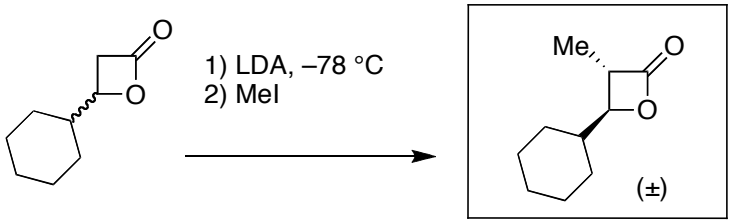
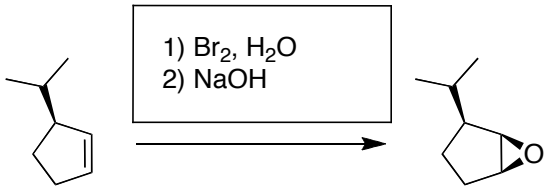
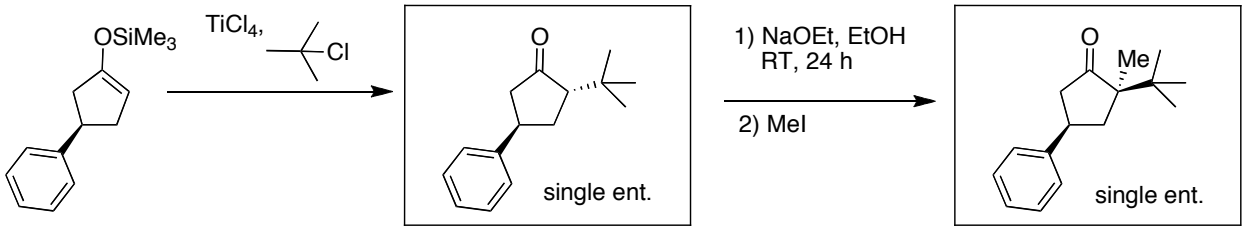
Problem set 4
Chapter 33.

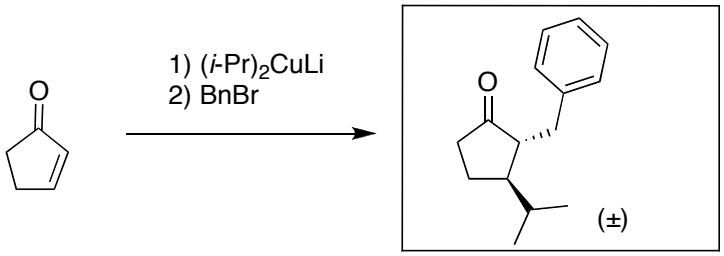
1. Fill in the boxes with the reagents required to produce the stereoisomer shown, or with the MAJOR stereoisomer produced by the reaction conditions given. *For all products, indicate whether the product is achiral, racemic, or a single enantiomer.*

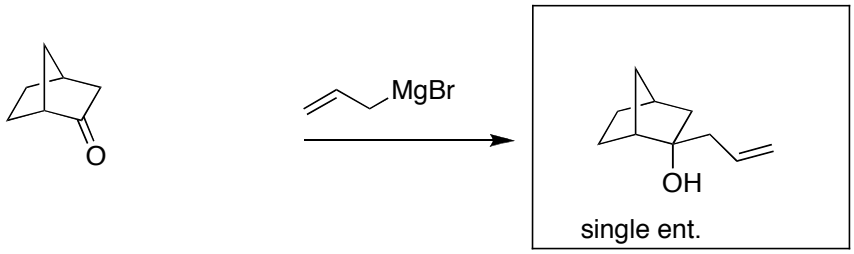


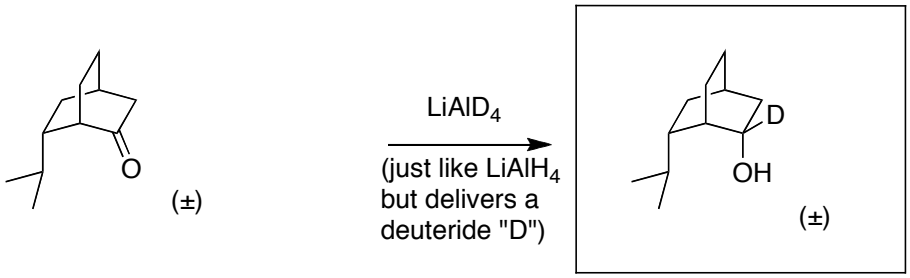


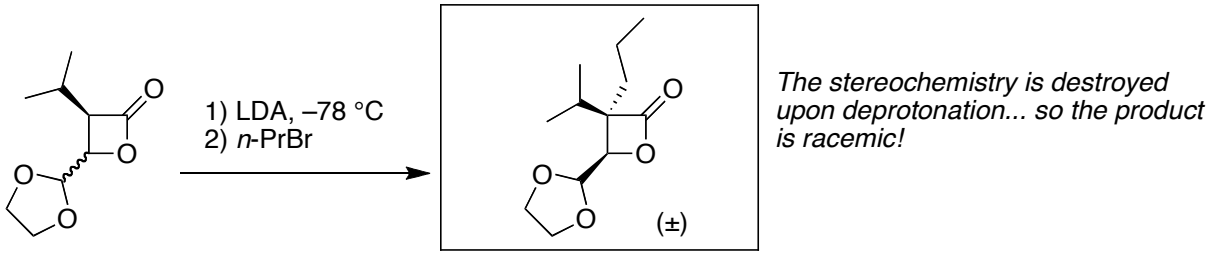


thermodynamic enolate formation = most substituted

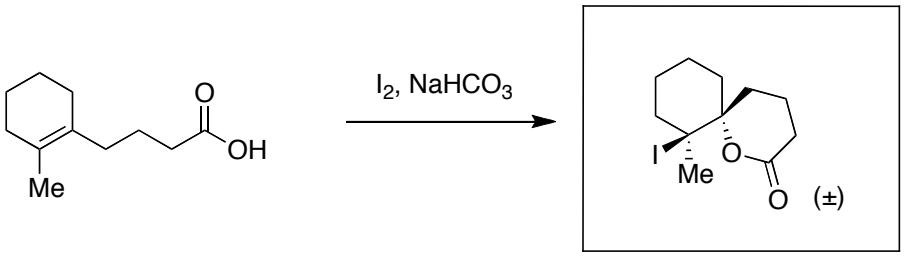






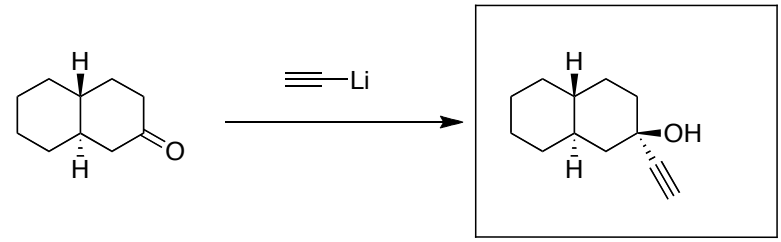


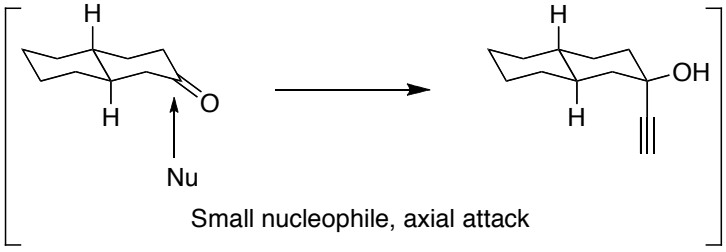
The stereochemistry is destroyed upon deprotonation... so the product is racemic!



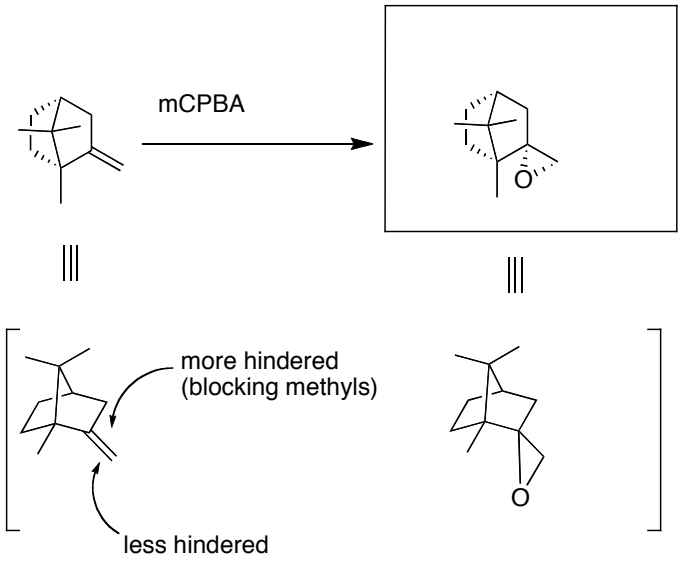
2. Give the product of the following reactions. In the space below each reaction, include stereochemical (3D) diagrams of starting materials and products that explain the observed stereoselectivity.

a)

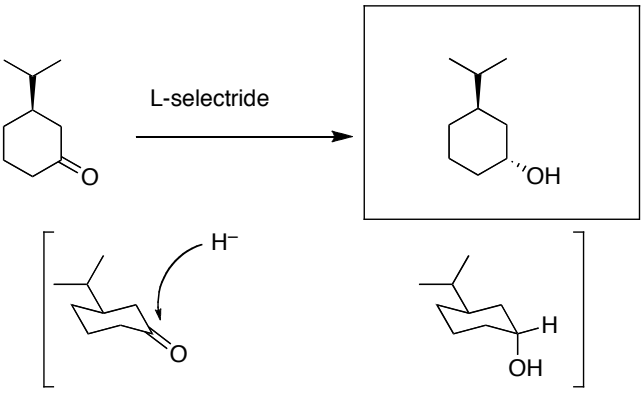




b)

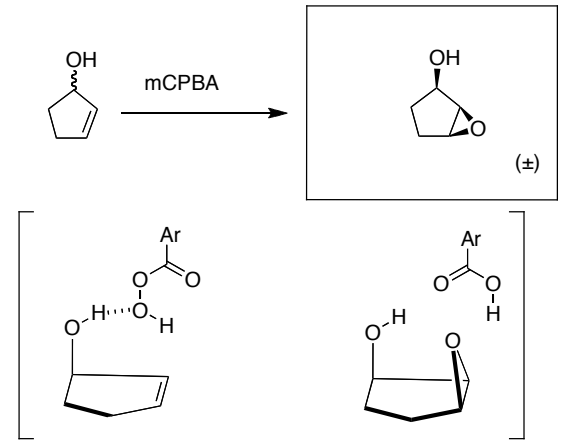


c)



Large reducing agent, equatorial attack of hydride

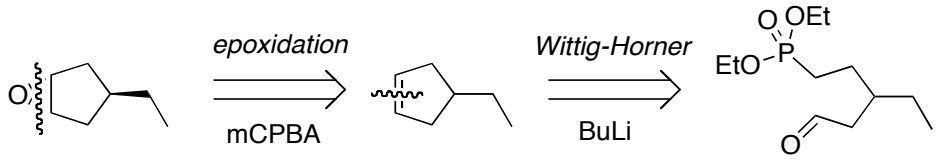
d)



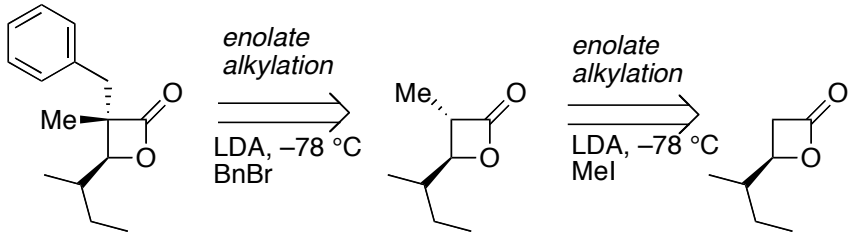
Hydrogen bonding attracts mCPBA to same side as alcohol

4. Plan a synthesis of the following compounds from materials following the rules given. **Clearly indicate the bond(s) you are disconnecting in each step and indicate which reagents and conditions are required for the reaction(s) you are conducting.**

a) Made from completely acyclic materials.

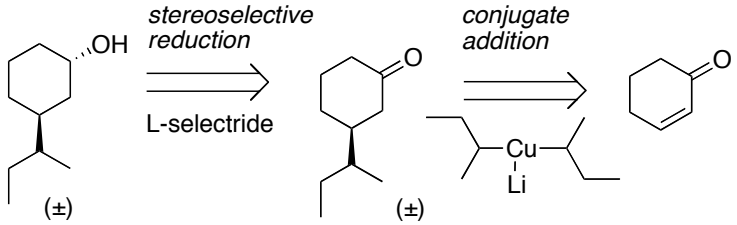


b) Made from materials with 7 or fewer carbon atoms.

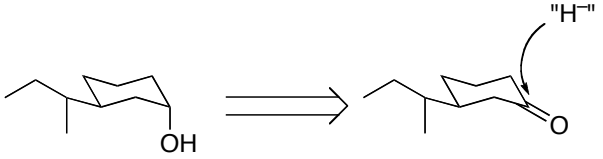


The key here is realizing that two alkylations are needed, and that the stereochemistry doesn't matter until the second step because the stereochemistry produced in the first step will be destroyed upon formation of the enolate a second time.

c) Made from materials with 6 or fewer carbon atoms.



When confronted with stereoselectivity in a retrosynthesis, draw the best conformation you can of the product in order to better understand all stereochemical approaches while you plan disconnections.



ketone reduction with equatorial attack = L-selectride