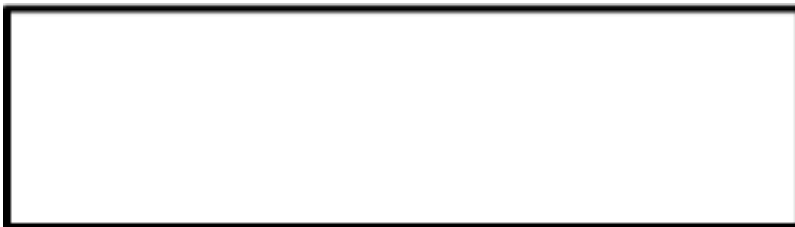


Chem 14D Dr. Ow  
Exam 2 Fall 2021

Honor Statement:

On my honor and character, I confirm that I am adhering to all academic codes of conduct. This includes, but not limited to: not consulting with any other students or individuals at any time during exam availability, not using any other websites/textbooks besides the ebook and CCLE, not using any apps/communication platforms whatsoever. **I am fully aware that academic dishonesty will not be tolerated and is subject to severe disciplinary actions.**

Sign here:

A large, empty rectangular box with a thick black border, intended for a student to sign their name.

1. For each question, CIRCLE your answer.

(15 pts)

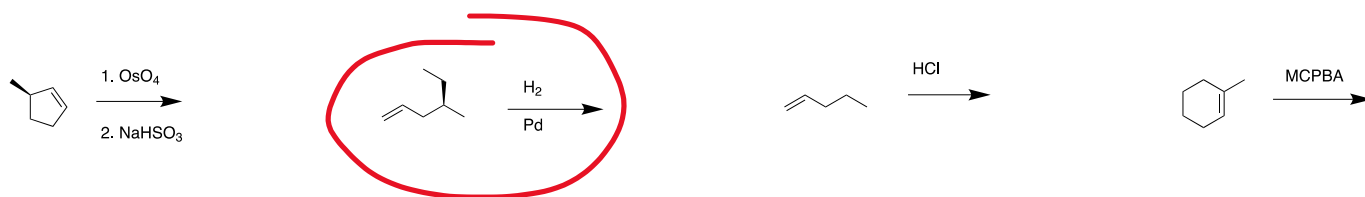
a) The reaction that does not proceed via a carbocation intermediate:



b) The compound that will react the slowest upon nitration:



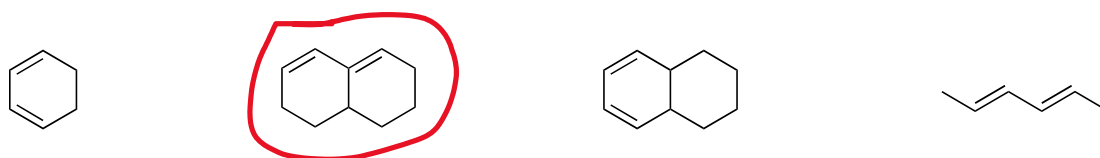
c) The reaction that will form the fewest number of major products:



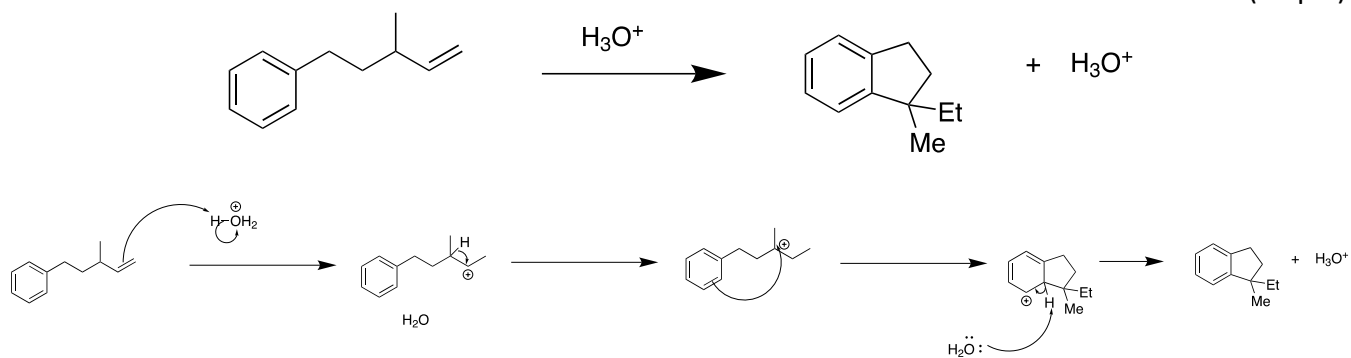
d) The reaction that will occur the fastest via elimination-addition:



e) The compound that cannot undergo a Diels-Alder reaction:

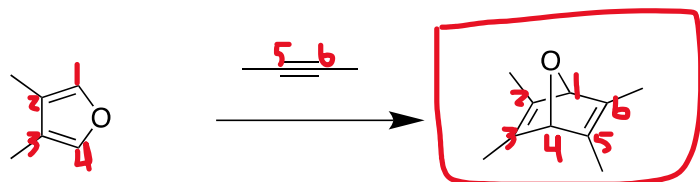
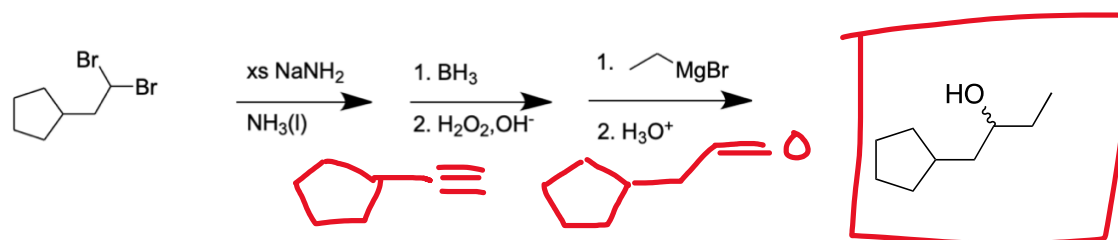
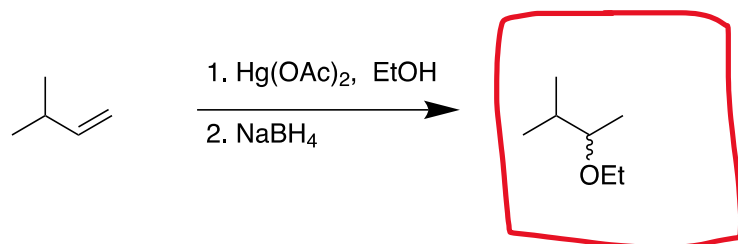
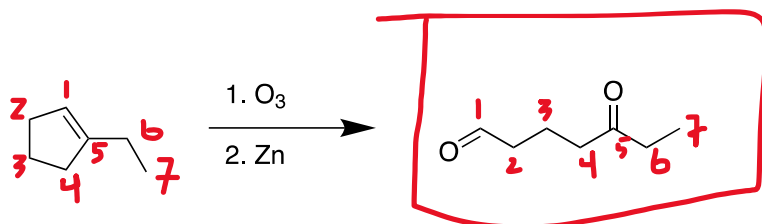
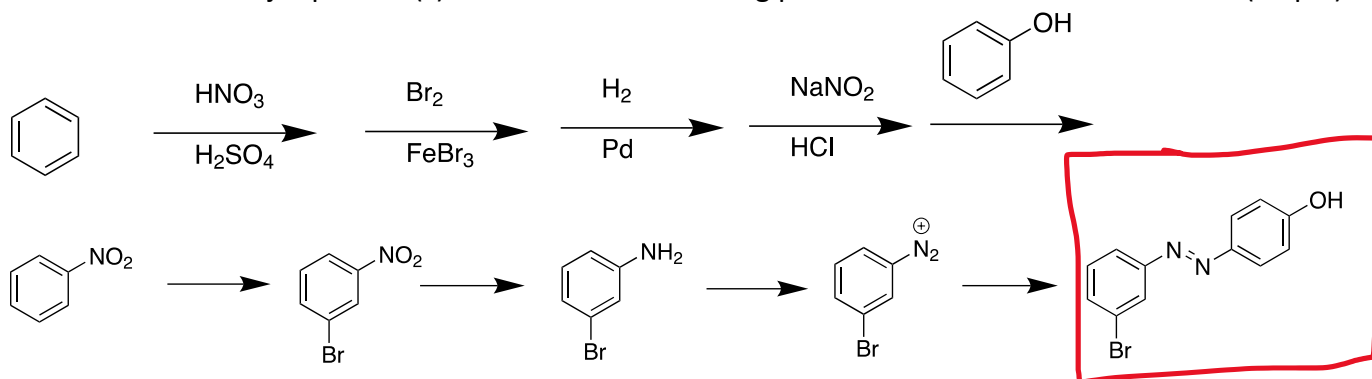


2. Use curved arrows to illustrate the stepwise mechanism for the following acid-catalyzed reaction:  
(13 pts)



3. Draw the final major product(s) for each of the following processes:

(30 pts)

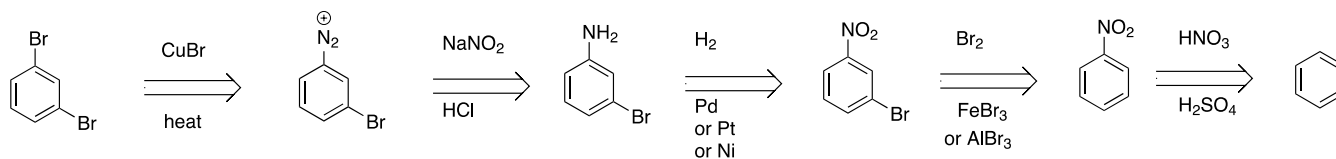
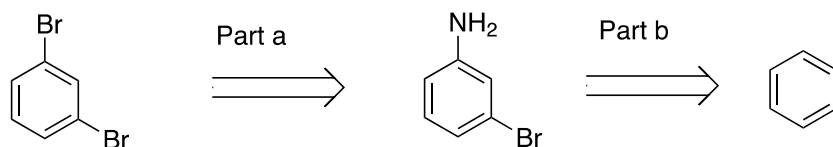


4.

(15 pts)

Complete the following retrosynthetic analysis. Supply all reagents and precursors. **Parts A and B each consist of at least one reaction.** Maximum points will be awarded for retrosynthesis routes that:

- are all correct and
- consist of the fewest possible reactions.



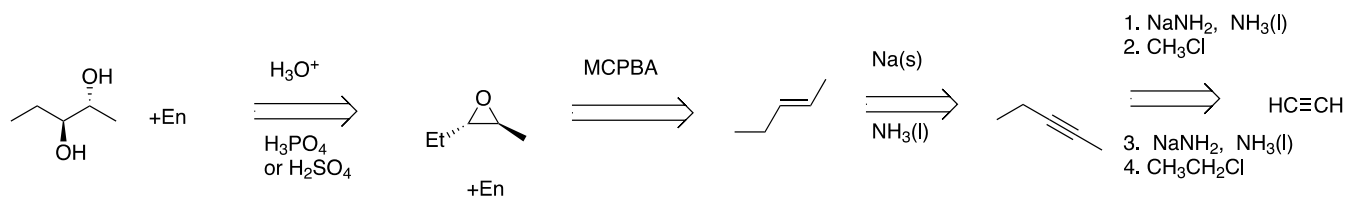
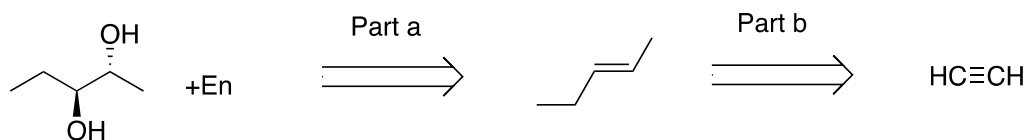
PART A

PART B

In place of cat-H<sub>2</sub>, can use HCl, Zn(Hg) or Fe, HCl

5. (15 pts)  
Complete the following retrosynthetic analysis. Supply all reagents and precursors. **Parts A and B each consist of at least one reaction.** Maximum points will be awarded for retrosynthesis routes that:

- are all correct and
- consist of the fewest possible reactions.



PART A

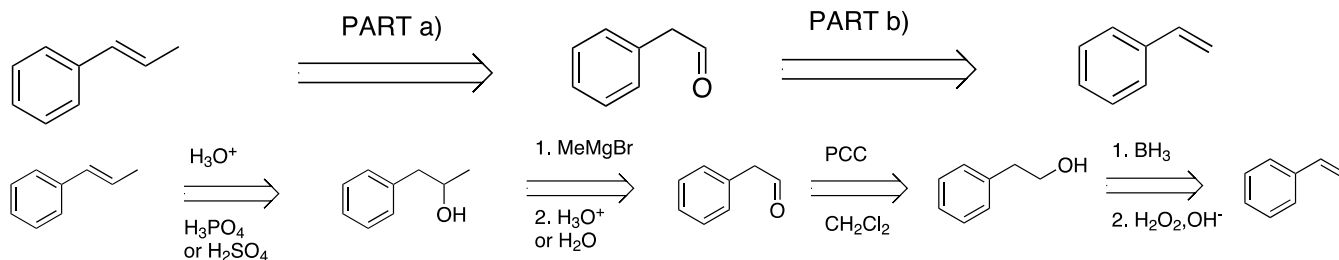
PART B

In place of MCPBA, can use RCO<sub>3</sub>H

In place of NaNH<sub>2</sub>/NH<sub>3</sub>, can use BuLi or NaH

6. (13 pts)  
Complete the following retrosynthetic analysis. Supply all reagents and precursors. **Parts A and B each consist of at least one reaction.** Maximum points will be awarded for retrosynthesis routes that:

- are all correct and
- consist of the fewest possible reactions.



PART A

In place of  $\text{MeMgBr}$ , can use  $\text{MeLi}$

PART B

In place of  $\text{BH}_3$  THF, can use  $\text{R}_2\text{BH}$