283G **Name**
Midterm
Instructor: Dr. Brian Pagenkopf
Saturday, March 15, 2008
2:00 pm – 5:00

Key

First Letter of Last Name

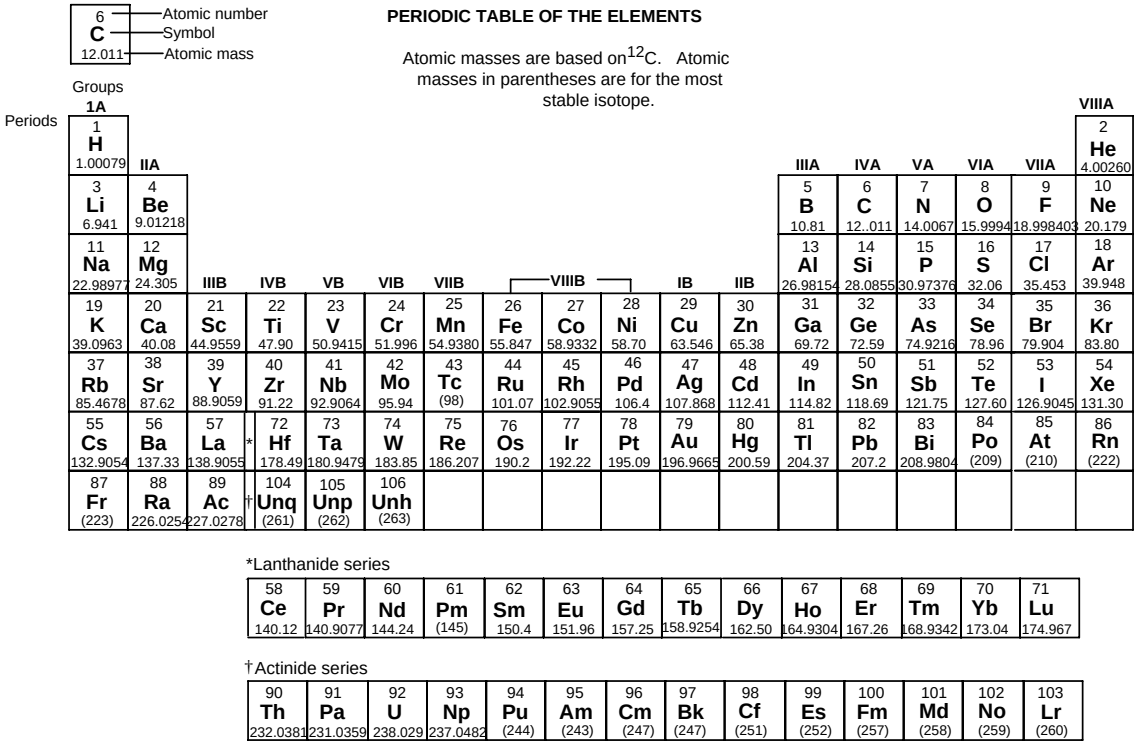
Work alone. Do not share answers or information. **No notes, books, calculators, cell phones, iPods, computers or electronics of any sort allowed. Please turn off your phone now.**

You have 3 hours to complete the exam.

Pay attention to how many points each question is worth, and manage your time accordingly. Be sure you have all of the exam pages.

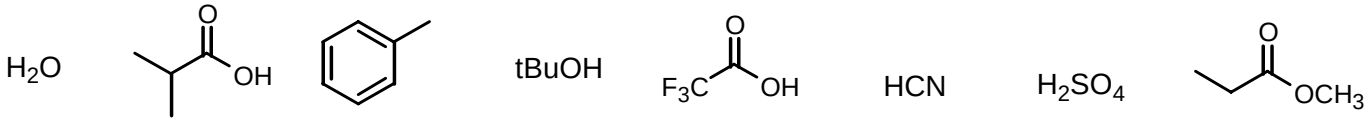
Please do not write your name on subsequent pages, but you may write your ID number.

If needed, any blank scratch paper must be provided by the proctor.



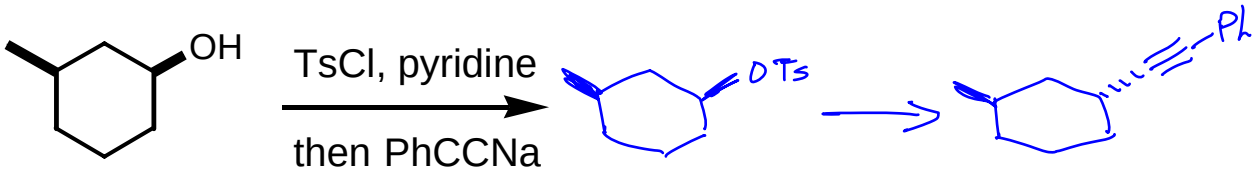
page	points	
3	13	
4	12	
5	12	
6	12	
7	12	
8	12	
9	12	
10	15	
Total	100	

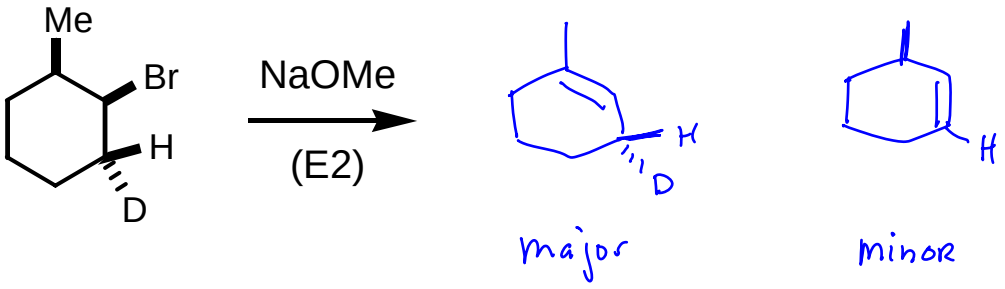
Rank the following molecules in order of increasing acidity (which is the same as decreasing pKa). Write an 8 in the box for the least acidic, a 1 in the box under the most acidic, and so on. (5 marks)

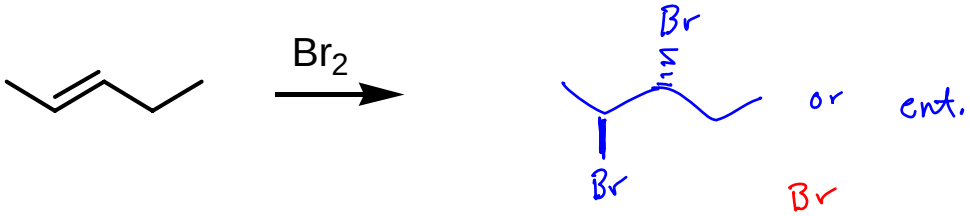


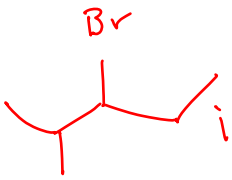
5	3	8	6	2	4	1	7

Show products for the following reactions. For some questions stereochemistry is a critical part of the answer for full marks. Be on the alert for carbocation rearrangements.

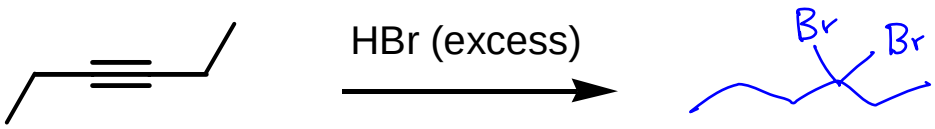


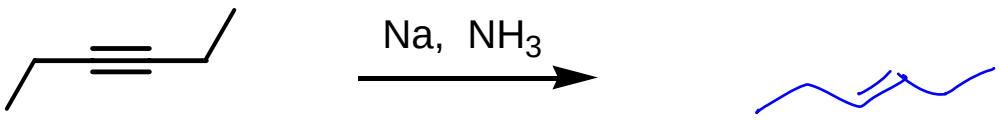




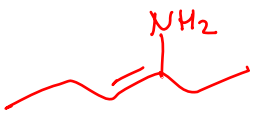


is not acceptable. There is no stereochem. info here.

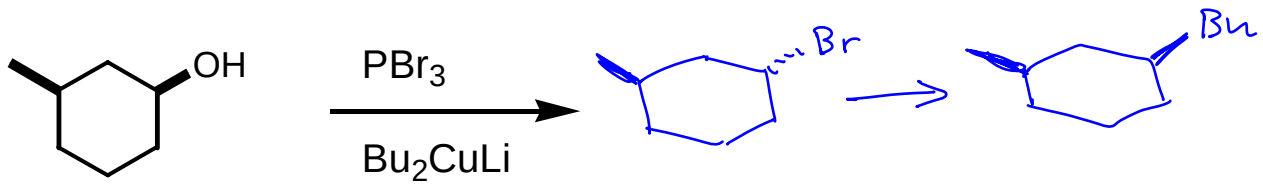


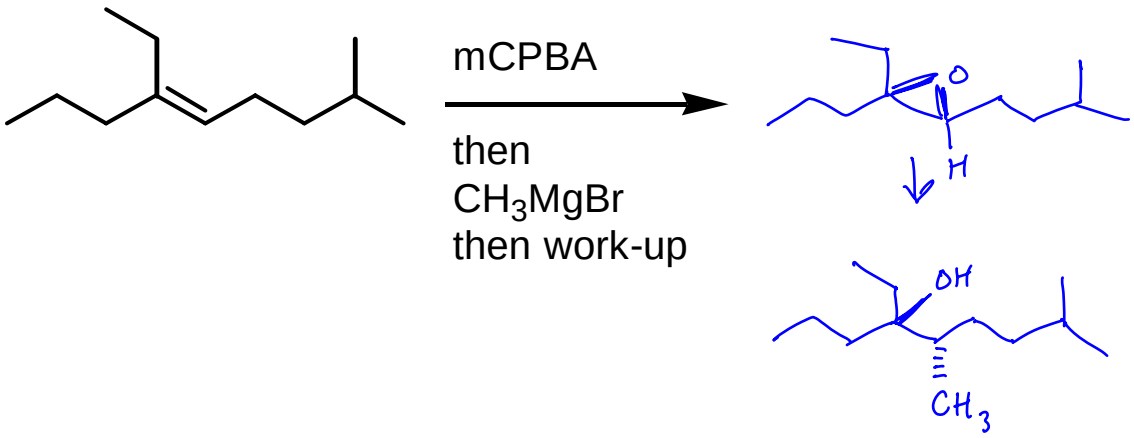


trans

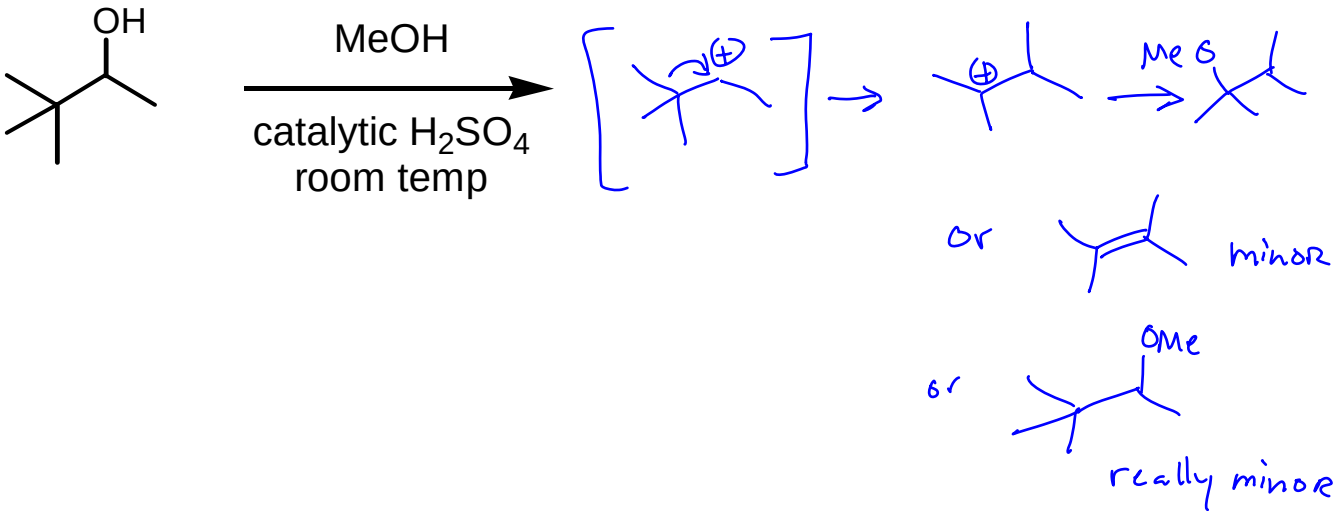


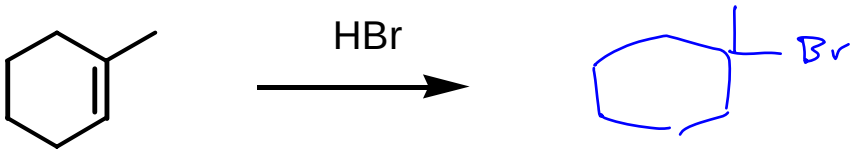
and related things are totally wrong

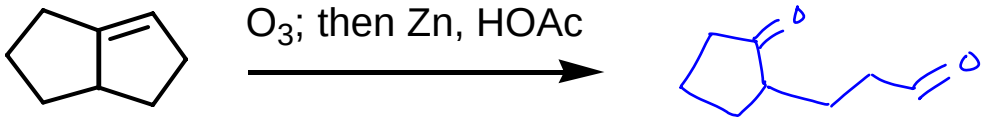


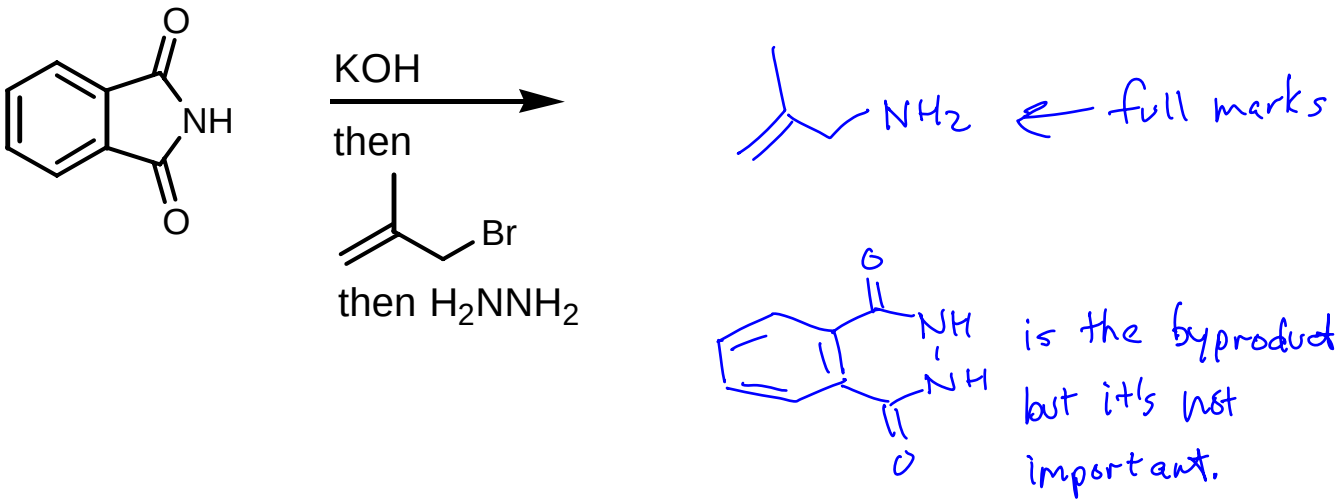


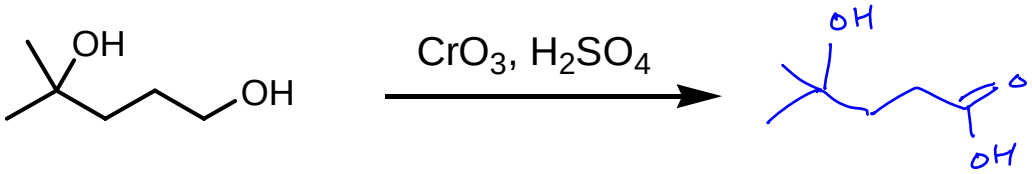
full marks required correct stereochemistry

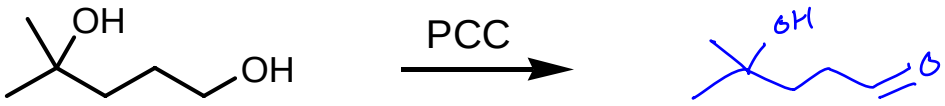


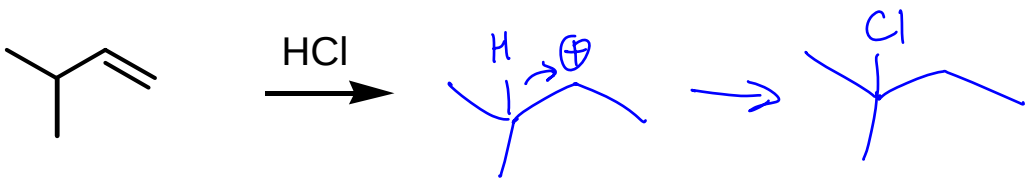

HBr
Br


O3; then Zn, HOAc
O
O

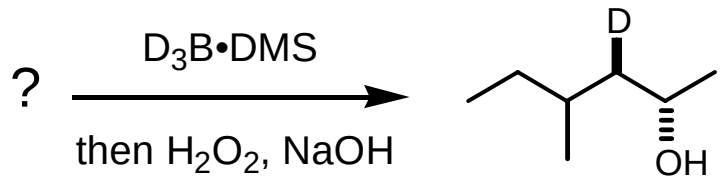

O
NH
O
KOH
then
Br
then H2NNH2
NH2
full marks
O
NH
NH
O
is the byproduct but it's not important.

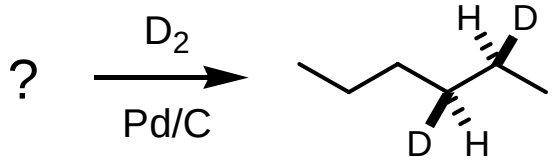

OH
OH
CrO_3, H_2SO_4
OH
O
OH

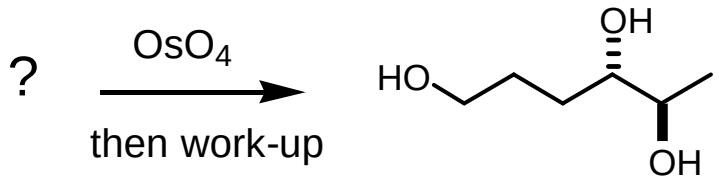

OH
OH
PCC
OH
O

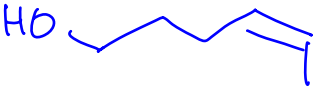

HCl
H
Cl

Identify the starting material, being careful in regard to cis//trans geometry of the alkene. You may need to do some bond rotations. 3 marks each for the cis/trans part

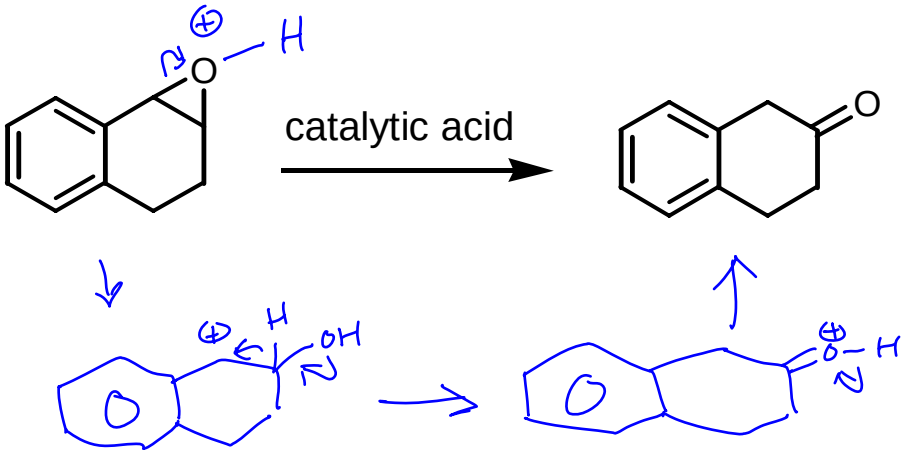


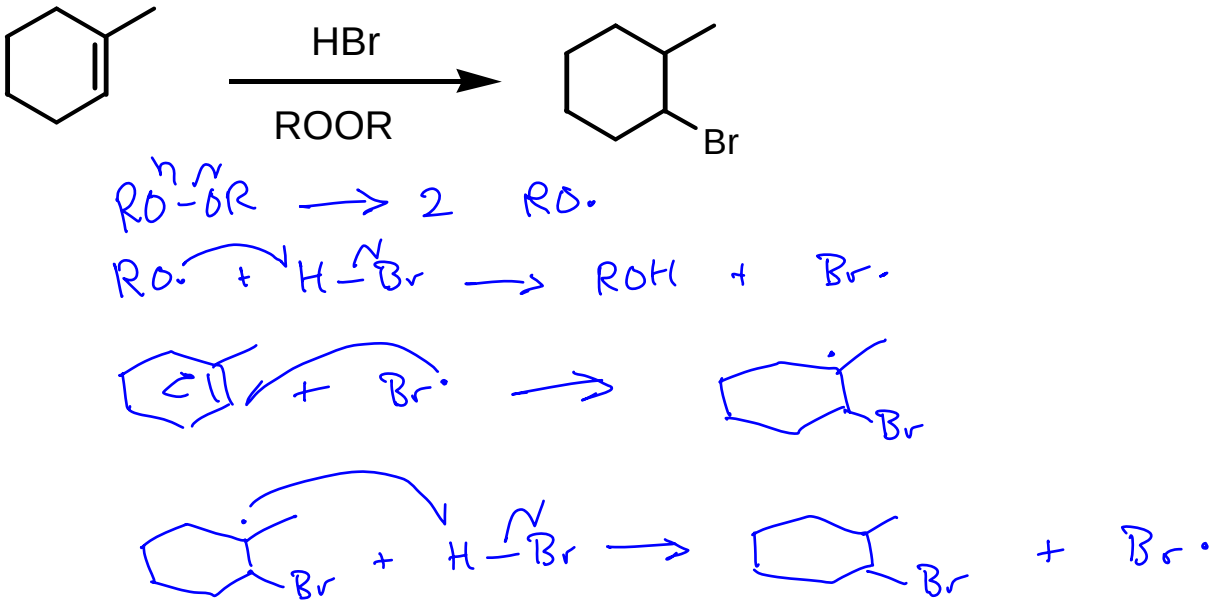




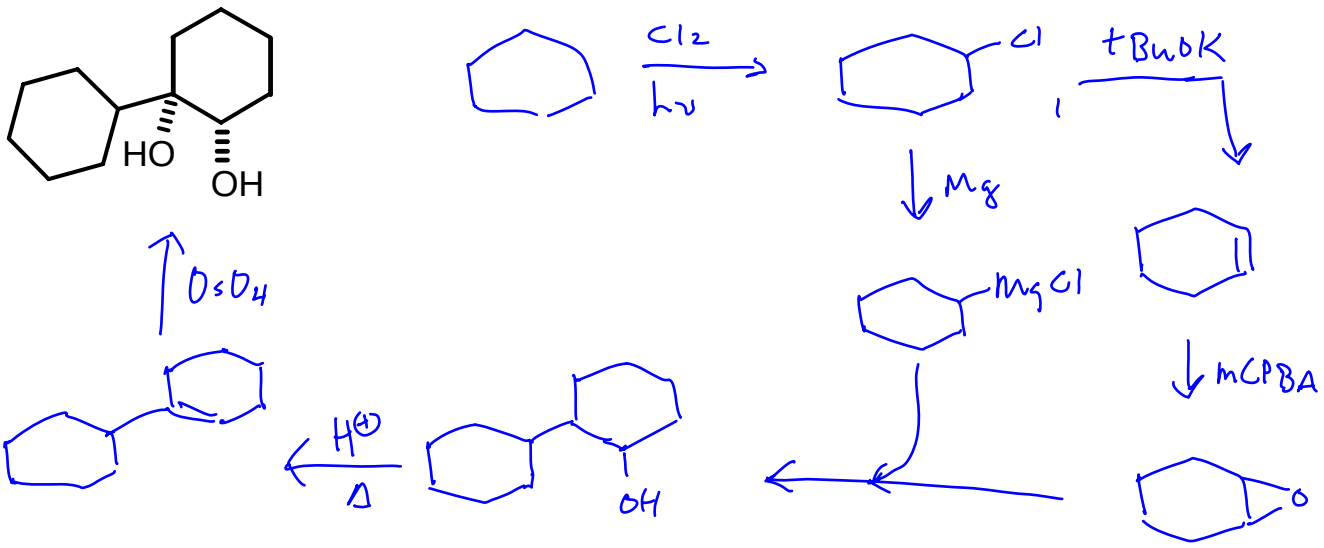


Provide plausible mechanisms for the following transformations (4 + 8 marks).

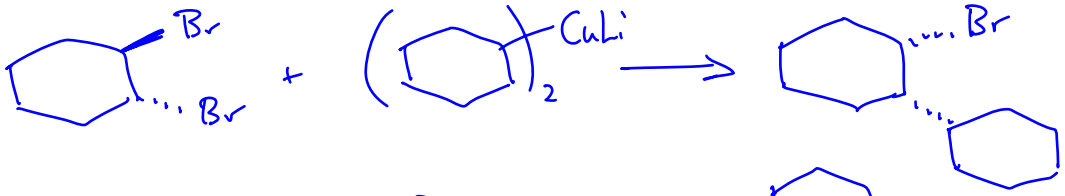




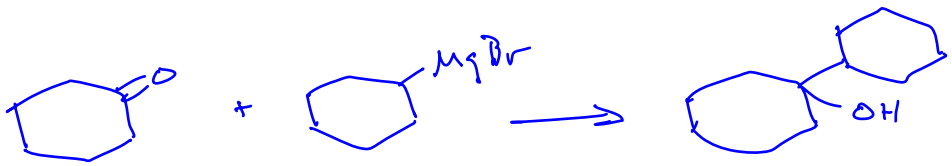
Propose a laboratory synthesis of the following compound using any reagents you want with the restriction that cyclohexane can be your only source of carbon.



also OK were routes involving the following



and



(but this chemistry hasn't been discussed in lecture yet)

Approaches that involved this proposed reaction are flawed on so many levels...