
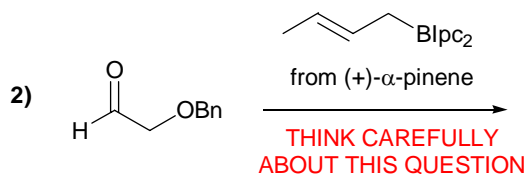
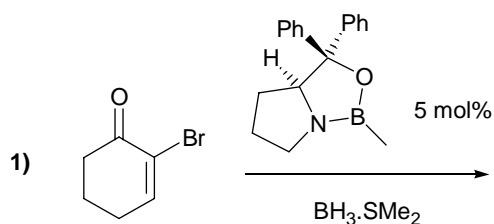


faces of the C=O

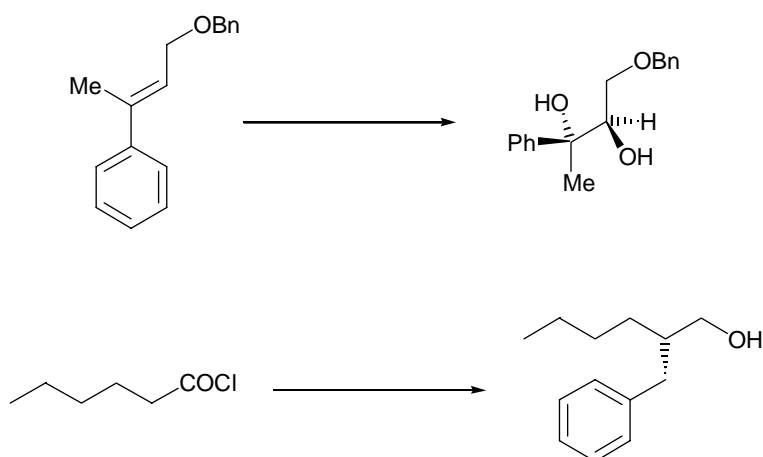


faces of the C=O

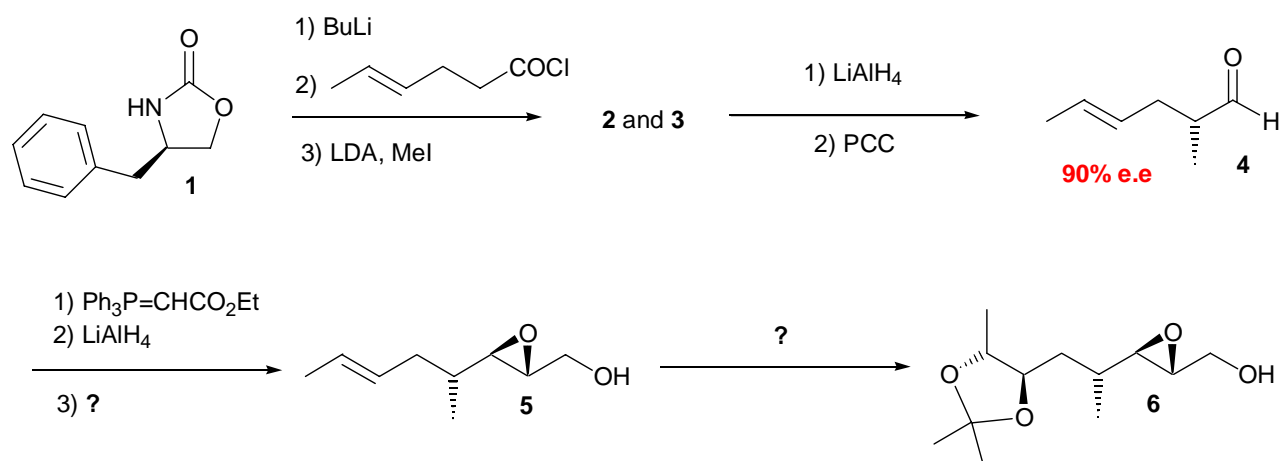
Q3: Giving your reasons, deduce the structure and stereochemistry of the major product for each of the following transformations.



Q4: Giving your reasons, deduce the reagent(s) needed to affect the following transformations.



Q5:



- Suggest a synthesis of **1**.
- Give structures for compounds **2** and **3**, identify the major compound and give the ratio of the compounds formed.
- With reference to the scheme above, suggest a method for the preparation of **4** in **98% e.e.**
- Provide mechanisms for the conversion of **4** to **5** and suggest reagents and conditions to accomplish the third transformation in the synthesis.
- Suggest reagents and conditions to transform **5** into **6**. Provide mechanisms for the reactions you choose and explain any selectivity issues.